

Nuclear



ADVANCED RISK MITIGATION SOLUTIONS

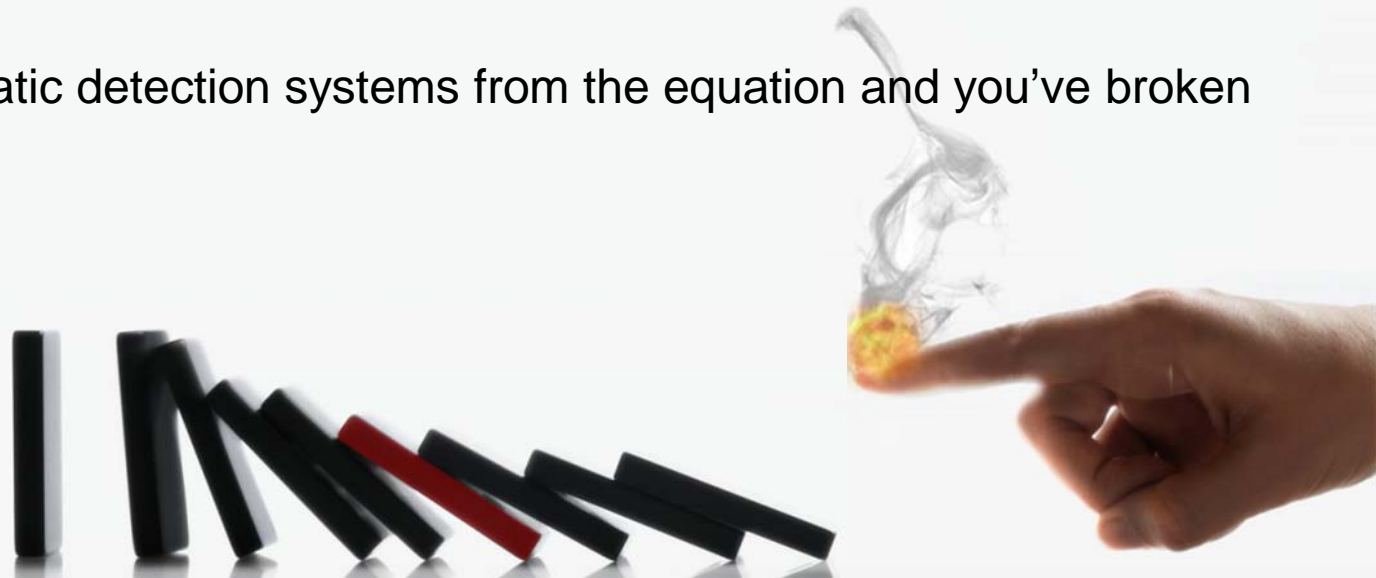


Role of Fire Detection

Automatic fire detection systems play an essential role in the overall fire protection strategy:

- First line of defense against fire (thermal) / smoke (non-thermal) threats
- Early intervention by personnel to mitigate potential incidents
- Potentially mitigates need for fire department response
- Initiation of sequential systems or procedures

Remove automatic detection systems from the equation and you've broken the sequence



Detection

Challenges

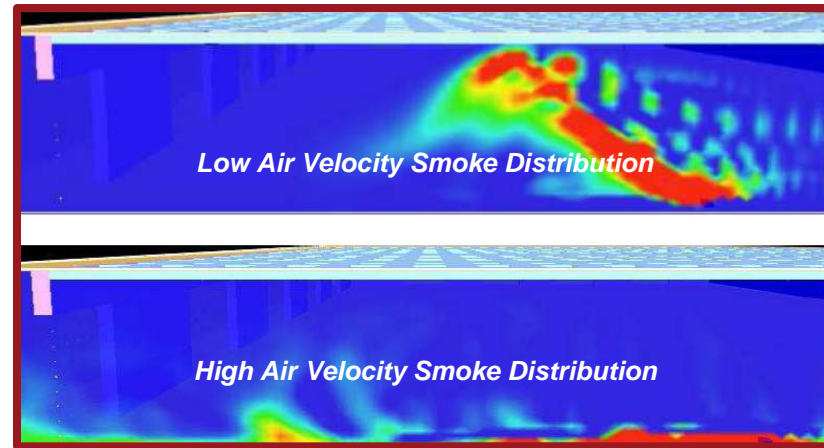
Challenges for conventional fire detection technologies

- Airflow
- Dilution
- Stratification
- Barriers
- Temperature
- Interference
- Integrity
- Ambient smoke
- Contamination
- Accessibility

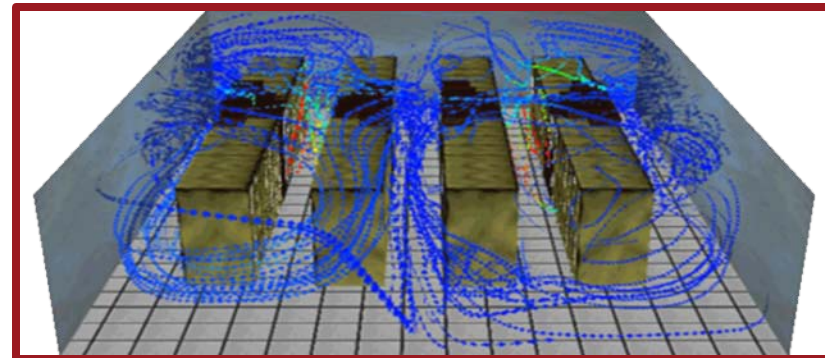
Detection Challenges

Challenges for reliable fire detection:

- Smoke dilution
- HVAC Scrubbing
- Airflow interferes with normal dispersion of smoke
- Unpredictable air flow patterns
- The cooling effects of HVAC systems will decrease the temperature of the smoke plume
- Limitations on placement due to:
 - Obstructions
 - Velocity
 - Temperature
- Accessibility for inspection, testing and maintenance once installed can be difficult and risks impact to network operations



Air velocity affect on dispersion of smoke



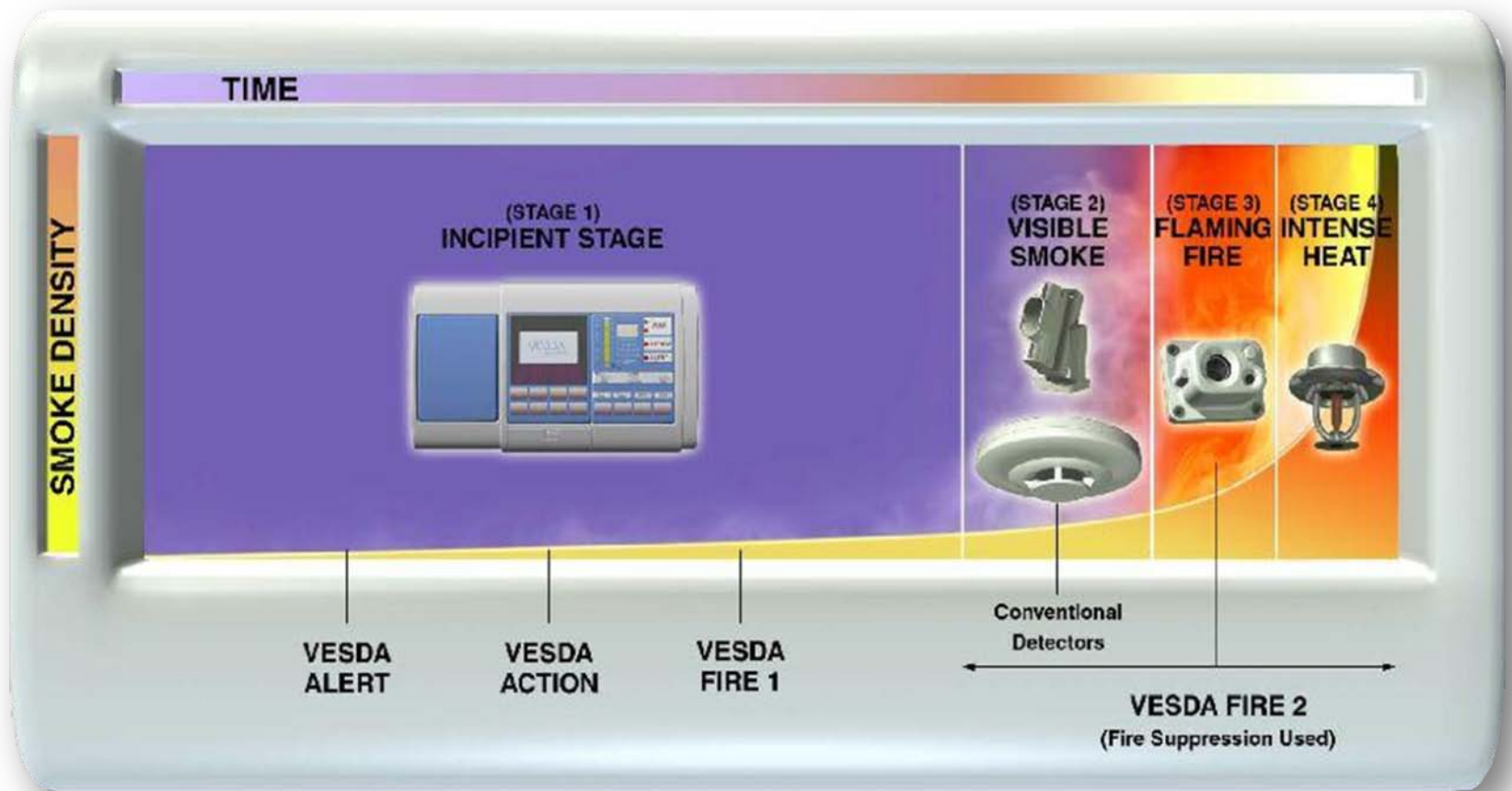
Unpredictable airflow patterns

Detection Challenges



Very Early Warning Fire Detection VEWFD

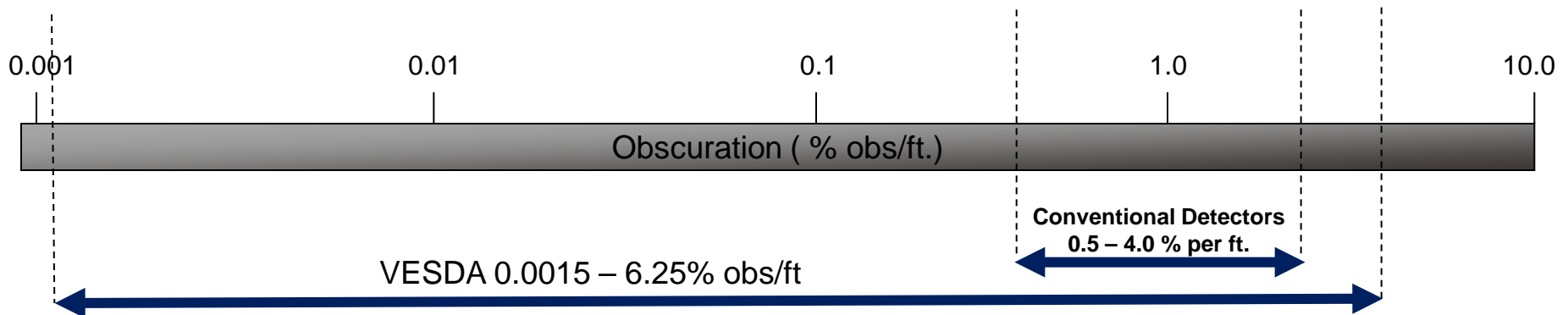
“One detector monitors the entire progression of fire development”



Sensitivity Comparison



In simple terms, Obscuration is the effect that smoke has on reducing visibility. Higher concentrations of smoke result in higher obscuration levels, lowering visibility.

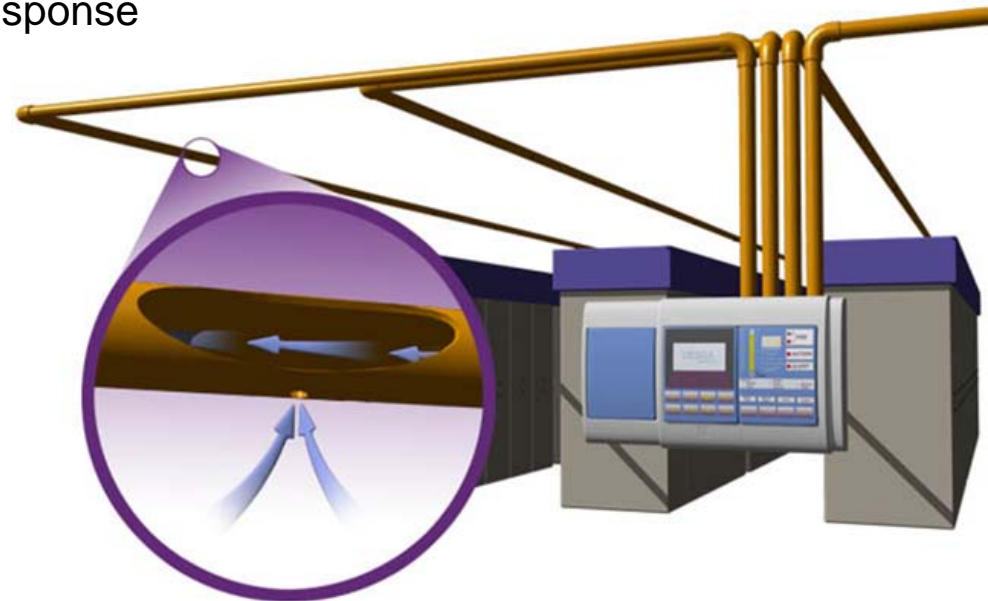


Air Sampling Very Early Warning Smoke Detection Apparatus

VESDA

Key Benefits:

- Very Early Warning Fire Detection
- Absolute smoke detection with fixed calibration
- Active vs. passive detection performance
- Predictable detection performance
- Cumulative detection performance
- One detectors monitors entire fire progression
- Multiple alarm thresholds for staged response
- Flexible sampling configurations
- Unaffected by airflow or temperature extremes
- Low maintenance



Operation of VESDA

Absolute Smoke Measurement Device

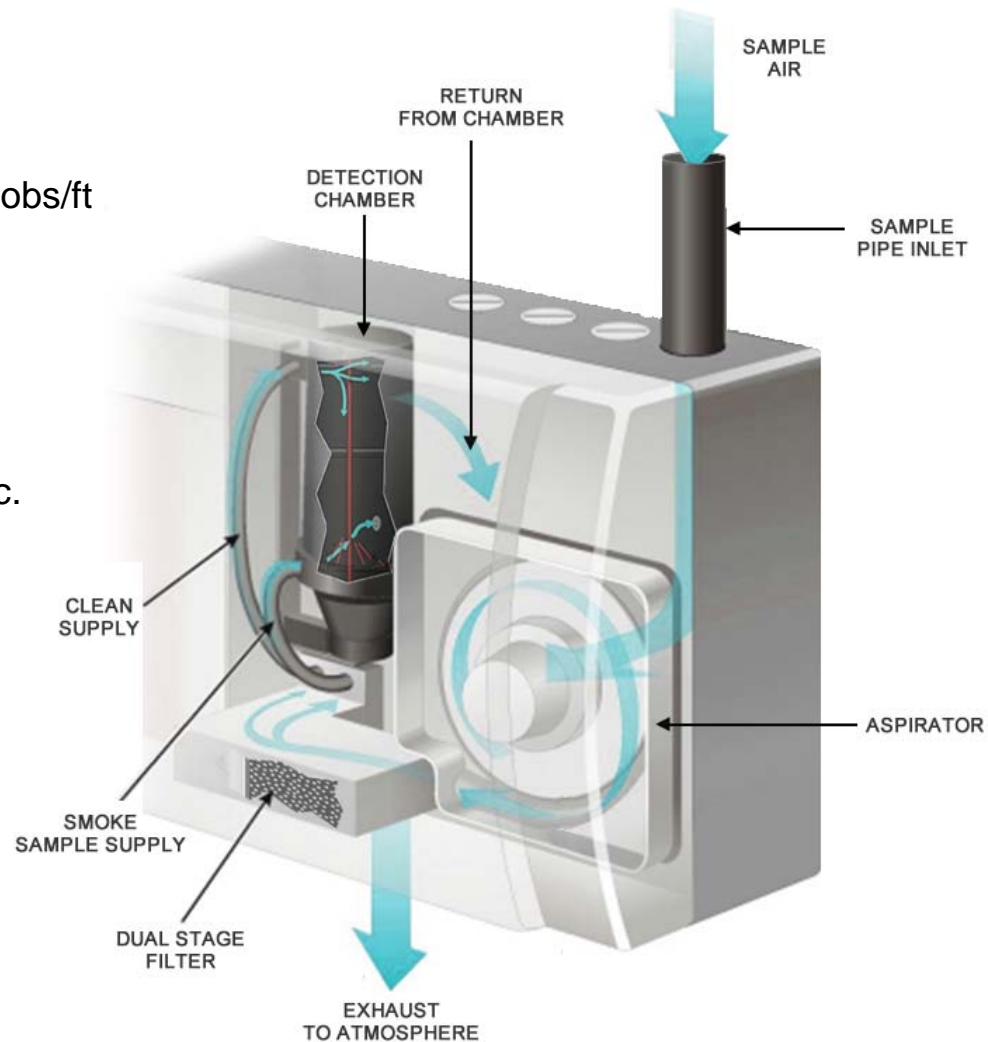
- High stability fixed calibration
- Alarm thresholds between 0.0015 and 6.25% obs/ft
- Optical light-scattering detection principle
- Solid state laser light source

Reliability

- High tolerance and rejection of nuisance alarms caused by dust, steam and insects, etc.
- High-stability optics

Integrity

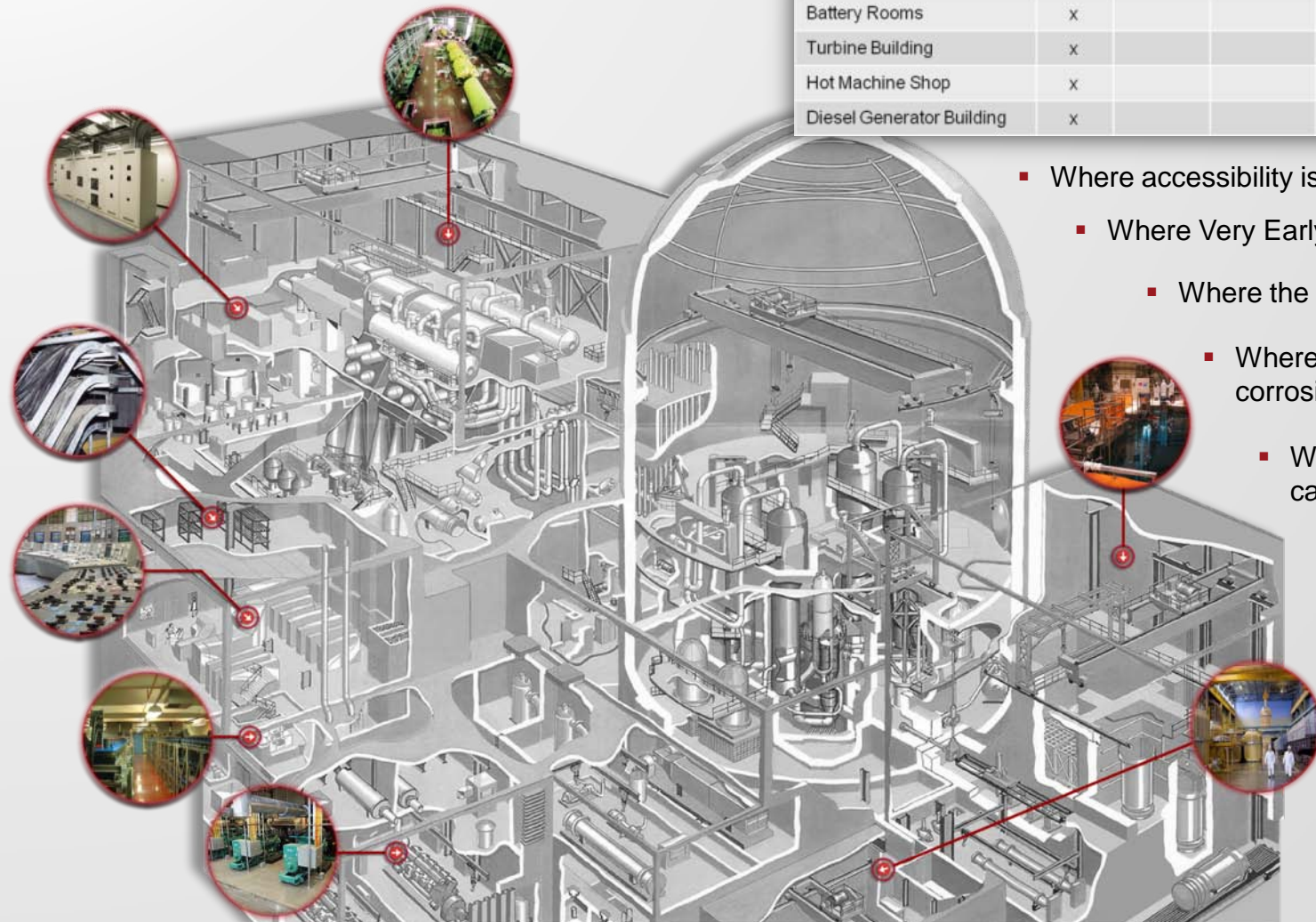
- Active monitoring of all critical detector functions
 - Flow, optics and calibration
- Optics automatically cleaned



Solutions for all Environments

Area	Application				Xtralis Solution							
	Open Area	Ceiling or floor void	HVAC Monitoring	In-Cabinet	VLF	VLC	VLP	VLS	VLI	VLT-15	OSID	VESDA ECO
Electrical switch gear, relay rooms and annexes	x		x	x	x	x	x	x	x	x		
Control Building	x	x	x	x	x	x	x	x	x	x		x
Cable Spreading Rooms	x				x	x	x	x				
Fuel Building	x				x	x	x	x	x		x	x
Battery Rooms	x			x	x	x	x	x		x		x
Turbine Building	x			x	x	x	x	x	x	x	x	x
Hot Machine Shop	x				x	x	x	x	x		x	
Diesel Generator Building	x			x	x	x	x	x	x	x		x

- Where accessibility is an issue
 - Where Very Early Warning is the objective
 - Where the environment is hostile
 - Where toxic, flammable or corrosive gasses threaten safety
 - Where nuisance alarms cannot be tolerated.
- For proven performance
 - In large open spaces





Challenging Environment

Characteristics of Hot Cells present a unique challenge for conventional fire detection technologies.

VESDA, a suitable solution

- No electronics in the piping network
- Detector externally located outside cell
- Easily accommodates detection of gases



Engineered for suitability

- Stainless steel pipe network
- Detector mounted in protective housing outside cell
- Detector exhausted back into cell
- Bag out filter

Questions?