



Multi-Story Perimeter Monitoring



The perimeter monitoring strategy (shown above by yellow lines) provides the **greatest probability of detection** - regardless of wind direction.

Image Credit: ST2 Engineering (Original image has been edited).

Problem: Warn Adjacent Areas of a Leak
Lethal H₂S plumes extend beyond area of release

Challenge: Sufficient Detector Coverage
Large perimeter stresses the projects feasibility

Opportunity: Capital and Operational Costs
Reduce the device count, infrastructure, & cabling

Solution: Most Economical Option Available
Is with Laser Based – Open Path Gas Detection

Sulphur Converters/Condensers

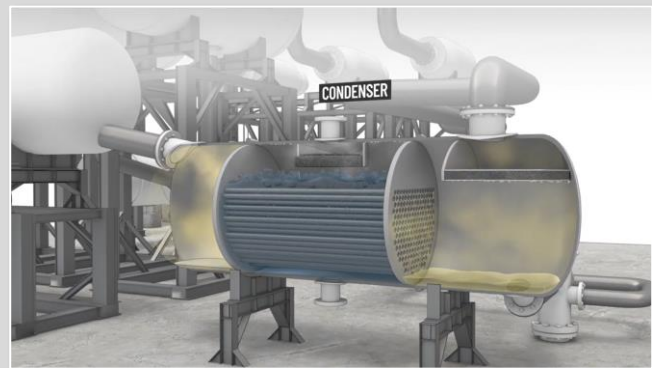
Problem: Mechanical Probability of Failure
Shell & Tube failure likely 3.9 in 1,000 times¹

Challenge: 90% Geographic Area Coverage
May not be feasible with Fixed Point Gas Detectors

Opportunity: Remove Maintenance Burden
By no longer calibrating or replacing sensors

Solution: Achieve Risk Mitigation Targets
With Laser Based – Open Path Gas Detection

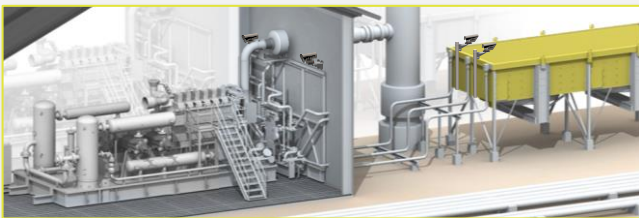
Reference¹: Shell & Tube - DNV GL Failure Frequency Guide
Image Credit: www.tartanacademy.com



In addition to perimeter monitoring, Laser Based – Open Path Gas Detection can be **positioned around high failure rate equipment** like Sulphur Condensers for area/equipment specific monitoring.

Acid Gas Compressors/Exchangers

Grade A* Hazard Rank – Compressor/Exchanger:
The early detection of a leak is vital to preventing a catastrophic incident.



Exchanger: The **high air velocities** and **temperatures** make the use of **Traditional – Fixed Point Gas Detectors unsuitable** for use in these environmental conditions. **Laser Based – Open Path Gas Detection not only survives but thrives** as only the laser beam is in contact with the flue gas.

Image Credit: Ariel Compressors (original image has been edited)

Problem: Mechanical Probability of Failure
Compressor failure likely 6.18 in 100 times¹

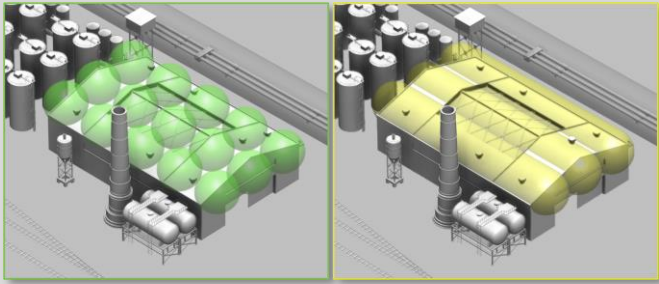
Challenge: Detection of Small Seal Leaks
Most H₂S E-Chem's have T90 Response >20 secs.

Opportunity: Vital Integrity Measurements
Used for passive Leak Detection & Repair (LDAR)

Solution: Find & Fix Leaks While Still Small
Is with Laser Based – Open Path Gas Detection

Geographic Area Coverage

Traditional – Fixed Point Gas Detectors vs. *Laser Based – Open Path Gas Detectors*



Laser Based – Open Path Gas Detection is the most economically viable option to minimize both the **Total Install Cost + Total Operational Cost (TIC-TOC)** in High Hazard Rank Applications.

Definition: The fraction of the geometric area or volume of a defined monitored process area that would be detected.

Exceed your Area Coverage Requirements
With Laser Based – Open Path Gas Detection

Increasing the Probability of Detection
Offers the greatest Risk Reduction Factor return¹

To Mitigate Risk in a Grade A Hazard Rank
You will need 90% Geographic Area Coverage¹

Laser Based – Open Path Gas Detection
Easiest & most economical way to Mitigate Risk

¹: As stated in ISA-TR84

Safety Availability

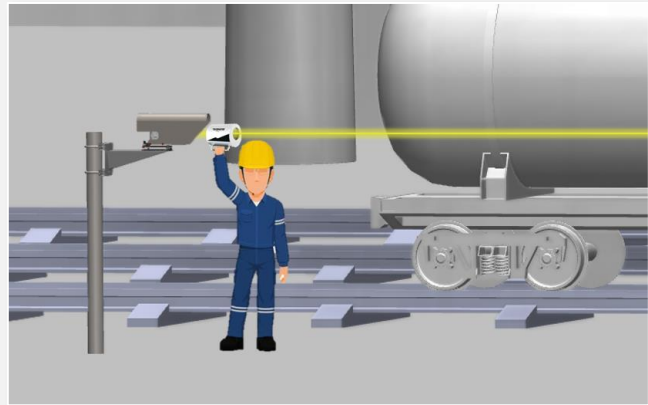
Surpass Safety Availability Requirements
With Laser Based – Open Path Gas Detection

Survive & Continue to Detect after a Leak
Lifespan/performance not effected by exposure

Smart Fail-Safe Device + SIL2 Suitable
Only outputs gas concentrations if ‘fully functional’

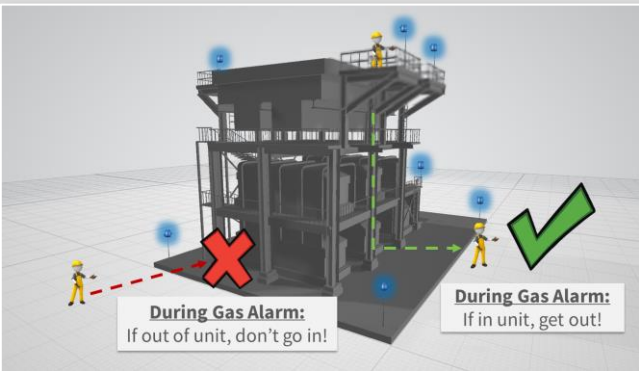
Eliminate your Maintenance Burden
No Calibration and easily perform Functional Tests

Definition: The availability of the FGS function designed to automatically mitigate the consequences of hazards.



To perform **Function Test**, simply hold the **Response Cell** in the Laser Beam to ‘Bump’, ‘Challenge’, or ‘Verify a Response’.

Mitigation Action Effectiveness



During Gas Alarm:
If out of unit, don't go in!

During Gas Alarm:
If in unit, get out!

During a Release: Prevent personnel from entering the area or evacuate personnel from that area.

Definition: The confidence that the final element(s) actions will successfully mitigate the consequence of the hazard.

Alarm Faster and at Lower Concentrations
With Laser Based – Open Path Gas Detection

Confidently Detect Incipient Level Leaks
Lowest Actionable Concentrations clearly stated

Gain an Instantaneous Response to a Leak
New and independent sample every second

Importance of Timely Personnel Evacuation
Rapid recovery actions prevent escalating event