



## Can I identify a flare with a performance issue: Alarm systems – Fibre Optics

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### Summary

There are a range of flare monitoring systems to detect and alarm if the flare is unlit. Each technology utilises a feature of the flare such as heat, light or sound.

In some countries, to comply with environmental regulations it is essential to confirm that the main flare or pilot flare always remains lit.

Where a flare is unintentionally unlit the methane emissions are much higher than reported based upon flow rates.

Fibre optic systems are integrally mounted in the flare pilot to relay the status of each unique pilot flame to a monitor in the ground in real-time. The monitors incorporate flame flicker technology to discern between the pilot and flare flame. This system will allow a discrete, accurate, and instantaneous signal among the pilots and between the pilots and the flare flame.

Where cold flares are in operation (where emissions can vary between vented gas and combusted gas) the inclusion of alarm systems can help identify what operating state the system is in.

### How it Works

Flame status can be determined by several means including monitoring heat, ionized gas, light or sound. To give constant feedback of pilot status one of the following systems will need to be used:

- Heat – Thermocouples
- Ionised Gas – Flame ionisation detection

- Light – IR or UV systems
- Sound – Acoustic systems

Whilst standards such as API 537 require the use of pilots in the flare, there are a large number of older facilities that operate without pilots.

For choosing properly the flame monitoring system, it is important know if it will supervise a pilot flame or a flare flame.

Technology	Individual pilot	Ground level Maintenance	Instantaneous response
Thermocouple	X	X	
Fiber Optic	X	X	X
Optical at grade		X	X
Acoustic	X		X
Flame ionization	X		X

Advantages

- Instantaneous response
- Feedback for each pilot
- Differentiates between pilot flame and main flare
- Robust against weather conditions – rain and wind

Limitations

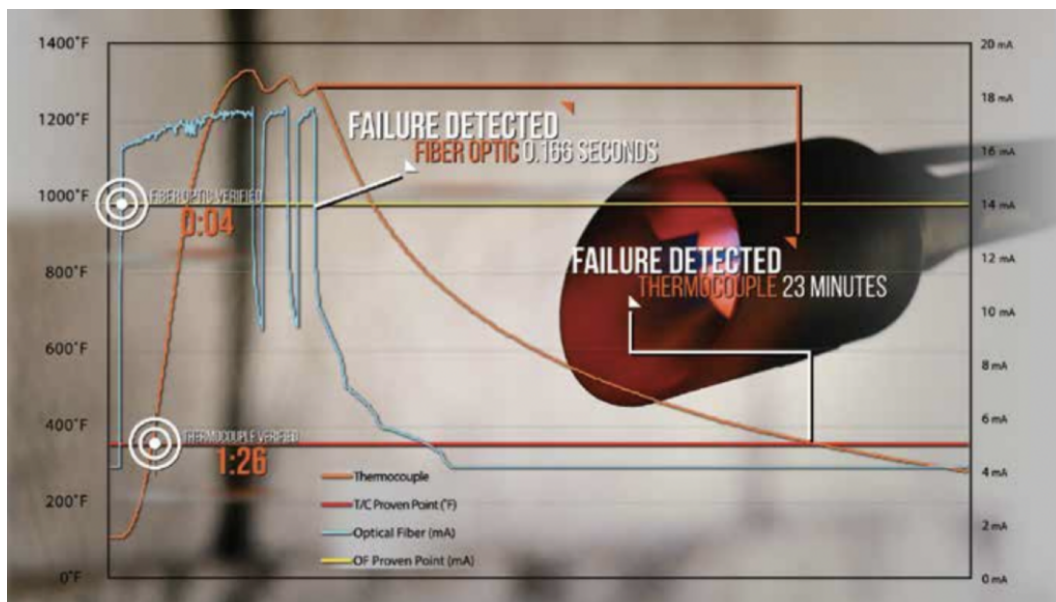
- Complex to fit retrospectively

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Case study

Comparison of response times of fiber optics systems compared to conventional thermocouples. Image courtesy of [Zeeco, Inc.](#)® – all rights reserved.



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