

Various technologies are used to monitor flares, but they have limited performance when looking through smoke.

Flare Stack Monitoring System

Thermal imaging can "see" through smoke, enabling inspectors to do quick spot checks or continuously monitor flare stacks.

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Why Flare Stack Monitoring is essential for the O&G Industry:

Flare systems are often a last line of defense to prevent dangerous pollutants from entering into the atmosphere. **Flaring without the pilot flame releases gas into the air, increasing the risk for explosions and negative environmental impact.** Various technologies have been used to monitor flares but have limited performance when looking through smoke or in case of cloudy/ foggy/ moist environments. **Thermal imaging is an ideal non-contact monitoring tool that offers automated remote monitoring of flare stack on a 24/7 basis, in virtually any weather.**

A FLIR thermal camera recognizes the difference between the heat signature of a flare stack flame and the surrounding background (usually the sky or clouds). **Even if the stack flame is invisible to the naked eye (or to a visual camera) because of its composition or low gas flow volume, a thermal camera can monitor whether a flare is burning or not.**



VISION WITH FLIR INFRARED: assists a Plant Manager to know immediately if flare stack combustion is lost

Advantages of Thermal Camera based monitoring over other technologies:

- **Thermocouples** are the most commonly used tool to monitor flare stacks. But these are contact type sensors, have relatively smaller design life and **eventually fail over period of time** due to harsh environment condition. Also, not being easily accessible due to their mounting location inside the stack, routine maintenance and quick replacements are difficult.
- **UV Sensors** detect a flame through its emitted ultra-violet energy. But they are **less effective for flare monitoring** as they need to be installed quite close to the stack. Otherwise they may detect UV energy from other sources, such as reflected sunlight and give false alarms. Also they can be blinded by smoke.

- **Visual Cameras** are often used as a low-end solution to visualize the flare in control room. But these are not at all suitable for smoky or foggy environment due to poor visibility. Further, the CCTV cameras **cannot visualize those flames that are invisible to the naked eye**.

Thermal camera recognizes the difference between the heat signature of a flare stack flame and the surrounding background (usually the sky or clouds). **Even if the stack flame is invisible** to the naked eye (or to a visual camera) because of its composition or low gas flow volume, **a thermal camera can monitor whether a flare is burning or not**.

Enhancing the combustion efficiency of a Flare System:

Smoke is an indication that hydrocarbons are not being combusted completely. Through Infrared-based Flare Monitoring System, **User can vary the steam flow rate to obtain an optimal flow rate and proper combustion, characterized by a smokeless flame**.



Well Operating Flare
High Combustion Efficiency

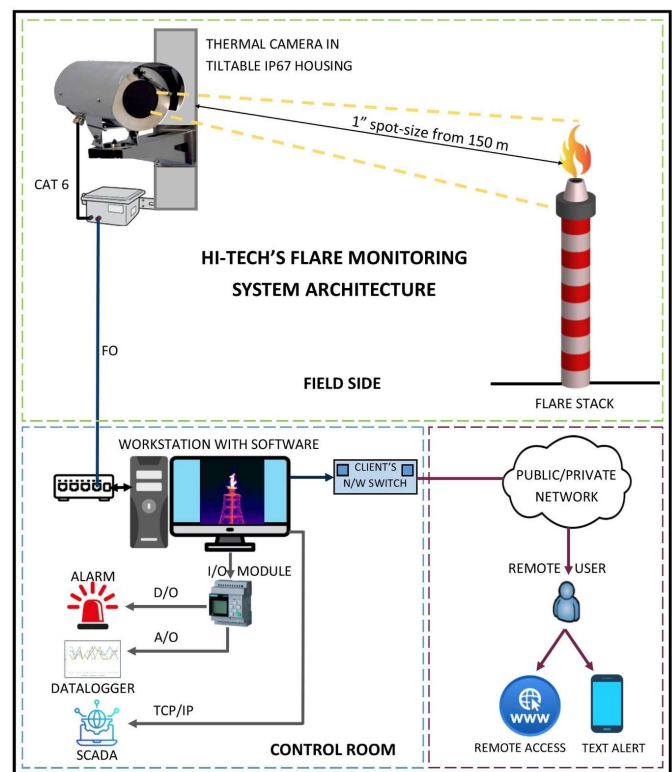
Poorly Operating /
Over Steamed Flare
Low Combustion Efficiency



Automated assist gas (air or steam) injection control through flare monitoring, can help avoid excessive steam consumption, and provide significant cost savings.

What our Flare Stack Monitoring Systems can perform:

- ♦ Verify combustion, minimize unburned pollutants, and assist in environmental compliances
- ♦ Instantly report loss of combustion with visual, audible and email/text alarms
- ♦ Transmit thermal and visual images in real time to a central control room over Ethernet
- ♦ Provide remote visual monitoring over a TV Screen or PC display
- ♦ Provide a quantitative readout of flame temperature and size with alarms, for process control
- ♦ Improve combustion efficiency by assisting control of the assist gas to waste gas ratio
- ♦ Provide 4 – 20mA analog outputs (or digital o/p) to be integrated to 3rd party control systems
- ♦ Assist data analysis, archiving and report generation using **Hi-Tech's Flare Monitoring Software**



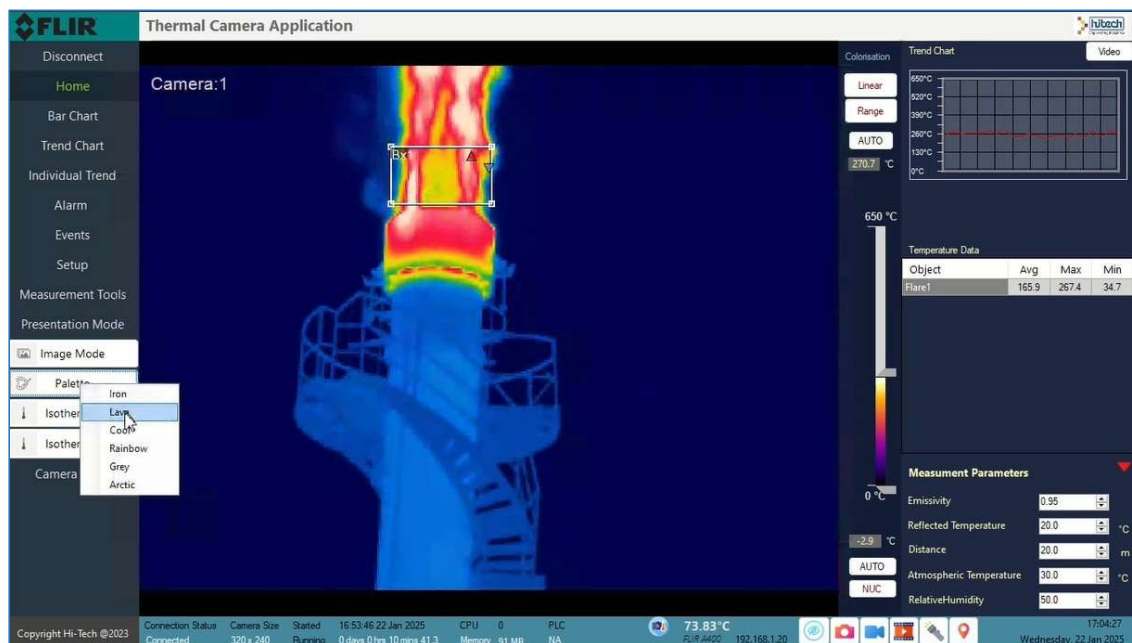
Why would you choose Hi-Tech's Flare Monitoring System?

- Huge install base with a proven track record
- Designed for extreme harsh outdoor environments
- Highest thermal resolution (640x480) available in the industry for accurate measurements
- Industry's best thermal range to ensure flame temperatures even above 1500°C can be recorded
- Radiometric accuracy $\pm 2^\circ\text{C}$
- Best distance to spot-size ratio, as high as 5800:1
- Wide array of optics: lenses ranging from 6° to 80°
- High image frequency of 30 frames/sec to ensure zero event loss
- Best in class thermal sensitivity ($<25\text{ mK}$) to capture even the smallest temperature deviation
- Rugged industrial enclosure with IP67 protection class, liquid/ air cooling facility, unmatched design to prevent entry of iron dust and moisture (includes explosion proof variants)
- Automatic alarm generation with email / text message alerts in case of anomalies
- State-of-the-art in-house Software with at-a-glance decision making, analytics, reporting
- Multiple communication protocols like RTSP, TCP/IP, GigE, Rest API, FTP, SMTP, and MODBUS

Hi-Tech's Substation Monitoring Software:

Hi-Tech's Flare Monitoring Software has been developed in-house by our proficient software development team in consultation with industry experts and actual end users.

- Hi-Tech's intelligent software can **record temperatures based on region of interests (ROI)** defined using on-board box, polygon or free-hand tools.
- Each reading is compared against **customized threshold values** set by the user.
- If a reading exceeds the threshold, **alerts are triggered via email /SMS/WhatsApp.**
- Has an **attractive, user-friendly dashboard** with simultaneous thermal and visual streams along with trend charts and alarm list, for **at-a-glance decision making.**
- It configures temperature /event data to be sent out via I/O module to 3rd party devices.
- Integrates the system with User's SCADA.
- Generates **user configurable reports** and trend analysis based on **wide variety of graphic charts.**
- Archives all events (image and video) for future reconciliations.



Our offerings:



Axxx Series Cameras



IP67 / Ex enclosures



Flare Monitoring Software

Our valued Clients:

When it comes to substation automation in India, Hi-Tech Systems & Services Ltd. is the go-to company, having implemented most projects so far, across the nation.



Automation Partner

Hi-Tech Systems & Services Ltd.

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