



FIRE & GAS DETECTION
TECHNOLOGIES INC.



Application Note
Flame Detection
for Helidecks

www.fg-detection.com

Ref: AN: 2021-X010

Introduction

The Civil Aviation Authority publication CAP 437 “standards for offshore helicopter landing areas” has become an accepted world-wide source of reference. The latest edition, 8.2 July 2021, maintains its position as one of the go-to documents for helicopter safety offshore.

The requirements set out in the publication relate to fixed and mobile installations, whether they are operating in the oil & gas or renewable energy sectors.

CAP 437 requires new build Normally Unattended Installations (NUIs) be fitted with deck integrated fire fighting systems (DIFFS) and existing NUI’s be retro-fitted with an alternative automatically activated fire fighting system.

DIFFS on NUIs should be integrated with platform safety systems such that pop-up nozzles are activated automatically in the event of an impact of a helicopter on the helideck where a Post-Crash Fire (PCF) is a foreseeable outcome. The overall design of a DIFFS should incorporate a method of fire detection, typically optical flame detection, and be configured to avoid spurious trips. The system should also be capable of remote over-ride.

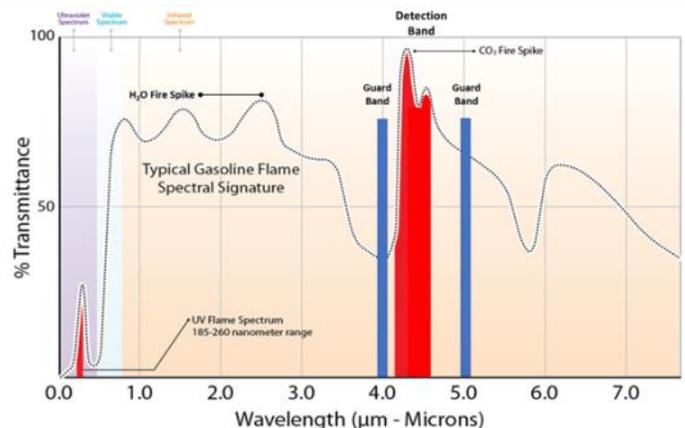
This application note discusses the latest advances Fire & Gas Detection Technologies have made for this application.

Triple IR Flame Detectors

Triple IR (IR3) optical flame detectors are arguably the most commonly used devices for hydrocarbon fires today.

A triple IR detector has three sensors, each sensitive to a different IR wavelength. The IR radiation emitted by a typical hydrocarbon fire is more intense at the wavelength accepted by one sensor, typically 4.5 microns, than the other two which monitor adjacent spectral bands (guard bands) for false alarms. “With other sources of radiation (e.g., heaters, lamps, sunlight) this is not the case, as the intensity at 4.5 micron is no greater than the intensity of at least one of the guard bands. Electronic circuitry in the detector translates the information received into data that can be analysed for:

- Flame flicker analysis.
- Threshold energy signal comparison.
- Mathematical ratios and correlations between various signals.





FIRE & GAS DETECTION TECHNOLOGIES INC.

Triple IR detectors are virtually immune to false alarms and can have extremely long detection distances to some fire types. There are however wide performance variations from brand to brand as no two triple IR detectors are the same..

FGD has developed a special IR3 configuration for applications where the presence of exhaust (combustion) gases of engines and turbines is known to cause false alarms for competing devices.

This detector configuration is ideally suited to applications in compliance with CAP 437 as helicopter engine downdraft is a potential false alarm source.

False alarms offshore are a genuine concern for production and safety. Should a helicopter engine downdraft induce a false alarm on approach to a helipad the fire fighting system could activate automatically and create a safety concern for all onboard the aircraft.



The special FlameSpec IR3 and IR3-HD configurations have been independently tested and approved by Factory Mutual (FM). The table below shows the response data for the FLS-IR3-HD-ASX3 as approved by FM with the detector set to extreme sensitivity.

(The suffix 3 denotes the special configuration that minimises false alarms due to hot carbon dioxide).

Fuel	Pan Size	Distance ft (m)	Ave Response Time (Seconds)
N-Heptane	1 x 1 ft	262 (80)	4.2
Gasoline	1 x 1 ft	230 (70)	3.2
Diesel	1 x 1 ft	164 (50)	3.6
JP5	1 x 1 ft	164 (50)	3.6
JP5	2 x 2 ft	262 (80)	10.3
Kerosene	1 x 1 ft	164 (50)	3.5
Polypropylene	1 x 1 ft	115 (35)	3.3
IPA	1 x 1 ft	180 (55)	2.5

What is more, the detector is FM tested to a wide range of modulated and unmodulated false alarm sources. The sources used are widely found in industrial applications, e.g. arc welding, electric arcs, sunlight, sunlight with rain droplets, heaters & lights.



FlameSpec IR3 hydrocarbon flame detector



FIRE & GAS DETECTION TECHNOLOGIES INC.

Fire & Gas Detection Technologies Inc. 4222 E. La Palma Ave. Anaheim, CA 92807 USA
Tel: (+1) 714-671-8500 | support@fg-detection.com
Specifications subject to change without notice.



A Typical Installation

A typical helideck suppression system is activated by a standalone control system mounted close to the DIFFs skid in an ATEX approved enclosure.

This system automatically monitors the helideck via three FlameSpec IR3-HD flame detectors, located at 120 degree intervals around the perimeter of the helideck.

The FLS-IR3-HD has an embedded HD camera which can be viewed remotely from a control room or shore based facility thereby providing live CCTV coverage of the Helideck area. This feature is particularly suited to facilities operating in remote locations, like a NUI.

The live video feed provides real time incident status and allows a more accurate and informed response to be taken by control room operators.



A further benefit of this device is that video and data of events are stored quickly on a solid state drive within the detector for post incident investigation. Recordings start one minute before detection and continue for up to a further three minutes.

FGD recommends the **FLS-IR3-ASX3** and **FLS-IR3-HD-ASX3** for CAP 437 installations.

References

UK Civil Aviation Authority, Safety Regulation Group, CAP 437 Standards for Offshore Helicopter Landing Areas, Edition 8, amendment 02; July 2021.

FlameSpec IR3-HD manual, document number F101V0020.06, published June 2021.



FlameSpec IR3-HD flame detector w/ colour HD camera

