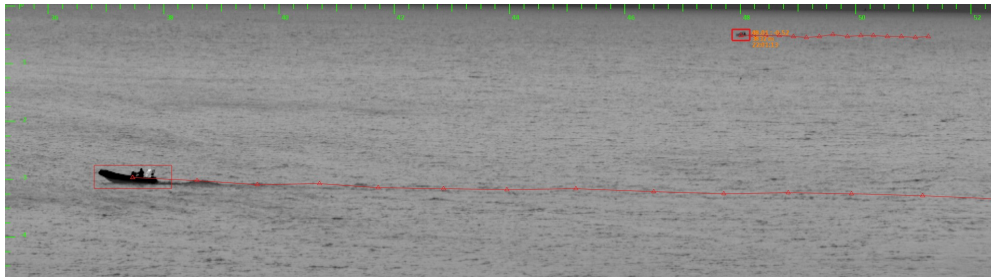


## 24/7 SURVEILLANCE FOR OFFSHORE NATURAL GAS PLATFORM



### OVERVIEW

**End User:** Royal Dutch Shell

**Challenge:** Provide all-weather, 24/7 real-time surveillance over 5000 m radius around their future largest floating Liquefied Natural Gas platform

**Solution:** Two Electro Optical Industries' Spynel surveillance systems located at the bow and stern of the platform

**Results:** Spynel has been selected for this project. Testing continues as construction on the platform is underway

**Conclusion:** The Spynel solution is built for maritime based wide area surveillance. The 360° FOV and day/night imaging, combined with long range intrusion detection and tracking should be considered the premiere off-the-shelf standalone perimeter security system for oil and gas platforms

### CUSTOMER

Electro Optical Industries' Spynel was selected for the Prelude Floating Liquefied Natural Gas Platform, to provide cost effective and reliable surveillance against asymmetric threats. The Prelude FLNG will be the largest floating structure ever built and will be moored 200 km off of the Coast of Australia for 25 years. The 488 meters-long and 74 meters-wide platform will weigh around 600,000 tons – roughly six times as much as the largest aircraft carrier. Royal Dutch Shell's strategic asset will face potential intruders or random fisherman approaching on small crafts, which are hard to detect with conventional surveillance equipment. In a fairly high traffic area travelled by numerous boats, Royal Dutch Shell also seeks to identify larger vessels through visual detection, radar and AIS.

### CHALLENGE

Shell's FLNG platform is a highly visible project and its security poses a number of challenges: isolation, a wide area to monitor, occasional severe weather and a need for a

reliable, proven solution that can sustain extensive 24/7 operation over months of use in salty water.

Although the security personnel will use small patrol boats equipped with short range radars, the area at risk requires a much broader solution that gives the control room visibility on the platform perimeter at all times.

A large number of PTZ cameras were first considered for wide area surveillance but it became clear that the number of high performance cameras needed to cover the full area would make the project complex and costly. Detection requirements insisted the range had to meet 5000m, with a 360° horizontal field of view which would have implied dozens of traditional PTZ cameras and a high installation and maintenance cost.

### SOLUTION

Electro Optical Industries' Spynel panoramic security system provides a ruggedized, passive, wide-area surveillance capability even in total darkness and adverse environmental conditions. The Spynel-C 3000 uses a continuously rotating line scan sensor to produce a 360° 12 Megapixel image and detects and tracks an unlimited number of intruders in real time. The Spynel camera operates like high definition "optical radar", providing operators with clear, reliable, actionable data.

In this deployment, two Spynel cameras are mounted to stationary towers located on both sides of the platform. The 10,000 meter radius area is fully covered by the 5 degree vertical field of view of the sensors. Each detection zone covers a 300° angle, the rest of the panorama being obstructed by the platform infrastructure. The camera's advanced long wave infrared sensor is capable of detecting any kind of watercrafts, day or night, at distances over 5 km. The LWIR sensor is not impaired by solar reflection on the water, as demonstrated in multiple preliminary tests.

In areas obstructed by the platform infrastructure, short range thermal and visible PTZ cameras built for explosive atmospheres (ATEX certified) will be installed to ensure close perimeter security under 800 meters. Cyclope software will integrate feeds from all sensors combined with a long range radar and AIS used for identification of larger boats. The software platform will prioritize alarms and bring up the Spynel image whenever a confirmed threat is detected.

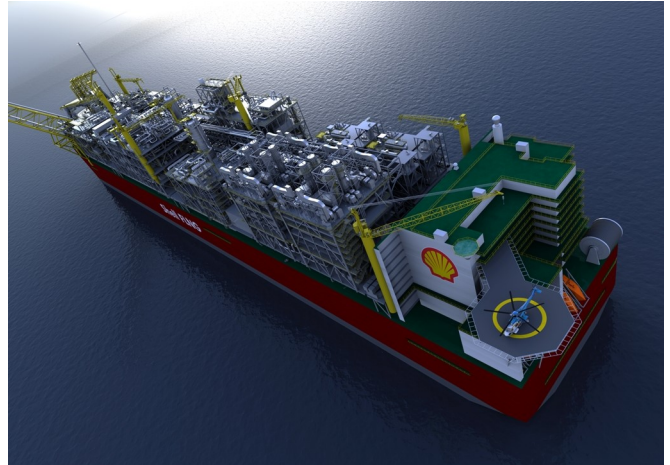
Alerts data can be brought back to shore in real time. The Spynel easily integrated with the hypervisor platform through a SDK based on standard protocols.

The Spynel is built specifically for operation in harsh, unprotected environments. The military and maritime specified construction is immune to the corrosive nature of ocean weather, all while standing up to the rigors of 24/7 operation. It will also provide a solution that requires minimal maintenance and repair resources for effective performance.

## CONCLUSION

The EOI Spynel infrared system provides effective coverage of ultra-wide areas while offering a lower total cost of ownership than a combination of multiple other sensors. The passive, long wave infrared technology provides consistent imaging with detection protected from electronic jamming and camouflaging. The Spynel is not affected like a radar is by sea clutter. Additionally, the ruggedized design and hardware allows for operational effectiveness in all environments. The standalone system is economical to operate and requires minimal maintenance.

*The Spynel performance was tested for a full year by a defense naval laboratory, under diverse scenarios, and compared with the performance of other sensors in maritime environment.*



Founded in 1964, Electro Optical Industries designs, develops, assembles and sells complete optronic systems for security, industrial and civil applications. EOI established itself as an international reference for infrared technology innovation through the development of its award-winning real-time 360 degree infrared camera, the Spynel (2008 Product of the year from Photonics Tech Briefs, 2010 Innovation Prize from the EuroNaval Committee, 2011 Kummerman award from the French Academy of Marine, 2012 GovSec Platinum Award). Tested by NSSA