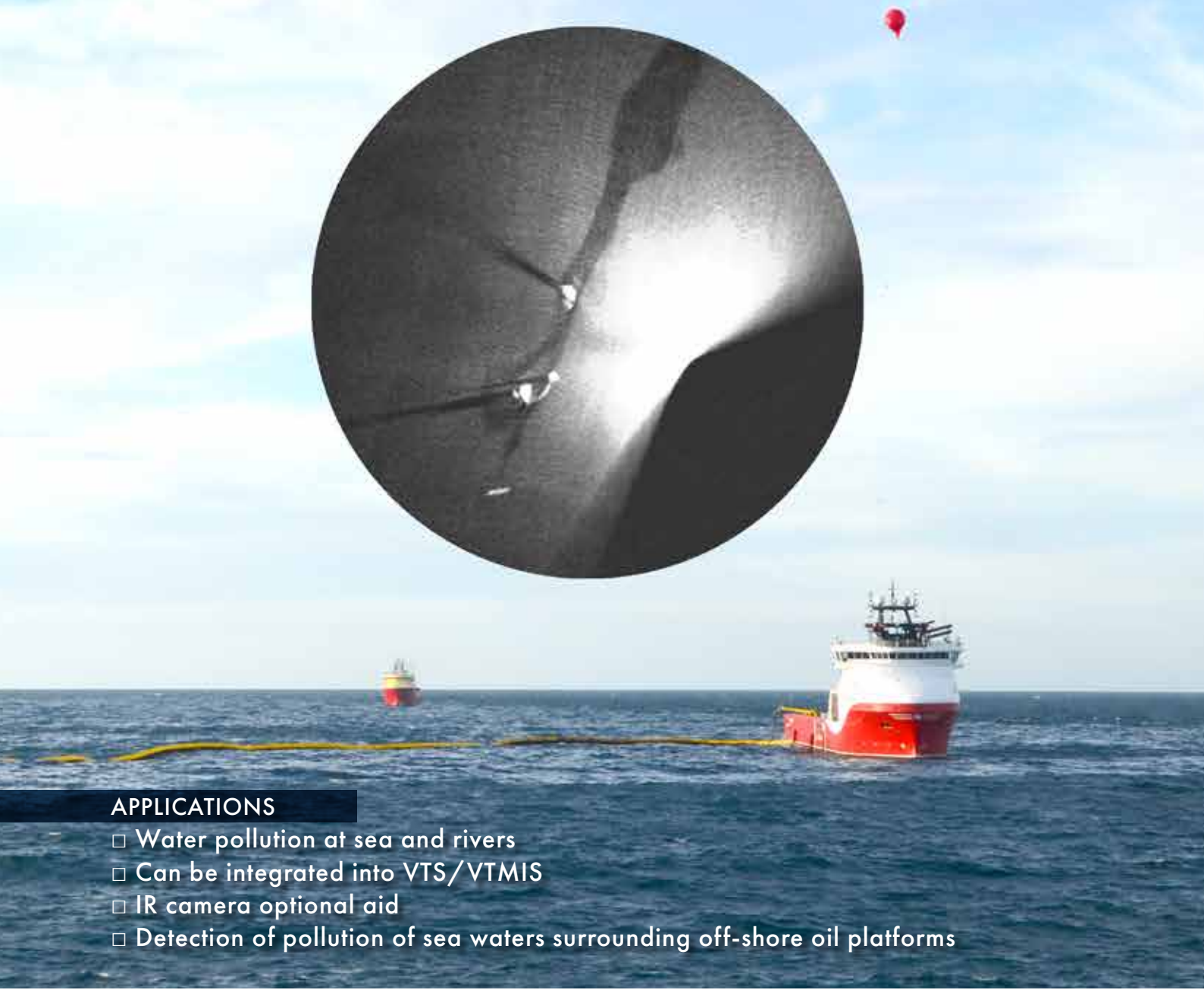
GEM elettronica

OIL SPILL
DETECTION SYSTEM

Using a high resolution X or K_a band radar, the Oil Spill software can detect and monitor oil spills on the sea surface. Using a combination of fast up date rates, great horizontal resolution and low detection limits, the system detection is both technologically at the forefront and an established tool in oil spill recovery operations.



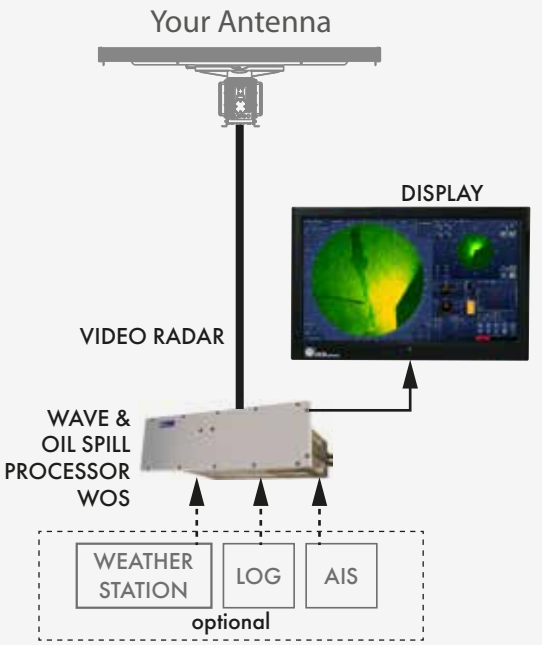
APPLICATIONS

- Water pollution at sea and rivers
- Can be integrated into VTS/VTMIS
- IR camera optional aid
- Detection of pollution of sea waters surrounding off-shore oil platforms

WHY OIL SPILL DETECTION?

- Oil water pollution is one of the most damaging environmental concerns of today as the number of gallons of large oil spills is 37 million gallons per year.
- On land, oil spills are usually localized and thus their impact can be eliminated relatively easily. In contrast, marine oil spills may result in oil pollution over large areas and present serious environmental hazards.
- The primary source of accidental oil input into seas is associated with oil transportation by tankers and pipelines (about 70%), whereas the contribution of offshore drilling and production activities is minimal (less than 1%).
- Some tankers washing their tanks with sea water. In this way, millions of tons of oil are discharged annually into the oceans.
- The oil floats on water, forming a layer that insulates the water from the air, preventing the exchange of gases. The depletion of oxygen caused kills many marine organisms.
- Eutrophication: the release of phosphate in the waters of seas and lakes increases the algae. When they die, bacterial decomposers consume oxygen dissolved in the water causing the death by asphyxiation of other organisms. The excessive presence of these organisms significantly affects the balance of aquatic ecosystems: it increases the consumption of dissolved oxygen in the water decreases the availability for other life forms like fish.

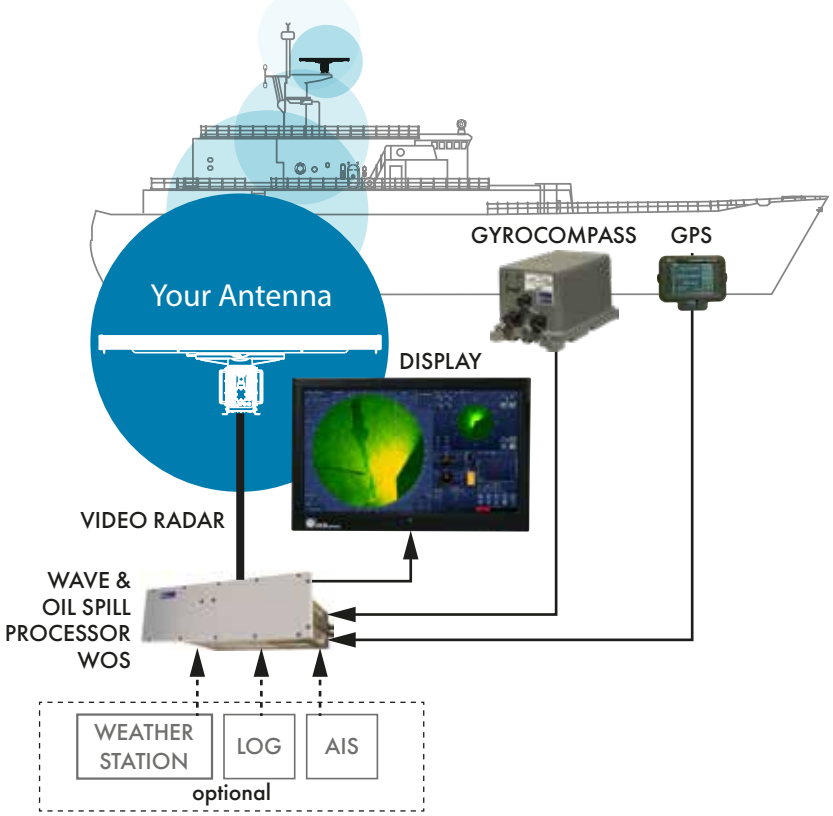
FIXED PLATFORM CONFIGURATION



Performance

BASIC	MEDIUM	ADVANCED
X-Band 7 9 ft	X-Band 19/21 ft	X-Band 19/21 ft
Horizontal polarization	Horizontal polarization	Vertical polarization
	K_a-Band 8 ft	
	Circular polarization	

SHIPBORNE PLATFORM CONFIGURATION



Performance

BASIC	MEDIUM	ADVANCED
X-Band 7 9 ft	X-Band 7 9 ft	X-Band 12 ft
Horizontal polarization	Vertical polarization	Vertical polarization
		K_a-Band 8 ft
		Circular polarization

SYSTEM PRINCIPLE

Oil on water is not like a solid, steady object with sharp edges as indicated as the upper slick. Oil slicks have very thin edges and “breathe” with wind and waves. Because of this the shape of an oil slick is not stable.

The thickness of oil depends on many parameters like oil grade, air temperature, water temperature, strength of wind etc. The transition zones indicated in the picture above is one of the main challenges for the Oil Spill Detection System.

These are also the reason why there is a boundary zone defining the extension of the slick and not a pencil beam definition of the edge.

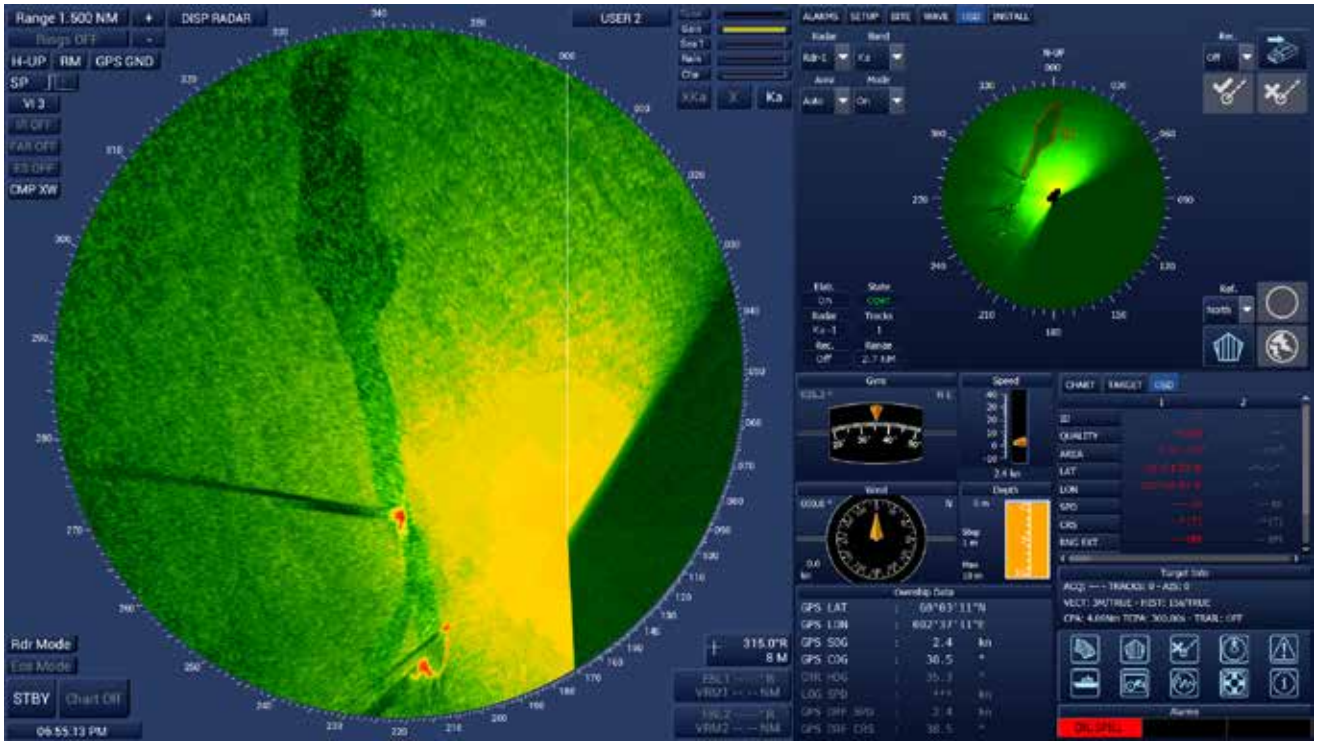
The presence of an oil slick can be detected as a "quiet" sea surface where the reflection from sea clutter is less compared to the surrounding areas. This means that a polluted area will appear in the image as a zone with less sea clutter than its surroundings.

New Oil Spill Radar: excellent results during NOFO oil-on-water trial

GEM elettronica participated at the 2018 oil-on-water exercise offshore Norway organized by the Norwegian Clean Seas Association for Operating Companies (NOFO).

The annual NOFO oil-on-water exercise uses cutting-edge technologies in a real oil spill scenario with the main goal to improve oil spill response preparedness. In this occasion our GEMINI X-Ka dual band radar together with OSD processor were extensively tested.

The oil spill was clearly detected by the GEMINI radar during the whole exercise. In particular the Ka-band radar demonstrated an exceptional contrast revealing also narrow patches of oil on the sea surface.



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CERTIFIED MANAGEMENT SYSTEM
ISO 9001 - ISO 14001