

Ocean Radar Systems are suited for surveillance applications of off-shore Infrastructure

The topic of “surveillance of civil off-shore infrastructure” is increasingly becoming a significant issue in Europe. For this reason, it is important to know that the operational civil ocean radar systems can be upgraded to monitor ship activities far behind the horizon.

Several “WERA” ocean radar systems are located on the European coastline. In particular, the systems at the German Bight, the Dutch North Sea coast, the French and Italian coast are well suited for this technical application.

The WERA ocean radar is classified as a “dual-use” system because these systems are suited for over-the-horizon ship detection and tracking. It can be used for the surveillance of very large areas of the coastal ocean to identify suspicious ship manoeuvres.

About 10 years ago, HELZEL developed a specific product for this surveillance application: the HELZEL OTHR. This OTHR system provides ship tracking for ranges of up to 200 nautical miles and is already in use in Asia and Africa. The main application is the surveillance of the exclusive economic zone (EEZ) to detect illegal fishing activities or other suspicious activities, e.g. smuggling or piracy and of course threats to off-shore infrastructure.

To extend an existing ocean radar WERA for this ship tracking application, the systems may need to be refurbished and extended to 16 receive channels. Figure 1 shows the existing WERA system in France near Brest.

The data of the WERA system on Wangerooge, Germany are already used to test this feature. Figure 2 shows ship tracks generated by this WERA system. The range is 70 km in this case.



Fig. 1: WERA Antenna Array on the French coast near Brest

This technology should be of interest to all countries with infrastructure on their coast. For new installations, the OTHR systems are best suited for these surveillance applications. It is worth mentioning, that such a “military” OTHR system can be used for civil applications as well. These dual use applications include ocean current monitoring for environmental protection and search and rescue.



Fig 2: Map with ship tracks generated by WERA on Wangerooge island. The green marked targets are identified by means of AIS. The orange marked targets don't have any identification or have turned off their AIS and thus these targets are visible on the radar monitor only.

The Multi-Sensor Tracker Software, used in the analysis, was developed and provided for these tests by Innovative Navigation GmbH