

# Visec Case Study

## South American Oil Refinery



**Challenge Faced:** Offshore oil platform needs wireless cameras capable of communicating over 15 miles to its land based oil refinery.

**Visec Solution:** Visec engineers implemented a sophisticated wireless system capable of reaching over 20 miles, with no special permits or licenses required.

**Summary:** A South American oil platform is located approximately 15 miles off shore. The South American company drills for natural gas (NG) and oil. It maintains a pipeline to transport Natural Gas (NG) and oil to its land base refinery. Once received, the Natural Gas (NG) is converted to Liquefied Natural Gas (LNG) where it occupies 1/600 of the volume and it is transported all over South and Central America, in special vessels by both land and sea.

The oil is also refined and shipped all over the world. The offshore platform was constructed of non-corrosive materials and resembles a small artificial island. It is anchored with concrete and steel supporting beams directly onto the seabed. The oil platform consists of a supporting deck that houses the excavation company’s mining equipment and several kilowatt electrical generators. Additionally, there is also a small living area that the crew resides in.

The offshore oil rig is in constant operation, it is comprised of a crew that works double shifts, a day shift and a night shift, with 24 hours a day, 7 days a week of nonstop mining. When the South American exploration company approached Visec engineers, it was interested in implementing a state-of-the-art video surveillance system. It wanted to have 24-hour video coverage to safeguard its critical infrastructure.

**Extremely Long Distance Wireless Solution Needed, Satellite or Subterranean Cable Solution Too costly and Slow:**

The South American Exploration Company wanted to make sure that its employees, equipment and investments were all protected. It also wanted to be able to remotely watch live video of the offshore oil rig from anywhere in the world and be alerted to possible emergency situations as they happened. Given a distance of over 15 miles, remote monitoring posed a challenge to this remote platform. The company initially investigated implementing a direct satellite system, which proved to be extremely costly and provided relatively slow bandwidth. A subterranean fiber optics cable system was also too expensive.

The South American Exploration Company approached Visec engineers for a more professional and cost effective solution to protect such critical infrastructure.

**How Visec did it:**

Visec engineers implemented an entirely wireless system consisting of 16 surveillance cameras with a 2 terabyte DVR Server, capable of communicating from the offshore oil rig, directly to the onshore land based refinery, up to 20 miles away. All recordings were done simultaneously on location at the oil rig itself and remotely on the Land based Oil refinery.

**Wireless Solution**

Visec engineers utilized a phased array of multiple 18 Decibel Isotropic (DBI) Yagi antennas with 8 elements arranged at 1/8 th wavelength separation on the 802.11, 2.4 Ghz spectrum. Visec engineers modeled all propagated signals minimizing attenuation coefficients. As such they achieved a peak gain with a high front to back ratio, averaging a 1 to 1.5 impedance (standing wave ratio). This led to a radiation pattern capable of easily reaching 25 miles at a meager 4 Watts of Equivalent Isotropic Radiated Power (EIRP) in full compliance with open architecture standards, meaning no special permits were required.

Additionally, the signal was encrypted and virtually indecipherable.

This strategic plan was accomplished without requiring any special radio frequency permits or special licenses. This was all done using open architecture standards.

**Visec Automation controls many Oil Platform sensors:**

Critical sensory equipment that is used on the platform was also integrated within Visec Automation. Gauges, such as pressure, temperature, density, and electrical, were all linked directly to the Visec software enabling oil personnel to have an additional means of monitoring. A system alert could cause specific, programmable events to occur.

**Visec Automation Technology (VAT) could be programmed to do any number of tasks.**

**For example,** if the temperature exceeded a particular threshold, a siren could sound and the machine could be disengaged until the temperature was restored to normal. Visec Automation provided a seamless integration to a complex system.

**Cost Savings**

This solution saved the South American exploration company 900%, with a cost approximately one tenth of the price it would have paid using other solutions that would have yielded substandard results.