



# Instead of burning off, producing gas

during oil production on an oil platform in the Black Sea

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Figure 1: Oil platform at night in the Black Sea

In principle burning off or releasing natural gas from oil platforms is a gigantic waste of energy that also pollutes the atmosphere with gases harmful to climate: CO<sub>2</sub> and methane. Despite global warming and scarce resources, the oil industry continues to burn off natural gas produced as a by-product of oil production from oil fields offshore and onshore (Figure 1). A report in the German magazine ›Spiegel‹ reports that, according to a study by the US National Oceanic and Atmospheric Administration, NOAA, around 170 billion cubic metres go up in smoke every year, or, and even worse for the climate, they are simply released into the atmosphere. The fact that there are other options to this waste is demonstrated on a platform in the Black Sea. The company VPT-Kompressoren from Remscheid received an order for compact gas compressor units installed in containers. VPT manufactures this type of equipment for use all over the world; special versions can be used in potentially explosive atmospheres. →

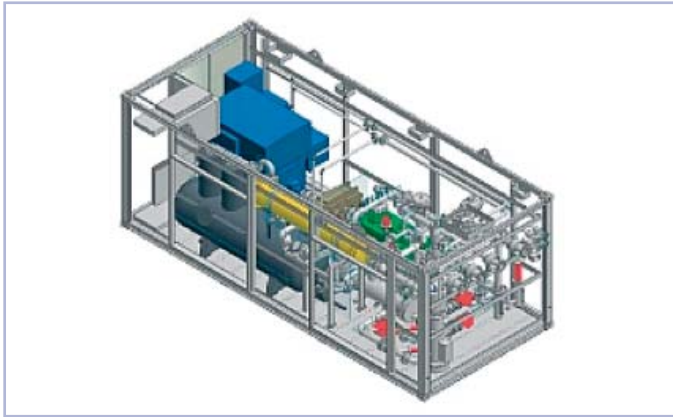


Figure 2: Schematic diagram of a gas compressor station



Figure 3: Safety switch series 8537

The objective of the project in the Black Sea: compression of the gas associated with the oil such that it can be piped to shore using a separate pipeline for further processing. VPT successfully filled the order for a total of 6 compressor units on 3 oil platforms in 2008.

The environment for the compressor units on the oil platforms is classified as hazardous area Zone 1. The electrical equipment for the compressor unit, which compresses the gas with an initial pressure of three to six bar in two stages to a pressure of up to 60 bar, must therefore meet the requirements for equipment category 2 G of the ATEX directive 94/9/EC. Knowing this, VPT uses corresponding components and systems manufactured by R.STAHL in order to deliver customer-specific and approved explosion-protected overall solutions. The solutions range from planning, through design, production, installation and commissioning, to training of personnel at the customer and maintenance.

Bearing in mind the small amount of space available on an oil platform, compact solutions are required. The compressor unit is therefore installed in a double-wall, acoustically insulated container (Figure 2). The same applies to the necessary cooling system. The units are completely integrated into the process automation system of the oil platform.

This layout offers the advantage of low set-up times on site, because complete assembly including the test run has been performed by the manufacturer in the factory prior to delivery. Installation in a container also means that the compressor units were easy to transport by sea to their required location.

The items of electrical equipment manufactured by R.STAHL are: safety switches type 8537, terminal boxes type 8125, installation switches type 8030, as well as, emergency stop buttons type 8040 that meet the requirements for equipment category 2. Explosion-protected emergency luminaires type 6008 ensure the operators and maintenance personnel are not left in the dark if the main power supply is interrupted (Figures 3 to 5).

To display information on the process in the hazardous area in the container, VPT uses the new Panel PC ET 416 from the Open HMI series manufactured by R.STAHL. The colour TFT terminal with 18-bit colour and a 10.4" display with a resolution of SVGA 800 x 600 pixels is

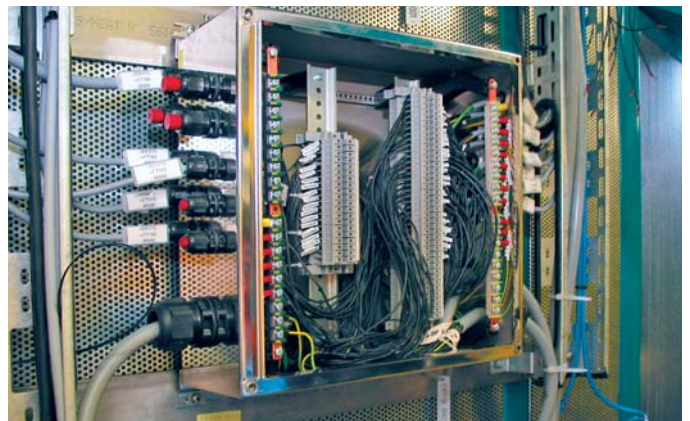


Figure 4: Terminal box stainless steel type 8125 (open)



Figure 5: Emergency luminaire series EXLUX 6008



Figure 6: Built-in control terminal ET 416 in enclosure type 8126



Figure 7: Remote I/O System IS1



Figure 8: ISpac Isolators for safety-related signals

notable for its very bright display. For background lighting, a CFL back-light with a very long service life of up to 50,000 hours is used.

In the container the built-in Panel ET 416 with monitor and keyboard is integrated into an enclosure with type of protection increased safety »e« from series 8126 (Figure 6). This enclosure performs a double function, as it is also used for mounting the Remote I/O System IS1 manufactured by R.STAHL (Figure 7).

The remote I/O technology, as an important element of the instrumentation and control technology, offers many advantages for the installer and operator, since it can be designed to suit the specific customer. As a factory-built system, the field stations are already certified, given compliance with the relevant explosion protection regulations for Zone 1, and are wired ready to connect up. The signal circuits are designed with type of protection intrinsic safety »i«, allowing changes to be made to the unit during operation without requiring shut down.

The effort required for the preparation of the necessary explosion protection document and commissioning is very low for the user, as the user receives a factory-built remote I/O system that is fully assembled and wired. On-site installation is therefore limited to only the field devices and the bus connection. Communication is via Ethernet using Modbus TCP, which is as simple as it is effective.

Safety-related signals that are not allowed to be routed via the remote I/O system are routed via ISpac isolators to the actuators and sensors (Figure 8).

Outside the hazardous area in the switchboard in the container for the main distribution, the non-explosion protected machine terminal MT 416 is used for setting parameters and control; another optimal solution manufactured by R.STAHL for this VPT application.

As a result of the close collaboration between VPT and R.STAHL, and the utilization of the experience of the two companies during the planning and installation of complete systems, a safe, cost-effective solution for the end customer was found.