Gas-insulated medium-voltage switchgear
for the oil and gas industry

Answers for energy.
The environmental conditions, under which processes in the oil and gas industry take place, are increasingly harsh and inhospitable. Therefore, it is absolutely necessary for the technology used to be safe and reliable, in the deserts as well as in the Arctic and the Antarctic. Safe operation is secured by a reliable and consistent energy supply. This is where the gas-insulated medium-voltage switchgear from Siemens points the way. Our switchgear performs reliably even under extreme conditions. This makes it ideally suited for oil and gas applications, as absolute operational safety, availability and maximum performance on minimum space are essential in this sector.

The worldwide demand for energy is still rising, and fossil energy sources are playing the decisive role in fulfilling this demand. Deposits whose exploitation was considered uneconomical in the past are constantly gaining importance in view of increased raw-material prices, and thanks to new extraction and processing methods. This applies to remote regions in the Arctic or the Antarctic, as well as for the Canadian oil sands.

Full power even under extreme conditions

8D10 switchgear
up to 24 kV, up to 20 kA, up to 1,250 A
up to 17.5 kV, up to 25 kA, up to 1,250 A
Superior technology for demanding tasks

Highly available, maintenance-free, compact, robust: Gas-insulated medium-voltage switchgear from Siemens provides a convincing solution, even under the most extreme conditions. A worldwide unique, hermetically welded pressure system in a stainless-steel vessel, vacuum switching technology, and a digital protection system make it independent from environmental conditions, and provide maintenance-free operation for life. On top of that, the $\text{SF}_6$ insulation enables an extremely compact construction.

The result: minimum operating costs, maximum performance, and highest safety in every respect.

Approvals, for example, NXPLUS C:
- Lloyds Register of Shipping (LRS)
- Det Norske Veritas (DNV)
- Germanischer Lloyd (GL)

Reliability
- Type and routine tests in accordance with IEC 62271-200
- Standardized, NC production processes
- Experience from more than 100,000 installed panels
- Quality assurance in accordance with DIN EN ISO 9001

Operational safety
- Hermetically welded switchgear vessels
- Permanently maintenance-free operating mechanisms
- Optimum accessibility of current and voltage transformers
- Complete logical mechanical interlocks
- Minimum fire load

Personal safety
- Safe-to-touch and hermetically welded primary enclosure
- Design tested for resistance to internal faults, metallic partitions, logical mechanical interlocks and capacitive voltage detecting system
- IP65 degree of protection for the primary part
The challenge: maximum performance around the clock

Energy supply for processes in the oil and gas industry must operate with absolute reliability around the clock. Electric power of up to 900 MW is required for such processes, and each breakdown in the supply would mean production stoppage and high losses. That is why reliable operation is an absolute must for medium-voltage switchgear for the oil and gas industry, so that the enormous energy demand can be covered at all times, both in the 30 kV and in the 6/11 kV level.

The Siemens solution: extremely reliable technology

With gas-insulated medium-voltage switchgear from Siemens you benefit from 25 years of experience and a degree of expertise only the market leader can provide. The probability of an outage is reduced to the absolute minimum, which means maximum reliability and availability.

The challenge: reliable operation despite extreme environmental conditions

Oil and gas production sites are often located in regions with harsh climatic conditions, for example in deserts or in the permafrost regions of the Arctic and the Antarctic. This means that operating conditions for the switchgear are often very tough: dust, extreme temperatures, high humidity levels, or particularly saline air. Medium-voltage switchgear for the oil and gas industry must withstand such permanent stress for a long time and without difficulty.

The Siemens solution: consistent exclusion of damaging environmental influences

Reliable protection of the high-voltage part of our gas-insulated medium-voltage switchgear is provided by a hermetically sealed primary enclosure and by insulation consisting of inert sulfur hexafluoride. This makes the switchgear resistant to environmental effects such as humidity, saline air, and dust, but also prevents ingress of small animals. Live parts of the primary circuit – busbar, three-position switch, vacuum circuit-breaker, connecting bars, bushings and cable connection – fulfill the IP65 degree of protection.
Stress-resistant

The challenge: maximum operational safety, even under oscillations and impacts

Switchgear on ships and platforms is constantly subjected to oscillations and vibrations caused by running aggregates and propellers. At rough sea, the equipment is also affected by considerable horizontal and vertical accelerations – a real test for the dielectric strength of the switchgear, the solidity of the SF$_6$ enclosure, and for all mechanical components. Even so, the switchgear must be able to operate reliably at all times.

The Siemens solution: intelligent engineering and consistent testing

We use only hermetically welded stainless-steel vessels or single-pole enclosed cast light alloy housings for our medium-voltage switchgear. Fixed installation of all components eliminates the need for moving contacts, as they would be exposed to exceptional stress by vibration. A computer-controlled three-dimensional copper bending technique minimizes the number of screwed connections; the use of three-position switches as busbar disconnectors, as well as of feeder earthing switches, additionally contributes to the reduction of moving parts. To provide the highest degree of safety, all our switchgear is thoroughly and comprehensively tested before delivery.

Compact

The challenge: individual adjustment to all space requirements

Net building volume is always a cost factor. Therefore it is essential that the available space is used as efficiently as possible. That is why switchgear is often installed in corners and nooks, and it must adjust flexibly to given conditions. Space-saving installations ask for a compact construction and minimum dimensions, without compromising on the safety of the switchgear.

The Siemens solution: modular and compact construction

Medium-voltage switchgear from Siemens provides the ideal solution for installations in confined spaces. Thanks to modular its design and small dimensions, our switchgear can be flexibly adapted to situations where space is limited.
Integratable

The challenge: perfect integration in control and automation systems

Medium-voltage switchgear units in the oil and gas industry are decisive network nodes and must meet the highest safety requirements in every respect, both for processes and personnel. Theoretical and practical knowledge in this industry differs from operator to operator, so it is extremely important that the switchgear is fully integratable in the control and automation environment of the complete system, for example in the power management system.

The Siemens solution: remote control and central monitoring

Siemens medium-voltage switchgear can be fully controlled from remote – from the control room as well as by the power management system. In connection with the combined protection and control devices, the switchgear panels can be integrated into power management systems and process control systems from different manufacturers.

Durable

The challenge: particularly high switching rates

The power supply for processes in the oil and gas industry has to meet quite specific demands. For example, the daily switching rate for generators, pumps, fans, and transport systems is very high and requires maximum safety. Medium-voltage switchgear used in the oil and gas industry must feature a high number of operating cycles to ensure trouble-free and cost-efficient continuous operation.

The Siemens solution: vacuum switching technology

Circuit-breakers and contactors from Siemens are exclusively equipped with vacuum interrupters. These extremely durable devices allow for up to 500,000 failure-free making and breaking operations. The operating mechanisms of the switching devices are located outside the high-voltage part. They are accessible from outside without reaching into the enclosure, and they can be inspected without interfering with operation.

Efficient

The challenge: maximum availability, minimum operating costs

Oil and gas applications need to operate non-stop in order to achieve maximum efficiency – 24 hours a day, 7 days a week. Each standstill costs money. That’s why maximum availability and a minimum need for maintenance are decisive quality criteria for medium-voltage switchgear used in the oil and gas industry.

The Siemens solution: highest reliability and availability

Medium-voltage switchgear from Siemens features a sealed pressure system, which makes the equipment maintenance-free, even under the toughest possible operating conditions. This allows for reduced operating costs and a higher return on investment.
Earthquake-proof

The challenge: maximum reliability and availability in regions prone to earthquakes

Oil and gas plants are often built in regions with an above-average earthquake risk. In certain parts of the globe, several minor earthquakes a day are not unusual. This places high demands on the medium-voltage switchgear used in those plants. Despite severe jolts and vibrations, the switchgear must operate continuously, reliably, and with a maximum degree of safety.

The Siemens solution: constructional solutions and comprehensive test

Our medium-voltage switchgear meets the highest safety requirements. Furthermore, a computer-controlled three-dimensional copper bending technique minimizes the number of screwed connections. The use of three-position switches as busbar disconnectors, as well as of feeder earthing switches, additionally contributes to the reduction of moving parts. These constructional measures provide the utmost reliability, even in case of vibrations and earthquakes.

Highly performant

The challenge: safe control of high currents

The oil and gas industry requires extremely high performance levels, which explains why increasingly efficient drives are used. This results in higher operating currents. In this respect, medium-voltage switchgear is particularly important for the safe progress of all processes, as it has to control and distribute all generated energy reliably.

The Siemens solution: a wide product range

Siemens offers a comprehensive range of gas-insulated medium-voltage switchgear. Whatever the requirements, there is always a suitable type of Siemens switchgear to meet them:

- **8DH10**
  - up to 17.5 kV, up to 25 kA, up to 1,250 A
  - up to 24 kV, up to 20 kA, up to 1,250 A

- **NXPLUS C**
  - up to 15 kV, up to 31.5 kA, up to 2,500 A
  - up to 24 kV, up to 25 kA, up to 2,500 A

- **8DA10**
  - up to 40.5 kV, up to 40 kA, up to 5,000 A