As a market leader in distribution and power transformers, Siemens now introduces the next generation of subsea transformers.

Optimized as the main transformer for Siemens’ Subsea Power Grid, it is also suitable as a step-down transformer for subsea boosting. Its generic design can be utilized for subsea distribution transformers across a broad power range.

The transformer’s electrical design is based on traditional onshore distribution transformers, but with an enhanced-efficiency insulation system. The cooling medium is the field-proven synthetic ester MIDEL 7131®, a biodegradable fluid with excellent electrical properties.

All materials are tested for pressure and fluid compatibility in an extensive qualification program. In addition, the design is verified with a full-heat run test in shallow water.

Siemens’ Subsea Transformers are designed with extended margins to established IEC standards. This increases both reliability and design lifetime, and eliminates the need for service and maintenance.

Prototype: Siemens’ Subsea Transformer
Siemens’ Subsea Transformer

The enclosure has a robust mechanical design with optimized natural cooling properties. All active parts and sensors are exposed to full pressure. There are no penetrations to sea water with differential pressure.

An integrated sensor and monitoring system can be seamlessly connected with Siemens’ Subsea Power Control system. This provides the operator with a continuous status display of the transformer integrity, and the ability to optimize operations for enhanced safety.

Key features Subsea Transformer

- Pressure-compensated
- Qualified for 3,000 meters water depth
- 100% natural cooling
- Biodegradable and environmentally friendly MIDEL 7131® fluid filling
- Broad power range
- Hybrid insulation system
- Flexible interfaces: dry-mate or wet-mate connections
- Advanced condition monitoring
- Robust enclosure
- Optimized as the main transformer for Siemens’ Subsea Power Grid
- Also suitable as a step-down transformer for subsea boosting

Key facts about Siemens’ Subsea Power Grid development

- Qualified for 3,000m water depth
- Scalable and flexible
- Oil-filled and pressurized
- Cooling by natural convection
- Condition monitoring
- Reliable: 30-year design life
- Universal and redundant control system
- No differential pressure on penetrations/connections

Above left: Subsea Transformer illustration

Right: In 2012, the Siemens Subsea Transformer was successfully operated in shallow water (Trondheim, Norway).

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