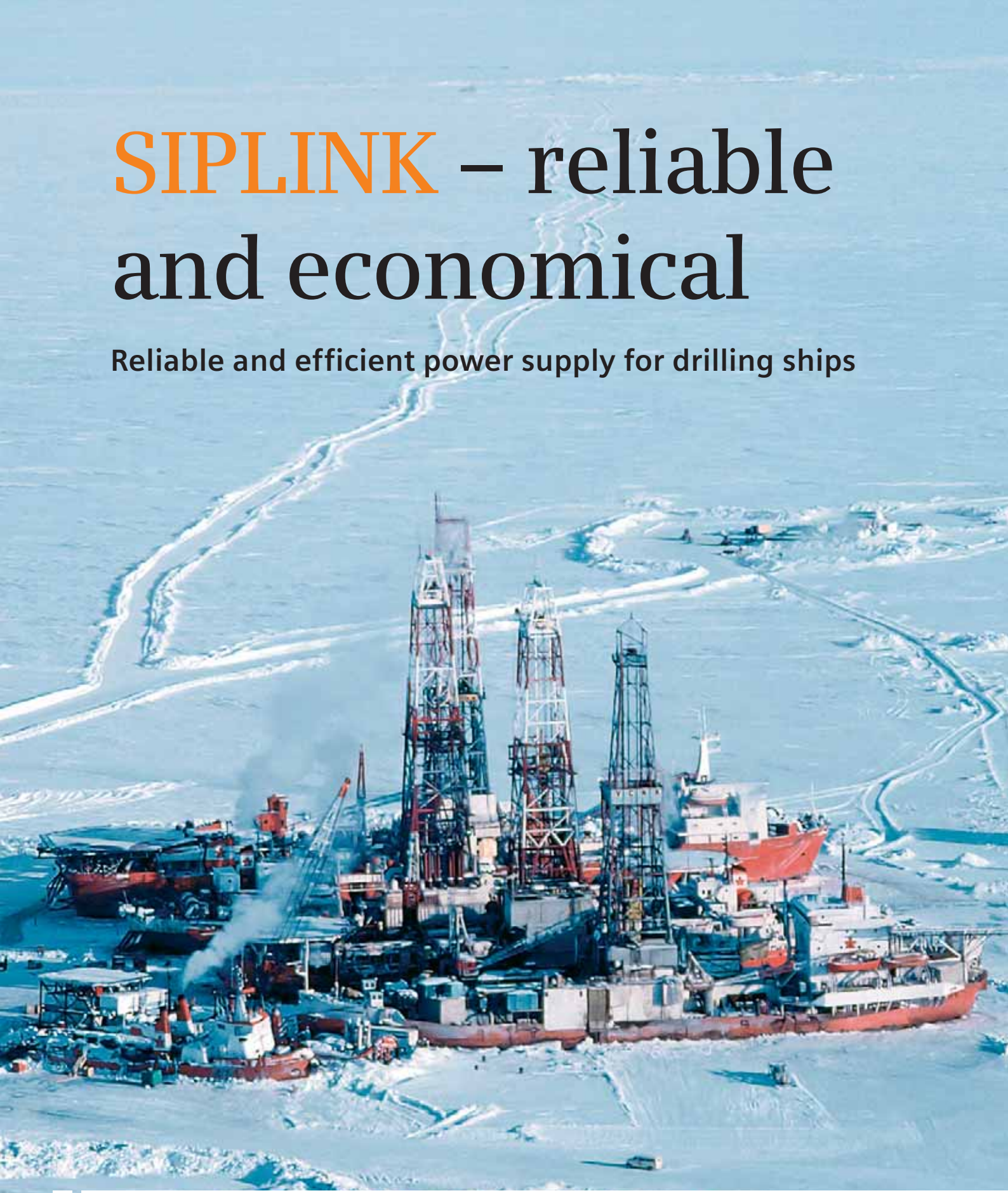
SIPLINK – reliable and economical

Reliable and efficient power supply for drilling ships



Power Transmission and Distribution

SIEMENS

Siemens – a partner for the challenges of the future

The oil and gas industry needs a reliable power supply.

The exploration of oil and gas fields will become increasingly challenging in the future. As requirements grow, there will be fewer and fewer potential partners who can help meet these demands. Siemens, one of the world's leading electrical engineering companies, can master these challenges – with its innovative products and ideas, comprehensive expertise, and its dedication that sets the standard for others. In short, everything you'd expect from a reliable partner.

Electrical engineering – our core business for over 150 years
When you're making investments for decades to come, it's good to have a reliable partner who is not just technically far ahead of the present state of the art with its "Global Network of Innovation". A further decisive factor is our comprehensive experience and our know-how that you can rely on both today and in the future. Siemens is one of the leading suppliers of electrotechnical systems worldwide, and it's our versatility that enables us to create tangible benefits for our customers. Time and again, these are the results of our theoretical research which we apply successfully in a wide range of business fields. Profit from our pioneering spirit and our ability to discover the technological potential of the solutions we find, and to put this potential to work in various applications. In this way, we help you make your project a complete success – both technically and economically.

Medium-voltage technology – a Siemens domain for over 50 years
For more than half a century, the name Siemens has been synonymous with supplying electrical power where it's needed – safely, reliably and efficiently. Over this long period, we've taken on the role of technology leader, actively promoting developments in this technology – for example with the world's first gas-insulated, medium-voltage switchgear some 25 years ago. But we still set the global benchmark today in energy automation too, as shown with the introduction of the new IEC-61850 standard.

Power supply for ships:
Attractive solutions for every application
The on-board power supply for large ships has also been a specialty of Siemens for many years. Siemens can provide you with an attractive, systemized solution for everything from the power supply of a luxury liner with GEAFOL transformers to the cost-effective supply of power to berthed vessels with intelligent SIPLINK technology (Siemens Multifunctional Power Link).
From our experience, we know that optimizing individual components often opens up just a fraction of the maximum potential benefits. That's why, with SIPLINK, we offer you a comprehensive solution that includes all power supply components, optimizes their use and maximizes their performance.

SIPLINK –
Power with precision

The intelligent solution for greater supply reliability and lower costs with no need for additional space!

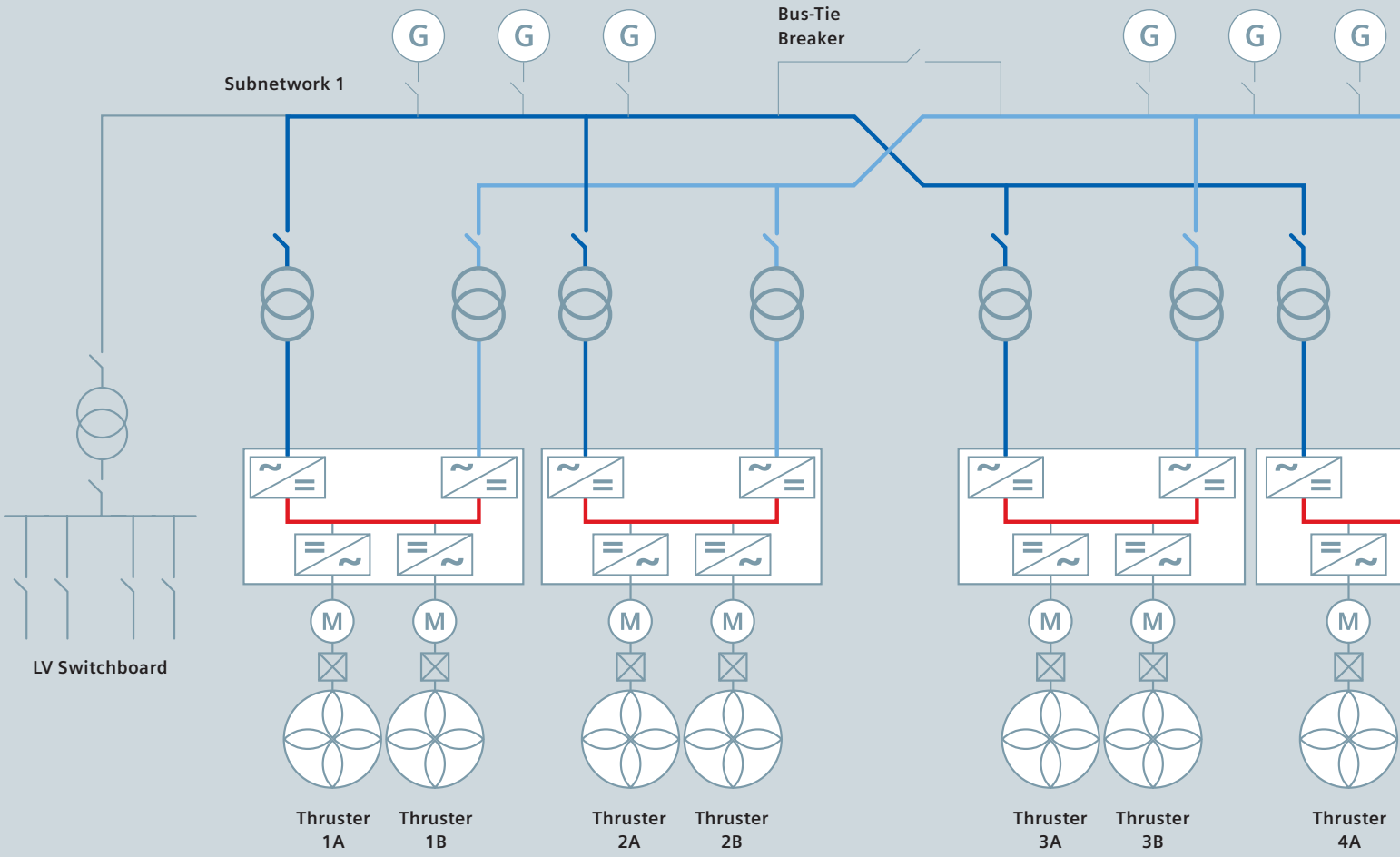
A power failure on board a drilling ship is a costly matter. If the position of the ship cannot be held exactly, the ensuing costs can easily escalate into the millions.
That's why a reliable, fail-safe power supply to the thruster motors is all the more important – a power supply as only innovative SIPLINK technology from Siemens can ensure. Since greater operating reliability can also be achieved with fewer diesel generators, this has the added benefit of a fast return-on-investment thanks to reduced maintenance and operating costs.

SIPLINK: an intelligent connection
Reliability of the power supply has top priority in the SIPLINK system for drilling ships. SIPLINK functions as a d.c. network coupling, interconnecting the electrically isolated parts of the on-board m.v. systems. The innovative power electronics in SIPLINK enables a flowing energy supply via a so-called fail-safe energy bus (FSE bus) in all operating modes from both parts of the onboard m.v. systems. This has many benefits. Because the diesel generators in both power subnetworks can now be adjusted to the particular requirements of one subnetwork, they optimize fuel consumption. At the same time, the reliability of the supply increases by 100 percent thanks to SIPLINK. And we can also integrate the on-board emergency power supply into this flowing energy supply via the FSE bus. If a fault occurs in a subnetwork in a conventional system, all the thruster drives supplied by it are put out of action. Power cannot be switched back on again until the fault is eliminated. On the other hand, if power is supplied via the FSE bus, all thrusters remain in operation.

SIPLINK: Save valuable resources
To guarantee a continuous supply of all thruster motors at all times, conventional power supplies on drilling ships are of redundant design. This means that there are actually two separate power networks on board, each with its own diesel generators that are usually running at very low load. Not only is this uneconomical because the diesel engines seldom run at their optimum torque, but it means increased wear on engines, and the costs for this all add up. SIPLINK enables you to use your resources efficiently because even if one 11-kV subnetwork is faulty, energy requirements can be covered continuously from the other power subnetwork without interruption. Up to 30 percent of operating costs can be saved through intelligent linking via SIPLINK.

SIPLINK – a systematic solution for power supply

Perfectly matched components for maximum efficiency and economy



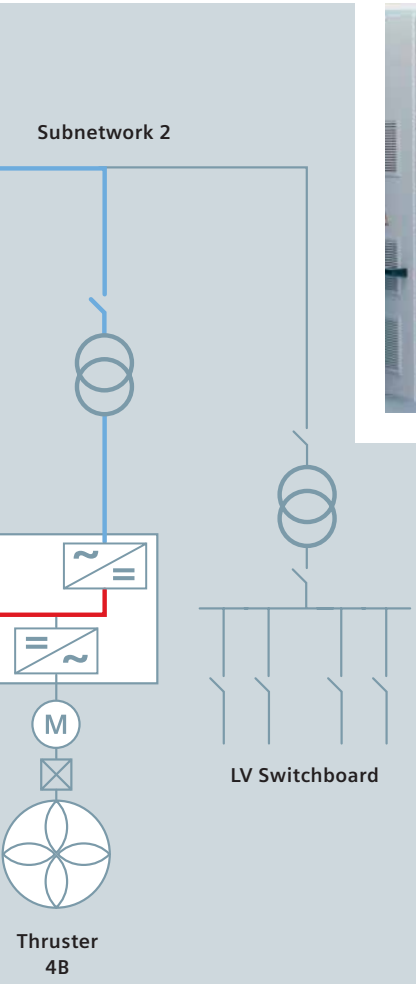
GEAFOL Transformers

MV Switchgears

MV Motors

MV Generators

SIPLINK is not a single unit, but an entire system of perfectly harmonized components. That gives you the advantage of a standard, optimized solution for your on-board power supply, for fail-safe operation at minimal cost.



SIPLINK

SIMATIC

SIVACON

Perfect planning, perfect components, perfect system
Depending on the application, SIPLINK essentially consists of power converters, a medium-voltage switchgear unit, transformers, protection devices and a master control system for operation and monitoring.
The basis for the d.c. back-to-back link are the IGBT (Insulated Gate Bipolar Transistor) pulse converters, which are connected together as a network interconnection in the d.c. intermediate circuit.

Despite the network interconnection, the two power networks are electrically decoupled since SIPLINK is integrated in the network structure via transformers. After an emergency shutdown, in a conventional system it is frequently necessary to connect the generators to load several times, a time-consuming process caused by the high inrush current of the transformers. SIPLINK avoids these problems completely since all transformers are always premagnetized. In the conventional system, it may be necessary to synchronize the power subnetworks during operation or fault situations. Due to the large rotating masses of the generators involved, this is a time-consuming exercise and can lead to power outages. SIPLINK avoids this problem too. Synchronization of the two power subnetworks is not required, because this is carried out automatically by SIPLINK in a matter of milliseconds. This also means considerably faster availability of the thruster drives, thereby significantly reducing the risk of the ship drifting.

System voltage distortions are not transmitted in the first place. Thanks to the sinus filter, which is provided as standard, SIPLINK can help improve power system qualities.

More than just technology: A complete solution with many advantages

Siemens – the solutions partner for power supply in the oil and gas industry

Siemens is an established partner to the oil and gas industry. Our focus is on supporting our customers both technically and in organizational and logistical terms through best-possible performance. The global Siemens organization provides an excellent foundation for this. Whether you want to build or refit your drilling ship in Korea, Thailand or Hamburg – we're always there for you with advice and support on any issue.

Comprehensive advice: the start of a successful partnership.
As drilling ships and their equipment are extremely specialized, their power supply systems have to be just as specialized. As in the systems business in general, standard solutions are the exception here. That's why we start every project by providing comprehensive advice and discussing ideas with the customer. In that way, we can precisely define your requirements and find the best, most cost-effective solution for you.

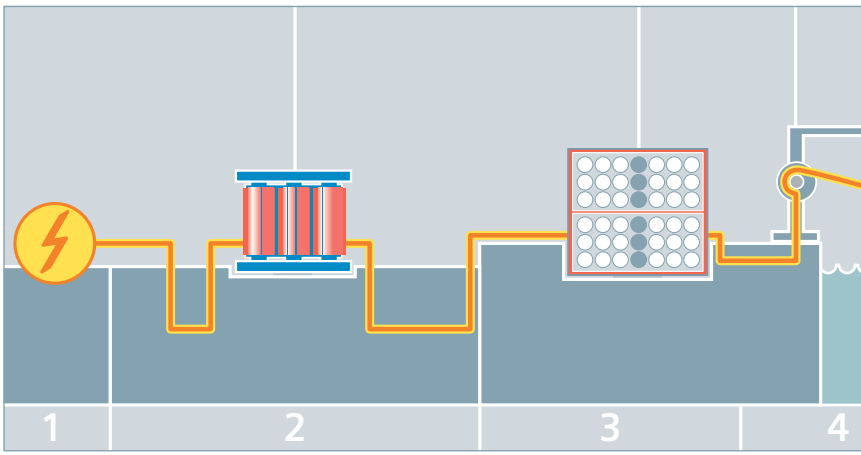
Global partnership: available locally throughout the world
Drilling ships are in demand around the world. And so naturally we put our global logistics and service network to work to benefit you. After all, we want to equip and refit your ships as simply and quickly as possible, so that you can carry on working with a secure power supply – and without system disruptions. And what applies to refitting also applies, of course, to the supply of spare parts or visits by maintenance staff: we're there when you need us, anywhere in the world.

We assume responsibility
With over 100 years of experience in the industrial systems business, and with our presence throughout the world, we're able to assume overall responsibility for even the most demanding projects. From planning and system design to construction, start-up and maintenance, we can offer you all services from a single source. Perfect project management and the best possible use of all our company's resources allow us to complete even the largest projects quickly, on time and within the agreed budget.

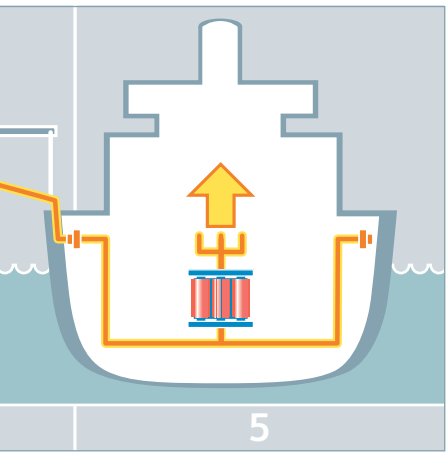
SIPLINK – One principle, many opportunities!

Solid expertise as a basis for a wide range of power supply solutions

1. Connection to the national power network
2. Connecting the substation with the dock terminal
3. Adapting the frequency of the land network to the ship's network
4. Main substation for the high-voltage cable
5. Transformer for adaptation to the ship's network



SIPLINK can connect two or more AC networks of different voltages, phase angles and frequencies with each other while ensuring a reliable power supply. As a result, SIPLINK not only ensures the efficient supply of drilling ships as described above. It also makes it possible to ecologically and reliably supply ships in dock, and set up high-availability power networks for complex systems in the oil and gas industry.



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SIPLINK in the harbor: Clean. Economical. Reliable.
With SIPLINK, ships in dock can be supplied with power safely, reliably and ecologically, and in compliance with increasingly strict environmental requirements. SIPLINK is able to couple networks with different frequencies. The adaptaion to the different voltages is carried out by transformers. SIPLINK generally uses the existing electrical cable intake, suitably refitted, for the problem-free connection of even older ships. Connection is on a plug-and-play basis and the power supply, which is computer-controlled, starts automatically within a few minutes. The ship's owners thus save valuable fuel. Moreover, electricity on land is generally much cheaper than the power that the ship's diesel engines generate in partial load operation, which is both unecological and uneconomical.

SIPLINK for high-availability power networks
SIPLINK is the first choice for supplying power to complex systems, such as those used in the oil and gas industry. With SIPLINK, power can be moved at medium-voltage level between two or more networks as required, depending on the individual demand in the various networks. This has numerous advantages: firstly, SIPLINK increases supply reliability, and secondly costs for the power supply can be considerably reduced by SIPLINK through the intelligent management of resources. In some cases, when less power is needed at the same time in a different part of the network, there is no need for any additional diesel generators to cover peak loads. SIPLINK from Siemens – for better-quality power, more reliable supply, lower costs and less environmental pollution.

Would you like to know more? We'd be happy to provide further information.

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