

POWER SUPPLY & AUTOMATION



*Solutions and services for
offshore and onshore
drilling rigs*

MISSION With exceptional professionalism we always exceed our customers' expectations by increasing their productivity and competitiveness and making sure that working with us is always a pleasure.

Through a spirit of togetherness and our dedication to continuous improvement we create a positive working atmosphere and an environment in which exceptional results are encouraged, recognized and rewarded.

With our socially responsible behavior we are a role model for others in sustainable community development.



25 *years of tradition
and reliability*

100 *employees*

over **3000** *references*

WHAT DO WE DO? development and design of power supply and automation systems and products

production of power supply and automation products and devices

delivery and installation of power supply and automation products and devices

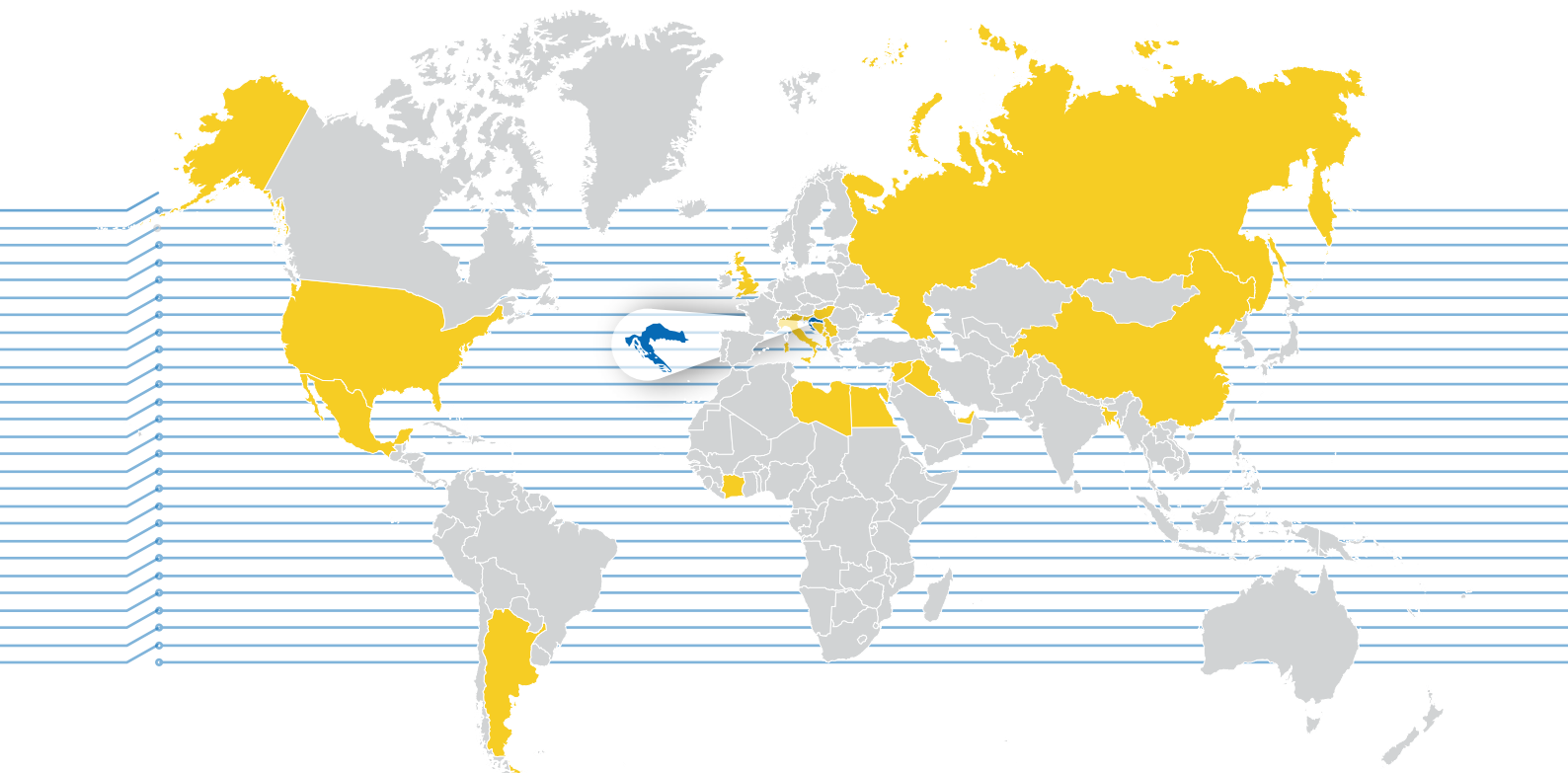
testing and commissioning of electrical switchgears,
automation systems and systems used in
explosive atmospheres

maintenance and improvement of power supply and automation products
and devices

***Quality management and environment protection – certified according
to ISO 9001 & ISO 14001***

25 years of product development for oil exploration activities

A vast portfolio of products for the oil and gas industry, ranging from instrumentation and SCADA systems to large containerized facilities for onshore and offshore rigs




PROJECTS IN: Albania
Argentina
Bangladesh
Bosnia & Herzegovina
China
Côte d'Ivoire
Croatia

Egypt
Germany
Iraq
Italy
Kosovo
Libya
Malta

Mexico
Montenegro
Russia
Slovenia
Syria
UAE
USA

Installation of components produced by the world's leading companies (Siemens, ABB, Schneider Electric, GE, etc.).

With our *highly qualified personnel* we ensure implementation of safety, legal and technical regulations and environmental protection



Containerized SCR / Silicon Controlled Rectifier and VFD / Variable Frequency Drive System

SYSTEMS FOR POWER SUPPLY AND CONTROL OF AC / DC MOTOR UNITS

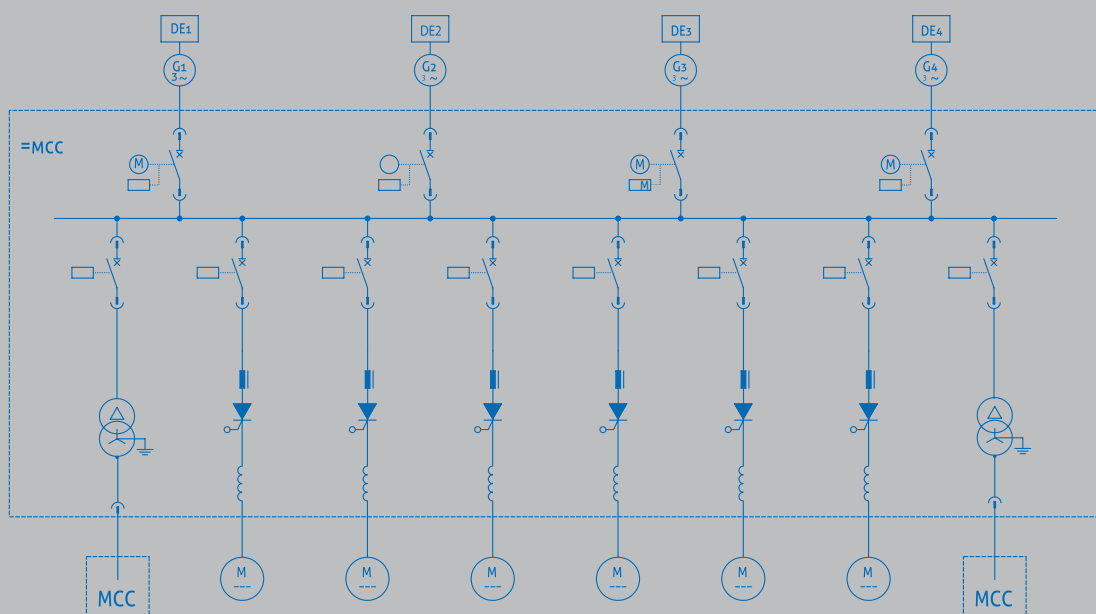
| | TWO DC DRIVES | FOUR DC DRIVES | SEVEN DC DRIVES | NINE DC DRIVES |
|------------------------------|----------------|----------------|-----------------|-----------------|
| DIMENSIONS (MM) | 3500×3300×2520 | 6500×3300×2520 | 12000×3300×3005 | 12000×3300×3005 |
| | 1 MW | 3 MW | 4 MW | 5 MW |
| | 1 | 3 | 4 | 5 |
| RATED BUSBAR CURRENT | 2000 | 3000 | 5000 | 8000 |
| POWER TRANSFORMER | 75 kVA | 650 kVA | 2X1000 kVA | 2X1000 kVA |
| DRILLER'S CONSOLE | ✓ | ✓ | ✓ | ✓ |
| REDUNDANT AIR — CONDITIONING | ✓ | ✓ | ✓ | ✓ |
| SCADA SYSTEM | ✓ | ✓ | ✓ | ✓ |

*Optional adjustments based on the size
and configuration of the rig*

Custom – tailored design

Short delivery time

- Designed for offshore and onshore drilling rigs
- Power supply and control for AC/DC motor units – Mud Pumps, Draw-works and Top Drives
- Central supervisory control and data acquisition system (SCADA)
- Load – Shedding System
- Generator incoming feeders
- Generator monitoring and control systems
- Power supply system for auxiliary AC drives
- Optional power transformer for MCC supply
- Redundant heating and cooling system
- For DC equipped rigs two basic types of SCR system:
 - DC drives with independent excitation
 - DC drives with serial excitation
- DC drives based on Siemens Technology
- Incoming and outgoing cable connection via receptacles



Reliable operation in extremely harsh working conditions

Designed for offshore and onshore drilling rigs

Two redundant incoming feeders with integrated protection and measuring systems

Separate incoming feeder for an auxiliary generator

Local and remote control of all motor drives

Soft start sections for larger motor units

Withdrawable sections for easier maintenance

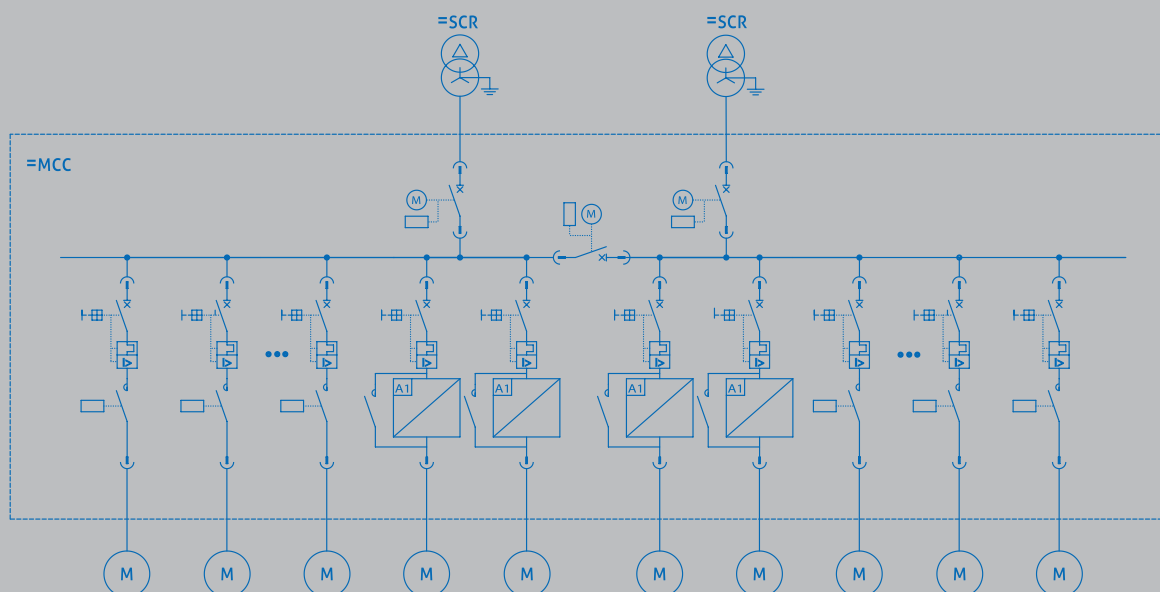
Short-circuit and thermal overload protection in all feeders

Robust design, suitable for extremely harsh working conditions

Additional transportation equipment available

Simple and fast installation enables efficient moving of the rig

Incoming and outgoing cable connection via receptacles





Containerized MCC / Motor Control Center

POWER SUPPLY AND CONTROL OF AC MOTOR UNITS

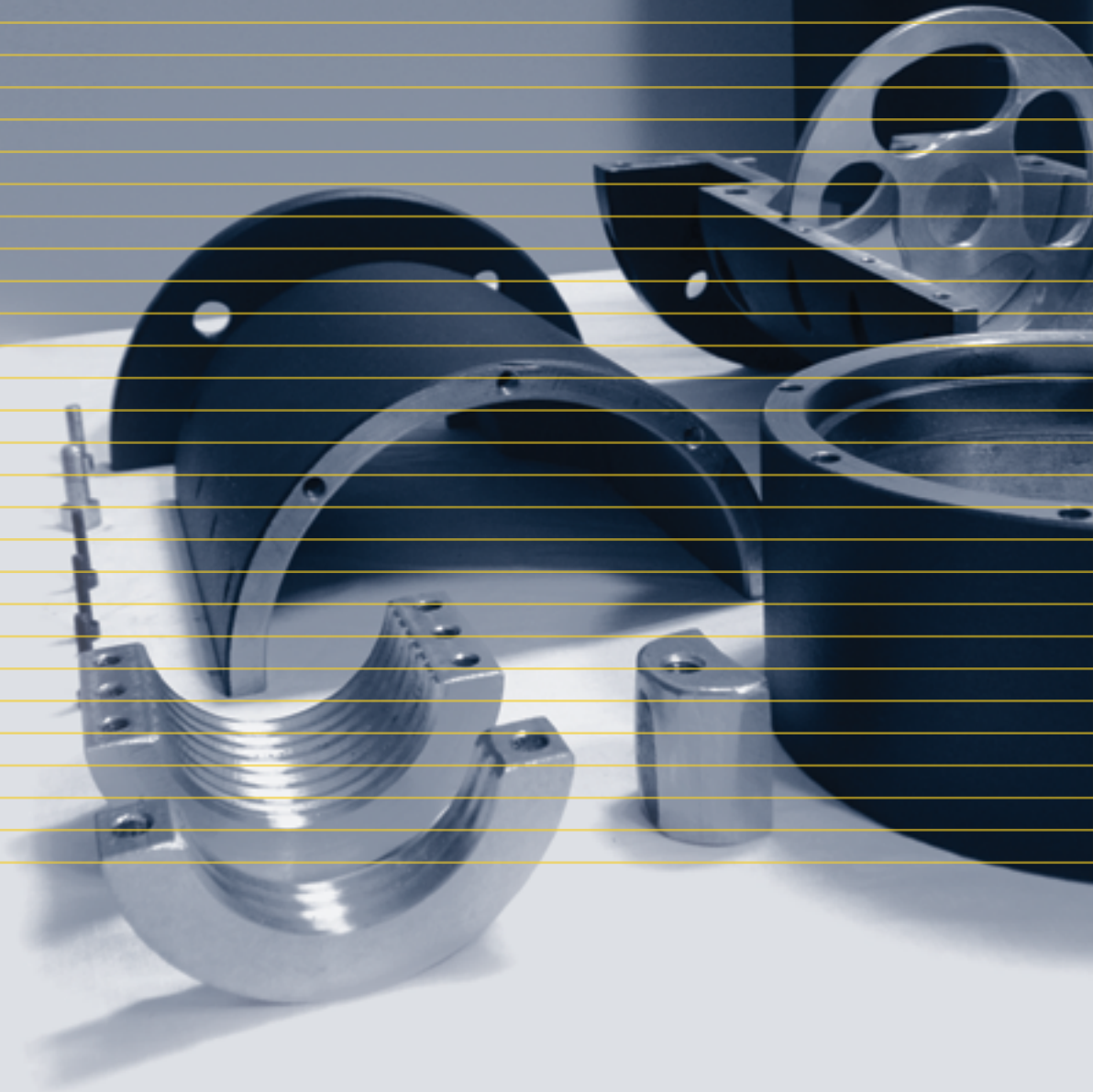
| DIMENSIONS (MM) | 10000×2600×2520 | 6500×3300×2520 |
|---------------------------|---------------------|---------------------|
| RATED POWER | 1 MW | 0,5 MW |
| NOMINAL VOLTAGE | 400 V _{AC} | 400 V _{AC} |
| NO. OF INCOMING FEEDERS | 2 | 2 |
| NO. OF GENERATOR CUBICLES | 1 | 1 |
| RATED BUSBAR CURRENT | 2000 | 1000 |
| MOTOR FEEDER POWER | UP TO 55 kW | UP TO 55 kW |
| SOFT STARTER POWER | UP TO 75 kW | UP TO 75 kW |
| SCADA SYSTEM | OPTIONAL | OPTIONAL |

*Short delivery
time*

*Custom –
tailored design*

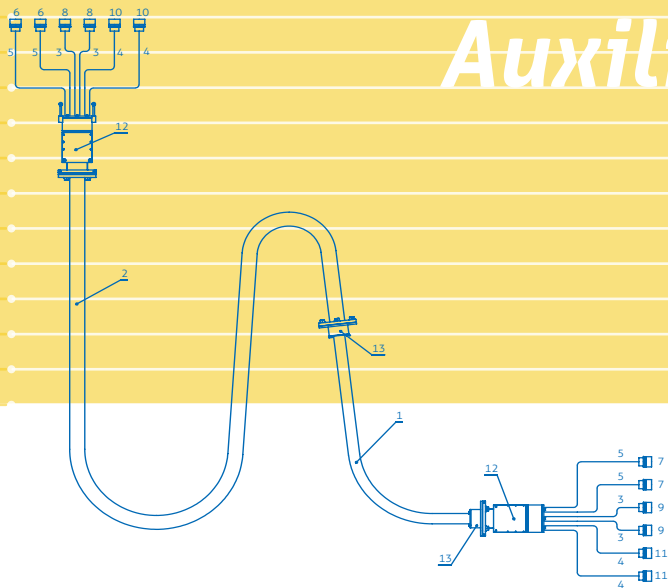
Superior lifespan

Short delivery time



*A unique product on
the global market*

Auxiliary Service Loop



Revolutionary cable design

Completely new concept prevents tangling and stranding of individual cable wires

Superior stability and flexibility

Special kevlar fiber reinforcement

Resistant to mechanical damages

Power and signal conductors implemented in a custom developed multicore cable

Reliable power supply and control

Custom-tailored to match specific needs of the Top Drive unit

Optional explosion proof connectors

Versatile and reliable power supply for camps

Rugged and compact design

Reliable operation in extremely harsh working conditions

Simple and fast installation enables efficient moving of the rig

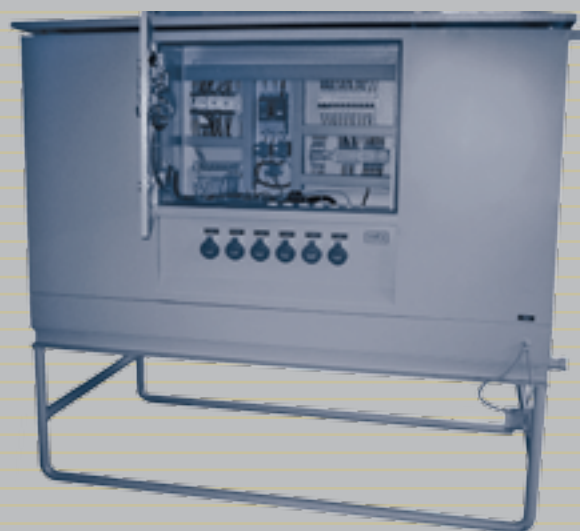
Cable connection via power and control plugs



RINA / Portable distribution board

ELECTRIC POWER DISTRIBUTION UNITS FOR
ONSHORE DRILLING CAMPS

| | |
|-------------------------|---------------------------|
| DIMENSIONS (MM) | 1800×1200×400 |
| | 80 kW |
| NOMINAL VOLTAGE | 230 / 400 V _{AC} |
| NO. OF INCOMING FEEDERS | 2 |
| RATED BUSBAR CURRENT | 200 A |
| OUTGOING FEEDER POWER | UP TO 22 kW |
| NO. OF OUTGOING FEEDERS | PER REQUEST |



STABLE POWER SUPPLY FOR
ELECTRONIC EQUIPMENT USED ON
ONSHORE DRILLING RIGS

Portable stable power supply distribution board 5 & 20 kVA

| | | |
|-------------------------|---------------------------|---------------------------|
| | 5 kVA | 20 kVA |
| DIMENSIONS (MM) | 800×500×500 | 1500×1100×2000 |
| RATED POWER | 5 kVA | 20 kVA |
| | 400 / 230 V _{AC} | 400 / 230 V _{AC} |
| NOMINAL CURRENT | 7,23 A | 28,90 A |
| NO. OF INCOMING FEEDERS | 1 | 1 |
| NO. OF OUTGOING FEEDERS | PER REQUEST | PER REQUEST |

Significant improvement of the electric power quality

Electromechanical voltage harmonic filter

Designed for onshore drilling rigs

Redundant incoming feeders

Custom-tailored to match the camp's electricity needs

Current, voltage and frequency measurements

General outgoing feeders with overcurrent and short-circuit protection

Motor outgoing feeders with thermal overload and short-circuit protection

Robust design suitable for operation in extremely harsh working conditions

Skid-mounted, suitable for lifting and transportation

Short delivery time

Designed for offshore and onshore drilling rigs

Operation control and monitoring of Top Drives, Mud Pumps, Draw-works and Rotary Table

Rugged and compact design suitable for harsh working conditions

Redundant safety systems

Use of the latest technology and equipment

Short delivery time

OPERATION CONTROL AND MONITORING
OF AC / DC DRIVES

Top Drive / Mud Pump / Draw-works / Rotary Table Control Panel



*Explosion proof
overpressure protection*

*Custom-tailored to match all
the requirements of the rig and
specific space requirements*

Designed for onshore drilling rigs

Implemented electromechanical power filter (motor-generator)

Compact and portable design

Reliable operation in extremely harsh working conditions

Rugged and modular design suitable for the oil industry

Skid-mounted, suitable for lifting and transportation

Short delivery time

Simple, modular and rugged design

Custom-tailored measuring devices and sensor configuration

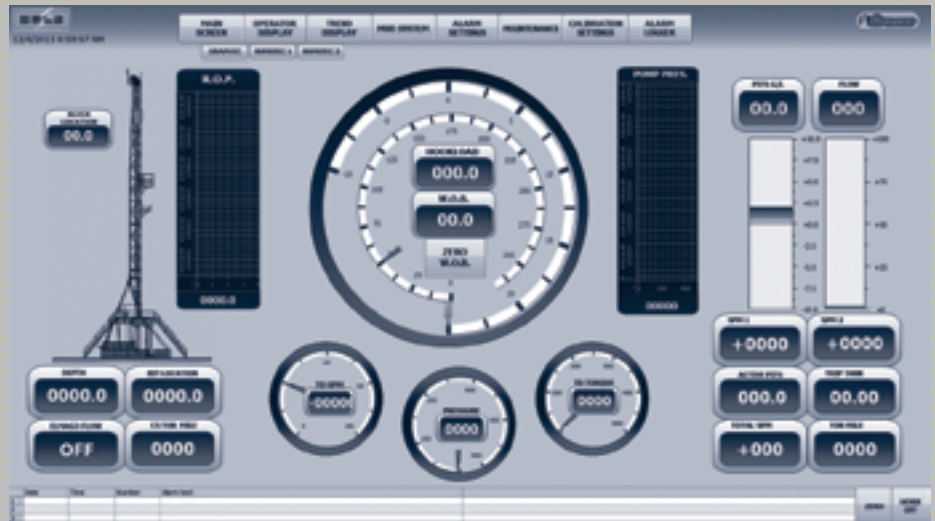
Optional modules:

Automatic Drilling System

Soft Pump System

Web Based Monitoring System

Drilling Monitor CCTV



HELB drilling instrumentation

Easy-to-read graphical tables, gauges, bar graphs and charts

Communication network via fiber optic, hard-wired or wireless

CENTRAL SUPERVISORY AND DATA ACQUISITION
SYSTEM FOR OFFSHORE AND ONSHORE DRILLING RIGS

REDUNDANT SAFETY SYSTEMS:

- Kinetic energy limitation
- E-STOP button
- Dead Man's Switch
- Travelling block location control

TWO BASIC DESIGN CONCEPTS:

- Stand-alone system
- Helb Drilling Instrumentation integrated module

STATE - OF - THE - ART AUTOMATIC DRILLING SYSTEM
FOR ACCURATE **ROP** AND **WOB** REGULATION

HELB autodriller

Accurate and reliable regulation algorithms

ATEX zone 2 certification



Designed for offshore and onshore drilling rigs

Independent monitoring of all relevant drilling parameters

Compact and rugged design

Redundant workstations

Simple and user friendly work environment

Long term data logging

Automatic report generation

Short and long term trend display

Custom generated trend display

Easy menu navigation

Designed for offshore and onshore drilling rigs

User defined ROP and WOB drilling optimization

Simple and intuitive user interface

Easy-to-read graphical trend display

Equipped with accurate encoder and pressure sensors

Simple installation and putting into operation

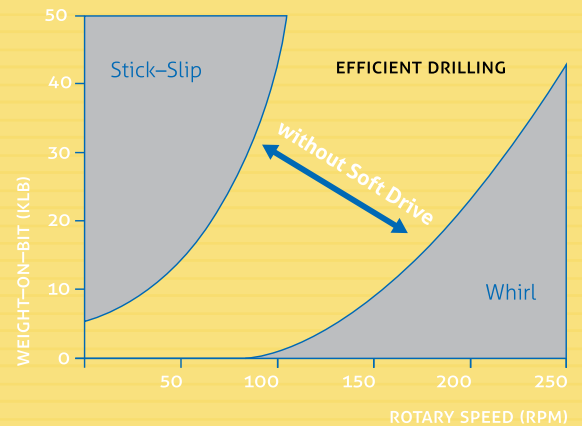
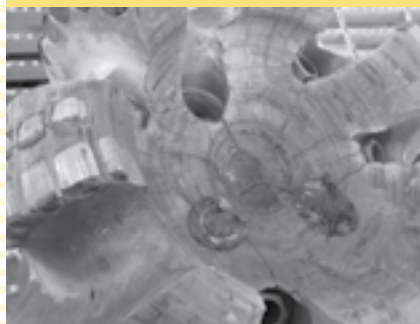
HELB soft drive

TOP DRIVE CONTROL UNIT FOR STICK SLIP MITIGATION AND EFFECTIVE ATTENUATION OF TORSIONAL VIBRATIONS

- Based on **our own** technology or
- Based **on new Z-TORQUE technology** approved by Shell
- Easy implementation, simple touch screen based user interface

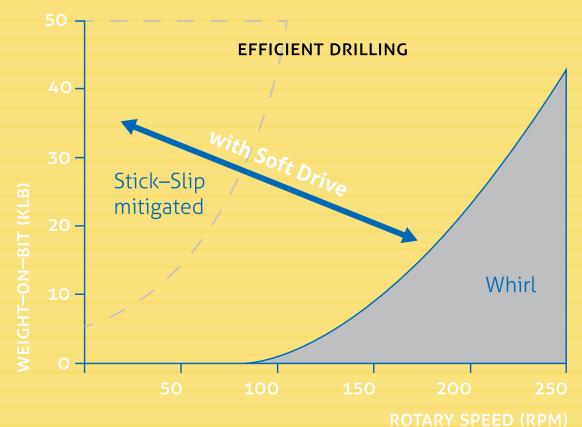
Drilling without Soft Drive

- REDUCED RATE OF PENETRATION (ROP)
- EQUIPMENT FAILURES
Rotary Steerable System (RSS),
Downhole motors, Measurements while drilling (MWD)
- BROKEN DRILL BIT CUTTERS
- DRILL PIPE FATIGUE FAILURE
- STICK SLIP ESTIMATED TO OCCUR 50% OF 'ON BOTTOM' DRILLING TIME



Drilling with Soft Drive

- HIGHER ROP**
- LONGER BIT LIFE**
- FEWER TRIPS FOR DOWNHOLE BREAKDOWNS**
- LOWER COSTS**
- LINE THEORY APPLIED TO DRILLSTRING
- INERTIA COMPENSATION/CORRECTION
- TD CONTROL SYSTEM DESIGNED TO ABSORB ALL TORSIONAL WAVES WHICH 'ARRIVE' AT THE TOP DRIVE
- NO TUNING REQUIRED (FIXED SETTING PER DP SIZE, TYPE)

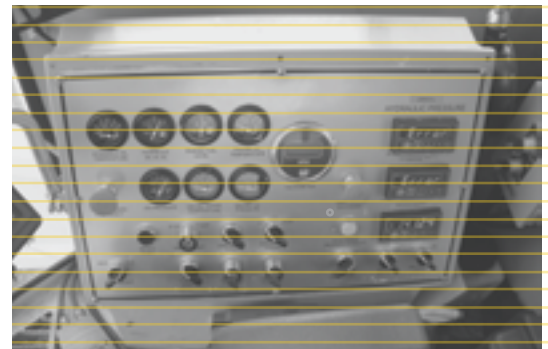


WHAT DO WE DO? Refurbishment and upgrade of onshore and offshore drilling rigs:
design, installation, testing and commissioning of power plants
replacement of existing instrumentation systems

HOW DO WE DO IT? Optimal use of a part of the existing plant without additional investment
on the primary equipment with respect for all applicable technical standards
(like BV, GL, DNV, LR, ABS, etc.)

Offshore & onshore upgrade

BEFORE
AFTER



Control panel for deck cranes

WHY CHOOSE US? **Custom tailored solutions** –we adapt each system to the requirements and needs of the customer

We have **extensive experience** in design, installation, testing and commissioning

Speed and flexibility of our performance is our imperative

We install the latest/the most modern equipment

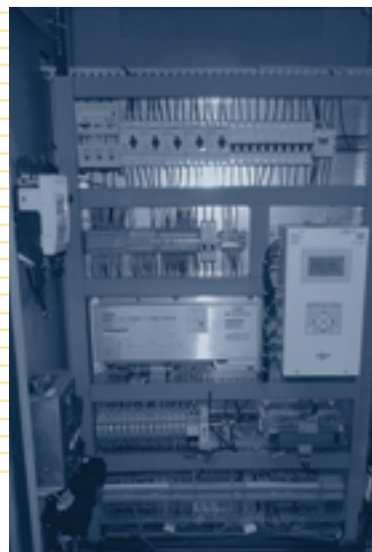
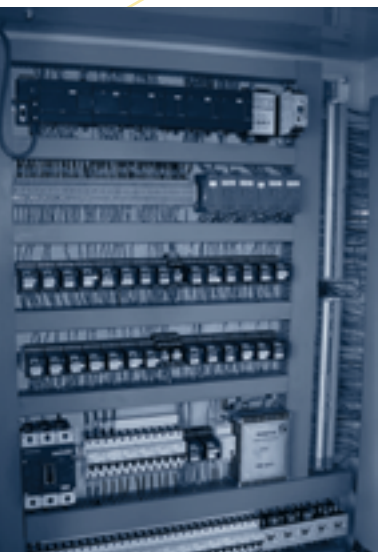
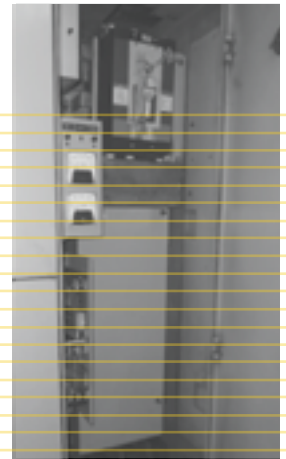
Our professional approach includes the following stages:

survey of site

preparation of possible solutions

proposal of possible solutions by categories:

Low Cost, Optional and High End



*Control and distribution
cabinet for deck cranes*

SCR/MCC room on offshore rig

Generator field

*SCR drive on
offshore rig*



offshore

20 years of experience in the oil industry have resulted in a skilled and professional team able to:

Overhaul complex electric power and automation systems on offshore drilling rigs

Maintain and comission entire electrical, automation and instrumentation systems on offshore drilling rigs



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