

WE support your **FUTURE**



Rockfin presentation

November 2017



1991-2017

BUSINESS OVERVIEW

Established in 1991, Rockfin is an engineering company specializing in:

engineering
& designing

procurement

production
& testing

delivery

site installation,
piping, erection

warranty & after
warranty service

spare
parts

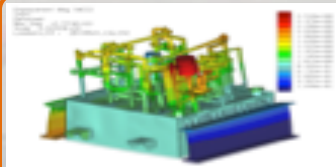
of liquid (oil, water, fuel) and gas systems, including:

- Generator Auxiliaries (incl. Nuclear Power Plants)
- Gas Turbine Auxiliaries
- Steam Turbine Auxiliaries
- Hydro Power Auxiliaries
- Power Conversion Auxiliaries
- Compressor Auxiliaries
- Process Auxiliaries
- High Pressure Systems & Cylinders
- Packaging of Power, Compressor, Gas Engine Skids
- Balance of Plant Auxiliaries
- Own Products
- Full Services

- Key clients include large global corporations operating mainly in the power generation, oil & gas & machinery industries which are highly prospective markets due to growing demand for energy.



Global & local
business



Engineering &
documentation



Functional tests



Variety of products
and services



Full range of site
service

LOCATION OF PRODUCTION PLANTS



PRODUCTION PLANTS and SERVICE CENTRES in POLAND

PRODUCTION PLANTS:

- Rockfin Headquarters and Production Plant 1 in Małkowo



- Production Plant 2 in Chwaszczyno



- Production Plant 3 in Bydgoszcz



- Production Plant 4 in Gorlice



SERVICE CENTRES:

- Service Headquarters in Chwaszczyno

- Szczecin

- Kostrzyn

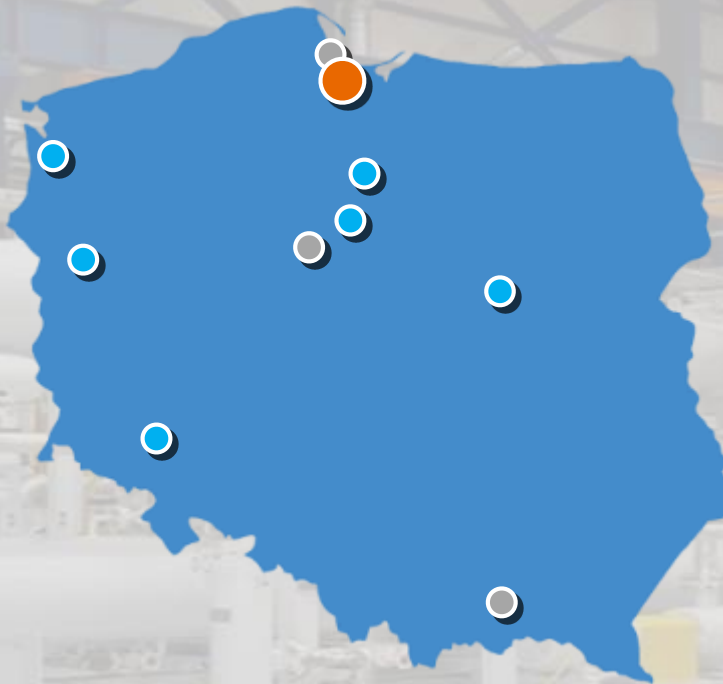
- Kwidzyn

- Świecie

- Łomianki

- Jelenia Góra

- Gorlice



HEADQUARTERS & PRODUCTION PLANT in Małkowo near Gdansk



- **Manufacturing of all systems up to 140T (overhead crain)**
- **Total area of 16500m², including:**
 - **6000m² of covered production area**
 - **900m² of office area**
- **Additional 11 operational cranes with max capacity of 1,5T each**
- **Additional 8 operational cranes with max capacity of 1T each**
- **Functional tests facility and equipment for 50/60Hz, 2MW, leakage tests, pressure test, electrical test**
- **Painting, welding shops**
- **NDT Laboratory**



QUALITY STANDARDS

QUALITY ASSURANCE

Quality Assurance is focused on planning, documenting and agreeing on a set of guidelines that are necessary to assure quality.

QUALITY CONTROL

Quality Control is a set of procedures intended to ensure that a manufactured product meets the requirements of the customer.

CERTIFICATES & APPROVALS

- INTEGRATED MANAGEMENT SYSTEM (ISO 9001; ISO 14001; OHSAS)
- ISO 3834-2
- ISO 17025
- PED mod. A1
- U-STAMP acc. ASME
- AD2000
- Repairs of hydraulics arrangements
- Filtration and diagnostic
- WHG certification



ENGINEERING & DOCUMENTATION

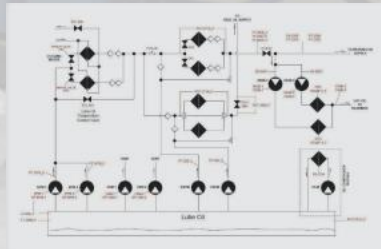
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INPUT DATA ANALYSES

- ▶ International Standards ISO, API, ASME, GOST, IEC, NEC, DOSH, KOSHA, SCA, AWS, etc
- ▶ EU Derectives MD, PED, EMC, LVD, ATEX
- ▶ Client & End User Specification

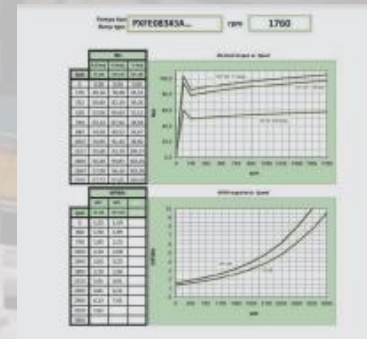
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P&ID DEVELOPMENT



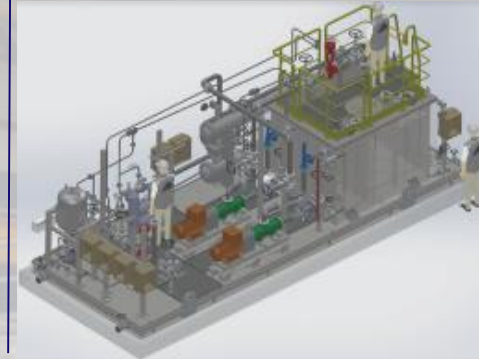
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MAIN COMPONENTS SELECTION



4

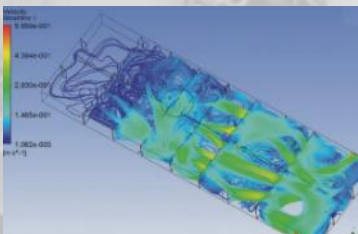
GENERAL ARRANGEMENT



5

ENGINEERING CALCULATION

- ▶ Final Element Method (FEM) strength analysis
- ▶ Seismic Loads Analyzes
- ▶ Flow Analysis



6

3D MODELING MANUFACTURING DOCUMENTATION



7

PROGRAMMABLE LOGIC CONTROLER

- ▶ Human machine interface
- ▶ Programming electrical power
- ▶ Control cabinet

8

TESTING DOCUMENTATION PROJECT VALIDATION



TYPICAL APPLICATIONS

**GAS TURBINE
AUXILIARIES**



**GENERATOR
AUXILIARIES**



**STEAM TURBINE
AUXILIARIES**



**COMPRESSOR
AUXILIARIES**



PACKAGING



**BALANCE OF
PLANT**



**HYDRO-POWER
AUXILIARIES**



**WASTE-TO-ENERGY
BURNING PLANT
AUXILIARIES**



**HIGH PRESSURE UNITS
& CYLINDERS**



**POWER
CONVERSION**



**ROCKFIN
PRODUCTS**



SERVICE



NUCLEAR POWER PLANTS EXPERIENCE

BORSSELE

- ▶ Upgrade of Nuclear Power Plant in Netherlands
- ▶ Installed Capacity 515 MW

RINGHALS 1

- ▶ Upgrade of Nuclear Power Plant in Sweden, delivery in year 2014
- ▶ Installed Capacity 881 MW

FORSMARK 3

- ▶ Upgrade of Nuclear Power Plant in Sweden, delivery in year 2014
- ▶ Installed Capacity 1187 MW

LAGUNA VERDE 1

- ▶ Upgrade of Nuclear Power Plant in Mexico, delivery in year 2010
- ▶ Installed Capacity 650 MW + 20% upgrade

FLAMANVILLE 3

- ▶ New Nuclear Power Plant in France, delivery in year 2009
- ▶ Installed Capacity 1750 MW

Hinkley Point 3

- ▶ New Nuclear Power Plant in UK, during execution



BASIC INDUSTRIAL STANDARDS

- ▶ Local (National) Regulations
- ▶ Harmonized Standards (Europe)
- ▶ PED 97/23/EC
Pressure Equipment Directive (Europe)
- ▶ EN ISO 15614-1
Specification and qualification of welding procedures for metallic materials (Europe)
- ▶ EN 17636 / EN 17637 / EN 23277
Non-destructive Examination (Europe)
- ▶ ASME Section VIII
Pressure Vessels (USA)
- ▶ ASME Section IX
Welding and Brazing Qualification (USA)
- ▶ ASME Section V
Non-destructive Examination (USA)

STANDARD KNOWLEDGE

AFCEN RCC-M 2012

Design and Construction Rules for Mechanical Component

- ▶ SECTION I
Nuclear Island Components
- ▶ SECTION II
Materials
- ▶ SECTION III
Examination Methods
- ▶ SECTION IV
Welding
- ▶ SECTION V
Fabrication

BASIC INDUSTRIAL SYSTEMS

- ▶ Integrated Management System
ISO 9001:2008; ISO 14001:2004;
PN-N-18001:2004; OHSAS 18001:2007
- ▶ ISO 3834-2:2007
ISO 17025:2005
- ▶ ATEX, NORSOK, FROSIO
- ▶ EN ISO 9606, Certification to
manufacture pressure vessels acc. to
PED and U-STAMP, piping acc. ASME
- ▶ Personnel qualification
PN-EN ISO 9712:2012 at level I, II, III
(in acc. to ASNT, SNT-TC-1A, CP-189,
PED, CSWIP, JSNDT)
- ▶ Rockfin Laboratory (LBT)
is an independent research unit
accredited by The Polish Atomic Energy
Agency PAA (license No. D-17405) and
has approval certificate in accordance
with ISO 17025:2005
(No. LBU 233/06-15),
DNV-GL (No. AOSS00000G4)



GENERATORS



- ▶ Seal oil systems (single, triple)
- ▶ Stator water cooling systems
- ▶ Hydrogen gas units
- ▶ Float traps
- ▶ Seal oil drain enlargement sections
- ▶ Air detraining sections
- ▶ Leakage detectors
- ▶ Hydrogen supervisory racks
- ▶ Hydrogen supply and purge valve units
- ▶ Local instruments, H2 bottles, Argon racks
- ▶ CO₂ expansion devices, bottle racks
- ▶ H2 High pressure reducing stations
- ▶ Generator leakage detectors
- ▶ H2 circulating fan
- ▶ H2 gas dryer
- ▶ Oil mist eliminator
- ▶ Bearing exhauster
- ▶ Storage tanks

Nuclear:

- | | | |
|-------------------------------|----------------------------------|--------------------------------|
| ▶ France: Flamanville 1750 MW | ▶ Poland: Kozienice 1075 MW | ▶ Thailand: Mae Moh 800 MW |
| ▶ Mexico: Laguna Verde 682 MW | ▶ South Africa: Medupi 800 MW | ▶ USA: Greenville 1000 MW |
| ▶ Sweden: Forsmark 1170 MW | ▶ Germany: Walsum 750 MW | ▶ Saudi Arabia: Yanbu 628 MW |
| ▶ Sweden: Ringhals 881 MW | ▶ Netherlands: Maasvlakte 750 MW | ▶ Saudi Arabia: Shuqaiq 640 MW |
| | ▶ USA: Hempstead 600 MW | |
| | ▶ UK: Staythorpe 430 MW | |

Since
1997 over
400
units

STEAM TURBINES



Lube oil & jacking system



Lube oil cooling
& filtration skid



Lube oil system



HP control system

- ▶ Hydraulic & lube oil systems
- ▶ Lube oil systems
- ▶ Hydraulic power units
- ▶ Jacking oil systems
- ▶ Cooling systems
- ▶ Filtration systems
- ▶ Hydraulic power and control system
- ▶ Lube oil purification systems
- ▶ Oil mist separators & vapor extraction systems
- ▶ Local instrument cabinets
- ▶ Oil transfer pump units

- ▶ Kozenice Power Plant 1075 MW
- ▶ Bełchatów Power Plant 860 MW
- ▶ Hempstead Power Plant 600 MW
- ▶ Pątnów Power Plant 460 MW
- ▶ Manjung Power Plant 2 x 1000 MW

- ▶ TanJungBin Power Plant 2 x 1000 MW
- ▶ Maasvlakte Power Plant 1x 1100 MW
- ▶ Neurath Power Plant 2 x 1100 MW
- ▶ Datteln Power Plant 2 x 1100 MW

Since
1995
over 280
units

GAS TURBINES



Combined auxiliary system



Lube oil & gas fuel system



Fuel forwarding skid



Fuel gas system



Water injection system



Fuel distribution system

- ▶ Combined auxiliary systems
- ▶ Lube oil systems
- ▶ Lube & jacking oil systems
- ▶ Fuel distribution systems
- ▶ Fuel gas systems
- ▶ Fuel oil systems
- ▶ Water injection skids
- ▶ Hydraulic power systems, PLC control for diverter dumper
- ▶ Control valve blocks
- ▶ Heavy fuel forwarding skids
- ▶ Light fuel forwarding skids
- ▶ Heavy fuel filtration skids
- ▶ Light fuel filtration skids

- ▶ Ahal
- ▶ Alon Tavor
- ▶ Amata
- ▶ Asyut
- ▶ BanPong
- ▶ Basra
- ▶ Bir M'Cherga
- ▶ Bouchain

- ▶ Chilca
- ▶ Deir Ammar
- ▶ Delek Sorek
- ▶ Derweze
- ▶ Dohuk
- ▶ Gorzów
- ▶ Guilin
- ▶ Ichthys

- ▶ IRPC
- ▶ JFE Chiba
- ▶ Holland Energy
- ▶ Kazan
- ▶ Los Guindos
- ▶ Machala
- ▶ Missan Oil
- ▶ Mogas Cogen

- ▶ Nakhodka
- ▶ Nanxun
- ▶ Nghi Son
- ▶ Porto Empedocle
- ▶ Rabab Harweel
- ▶ Reliance
- ▶ Samsung Total
- ▶ Shell Bukom

- ▶ Siam Pure Rice
- ▶ Soyo
- ▶ Stalowa Wola
- ▶ Thai Oil
- ▶ Watan
- ▶ Włocławek
- ▶ Yamal

Since
2013
over 400
units

COMPRESSORS



Lube oil system driven
by steam turbine



Lube oil system



Seal gas panel

- ▶ Lubrication & control oil systems
- ▶ Dry gas shaft sealing systems
- ▶ Oil type shaft sealing systems
- ▶ Booster panels
- ▶ Lube oil rundown tanks
- ▶ Overhead tanks
- ▶ Lube oil filters
- ▶ Local gauge boards
- ▶ Oil purification units (centrifugal or coalescence)
- ▶ Oil mist separators

- ▶ Amec Foster Wheeler
- ▶ Bayer Technology
- ▶ Bechtel
- ▶ BP
- ▶ Chevron Texaco
- ▶ Chiyotec
- ▶ Chiyoda
- ▶ ConocoPhillips
- ▶ Daewoo

- ▶ Daelim
- ▶ Dresser-Rand
- ▶ Enx
- ▶ ExxonMobil
- ▶ Flowserve
- ▶ Fluor
- ▶ Gaz De France
- ▶ GE Oil & Gas
- ▶ Hitachi

- ▶ Indian Oil
- ▶ Kuwait National Petroleum
- ▶ Linde
- ▶ Lurgi
- ▶ Maersk
- ▶ MAN Turbo Diesel
- ▶ Messer
- ▶ Mitsubishi Heavy Industry
- ▶ Modec

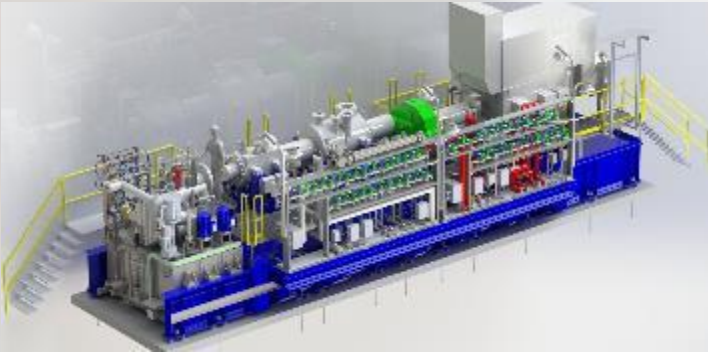
- ▶ NNPC
- ▶ Petrobas
- ▶ PKN Orlen
- ▶ Praxair
- ▶ Repsol
- ▶ Samsung Heavy Industries
- ▶ Sasol Technology
- ▶ SBM

- ▶ Shell
- ▶ Siemens
- ▶ Thyssen Krupp Uhde
- ▶ Technip
- ▶ Total
- ▶ Zachry

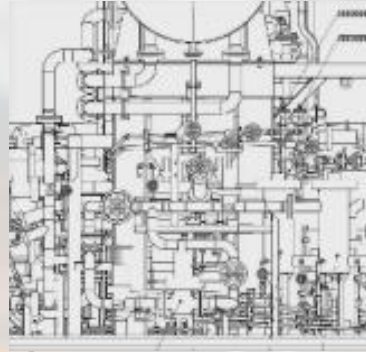
Since
1995
over 450
units

PACKAGING

Design & Engineering



Documentation



Shop test



Service



1

2

3

4

5

6

7

8



Purchasing



Manufacturing & Assembly



Logistic to Site



Customer support

HIGH PRESSURE UNITS & CYLINDERS



**High pressure (700 bar)
mobile power pack**



- ▶ Hydraulic power units
- ▶ Control blocks (manifolds)
- ▶ Hydraulic systems with conventional or proportional control
- ▶ Hydraulic cylinders with position control or measurement of stroke
- ▶ Hydraulic cylinders with hydraulic or mechanical interlock
- ▶ Hydraulic accumulator stations
- ▶ Cleaning mobile unit, Purifiers, Cetrifugal

Hydraulic power units



Cylinders



HYDRO-POWER

Servomotors



- ▶ Servocylinders for water turbine
- ▶ Cylinders for wicket gates
- ▶ Hydraulic units
- ▶ Lube & cooling units

Water cooling system



Hydraulic power packs



POWER CONVERSION

Water cooling unit



Water cooling unit



Pumping skids



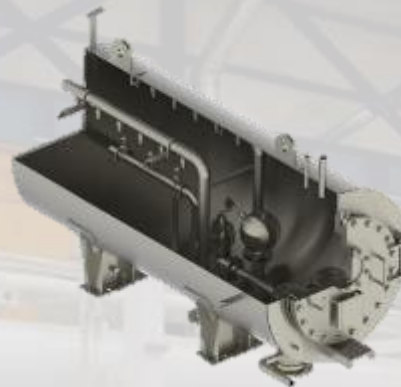
- ▶ Water cooling skids
- ▶ Chillers
- ▶ Pumping skids

Pumping skids



ROCKFIN PRODUCTS

Pressure vessels



- ▶ Pressure vessels based on customer requirements
- ▶ Design code : ASME sec. VIII div. 1 with U-STAMP or EN 13445
- ▶ Wide range of used materials : SUPER DUPLEX, DUPLEX , STAINLESS STEEL OR CARBON STEEL

Oil mist separators



- ▶ Flow range 100 – 1000m³/h
- ▶ Medium
AIR + OIL MIST
AIR + OIL MIST + HYDROGEN
- ▶ Separation efficiency
> 99,99%
- ▶ Noise level
< 85 dB

ROCKFIN PRODUCTS

FILTERS

LUBE OIL FILTERS

- ▶ Flow range 300 – 7500 lpm
- ▶ Design code
ASME sec. VIII div. 1 or
EN 13445
- ▶ Filter type
SINGLE or SUPLEX
- ▶ Housing materials
STAINLESS STEEL or CARBON STEEL



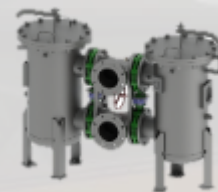
WATER FILTERS

- ▶ Flow range 300 – 7500 lpm
- ▶ Design code
ASME sec. VIII div. 1 or EN 13445
- ▶ Filter type
SINGLE or SUPLEX
- ▶ Housing materials
STAINLESS STEEL



CUSTOMIZES FILTERS

- ▶ Flow range
up to 12000 lpm
- ▶ Design pressure
up to 200 bar
- ▶ Requirements GOSH, KOSH, DOSH
- ▶ Housing materials: DUPLEX,
SUPER DUPLEX, INCOTEL 625,
TITANIUM and others



Filters & filter elements Industrial Test Bench

LUBE OIL FILTERS

- ▶ flow vs pressure test based on ISO 3968
- ▶ flow vs pressure test
- ▶ multipass test based on ISO 16889
- ▶ fatigue test based on ISO 3724
- ▶ collapse pressure on ISO ISO 2941
- ▶ bubble point test based on ISO 2942
- ▶ compatibility test with fluid based on ISO 2943



ROCKFIN PRODUCTS

Pipe CNC Bending

- ▶ Cold bending of pipelines in diameters :
CNC : $\varnothing 60.3 \div \varnothing 168.3$ mm
NC1: $\varnothing 15 \div \varnothing 48.3$ mm
- ▶ Bending machine and software are compatible with the most popular CAD programs Autocad | Inventor | SolidWorks | Nupas | Cadmatic | Tribon
- ▶ The bending is carried out on a fully automated CNC bending machine



Piping prefabrication & Spools

- ▶ Welding according ASME, EN, AD2000 Markblatt standards
- ▶ Welding materials: SS, CS, Duplex, Inconel ® and 6Mo
- ▶ Technology: TIG, MAG, FCAW, SAW
- ▶ Orbital welding or tubing
- ▶ Welding of pipes and vessel above 10" diameter using SAW technology Column & Boom for SAW:
range of vessel dimension $323,8 \div 2000$ mm
max length of longitudinal weld 2000mm
roller bed: 15t
- ▶ CNC bending up to 6"



SERVICE

1

SYSTEM ASSEMBLY

- ▶ Piping systems & piping prefabrication
- ▶ Materials & components supply
- ▶ Site installation (mechanical, piping, tubing, electrical & automation)



2

INDUSTRY & PERMANENT SERVICE

- ▶ Oil flushing & testing
- ▶ Site & in house repair & testing
- ▶ Maintenance, permanent service



3

WARRANTY & POST WARRANTY

- ▶ Site inspections
- ▶ Improvements and modernization of existing systems
- ▶ Specialized measurement
- ▶ Commissioning, supervising, erection



4

GLOBAL SUPPORT CLIENTS

- ▶ Availability 24/7
- ▶ Spare parts
- ▶ Engineering and technical support



WE support your **FUTURE**



Thank you