STEAG Energy Services
Energy in good hands!

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Power Plant Sites

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Based on decades of experience…








Weiher	Fenne	Walsum 9	Lünen	Herne	Voerde	Bergkamen	Bexbach
724 MW	466 MW	560 MW	507 MW	960 MW	2,234 MW	780 MW	773 MW

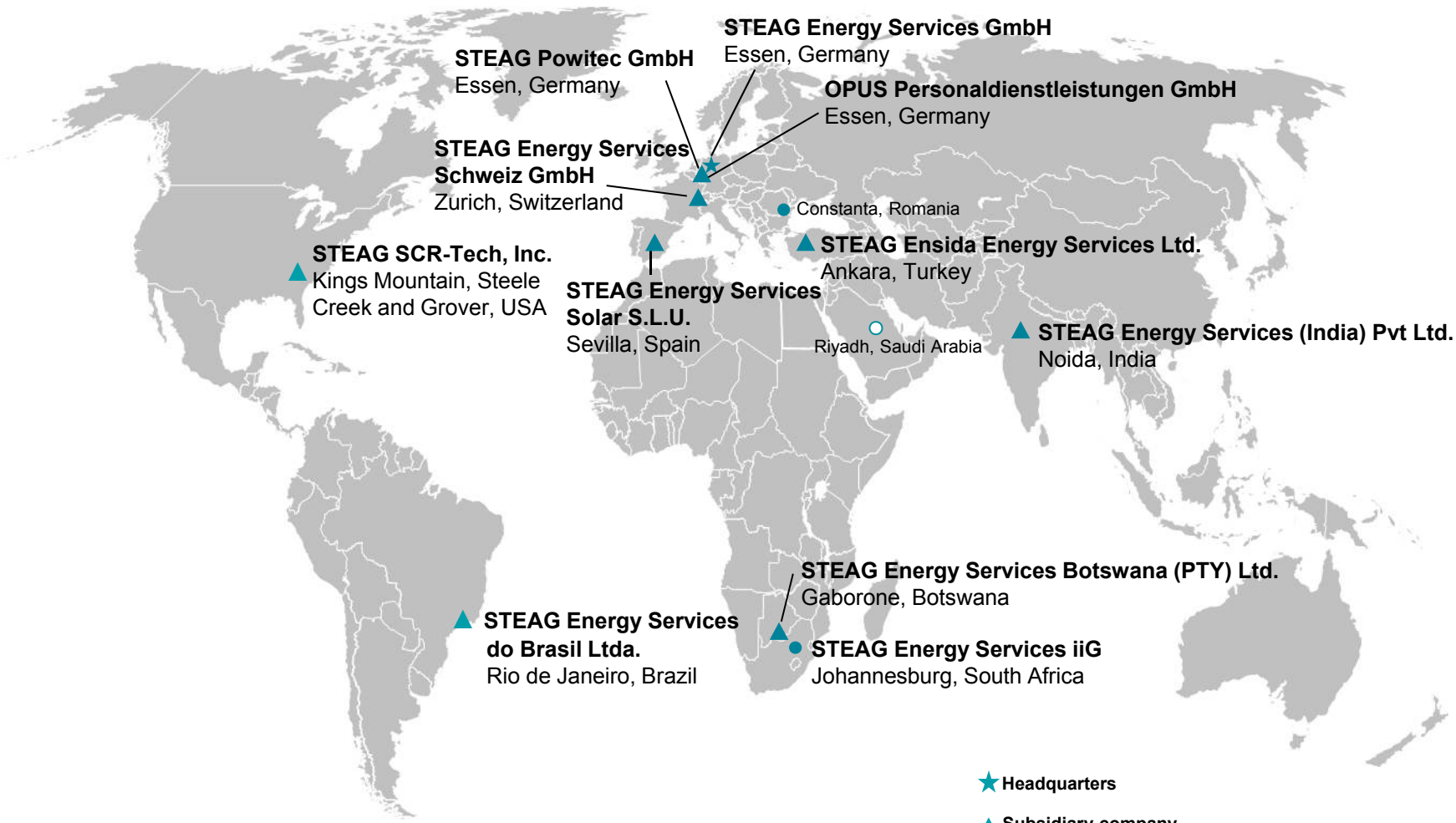
… treading new paths in the energy business.






Leuna	Köln-Godorf	Termopaipa	Iskenderun	Mindanao	Walsum 10
162 MW_{equ}	211 MW_{equ}	165 MW	1,320 MW	232 MW	790 MW
1996	2004	1999	2003	2006	2013

Overview of STEAG Energy Services Group



- ★ **Headquarters**
- ▲ **Subsidiary company**
- ● **Site or branch office**
- ○ **Permanent establishment**

Data 01/2016

STEAG Energy Services Group

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Revenue € 167 million
(consolidated)

Employees 1,615
(consolidated)

data 2015

STEAG Energy Services

Energy Technologies

Design, site supervision and commissioning of power plants

Plant Services

Operation & Maintenance, catalyst management and –regeneration, personnel services

Nuclear Technologies

Decommissioning and dis-mantling of nuclear plants, safety, radiation protection and realization of final disposal sites

System Technologies

Energy Management Systems, IT solutions for monitoring, optimization and advanced process control

Information Technologies

Operation Management Systems, Communication Technologies, Site IT

Organisation

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Management Board

Dr. Schiele (CEO), Sigel

Dr. Schiele (CEO)

Energy Technologies
Dr. Benesch

- Civil Engineering
- Electrical
- Plant and Process Engineering
- Project Realization & Plant Control
- QA / QC
- Sales

Nuclear Technologies
Schröder

- Nuclear Engineering
- Nuclear I&C / Electrical Systems
- Nuclear International Decommissioning & Dismantling
- Nuclear Physics
- Sales & Business Development

Marketing
Fricke

International Business Development
Schierenbeck

Sigel

System Technologies
Krüger

- Energy Management Systems
- Product Development
- Sales
- STEAG Powitec GmbH

Plant Services
Nietzschmann

- Operation & Maintenance
- SCR Management & Catalyst Testing
- OPUS Personal-dienstleistungen
- SES Solar S.L.U.

Commercial Department
Schmukal

- Commercial Project Execution
- Commercial Project Management / Shareholding Management
- Project Controlling / Subsidiaries
- STEAG-ES Dienstleistungsges. mbH

Information Technologies
Hennig

- Application Services
- Infrastructure Services
- Customer Services

Subsidiaries

STEAG Energy Services (India), Pvt. Ltd.	100 %
STEAG SCR-Tech, Inc.	50 %
STEAG Energy Services do Brasil Ltda.	100 %
STEAG Energy Services Solar, S.L.U.	100 %
STEAG Ensida Energy Services Ltd.	99,8 %
STEAG Energy Services Schweiz GmbH	100 %
STEAG Energy Services Botswana (Pty)	100 %
OPUS Personaldienstleistungen GmbH	100 %
STEAG Powitec GmbH	100 %
STEAG-ES Dienstleistungsges.mbH	100 %
STEAG Energy Services Beteiligungsges.mbH	100 %

Short description Energy Services

Engineering

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Energy Technologies	Nuclear Technologies
Plant and Process Engineering	Nuclear Engineering
Civil Engineering	Nuclear I&C / Electrical Systems
Electrical	Nuclear Physics
QA / QC	Nuclear International / Decommissioning & Dismantling
Project Realization & Plant Control	Sales & Business Development

concepts, studies → basic engineering → tendering, permitting management / general contractor, supply of components → site supervision → commissioning

Projects of Energy Technologies

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Modernization of I&C equipment and control room at Voerde power plant

Project management of modernizing the I&C systems in several plant sectors and upgrading of the control room of Unit B. Supervision of construction and commissioning and cost control.

Wind energy project Crucea North, Romania

At this project we provided the overall project management, the development of an O&M concept and the drawing up of technical tender documents. Furthermore we provided the technical evaluation and comparison of tenders, the preparation and conduct of technical contract award talks, and the complete planning of the grid connection.

Projects of Energy Technologies

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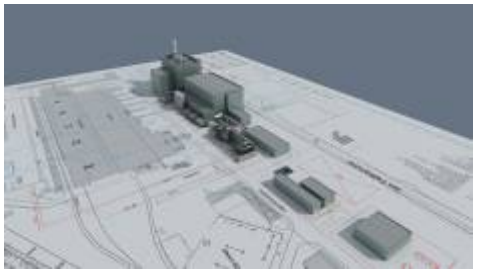
Construction of a new combined-cycle power plant for the Stadtwerke Düsseldorf



Assistance by preparation of the European call for tenders and the permit application. engineering services for the plant construction planning. Furnishing of engineering services for the plant construction as project management, quality control and construction supervision.

New-build coal-fired power station Medupi in South Africa

Support and advise in all matters relating to the power plant process, with special emphasis on interdisciplinary engineering. At the moment the expertise is required to implement the instrumentation and control system for the power plant process. We also handle various duties in project management, for example in Engineering Management, and engages in strategic and organizational consulting.

Projects of Nuclear Technologies

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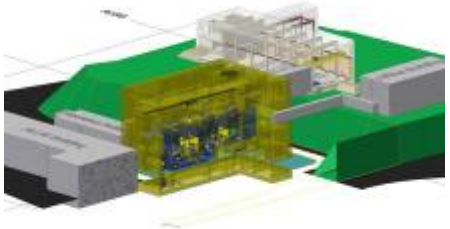
Construction of an active storage building at the Leibstadt nuclear power plant (Switzerland)

As general planner we are charged with handling the overall management, project planning and call for tenders for this active storage building. In the implementation phase, we will handle the management of construction and field erection up until commissioning is complete.

Vitrification Plant China (VPC)



Consortium leader; planning of the interim storage facility for the canisters as well as for the planning and delivery of key mechanical components such as crane systems, remote handling manipulators, rail-bound transport systems, shielding gates, etc.

Plant Services

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Plant Services

- Operation & Maintenance
- SCR Management & Catalyst Testing
- OPUS Personaldienstleistungen GmbH
- STEAG Energy Services Solar S.L.U.

Plant Services
Operation & Maintenance

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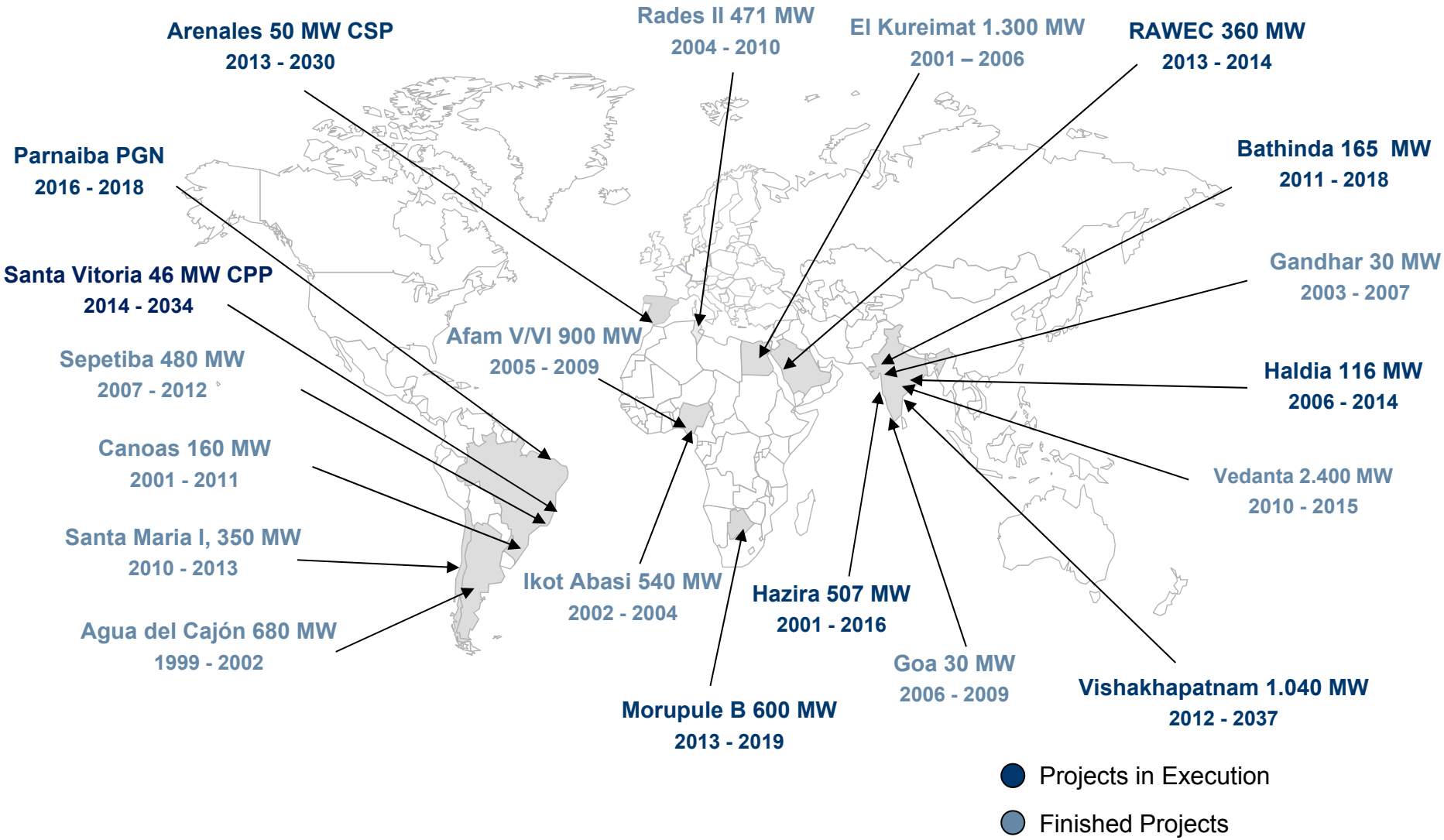

Plant Services
SCR catalyst management and regeneration

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Comprehensive catalyst service

Catalysts serve to reduce the nitrogen oxide from the flue gas of the combustion processes. In the course of use catalysts lose their capacity to convert the flue gas components into natural components of air. For efficient and therefore cost-effective operation of the $DeNO_x$ catalysts it is important for the operator to know when the time is right for regeneration or replacement of catalyst elements. This can be determined by catalyst management, by measurement of the activity of catalyst samples in a bench reactor.

Bench reactor

Scope of services:

- Determination of the catalyst activity in a bench reactor
- Catalyst services (catalyst management and regeneration)
- Performance of NO_x distribution measurements in the flue-gas path (with adjustment of the ammonia injection grid)
- Preparation of status reports (including service life prognosis and catalyst replacement concept) for $DeNO_x$ reactors

OPUS
Personaldienstleistungen GmbH

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Operating staff
Plant operator
Power plant people
Supply and disposal

Repair personnel
Technicians
Master
Craftsmen

Technical support
Engineers
Master
Technicians
Craftsmen
Commercial advisors

Training
Power plant people

Portfolio:

- **Temporary placement / hiring-out of personnel**
- **Personnel Recruiting**
- **Qualification / Education and Training**

OPUS has the permission of Labour Leasing according to the Employee Lending Law (AÜG)!

System Technologies

System Technologies

Energy Management Systems

Product Development

Sales

STEAG Powitec GmbH

monitoring and optimization of operating procedures → user training → process optimization by sensor-based solutions → early damage recognition

Energy Management Systems
EBSILON®

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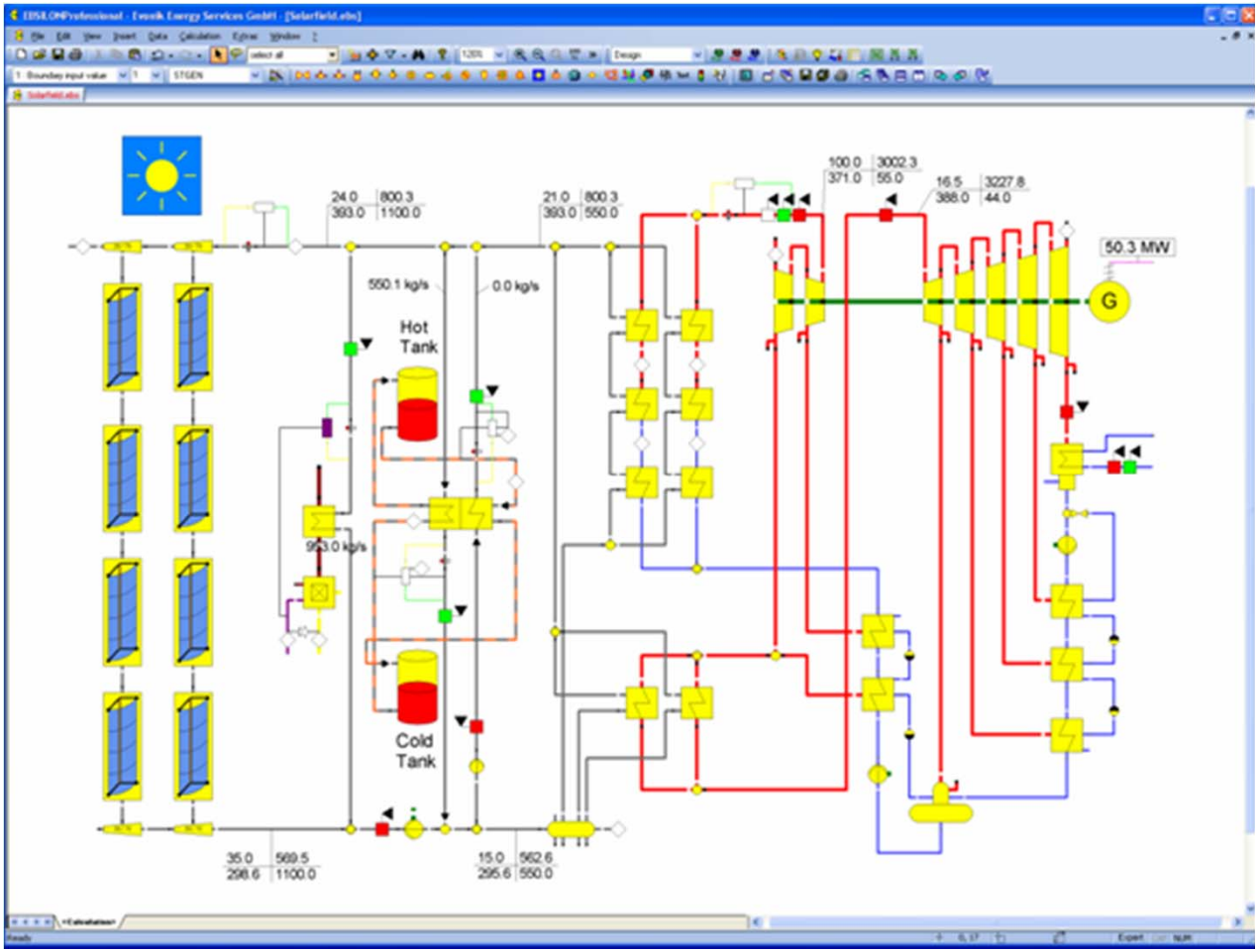
Cycle calculation program

500 licences worldwide in 19 countries



Energy Management Systems
Statistical Process Control (SPC)

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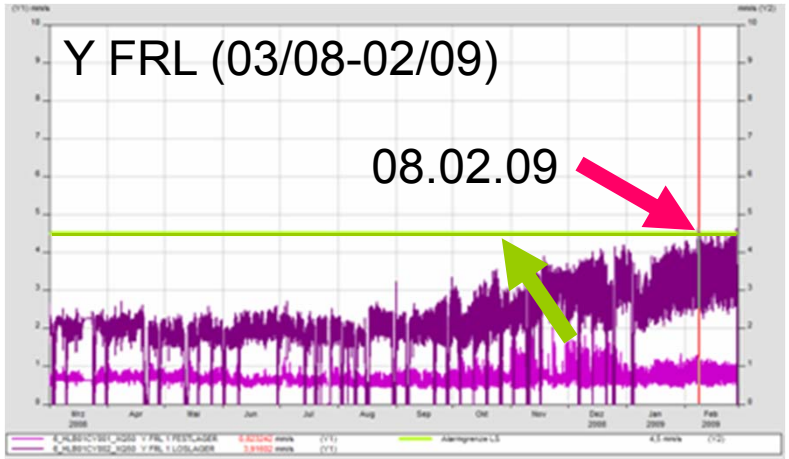
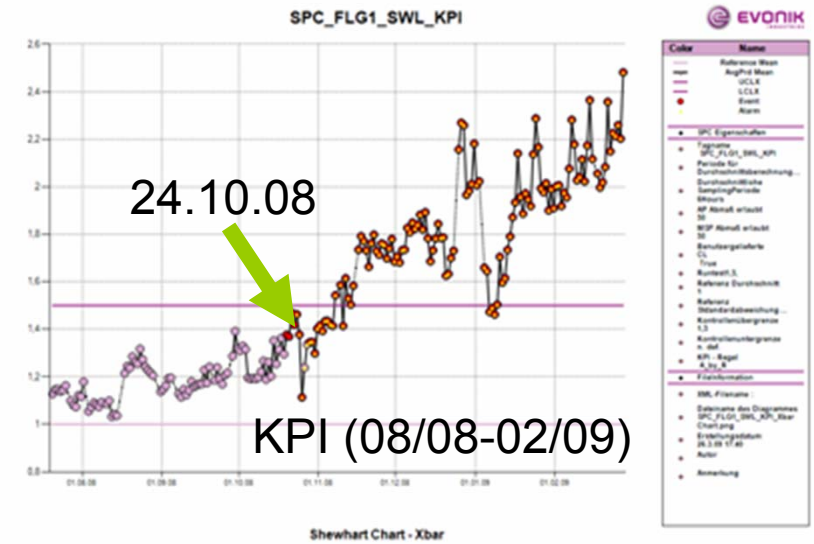
Statistical Process Control

Analysis of operational measurements to detect imminent damage to components or losses of process quality.

Example: Unbalance of a forced-draft fan





Information Technologies

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Information Technologies

- Application Services
- Infrastructure Services
- Customer Service

Operation Management Systems
RFID / SI

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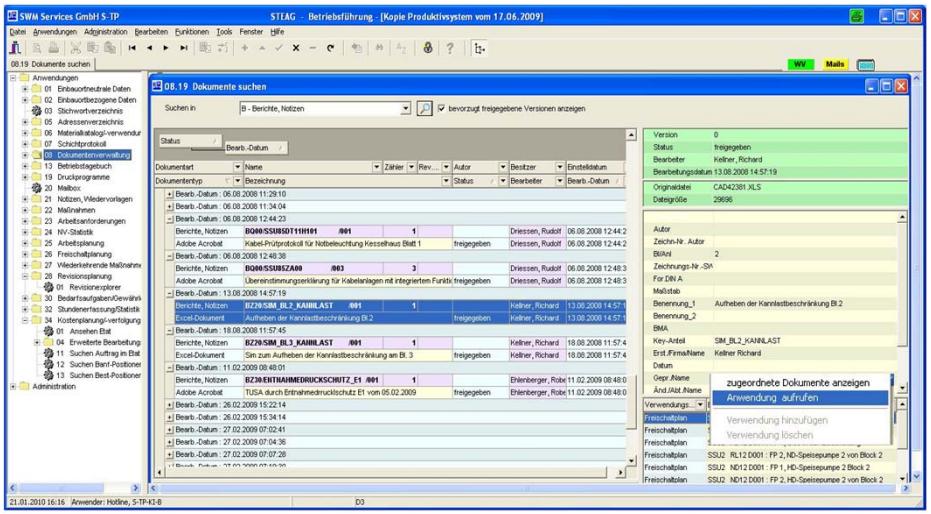
Optimal support of operation management by networks processes with SI



Activation and recurring methods with RFID

Information Technologies
seNet®

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seNet® - the private mobile radio

Our digital seNet® private mobile radio network is the first digital radio network in the Ruhr district that provides reliable, high-performance radio communication to professional users.
seNet® combines the advantages of modern voice and data communication with the specific functions of private mobile radio and security systems.

(300 internal user - 1.400 external user)

- Operation of the transmission of radio relay systems
- Operation of the telephone system
- Telephone support

Supply area

Subsidiaries
STEAG Energy Services (India) Pvt. Ltd.

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Registered Office: Noida

STEAG Energy Services (India) offers engineering services for modernization and construction of power plants. It also provides operation and maintenance services for thermal power plants and waste treatment plants. The subsidiary develops specific software solutions for energy management systems partnering with the System Technologies division.

Scope of services:

Engineering

Engineering services for modernization and construction of power plants

Plant Services

- Operation and Maintenance
- Testing Services
- Training

System Technologies

Development of specific software solutions for energy management systems, configuration of and service for such systems; training of users.

Haldia

Subsidiaries
STEAG SCR-Tech, Inc., USA

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Registered Office: Kings Mountain, Grover and Steele Creek, North Carolina

In the US, Energy Services is active in marketing the business lines‘ environmental capabilities, offers SCR (Selective Catalytic Reduction) catalyst management and runs the world‘s most modern catalyst regeneration facility. Additionally, the services include consulting as well as plant optimization and retrofitting.

Scope of services:

Regeneration of catalysts

Basic idea of Power Inland
- License from Integral
- Own deployment

Popcorn Ash Screens

Patented filter, developed in the Voerde power plant

Engineering

Marketing of environmental know-how

Regeneration facility

Subsidiaries
STEAG Energy Services do Brasil

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Registered Office: Rio de Janeiro

Growing industrial production and increasing prosperity have caused energy needs to rise sharply.

This is where STEAG Energy Services do Brasil comes in, which has been present in Brazil since 1974.

STEAG Energy Services is offering O&M and engineering services. From conceptual work to site management and subsequent operation, we make an important contribution to enable Brazil‘s energy balance to keep pace with the demands of a rapidly growing economic power.

Scope of Services:

- Operation and maintenance
- Services in core areas of engineering

Canoas

Subsidiaries
STEAG Ensida Energy Services, Turkey

Registered Office: Ankara

STEAG Ensida Energy Services, Turkey offers engineering services for the construction, modernization and operation of power plants. A 90%-share in the company was acquired in 2011.

Scope of services:

Engineering

- Coal- and gas-fired power plants: Feasibility studies, owner's engineering, asset evaluation
- Wind energy power plants: Grid connection, owner's engineering

Plant Services

- Operation and Maintenance
- Testing Services

System Technologies

- Specific software solutions for energy management systems, configuration of and service for such systems; user training

Local Company
STEAG Energy Services GmbH, South Africa
(incorporated in Germany)

Registered Office: Johannesburg

STEAG Energy Services, South Africa offers engineering services for the development, project execution, modernization and operation of power plants.

Scope of services:

Engineering

- Coal- and gas-fired power plants: Feasibility studies, owner's engineering, asset evaluation / management
- Industrial power plants: Feasibility studies, owner's engineering, asset evaluation
- Flue Gas Cleaning, biomass and solar-thermal power plants, wind farms, energy efficiency

Plant Services

- Operation & Maintenance
- Training

System Technologies

- Specific software solutions for energy management systems, configuration of and service for such systems; user training

Subsidiaries
STEAG Powitec GmbH

Registered Office: Essen and Ilmenau

STEAG Powitec develops, sells and implements sensor-based control systems for the automation of production processes, primarily used in power plants, waste incineration facilities, cement plants and lime works. The solutions by Powitec complement the existing portfolio of System Technologies optimal in particular with the core product of combustion optimization.

Scope of Services:

System solutions out of combination most modern Software (based on neuronal networks / artificial intelligence / CFD applications) for Advanced Process Control (APC) under involvement of hardware sensors.

Scope of application:
- Combustion optimization
- Denitrogenation with SNCR
- sustained improvements in energy efficiency, emissions, production and process stability

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