Siemens Industry Customer Service

References
# Energy efficiency audit and project implementation at Super Continental Pte Ltd.

## Challenge

Identify areas of energy savings in the plant focusing on major energy-consuming areas like:

- Energy supply contracts
- Lighting
- Water-Cooled Chillers, Cooling Towers, Diesel-Fired Boiler
- Chilled and Condenser Water Pumps, high-pressure pumps
- Air Compressors

## Solution

- Electrical and thermal Energy Audit
- Differentiation of base load and load depending on production
- List of potential energy-saving areas and related energy savings
- Definition of necessary investments and the resulting ROI

## Environmental benefit

- Reduced energy consumption and CO₂ emissions through better utilization of the energy used
- Use of an environmentally friendly refrigerant in the new chiller

## Customer benefit

- 10 energy-saving projects with a saved volume of 1.375 MWh / EUR 215,000 per annum
- Reduction of 9.9% in the existing Utility Bills
- ROI ranges from 1.1 years to 6.2 years with a mean value of 3.3 years.
Integral plant maintenance – Vedanta Aluminium Jharsuguda – Plant 1, India

**Challenge**
- Take over complete maintenance responsibility for aluminum production plant with multivendor equipment:
  - Carbon area (rotating equipment, conveyors)
  - Metal area (HDR – ABB)
  - Cast house (Robots – ABB)
  - Utilities (Electrical supply – partly Siemens)

**Solution**
- Initial Maintenance Health Check at Lanjigarh plant in June 2009. Take over of Performance-based Maintenance for the entire plant 1 (KPI: availability, energy consumption and spare parts costs), including:
  - Maintenance management and reliability increase, planning, scheduling, spare parts and warehouse management, supply of maintenance consumables
  - Execution of corrective, preventive and predictive maintenance, planned shutdowns and repairs
  - DC Energy optimization and management
  - Contract Duration: 3 years, with yearly renewal option
  - Structure: 329 employees. Customer’s maintenance personnel will be taken over by Siemens. Contract start: November 1, 2010

**Customer benefit**
- Customer can concentrate on core processes
- Performance-based costs
- Increased availability
- Reduced energy costs
Motor management program for seven hydraulic power stations on the Mosel

**Challenge**
- Secure long-term availability of power station generators for seven hydraulic power stations
- Reduce unscheduled downtime and systematically shift maintenance/inspection work to low-water periods

**Solution**
- Synchronize Siemens sales activities of RC with service know-how specialists from Repair Center St. Ingbert
- Utilize long-term business relationships
- Take over repair management with customer support
- Periodically monitor conditions (3 times a year)
- Systematically derive and perform scheduled maintenance work on the generators

**Customer benefit**
- Reduced station downtime
- Increased power output through shifting of maintenance and inspection work
- Cost reduction due to on-demand maintenance
- Reduction in handling through on-site service and in-house service from a single source
- Use of cost-effective yet innovative technology
Introduction of remote services for CHIRON-WERKE GmbH & Co.KG, Tuttlingen

Fault management around the world – Teleservice

If you need fast support from Chiron, you can press a button on your machine controller and a secure Internet connection is established between your facility and CHIRON’s service center. Within seconds, our system can find and update the current condition of the machine tool in detail. Globally, around the Clock.

- Support anywhere in the world, without a service technician
- Faults are located faster and resources are more efficiently used which reduces the costs
- Downtimes are detected immediately and the appropriate service personnel are notified immediately via text message or e-mail
- Through our diagnostic tools, we determine the correct service procedure depending on the condition of the machine

<table>
<thead>
<tr>
<th>Challenge</th>
<th>Solution</th>
<th>Customer benefit</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Enable worldwide support without expensive service trips&lt;br&gt;- Determination of the correct service procedure depending on machine condition&lt;br&gt;- Reduced service costs and enhanced product quality</td>
<td>- Implementation of ePS setup to handle &gt;1,500 machines&lt;br&gt;- Service concept with text message/e-mail and SAP connection&lt;br&gt;- ePS software solution to support the service and support initiative of a leading machine tool manufacturer</td>
<td>- More than 1,500 machines worldwide are successfully serviced&lt;br&gt;- Centralized service organization with 5 employees covering all installations worldwide&lt;br&gt;- Successful remote fix rate on machine faults raised from 32% to 54% within 2 years.</td>
</tr>
</tbody>
</table>
### Challenge
Develop a maintenance concept and carry out complete plant maintenance at MTU Aero Engines, Munich Karlsfeld, Germany

### Solution
- Reorganization of the existing structure into three areas (infrastructure, facility and maintenance) proposed by Siemens.
- Siemens commissioned as official partner for maintenance
- Joint development of a performance-based framework agreement for 10 years
- Based on this agreement, MTU commissioned Siemens to take over responsibility for maintenance activities (over 6,000 machines)

### Customer Benefit
- Strong partnership with a maintenance expert
- Maintenance contract based on clearly defined KPIs
- Continuous reduction of maintenance costs
- Improved transparency in costs and performance by implementing professional processes and clear responsibilities
- Improvement of planning and scheduling by means of a central maintenance control center
High-quality products and services and good customer relations were the basis for the success at Tüpras in Turkey

<table>
<thead>
<tr>
<th>Challenge</th>
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<tbody>
<tr>
<td>Tüpras refines 28.1 million tons of crude oil per annum in four refineries in Turkey</td>
</tr>
<tr>
<td>Goal of raising plant availability and avoiding production downtimes at Istanbul factory</td>
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<table>
<thead>
<tr>
<th>Solution</th>
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<tbody>
<tr>
<td>On-site audit of installed and active spare motors, inventory reduction and reliability testing of spare motors</td>
</tr>
<tr>
<td>Condition monitoring, repair and overhauling</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Customer benefit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reduced station downtime due to condition-based maintenance measures</td>
</tr>
<tr>
<td>Customer can focus on its core processes (production)</td>
</tr>
<tr>
<td>One reliable partner is responsible for motors of the main process and auxiliary equipment</td>
</tr>
<tr>
<td>Siemens knows the customer’s process and critical steps</td>
</tr>
</tbody>
</table>
### Maintenance consulting
**Metsä Tissue, a leading tissue company in Europe**

#### Challenge
- Evaluate the maintenance organization at a corporate level to determine the main areas of improvement in selected production sites
- Verify the feasibility of running a maintenance improvement project

#### Solution
- **Assessment phase:**
  - Maintenance Health Check (MHC) in 3 plants
  - Maintenance Business Review (MBR) in 2 plants
  - Identified internal best practices
  - Identification of local and corporate areas of improvement
- **Alignment workshop with the top management to support the go/no go decision**
- **Development of a Corporate Maintenance Handbook and simultaneous implementation in two pilot plants**

#### Customer benefit
- Increased awareness about the potential of improving the maintenance organization
- Identification of significant improvement potential regarding costs and equipment performance
- Development of corporate maintenance program to achieve synergies and spread best practices within the plants
- Siemens support allowed the company to decide with confidence to start a corporate maintenance initiative
Preventive maintenance and managed services were the basis for the increase in service quality

**Challenge**
- Rapid assistance in case of system failure
- Qualified assistance for the whole lifecycle of the system
- Goal of raising system availability in the chemical factory and avoiding downtimes

**Solution**
- Modular SIMATIC Remote Support Services
- Partnership for the complete lifecycle
- Worldwide technical support network
- Highly secure Siemens Remote Service (SRS) platform

**Customer benefit**
- Reduced downtime of the system due to preventive maintenance measures
- Rapid availability of SIMATIC Experts
- One reliable partner is responsible for active coordination of all service activities
- Optimization of the system availability
- Planned replacement of spare parts
### Energy optimization
Alpro NV Wevelgem

<table>
<thead>
<tr>
<th>Challenge</th>
<th>Solution</th>
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</table>
| Create a higher energy awareness  
Establish the transparency of energy consumption  
Define & realize energy-saving projects  
Introduce energy management | 11-month on-site assignment (2005-2006)  
Quickscan One-2-Five to identify the energy-saving potential  
Energy Potential Scan to analyze the potential  
Optimization of: boiler house, energy recuperation, lighting, insulation, process sequences, etc |

<table>
<thead>
<tr>
<th>Environmental benefit</th>
<th>Customer benefit</th>
</tr>
</thead>
</table>
| Reduced energy consumption and CO₂ emissions through better utilization of the energy used and by creating an overall awareness about energy issues at all production sites | Increased awareness about the importance of energy in the whole organization  
Implementation of transparent energy reporting  
Development of economically viable projects to achieve energy savings worth > EUR 600,000 (payback < 2 years)  
Function of divisional energy manager created  
Evolution One-2-Five score: from 1 star in 2005 (4% achievement) to 2 stars in 2006 (31% achievement)  
Corporate target set: CO₂-neutral starting from 2020 |
Optimized lifecycle costs with lifecycle contracts for SIMATIC PCS 7 system

**Challenge**
- Secure long-term serviceability of DCS System for the production lines
- Reduce unscheduled downtime
- Reduce risk of obsolescence
- Maintain spare parts availability for several years
- Transparent lifecycle cost

**Solution**
- Long-term agreement on service partnership
- System assessment in order to determine the current status of serviceability and upgradeability
- Defined upgrade phases, scope of services (SLA)
  - Corrective maintenance
  - Preventive maintenance
- Upgrades, Updates, Patches
- Spare parts

**Customer benefit**
- Long-term investment protection
- High system availability
- Avoidance of obsolescence risk
- Transparent lifecycle cost

Service Portfolio
- Fast Service Support
- Preventative Measures
- Manage Obsolescence
- Transparent LC-costs

Contract modules
- Basis Life Cycle Service
- Extended Life Cycle Service
- Inspection and maintenance
- Obsolescence management (retirement service)
- Spares parts inventory (regular)

Options
- Extended service
- Software update service
- Extended exchange option
- Asset optimization
- Agreed technical support
- Remote service
### Challenge
- Examine maintenance processes and organization for determining areas of improvement
- Determine savings potential and develop a maintenance optimization plan with a short amortization period

### Solution
- Maintenance Business Review (MBR)
- Identify possible improvements
- Coordination workshop with management to define the project plan for implementation
- Identify a project team for the implementation phase
- Implement the improvement measures laid down in the project plan, such as: workflow process, preventive maintenance, maintenance organization adaptation, implementation of maintenance planners

### Customer benefit
- Defined maintenance processes
- Maintenance cost transparency
- Cost drivers and weaknesses can be determined
- Preventive maintenance as standard maintenance program
- Cost efficiency and savings through organizational adaptation within maintenance and reduction of external services and spare parts costs
- Reduction in equipment downtimes
### Energy Optimization at British American Tobacco

**Challenge**
- BAT aims to reduce CO₂ emissions by 50% by 2030 and by 80% by 2050 compared with the 2000 value
- Reduce energy consumption by 6.7% to a max. of 11.03 GJ per million cigarette equivalent by 2012 compared with the 2007 baseline
- Create a higher energy awareness
- Define & realize energy-saving projects

**Solution**
- Evaluation of energy efficiency and saving potential by means of an “Energy Health Check” conducted in Singapore, Germany, and Russia
- Development of a corporate roadmap for internal energy assessments
- Piloting of the self-assessment tool in two pilot plants in South Africa and Germany including a comprehensive “Energy Analysis” with an estimation of savings potential and necessary investments

<table>
<thead>
<tr>
<th>Environmental benefit</th>
<th>Customer benefit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reduced energy consumption and CO₂ emissions through better utilization of the energy used and by creating awareness about energy issues</td>
<td>Energy-saving potential of between 5% and 15% identified in the EHCs</td>
</tr>
<tr>
<td>Identified energy-saving potential proved by technical measures</td>
<td>Increased awareness regarding the potential to optimize energy in the company</td>
</tr>
<tr>
<td>Development of a standard corporate energy assessment program to achieve synergies and communicate best practices within the plants</td>
<td></td>
</tr>
</tbody>
</table>
Energy management with SIMATIC S7 and B.Data at Schmitz Werke GmbH + Co KG, Emsdetten

Challenge
- Existing meters to be registered via their pulse interfaces. Metering stations without interface shall be registered manually
- System to be prepared for expansion, i.e. to automatically optimize load management
- Allow flexible generation and distribution of reports

Solution
- Meter pulses are recorded by SIMATIC ET 200S, which in turn are connected as PROFINET IO Slaves to a SIMATIC S7-319 station. The S7-319 counts the pulses and stores them in the internal data registers. B.Data retrieves the metered values from S7 via the SIMATIC Net OPC Server and archives them in the long-term archive.

Environmental benefit
- Real-time recording of energy consumption allows process adaptations at short notice for reducing energy consumption and CO₂ emission

Customer benefit
- The modular setup of SIMATIC S7 and ET allows future incorporation of additional tasks
- Solution is prepared to incorporate load management optimization
- Prepared for production data integration
Energy optimization at Mangels Steel Division - São Bernardo do Campo

Challenge
- Increasing the company’s competitiveness by reducing the energy costs
- Prioritization of future energy-efficiency investments
- Cost savings in a sustainable manner

Solution
- Suggestions for Optimization for Lighting, Refrigeration, furnaces, motors, compressed air generation and distribution, and energy tariff
- Feasibility analysis
- Prioritization of the feasible measures

Environmental benefit
- Reduction of overall CO₂ emissions by decreasing energy consumption

Customer benefit
- Potential Savings of BRL 1.9 million/year (ca. EUR 800,000)
- Costs Reduction up to 22.5%
- Additional benefit of reduced maintenance costs with renewal of the installed base
Green solutions for Pulp & Paper
Energy optimization at Felix Schoeller jr., Germany and Canada

**Challenge**
Analysis of two facilities (Osnabrück, Germany and Drummondville, Canada) with regard to energy-saving potential and subsequent implementation of measures.

**Solution**

**Environmental benefit**
Reduced energy consumption and CO₂ emissions through better utilization of the energy used and by creating awareness about energy issues.

**Customer benefit**
- Savings of EUR 460,000 annually, ROI within 0.9 years
- 9 percent reduction in energy costs
- Customer (Nov. 7, 2007): “Without the Siemens study, this would have never come about. Concentrated expert knowledge is available through an extensive network of specialists. Its success derives from the highly structured approach throughout the entire project.”
**Challenge**
- Handle plant maintenance at one of the country’s leading tobacco companies, allowing it to focus on its core business and achieve its targets.
- Develop a win-win concept achieving a long-term relationship.

**Solution**
- Integral Plant Maintenance of auxiliary processes. (Jan. 02 – Dec. 10).
- Implementation of preventive and predictive maintenance routines. CMMS integration.
- Operation of compressed air, vacuum, steam and HVAC systems.
- Monthly reporting.
- Workforce: 24 employees

**Customer benefit**
- Establishment of a KPI system for maintenance control and increased plant availability.
- Reduction of corrective maintenance from 50% to 7%.
- Nobleza Piccardo carried out an internal maintenance benchmarking, achieving a place among the plants with best maintenance practices in the British American Tobacco group.
<table>
<thead>
<tr>
<th>Challenge</th>
<th>Solution</th>
<th>Customer benefit</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Realization of fast load shedding for consumer groups to secure the production also in case of disturbances (utility blackout, generator shutdown)</td>
<td>- Integration of ESM into the existing PCS7 process control system to visualize and acquire the relevant data in the switchgear</td>
<td>- Control and Monitoring of the switchgear as well as the load management from one control room</td>
</tr>
<tr>
<td>- Load management system for capping energy consumption</td>
<td>- Integration of the load management LMS for fast load shedding into the existing PCS7 process control system providing priority lists for selecting consumers</td>
<td>- Cost-effective grid operation considering company guidelines and contractual conditions</td>
</tr>
<tr>
<td>(contractual consumption limit)</td>
<td>- Implementation of additional functions for monitoring the maximum energy consumption as well as the power and frequency control of turbine/generator</td>
<td>- High availability and stable operation of company grid operation despite disturbances e.g. utility blackout or generator shutdown</td>
</tr>
<tr>
<td>- Integration of the new load management system into existing PCS7 process control system</td>
<td></td>
<td>- Transparency of the energy flows and temporal load curves are the database for further optimizations</td>
</tr>
<tr>
<td>- Installation of MV / LV fields for ≈ 4 MW</td>
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</tbody>
</table>

Energy management – Stable energy supply in Gelatine plant (ESM/LMS)
In 2007 we received a request from Tropicana, Seebrügge (Belgium) for an energy audit. Subsequent realization of the most promising actions.

### Challenge
- Energy Health Check for analyzing potential to reduce energy consumption
- Implementation:
  - Optimization of plant energy consumption
  - Optimization of the building plan for planned extension
  - Improved control of conveyor belts
  - Optimization of lightning
  - Foundation of a staff initiative
  - Proposal to improve the efficiency of the compressor and further plant parts.

### Solution
- Reduced energy consumption and CO₂ emissions through better utilization of the used energy
- Launch employee initiative for creating awareness of energy issues

### Environmental benefit
- Annual improvement of energy efficiency during the term of 4 years
  - → 5.5% potential energy savings of the energy costs were identified

### Customer benefit
- Customer: “We do not regret this choice. Our expectations were exceeded.”
## Maintenance outsourcing – Covering production site and HQ Building of 3M, Italy

**Challenge**

Performance-based Maintenance Contract for electrical, mechanical and automation equipment at 3M’s production site, Central Warehouse, and the HQ Building covering maintenance planning, management and execution, partly with subcontractors

**Solution**

Maintenance Outsourcing agreement based on the following KPIs:
- Equipment availability
- Safety
- Preventive versus corrective maintenance
- Preventive maintenance backlog

Volume: EUR 1.24 million/year (Contract start: 2000)

**Customer benefit**

- Easy performance controlling due to performance-based contract
- Customer can concentrate on core processes
- One contact/responsible person for all maintenance activities
Performance-based maintenance contract at B/S/H Hortolândia site, Brazil

<table>
<thead>
<tr>
<th>Challenge</th>
<th>Maintain plant equipment at B/S/H Hortolândia site according to performance-based contract</th>
</tr>
</thead>
</table>
| Solution  | - Maintenance of production equipment and facilities (mechanical, electrical)  
           | - CMMS implementation (SIM)  
           | - Development of maintenance plans, strategies, improvements  
           | - Warehouse management  
           | - Workshop services |
| Customer benefit | Due to a performance-based contract measured in terms of various KPIs, the following results were achieved:  
                        | - a remarkable increase in plant availability  
                        | - significant reduction in total maintenance costs  
                        | - reduction in Energy consumption |
## Challenge
- Enhance Overall Equipment Effectiveness (OEE) by increasing the reliability of process measuring and control technology
- Reduce Maintenance costs

## Solution
- Assume responsibility for maintenance management and planning (preventive and corrective maintenance)
- Adapt organizational structure to local needs to set up 2-shift operation for process measuring and control technology and 4-shift operation for energy supply and distribution
- Technical and mechanical Hotline service
- Purchasing of materials

## Customer benefit
- Effective cooperation with a recognized maintenance expert 24 h/day
- Enhanced Overall Equipment Effectiveness
- Continuous reduction of maintenance costs
- Cost transparency by dividing into fixed-price services and time- and expenditure-dependent services
## Contract with Eolia Renovables to handle full operation and maintenance contract services for Los Navalmorales, Spain

<table>
<thead>
<tr>
<th>Challenge</th>
<th>Provide comprehensive, long-term maintenance solution for 6.4-MW photovoltaic plant at Los Navalmorales, Spain</th>
</tr>
</thead>
<tbody>
<tr>
<td>Solution</td>
<td>24-year maintenance and operation solution for SINVERT, WIN CC, transformers, electrical installation, solar panel cleaning, facility management, access control, and security for photovoltaic power plant</td>
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<table>
<thead>
<tr>
<th>Environmental benefit</th>
<th>Green power from renewable sources</th>
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| Customer benefit       | Siemens is a reliable partner for long-term maintenance projects with a large installed base of SINVERT converters in Spain |
|                       | Synergies with parallel maintenance projects |

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<table>
<thead>
<tr>
<th>Challenge</th>
<th>To secure the required functionality and availability of measuring and testing equipment in compliance with international quality standards</th>
</tr>
</thead>
<tbody>
<tr>
<td>Solution</td>
<td>Calibration of physical, electrical and mechanical measuring and testing equipment in Siemens laboratory accredited to DIN EN ISO/IEC 17025 as well as on-site at production lines of MTU by employees of Siemens MTU service points</td>
</tr>
<tr>
<td>Customer benefit</td>
<td></td>
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</tbody>
</table>
- Efficient on-site calibration processes in the development and production using local resources  
- Reduced investment for documentation and archiving through use of a standardized system |
Modernizing the process control system at Rosen Eiskrem GmbH in Nuremberg, Germany

<table>
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<tr>
<th>Challenge</th>
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<tbody>
<tr>
<td>Substitution of an outdated PCS reaching higher production quality,</td>
<td>- Transfer of an SAP-based mixed contract into a MES work order via</td>
<td>- Improved quality and process control</td>
</tr>
<tr>
<td>flexibility and transparency</td>
<td>Simatic IT DIS interface</td>
<td>- Improved data survey and data quality</td>
</tr>
<tr>
<td>reduced manual data recording</td>
<td>- Batch processing with Simatic Batch</td>
<td>- Implementation of comprehensive production know-how</td>
</tr>
<tr>
<td>Increased process efficiency</td>
<td>- Simatic PCS7 for short-term archiving and control and visualization</td>
<td>in the MES</td>
</tr>
<tr>
<td>and implementing a long-term archiving system with short commissioning</td>
<td>tasks</td>
<td>- Reduced manual work (paperless environment)</td>
</tr>
<tr>
<td>time</td>
<td>- MES for long-term archiving and genealogy</td>
<td>- Reduced production costs</td>
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### Challenge

- Assume responsibility for:
  - maintenance of all systems and equipment
  - implementing a computerized maintenance management system
  - support during technical optimizations
  - modifications on all types of equipment and machinery

### Solution

- Assembly of a maintenance team consisting of 9 engineers and 32 technicians
- Definition and implementation of key performance indicators (KPIs) for monitoring and control of maintenance activities

### Customer benefit

- Top-quality maintenance processes
- Customer can concentrate on core processes
- Optimized OEE
The customer requires first-class service with defined reaction and response times for its more than 10 factories and 3 distribution centers throughout Italy, where Siemens provided a goods tracking system, Simatic IT, and Warehouse Management System, including an automated storage system.

**Challenge**

<table>
<thead>
<tr>
<th>Solution</th>
<th>Customer benefit</th>
</tr>
</thead>
</table>
| Level 2 Service Agreement  
  - Hotline 24 h x 365 d.  
  - Remote Service 24 h x 365 d.  
  - On-Site Services  
  - Preventive Maintenance  
  - Logistics Services |  
  - Reduced downtime of goods tracking system, Simatic IT and Warehouse Management System, including automated storage system  
  - Improved reliability and availability of stacker cranes and LGVs due to introduction of Preventive Maintenance routines |
### Challenge
Detailed engineering, provision and installation of electrical system, automation equipment, and instruments of a pilot unit for the production of carbon fibers

### Solution
- Electrical and software engineering, supply, installation, cabling, test and start-up of:
  - Process instruments, process automation and supervision system
  - Electrical MV and LV equipment
  - Lighting, power sockets and danger alarm system

### Customer benefit
- State-of-the-art automation system
- Modern substation control system for optimizing energy consumption and limiting energy costs
- 365/24 service availability during and after warranty period
## Maintenance services for a cement plant of HOLCIM S.A.L

### Challenge
- Securing plant availability and minimizing risk of downtimes of SIMOVERT Masterdrives
- Elimination of failures in auxiliary systems
- Improvement of plant production

### Solution
- On-site troubleshooting by Siemens specialists including **Supply of Spare Parts and Repair**
- Service contract with an **OnCall Service** (24h/365d) for 5 SIMOVERT Masterdrives:
  - Phase 1: **Phone Support**
  - Phase 2: **Remote Monitoring and Diagnosis**
  - Phase 3: **On-site troubleshooting**
- Annual **maintenance** and **inspection** on-site for 5 most important drive systems

### Customer benefit
- High added value through reduction of outage costs (USD 15,000 per hour) - achieved with a comparatively low investment
- Sustained minimization of outage risk
- Contractually agreed reaction and response time