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JORNADAS TÉCNICAS ABB, JULY 2019, SANTIAGO, CHILE

# Increasing availability with ABB LTSA – Long Term Service Agreement

Presented by Carlos Miguez



# Grinding is at the core of a mineral processing facility

Every hour of unplanned downtime counts



Concentrator ideal operating time

Planned production time

Planned stops

Operating time

Unplanned stops

← Availability

Concentrators are required to achieve typically 95% availability in order to meet business objectives <sup>(1)</sup>

Approximately 10% of production time is lost by unplanned maintenance <sup>(2)</sup>

Facts

New, large-scale Las Bambas, Cobre Panamá, Aktogay & Bozshakol mines have high capital intensities of > US\$6.6/lb of annual copper capacity <sup>(3)</sup>

Trends

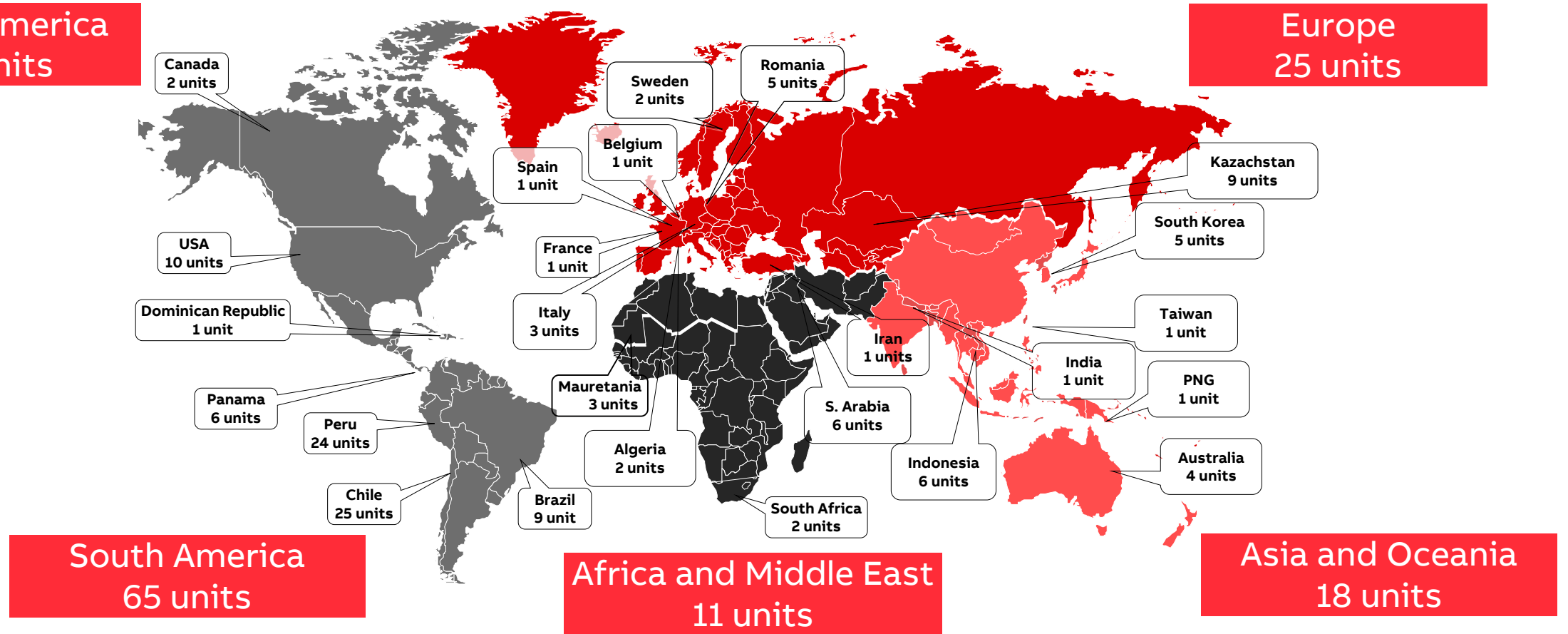
<sup>(1)</sup> Hamilton, Wainwright, Diering, "Lesson learned from recent failures of gear drives on mills in South Africa", SAG 2006 conference,

<sup>(2)</sup> Dhillon, "Mining equipment reliability, maintainability and safety", 2008, Springer <sup>(3)</sup> AME Research



# ABB Gearless Mill Drive systems (GMD)

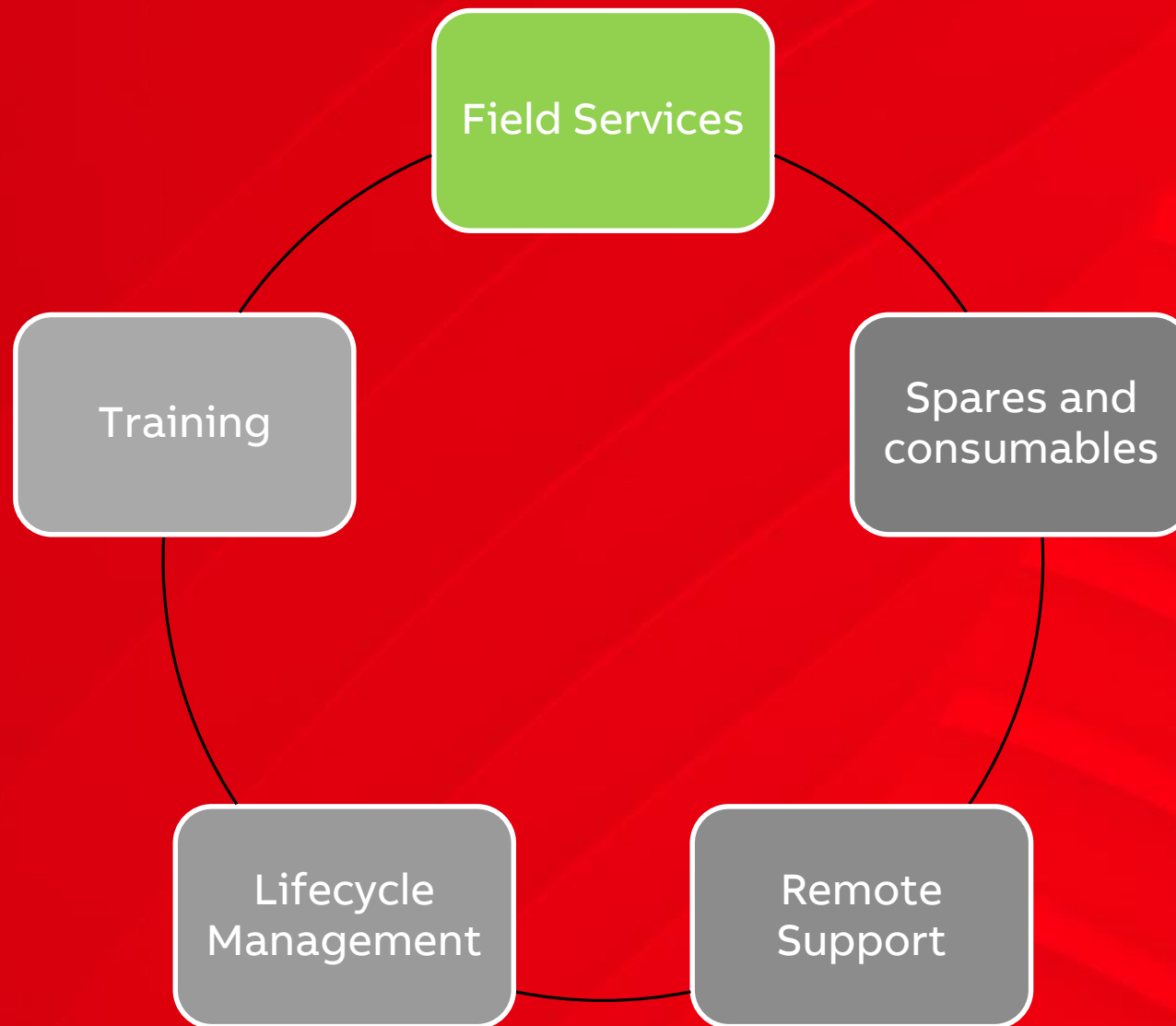
131 units installed and recently ordered



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# ABB LTSA

GMD Services





# GMD field services

Expert on-site support



## Field services include among others:

- On-demand site inspections
- Scheduled (6M, 12M, 36M) preventive maintenance inspections
- Emergency repairs
- Extended on-site support

## Benefits:

- Reduces the risk of disruptive life cycles and overall cost of maintenance
- Optimized GMD asset performance
- Reduce your risk of performance problems and premature equipment failures

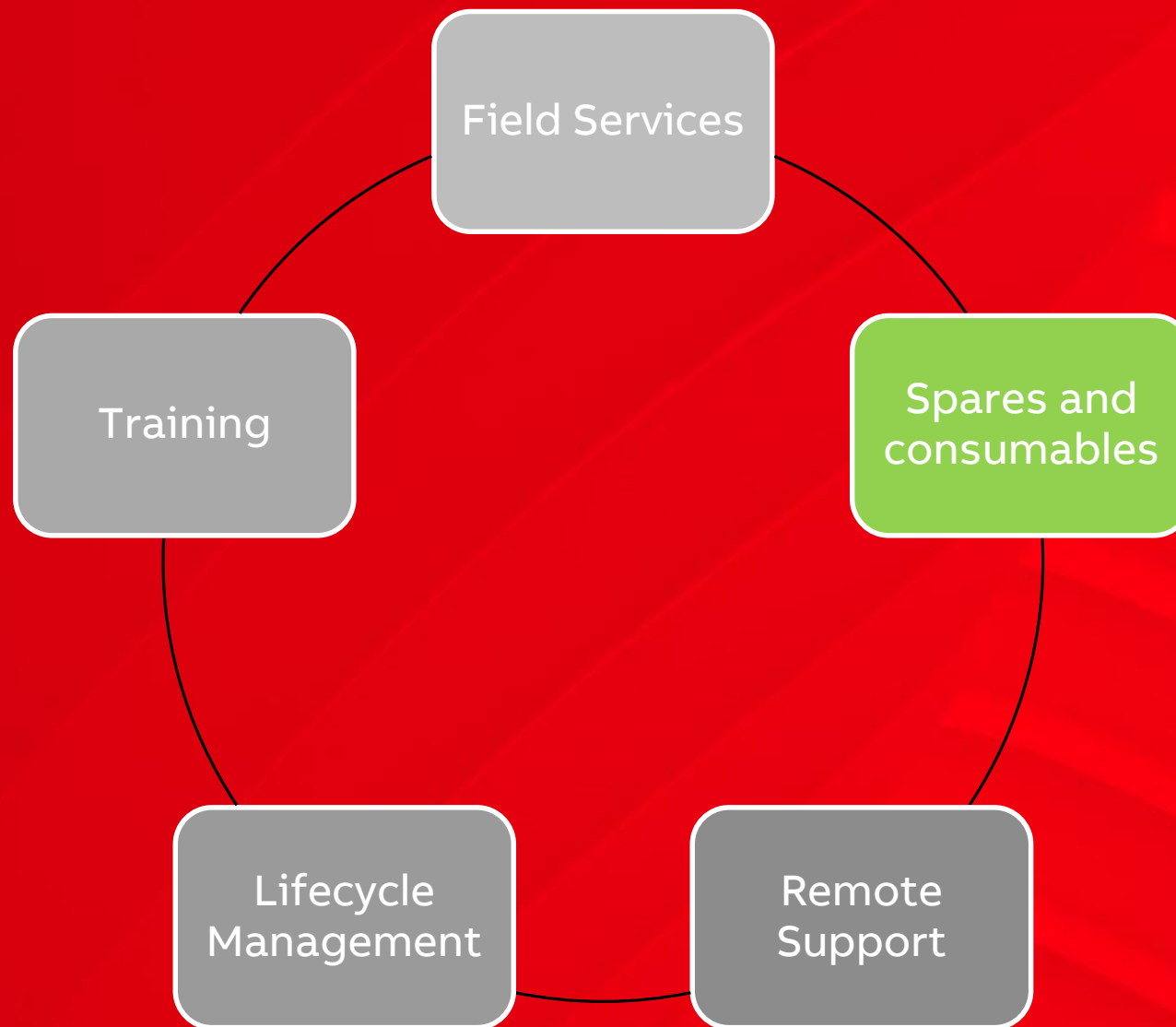
Improve your GMD equipment availability and reliability



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# ABB LTSA

GMD Services





# Spares and consumables

Spare parts services from ABB ensure reliable and safe operation

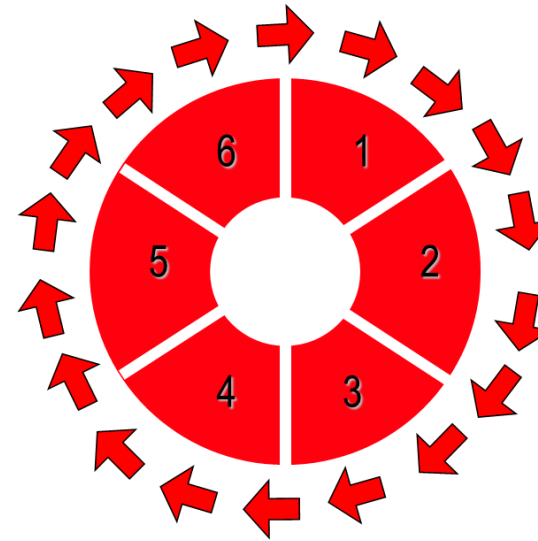
## Spare parts

- Spare parts lists & kits
- On-demand spares
- Emergency spares
- Inventory audits

## Benefits

Effective, preventive and predictive maintenance services maximize the reliability of your plant equipment.

Our service specialists utilize the most advanced diagnostic and repair practices to maximize equipment, performance and availability.

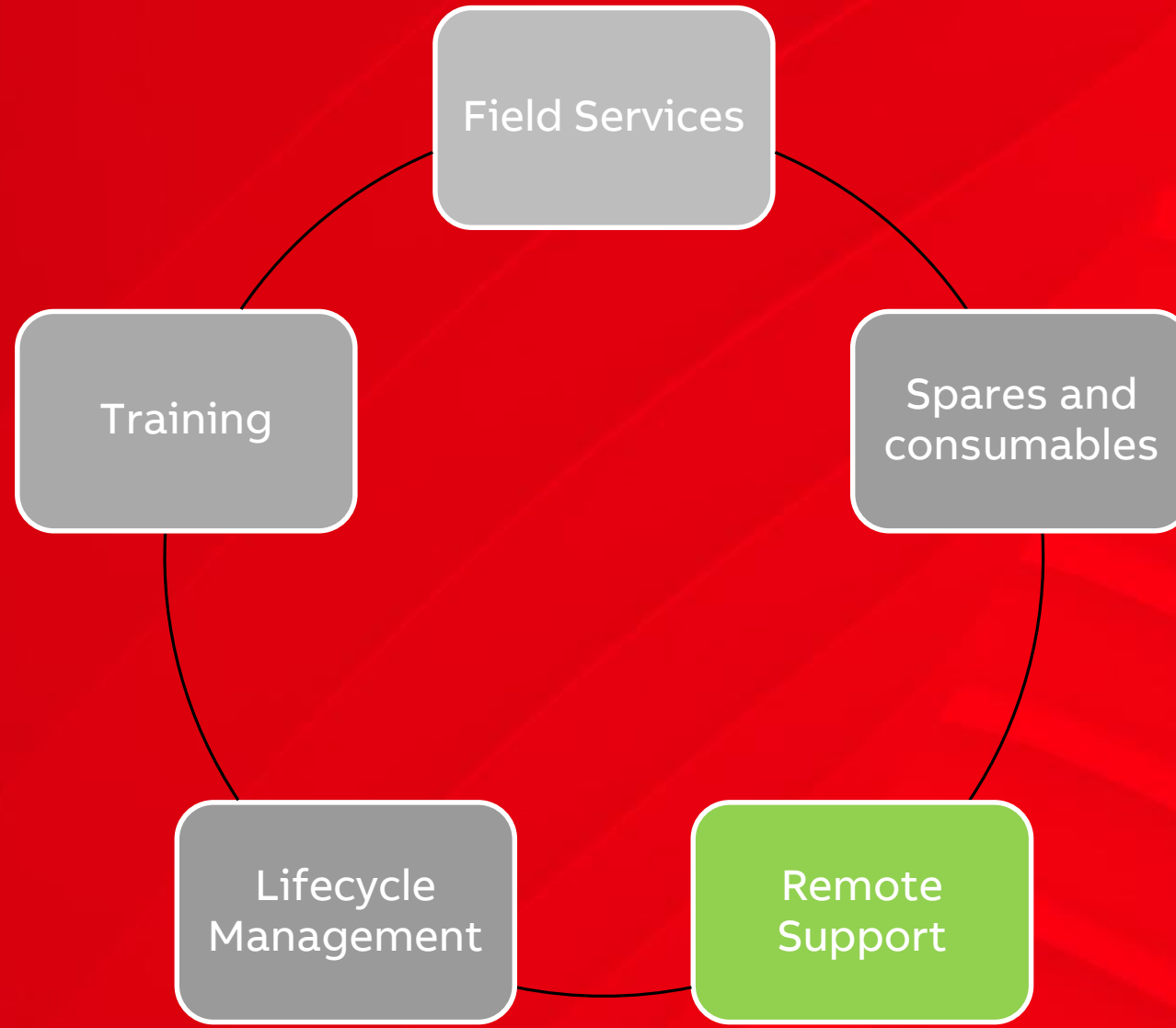


- 1 Request for Quotation
- 2 Proposal / Offer
- 3 Purchase Order
- 4 Order Confirmation
- 5 Order Fulfillment
- 6 Customer's Obligation and Feedback

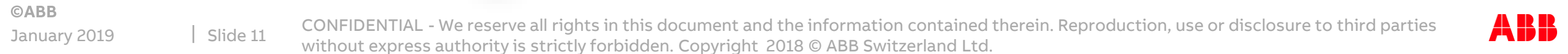
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# ABB LTSA

GMD Services



# Remote Connection Worldwide



# Remote assistance – 24 X 7 SupportLine & troubleshooting

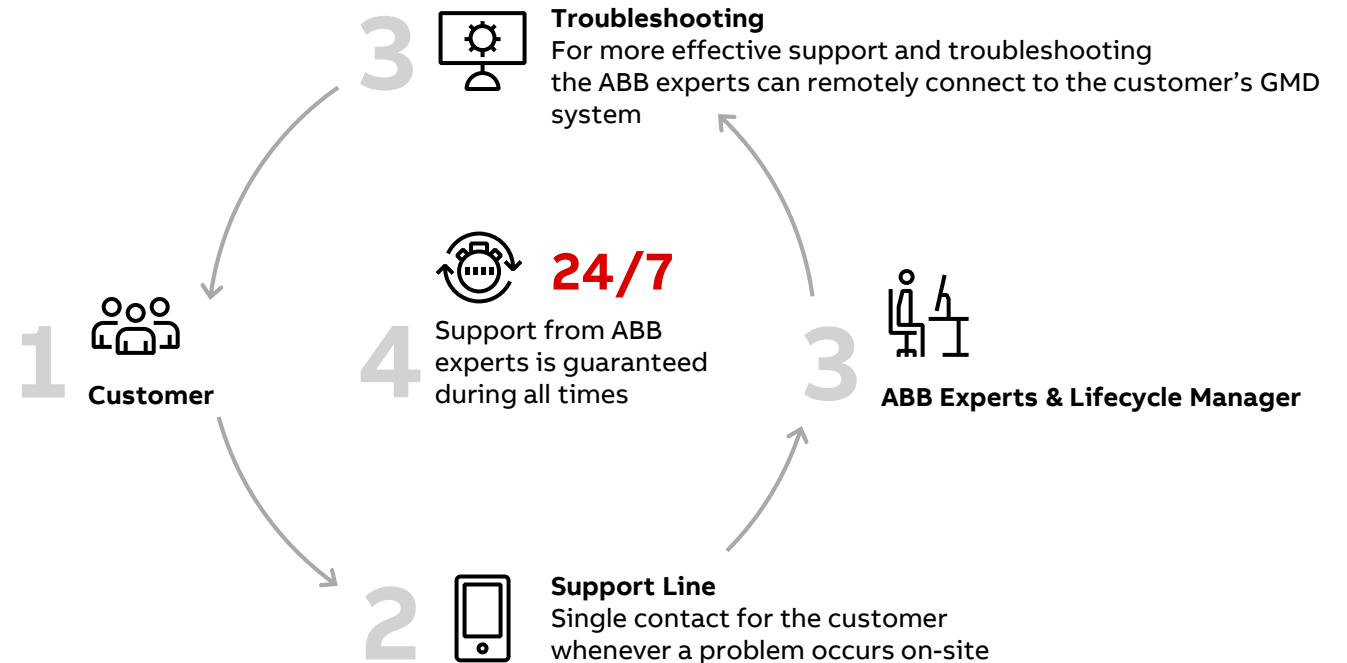
## Corrective maintenance service

- Telephone **SupportLine** with guaranteed response time
- 24/7 service gets the customer in immediate contact with our technical support engineers
- ABB experts are linked to the operators' HMI via a secure remote access connection to enable on-demand problem solving

➤ **88 – 110 support line tickets per year, from across 44 different sites**

➤ **Average case resolution time – 1.5 to 2 hours**

### Corrective Maintenance

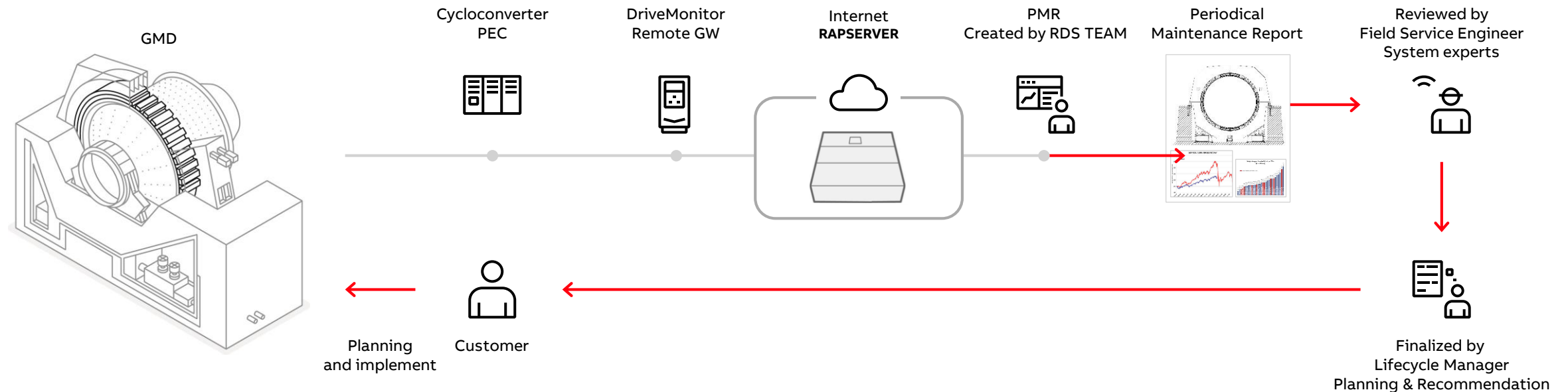


[Link to success stories](#)

# Asset health – Periodic Maintenance Report (PMR)

Preventive maintenance service – Reliable analysis to avoid unexpected shutdowns

Periodic maintenance reports are a set of regular health checks, which provide valuable inputs to the customers preventive maintenance routine

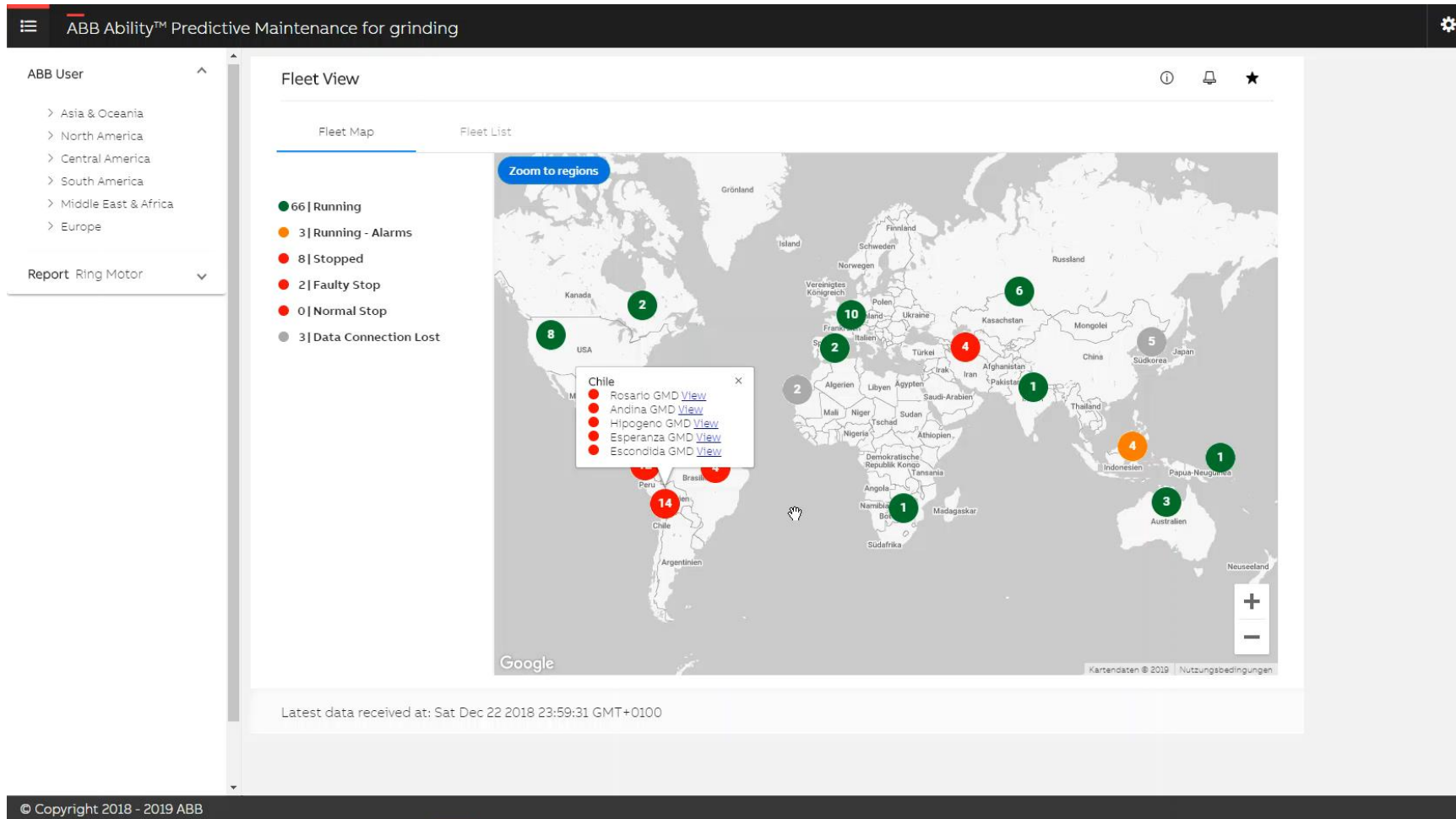


- Faster identification and resolutions of problems
- Better insight into the problem when troubleshooting on site



# ABB Ability™ Predictive Maintenance Platform for Grinding Power Train

## The new user experience



# ABB Ability™ Predictive Maintenance Platform for Grinding Power Train

Delivery of services using the digital platform



## Ring Motor



- Rotor
- Stator
- Cooling
- Lubrication (Coming Soon)
- Brake (Coming Soon)

[VIEW MORE](#)

### Pole Flange Monitoring

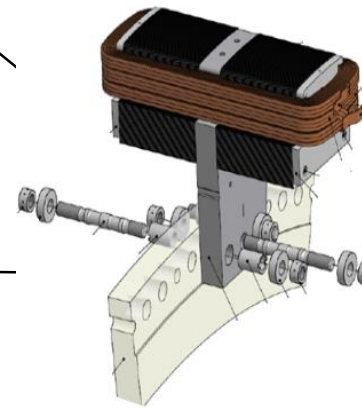
Trending Change in Pole Alignment over time compared to a benchmark

### Mill shape

Monitor Mill shape based on airgap values

### Core vibration monitoring

Monitor core vibration & correlations using trends and spectral plots



### Pole Flux - Monitoring

Supervision of the magnetic flux in the Ringmotor air gap. The measured Flux gives an indication of pole winding Health

### Rotor Insulation resistance

Supervision of the ohmic resistance between total rotor winding insulation and ground

### Pole Alignment

Trending Change in Pole Alignment over time compared to a benchmark

The power of choice

# ABB Ability predictive maintenance & remote assistance for Grinding

Avoid mill downtime



2013

→ Top 3 cases yielded an estimated 32 Hrs. reduction in downtime

2014

→ Top 5 cases yielded an estimated 60 Hrs. reduction in downtime

2015

→ Top 5 cases yielded an estimated 146 Hrs. reduction in downtime

2017

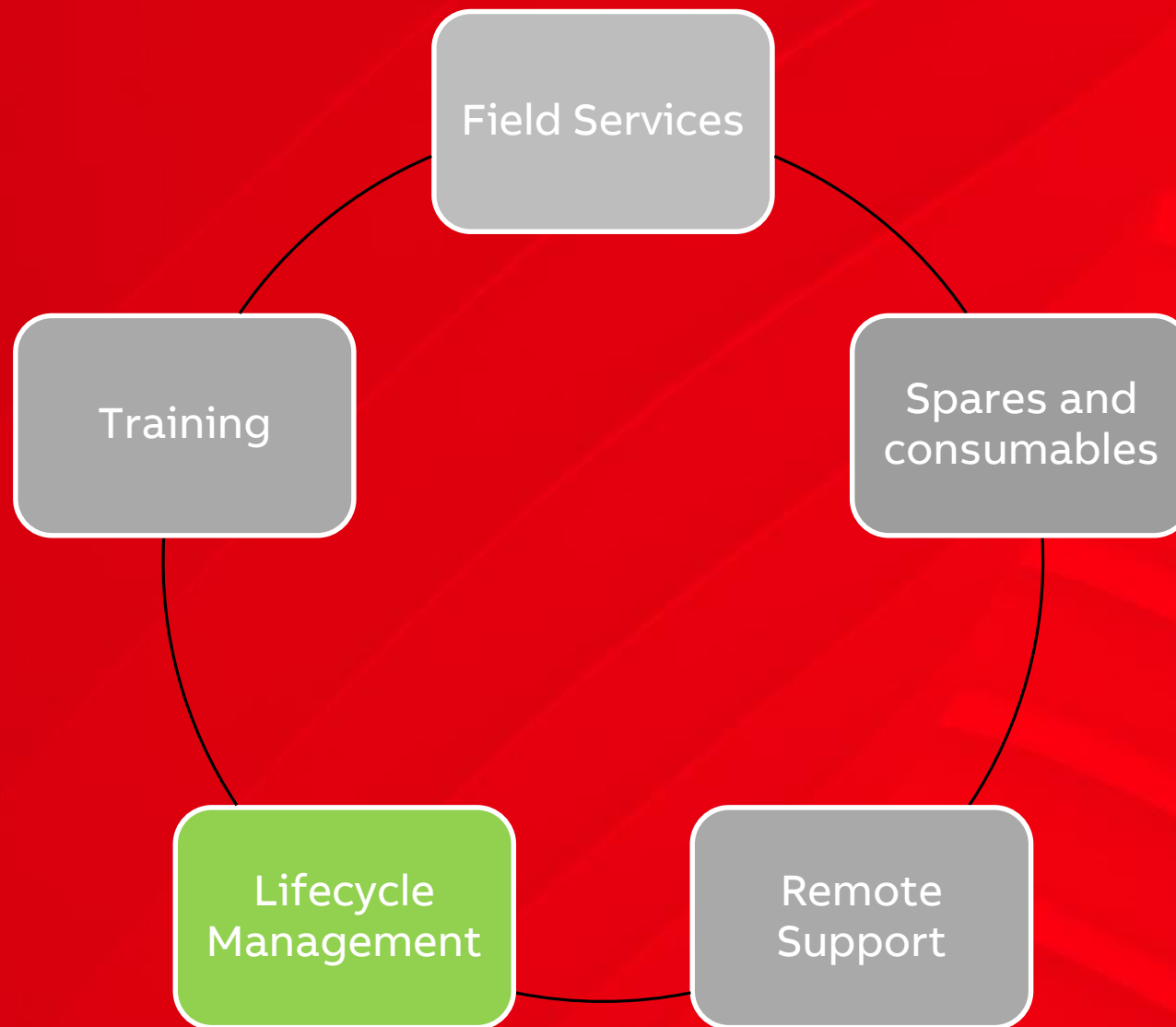
→ Top 5 cases yielded an estimated 88Hrs. reduction in downtime

Note: Excludes cases of major failures where downtime is significantly high

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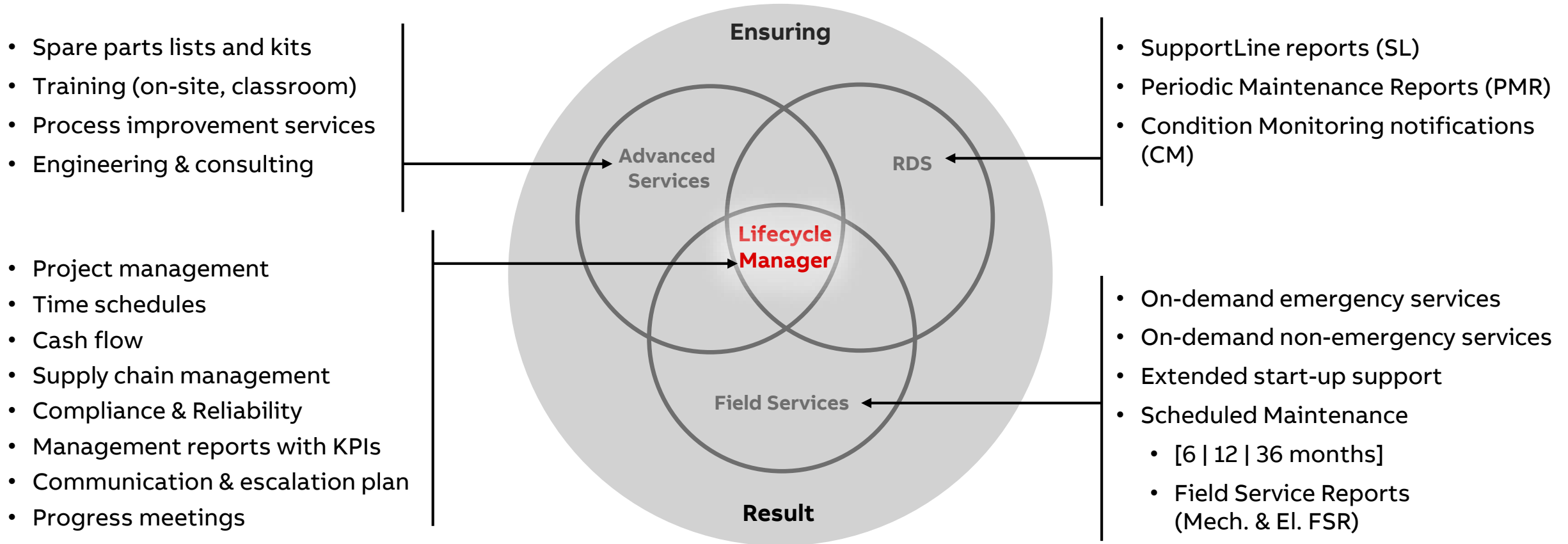
# ABB LTSA

GMD Services



# Lifecycle Management

## Long Term Service Agreement Key Player

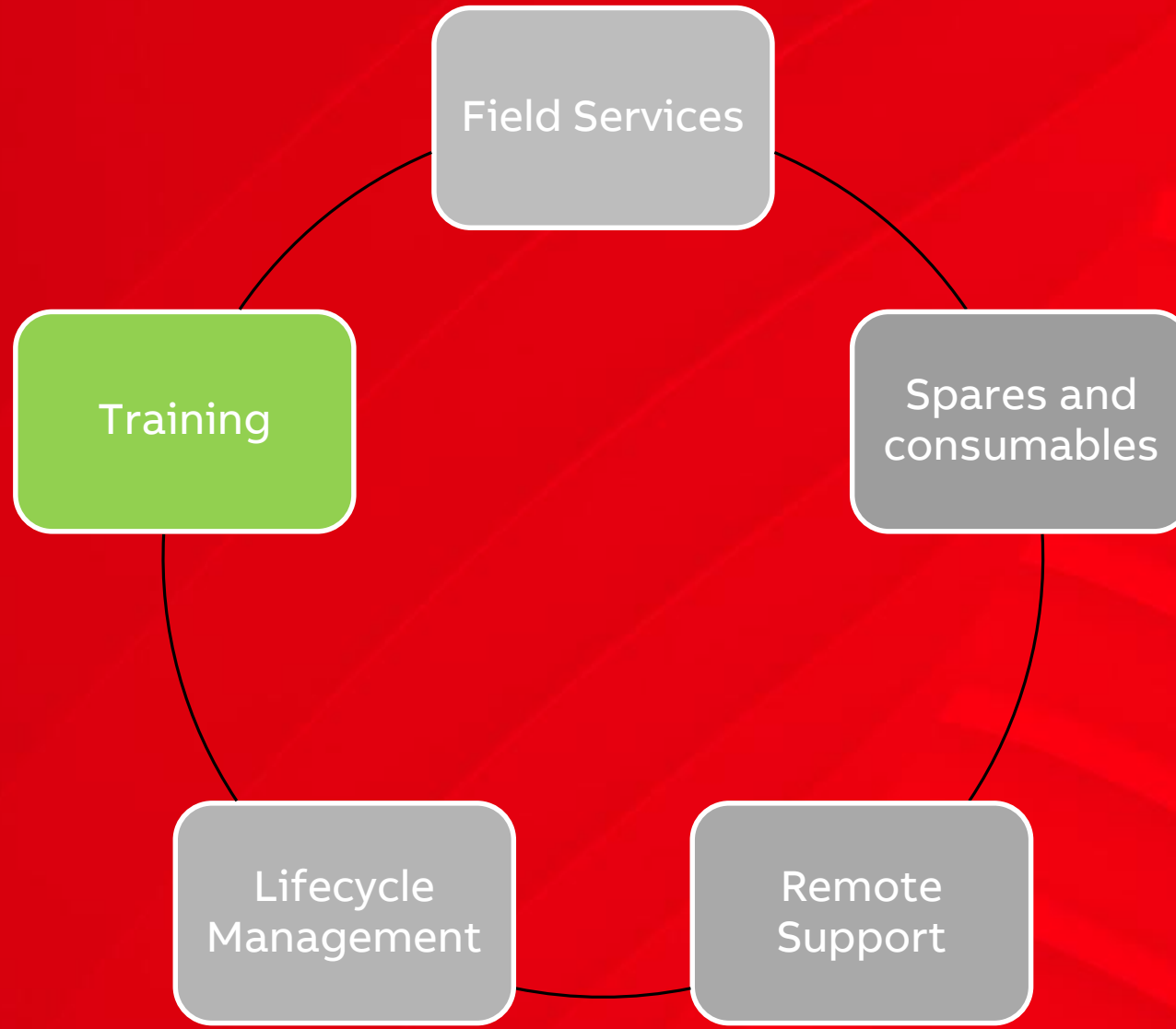




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# ABB LTSA

GMD Services



# Training – Learning Center Mining, Aluminium and Cement

Onsite, classroom and virtual trainings



## Three types of training



Classroom training **in our learning center** in Baden-Daettwil, Switzerland



Classroom training **on-site** at your plant or in any other appropriate location near you



Web based training (virtual classroom training) using a **remote learning platform**

# Training – Learning Center Mining, Aluminium and Cement

## Scope of courses

### Our offerings

We provide professional process and product training courses for our worldwide customers in the cement, mining and mineral processing industries

Our courses cover these products and processes:

- 800xA control system
- Gearless mill drive
- Ring-gearless mill drive
- Expert Optimizer
- Knowledge Manager
- High power rectifier
- ACS880
- Cement and mineral processing





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# Training - Learning Center Mining, Aluminium and Cement

Our facilities

Welcome to our learning center!



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# ABB Ability™

Performance optimization and lifecycle assessment services



# ABB Ability™ Performance optimization

Performance optimization for mining

Evaluate Potential

APC Implementation

Sustain Benefits



Fingerprint



APC Commissioning



Collaborative Operations

ABB Ability™ Performance optimization is a systematic and proven approach to improve and sustain process performance through collaborative operations

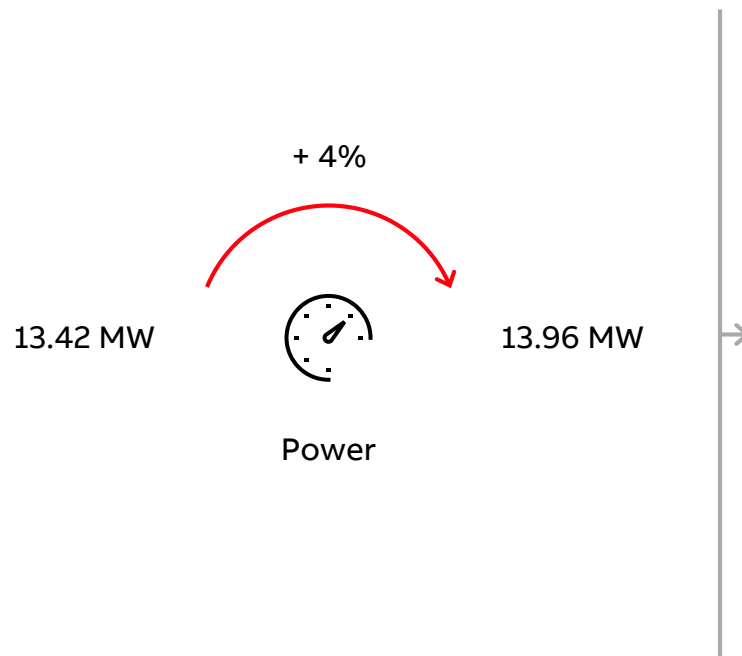
# ABB Ability™ Lifecycle assessment services

GMD and RMD – Power upgrade Services – sweat your asset

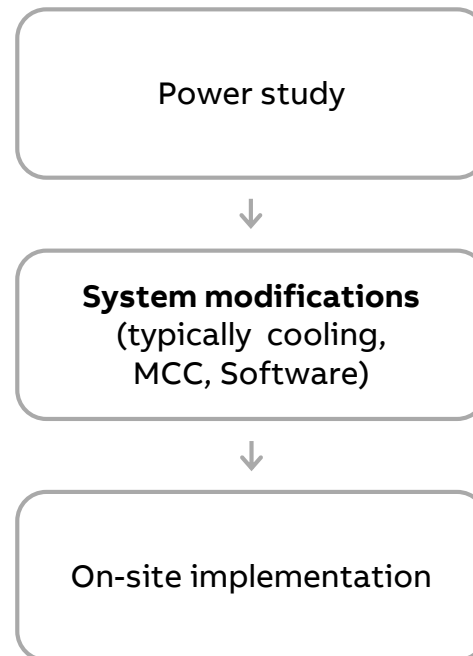
Increase system power to increase production

Site services performed during standard SAG mill maintenance (liner change)

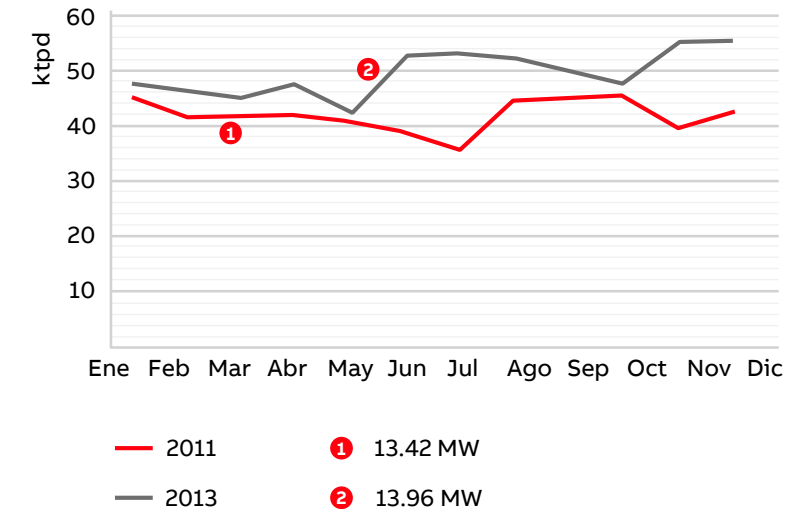
Average increase in treatment capacity of 14% (or higher)



## Typical steps



## Average ore processed in SAG Mill



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# ABB Mining Care: designing a Service Contract

Service agreements built with care. We work with you to understand your needs



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## Cut complexity

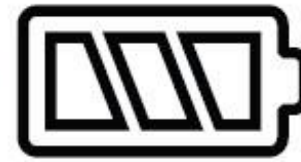
**Less time wasted. Fewer hassles.**  
**Simplified service interaction.**  
Services performed safely and efficiently with one point of contact from the start through the duration of the contract.



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## Control cost

**More predictability. Fewer surprises.**  
**Consistent service delivery.**  
Structured approach with fixed annual pricing, so customers have a consistent experience every time.



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## Maximize capital

**ABB equipment. Your equipment.**  
**Customized service alignment.**  
Issues detected early enough to take action, and improvements implemented that avoid problems and sustain gains.

# **ABB Ability™ Remote Assistance**

A look into the future



# ABB Ability™ Remote Assistance

Remote assistance using augmented reality







**ABB**