Maintenance Contract (LTSA)
Definition of Service Agreement

- Long Term Service Agreement (LTSA) combining all primary and specialized life cycle and maintenance activities with strong performance focus while covering all project execution phases from ramp-up to normal operation.

- Cross-divisional approach with combination of high technology and traditional services in a multi module package adjustable and tailor-made according to customer needs and ABB installed base.

- Holistic solution to enhance processing of plant data/information with aim to convert it into knowledge. Asset management and real time process optimization form an integral part of the delivery process.

- Creation of an environment of constant awareness to improve the main electrical assets and plant profitability.
Maintenance Contract (LTSA)
Values and benefits

Our contractual life-cycle and maintenance services are delivered seamlessly through strategic partnerships with our clients to ensure all expectations for quality, timeliness, safety are met.

KPI's form the backbone to measure our performance.

In providing unique contractual services we strive to identify inefficiencies and duplications in manpower and material in order that the true value of work is justified and practical.

Our success is based on cooperation and creating profitable growth for our business partners and employees.
Process plant and infrastructure
Field of plant services

- Power factor correction system
- MV switchgears
- Power transformer
- HV switchgears
- Control system
- Drive transformer
- Distribution transformer
- Motor control center
- LV VSD
- MV VSD
- LV motor
- MV motors
- MV switchgears
- Overhead lines
- Valves
**Distinguished service products in one single agreement**

**The service mix: portfolio**

<table>
<thead>
<tr>
<th>Field services</th>
<th>Spare parts services</th>
<th>Remote services</th>
<th>Training services</th>
<th>Special services</th>
</tr>
</thead>
<tbody>
<tr>
<td>On-demand service</td>
<td>Spare parts lists and kits</td>
<td>SupportLine</td>
<td>Classroom</td>
<td>Upgrades &amp; migrations</td>
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<tr>
<td>Long-term-scheduled maintenance</td>
<td>On-demand spares</td>
<td>Remote diagnostics: Trouble shooting</td>
<td>On-site</td>
<td>Engineering &amp; consulting</td>
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<tr>
<td>Site audits</td>
<td>Emergency spares</td>
<td>Remote diagnostics: Periodic maintenance</td>
<td>Training partnerships</td>
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<tr>
<td>Extended start-up support</td>
<td>Inventory audits</td>
<td>Remote diagnostics: Condition monitoring</td>
<td>Competence developments</td>
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<td>Long-term on-site support</td>
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**Long-Term Service Agreements (LTSA)**
We are entering into this phase of pre-feasibility.

PdP = Partnership development Phase
Life Cycle Management
Concept and deliverables

Detailed engineering → Equipment Selection → Construction Phase → Commissioning & Start Up → Normal Operation → Project Execution Phase → Operation Phase

- Maintenance Strategy Definition Services
- Equipment Tree & Tagging System Services
- Maintenance Documentation and CMMS Implement
- Commissioning Planning & Installation and Commissioning Execution Services
- Equipment criticality analysis & Asset Management Services
- Preventive Maintenance Plan
- Competence Development Program – Training Services ABB University
- Local Development Training Center facility

Life Cycle Service Contract including:
- preventive maintenance activities,
- remote diagnostics,
- spare parts management,
- upgrades and evolution planning,
- 24 hours support.
# PdP: Scope of technical support to plant ramp-up

Early Maint. Engineering and Test & Commissioning main activities

<table>
<thead>
<tr>
<th>Main Tasks</th>
<th>Activities to be performed by EM Team (Early Maint. during pre&amp; commissioning/start-up)</th>
<th>Activities to be performed by T&amp;C Team, (Testing &amp; Commissioning/Start-up).</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Service Scope</strong></td>
<td>Contribute, facilitate, follow-up, assist, provide tech. support, information and help solution in case of emergencies, during the commissioning &amp; start-up warranty phase.</td>
<td>Management + execution of T&amp;C/start-up and warranty program. Execute schedule chart, job activities, documentation delivery, test records, final test reports for: pre-commissioning, commissioning, start-up and warranty phases: conditioning, cold run, hot run, idle run, normal &amp; commercial run.</td>
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<td><strong>Service Performance</strong></td>
<td>Inspect, evaluate, follow-up the T&amp;C/start-up activities progress and the factory acceptance tests in order to ensure that the assets are performing as contractually specified and according to proper engineering practices</td>
<td>Do the jobs, perform, and execute all T&amp;C tasks: pre-commissioning, commissioning, start-up, warranty and stand-by operation. Check functionality of equipment before energize.</td>
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<tr>
<td><strong>Punch-list</strong></td>
<td>Monitoring and ensuring quality completion of punch-list and the clearance of construction pending points. Back-log clearance follow-up</td>
<td>Complete clearance of all pending points, eliminating the possible passive/backlog of construction phase (punch list)</td>
</tr>
<tr>
<td><strong>Documentation</strong></td>
<td>To proceed implementation of the Maint. Technical Documentation mgmt. system. Assistance to design reviews documentation “as-built”.</td>
<td>Execution of protocols, procedures and communication of documents revision. Manage the execution of documentation “as-built” by the EPC company. Prepare and fulfill documents, test routines, sequences, check-lists, technical &amp; safety procedures, switch-on process, applied standards, test records, calibration reports, acceptance certificates,</td>
</tr>
<tr>
<td><strong>Equipment Reception</strong></td>
<td>Assistance in equipment handover from commissioning</td>
<td>Perform all the final acceptance tests for warranty effectiveness.</td>
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<td><strong>Stand-by operation</strong></td>
<td>Work with the operational people for plant technical assistance after start-up</td>
<td>Prepare and supply the work team for stand-by operation, according to contract EPC</td>
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</table>
Next Step after Budget estimation: PdP approval

PdP = Partnership development Phase.

The PdP delivery document is a Complete Bid Offer for the Service Agreement business case, with respective Maintenance Management & Implementation Maintenance Plan and covering since Pre-Commissioning and Start-up period to 03/05 years normal operation.
Smart electrical maintenance™ Portfolio

- Long Term Service Agreement combining primary and specialized life cycle and maintenance activities with strong performance focus, while covering all project execution phases from ramp-up to normal operation.
- Combination of high technology and traditional services tailor-made according to customer needs.
- Co-sourcing arrangement – Work together determine optimal maintenance and optimization approach
GMD Condition Monitoring Dashboard

- Plots are scalable
- Multi-page message panel
- Current information on voltage, current, power and speed
- Current information on winding temperature and heat exchanger
Power and productivity for a better world™