



SMS group

# TECHNICAL SERVICE



METALLURGICAL PLANTS and ROLLING MILL TECHNOLOGY

SERVICE



# Support **WORLDWIDE**



There has been an increasing demand over the years not only for us to supply equipment, but also to provide support for mechanical, automation, maintenance and process technology.

## TODAY'S APPROACH

Committed to meeting this requirement, SMS Demag has established its Technical Service Division. It covers the full range of customer wants and needs after equipment supply – ranging from blast furnaces to strip finishing and all our automation systems. Included here are:

- Erection and commissioning
- Maintenance systems
- Technological process support
- Automation
- Components.

So now you benefit from one entry point to SMS Demag where you will find direct support. See for yourself how our internal organization, with its close ties to the experts and know-how of all our divisions, is optimized to give you the most effective response to your demands.



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# CONSULTING



# CONSULTING

## HOW TO KEEP YOUR COMPETITIVE EDGE

Planning a plant efficiently is a task we aim to accomplish together with you. It is equally challenging to ensure you achieve an ever more impressive performance from your plants during their entire operating phase.

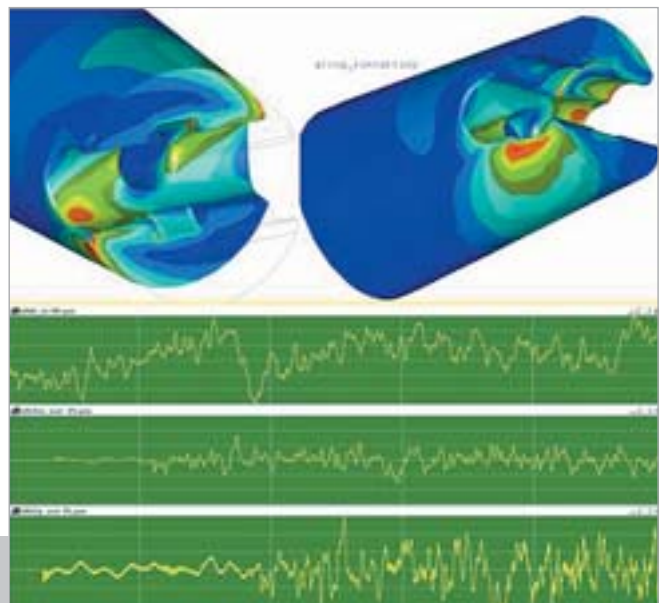
That's where our comprehensive consulting services come in. They cover everything from technical to economic aspects. And our consultants do not restrict themselves to components supplied by SMS Demag, but look at the entire process – irrespective of the machine manufacturers.

Always there for you are top specialists who support you with

- extensive technical assistance – if you wish also in teamwork with other specialized partners,
- spot-on studies – for instance to increase your productivity and to optimize your product launches, and
- professional audits – e.g. to streamline your workflows and maintenance processes.

Here are further benefits you derive from the strategies we devise for you within our consulting services:

- you improve your existing processes and, where necessary, replace them,
- you boost your efficiency and accelerate your ROI,
- and you keep your edge over the competition.



Example: Fact Finding Studies Simulation plus Stress and Strain Analysis

## ALL YOU NEED TO SUCCEED

### For existing plants

- Systematic determination of your potentials for improvement
- Examination of how you can apply technological improvements
- Extension of your product range with new process technologies
- Product improvements through new process models
- Studies on how you can increase your capacity
- Improvement of maintenance processes
- Provision of specialists to carry out
  - inspections
  - plant measurements
  - repair support
  - process optimization

### For new plants

- Assistance during installation and commissioning
- Support throughout the commissioning and run-up phases
- Technological support during ongoing production
- Studies and solutions relating to environmental and safety regulations

## WHAT YOU GAIN

- All-round backup from specialists who know the latest technologies and techniques inside out – customized to your needs and demands.
- Systematic support during planning and implementation in the form of know-how and expertise from the divisions of SMS Demag AG.
- Utilization of synergies through cooperation with selected partners.
- Tailor-made services from planning right through to implementation.

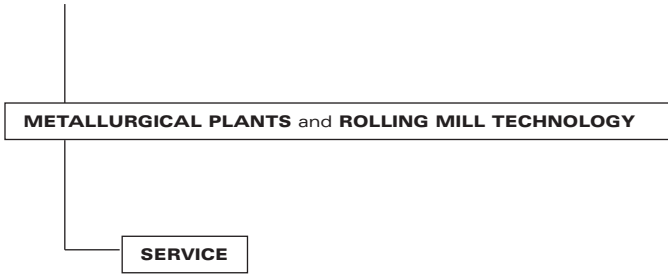
Example: Hot Strip Mill in Asia: Fact Finding, Operation and Maintenance Support, Technical Assistance for Improving Mill Performance.  
Results: Increased Plant Availability up to 18.0%,  
Reduction in Maintenance Delays up to 8.0%.





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# INTEGRATED MAINTENANCE MANAGEMENT SYSTEM IMMS



# INTEGRATED MAINTENANCE MANAGEMENT SYSTEM IMMS

## INTRODUCTION

Traditionally, plants and equipment have been maintained in response to breakdowns. That, in turn, has been associated with hurried interventions, unplanned measures and firefighting methods. Seen in this way, maintenance does not appear to be an activity amenable to management techniques and tools.

However, over the years, maintenance has evolved into a sophisticated set of techniques designed to maximize Overall Equipment Effectiveness (OEE). To attain this objective, SMS Demag analyzes the extent to which the means for a Continuous Improvement Process (CIP) are available and used. We carry out an initial maintenance audit that provides an overall impression and clues about potentials. This is one of the main instruments SMS Demag uses to achieve OEE at minimum cost while observing the conditions required for safety and environment protection.

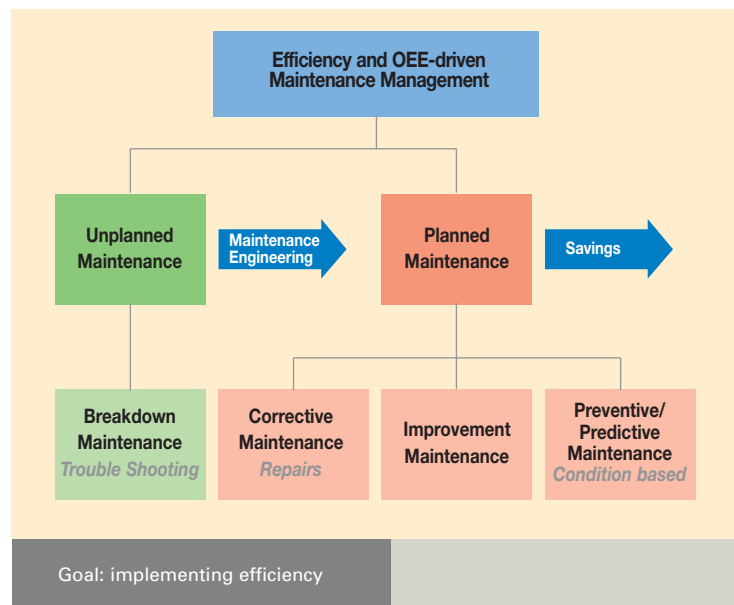
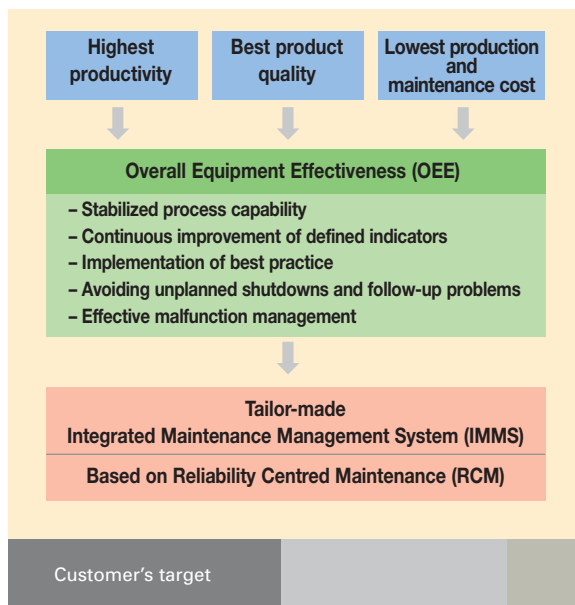
It is important to remember that the cycle of maintenance and its objectives starts well before you commission your new equipment. Take for instance investment studies, which are vital in helping you choose equipment and determine life-cycle costs.

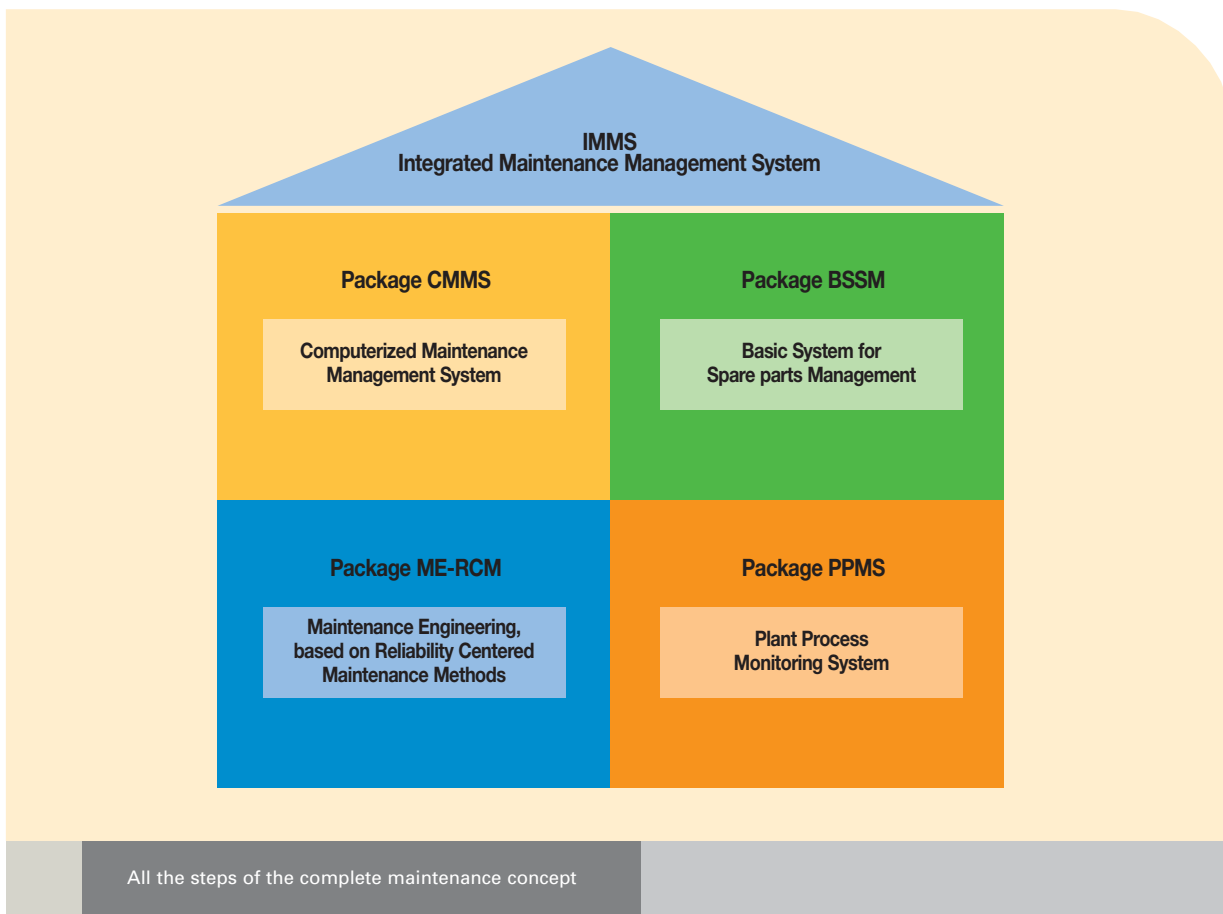
## YOUR REQUIREMENTS

If you underestimate what is required for qualitative and quantitative aspects of availability and reliability, you will face higher maintenance costs, production losses, production planning costs and quality problems (OEE losses).

That is why the main objectives of effective maintenance are to:

- maximize the availability and reliability of all assets
- ensure quality targets are met
- obtain maximum Return On Investment (ROI)
- extend the useful lifetime of all assets by minimizing wear and tear, etc.
- reduce follow-up costs
- improve continuously plant performance (CIP)





## WHAT WE CAN DO FOR YOU

To prepare you for maintenance tasks, we have developed an Integrated Maintenance Management System (IMMS) which focuses your activities on developing a preventive and plannable maintenance strategy. Preventive maintenance is based on the principle of thinking ahead. It is a matter of setting a series of goals to:

- inspect equipment before faulty operation interferes with production and causes follow-up losses
- take action before repair costs skyrocket
- eliminate or minimize the breakdown risk for strategic, critical equipment
- enable you to carry out repairs under the best possible conditions
- reduce the overall maintenance workload through better work preparation and reduce unforeseen production stoppages

You realize, of course, that implementing preventive maintenance requires an investment scheme to develop routine maintenance, equipment inspection, etc.

## IMMS CONSISTS OF FOUR MAIN PACKAGES

- Maintenance Engineering, based on Reliability Centered Maintenance Methods (ME-RCM)
- Computerized Maintenance Management System (CMMS)
- Plant and Process Monitoring System (PPMS)
- Basic System for Spare parts Management (BSSM)

We use our ME-RCM package to determine your maintenance strategies and preventive maintenance activities.

Then we transfer the results of the ME-RCM package to the second package, the Computerized Maintenance Management System (CMMS). Next in line are additional modules (documentation, spare parts management and purchasing) implemented and customized to provide the complete management functions of a CMMS.

Furthermore, you can choose a basic system for spare parts that we can install separately. We offer you the option of implementing packages for the PPMS diagnosis system so you can use condition based maintenance for dedicated application areas.

# Package ME-RCM

## RELIABILITY CENTERED MAINTENANCE STUDY

The ME-RCM package pools the target components safety, reliability and planning capability of the maintenance process. It aims to ensure the maintenance process is available over the entire life cycle of the plant – in the necessary quantity and quality as well as at the lowest possible cost.

Included in the ME-RCM package are a thorough plant analysis, diagnosis and localization of possible malfunctions, specification and prioritization of preventive measures. ME-RCM is an integral part of the Continuous Improvement Process.

This gives you a result that consists of a central database featuring all the experience-based values, transparent processes, minimal breakdown rates, low total costs and high quality of an expert maintenance process. The program is ideal for plants with high demands relating to safety, quality, productivity and costs.

## ME-RCM OBJECTIVES

Teaming up with you, we aim to

- Improve safety and environment protection
- Increase availability and reliability
- Extend the service life of cost-intensive plant components
- Create a comprehensive database
- Enhance motivation
- Detect faults before they arise
- Explain why malfunctions occur in plants and how they can be avoided

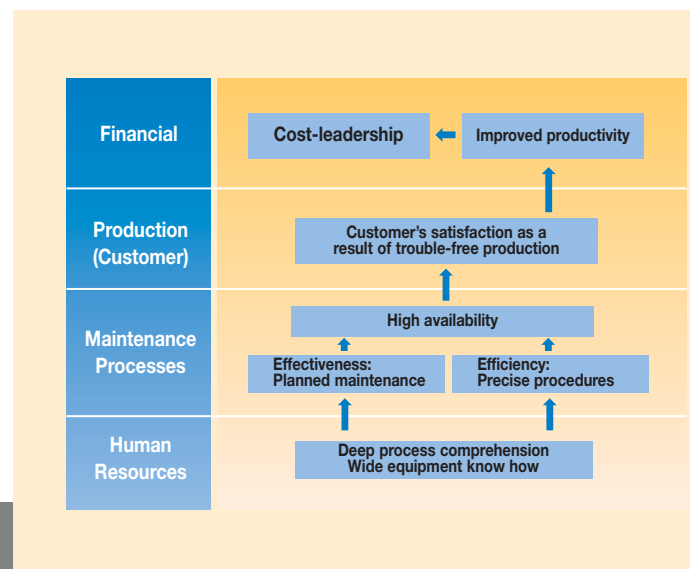
## ME-RCM ANSWERS THESE QUESTIONS

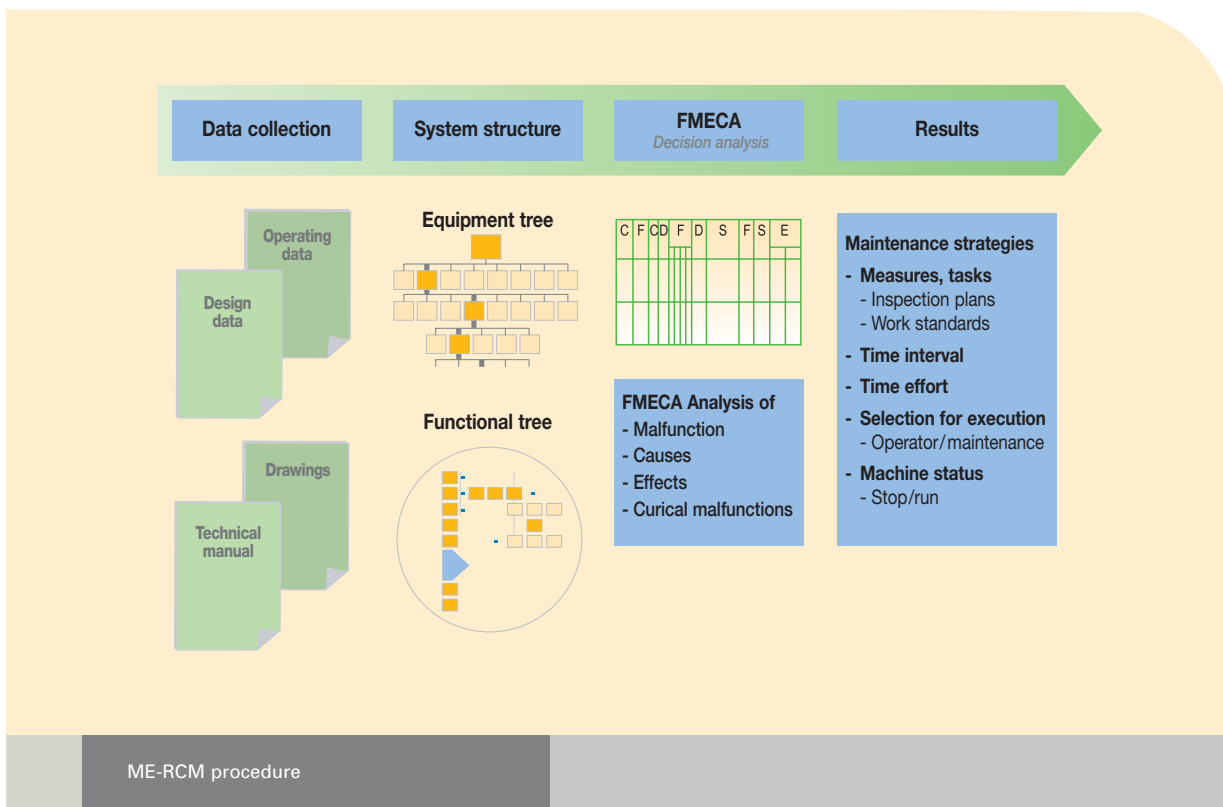
- What is your optimum maintenance strategy mix?
- What are your appropriate maintenance measures/tasks?
- At what intervals should your maintenance tasks be performed?
- Who can carry out your maintenance task?
- How much time is required?

## WHAT YOU WILL GAIN FROM THE STUDY

- Customized maintenance strategies
- Analysis of effective maintenance measures
- Preventive maintenance activities pooled in fixed-time schedules
- Experience-based inspection plans that optimize replacement intervals
- Mapped-out and detailed technical knowledge

Balanced score card of the maintenance management process





## QUALITATIVE BENEFITS

Lower accident risk and improved environment protection

- Protection of people has priority over protection of production
- Clear guidelines for avoidance and prevention

Higher productivity

- Only maintenance activities that are necessary are undertaken
- Faster recognition of faults, therefore less serious consequences
- Longer intervals
- Systematic gaining of experience

Improved maintenance efficiency

- Improved operating instructions
- Improved knowledge and understanding of plants

Clear guidelines for the introduction of new maintenance technologies

- Longer useful service life of machinery and plants

Maintenance database

- Systematic documentation
- More precise maintenance and inspection schedules as well as maintenance and inspection regulations

- Reduced knowledge and experience drain through staff turnover

Employee satisfaction

- Increased participation
- Improved communication

## QUANTITATIVE BENEFITS (MONETARY)

### Summary

- ME-RCM is one of the most forward-looking maintenance concepts currently available.
- The objective is "to do the right things at the right times with the lowest cost expenditure!"
- This requires a precise analysis of the plant and its processes.
- Systematic troubleshooting is achieved with modern methods from the quality assurance field. The maintenance measures derived from this guarantee the best possible results in terms of safety, costs and plant availability.

*Conclusion: Preventive maintenance using ME-RCM is an effective method for achieving sustained corporate and maintenance objectives*

# Package CMMS

## COMPUTERIZED MAINTENANCE MANAGEMENT SYSTEM

To create added value from the mix of different maintenance strategies (breakdown, preventive and predictive maintenance), you require a maintenance management tool that lets you focus on the technical conflicts and issues you face. You need a tool that provides IT support for recurring standard functions and processes in day-to-day maintenance. So, what does CMMS stand for?

**Computerized** refers to the software that supports the information flow and the just-in-time decision taking process.

**Maintenance** is defined in DIN 31 051/DIN/EN 13 306.

**Management** means the transformation of information into actions and guidance of responsible personnel.

**System** describes the holistic approach that links all processes involved in maintenance management.

## PROFILE

CMMS supports sustained maintenance management geared to efficiency and OEE indicators. This provides optimized management of fixed assets. It is an added advantage that CMMS offers you a better information base for technical and economic decisions relating to Mean Time To Repair (MTTR), Mean Time Between Failures (MTBF) and costs.

Included in the CMMS components are an in-depth analysis of the workflow and complete mapping of the entire maintenance process. Implementation options are also evaluated.

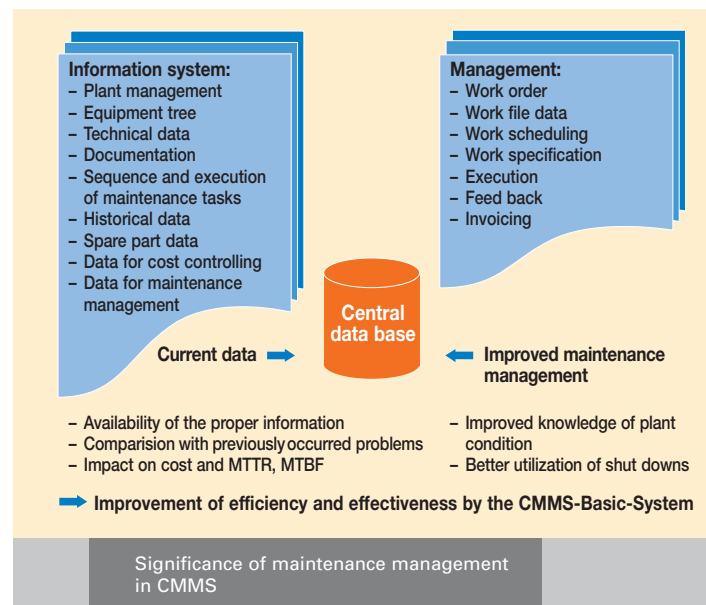
What you get is everything from a central database dealing with technical and economic aspects to transparent processes and the identification of cost centers. That all upgrades your maintenance processes to a high quality. CMMS makes your maintenance costs predictable and improves your planning and preparation processes.

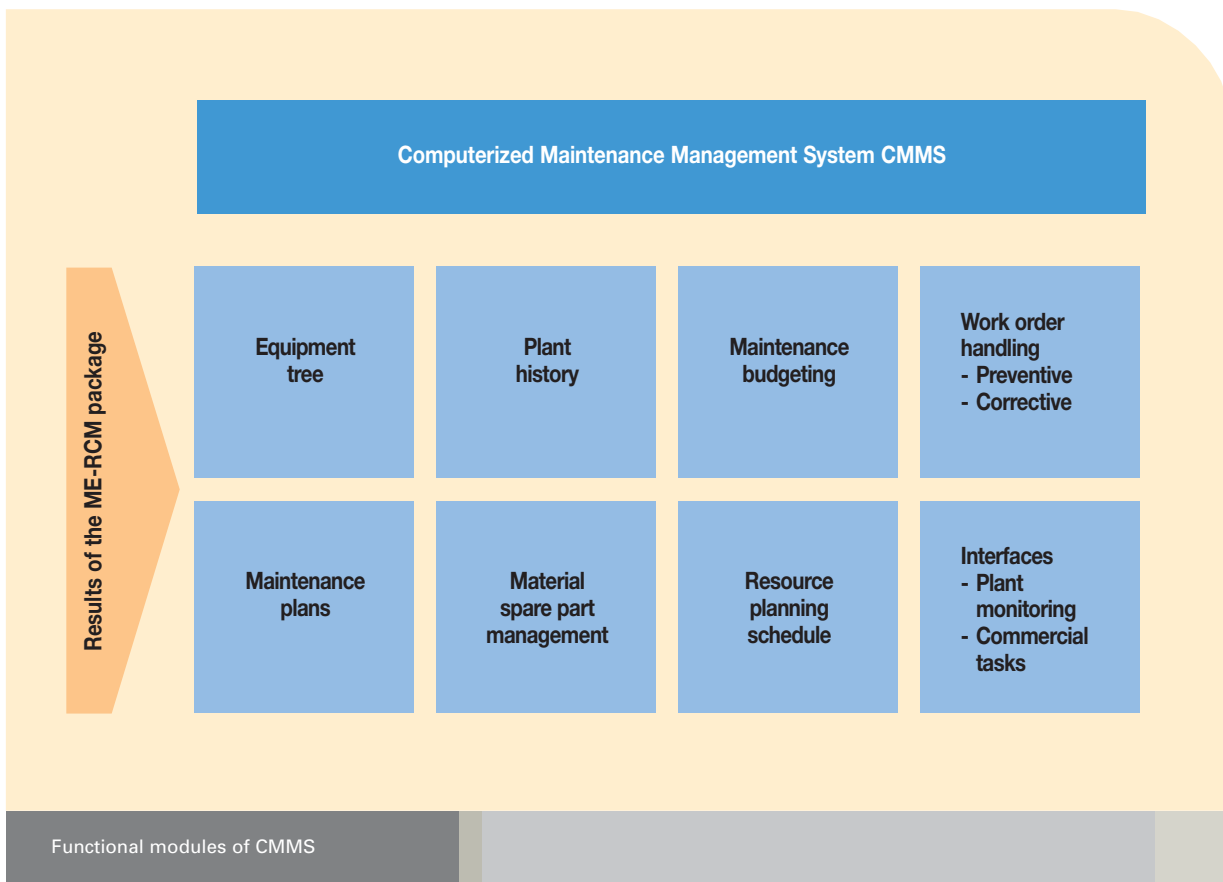
You substantially benefit from the system because it ensures you constantly improve both your techniques and technologies (CIP).

CMMS is particularly suitable for plants that are critical for quality, productivity and costs. It helps you meet tight supply deadlines and coordinate linked production networks.

## CMMS OBJECTIVES

- Improved maintenance planning and preparation
- Maximized production line availability, minimized breakdowns, improved weak point analysis
- Predictable maintenance costs
- Improved cost and technical controlling – transparent costs
- Continuous technical and economic improvement
- Improved planning and purchasing of spare parts, materials and subcontractor supplies
- Central maintenance database
- Employee satisfaction





## TOOLS, METHODS, SOLUTIONS

- OEE-driven maintenance management
- Asset management decision support
- Tools for technical and economic parameters
- Detailed reporting
- Precise and immediate feedback
- Know-how conservation
- Active project participation
- Improved communication

## WHAT YOU WILL GAIN FROM CMMS

### Qualitative benefits

- Longer inspection and revision intervals
- Short reaction times in the event of breakdowns or other irregularities
- Reduced downtimes
- Higher utilization of maintenance personnel
- Reduced spare part stocks
- Greater efficiency in purchasing activities
- Improved controlling using evaluation tools
- Know-how conservation
- Improved documentation saves time for planning, preparing and searching
- Better communication for interdisciplinary tasks
- Increased coordination between production, maintenance and subcontractor personnel
- Eliminated technical interface problems
- Enhanced planning and procurement of new equipment/plants due to information pooling

# Package BSSM

## BASIC SYSTEM FOR SPARE PART MANAGEMENT

Integrated in the Computerized Maintenance Management System (CMMS) is a complete spare part management system including links to documentation, planning, preparing, cost and technical controlling and other relevant functions.

You can use the basic system for spare parts as a stand-alone unit to support your purchasing department. Alternatively, it can be added on to any existing CMMS to link your purchasing and maintenance divisions. This is the right tool for you if you want to start your asset management system with a spare part function.

Depending on the maintenance strategies used, the availability of spare parts can be very important. When components malfunction (breakdown management) or have to be routinely replaced or overhauled (preventive, predictive maintenance), the spare parts required must be in stock.

## OBJECTIVES

- Mapping the main process of spare parts management
- Simple spare parts handling using experience-based system modules
- Object-oriented spare part data management for exact technical specification
- Easy system implementation both for you and SMS Demag

## FUNCTIONS

Here are some of the features you can use to

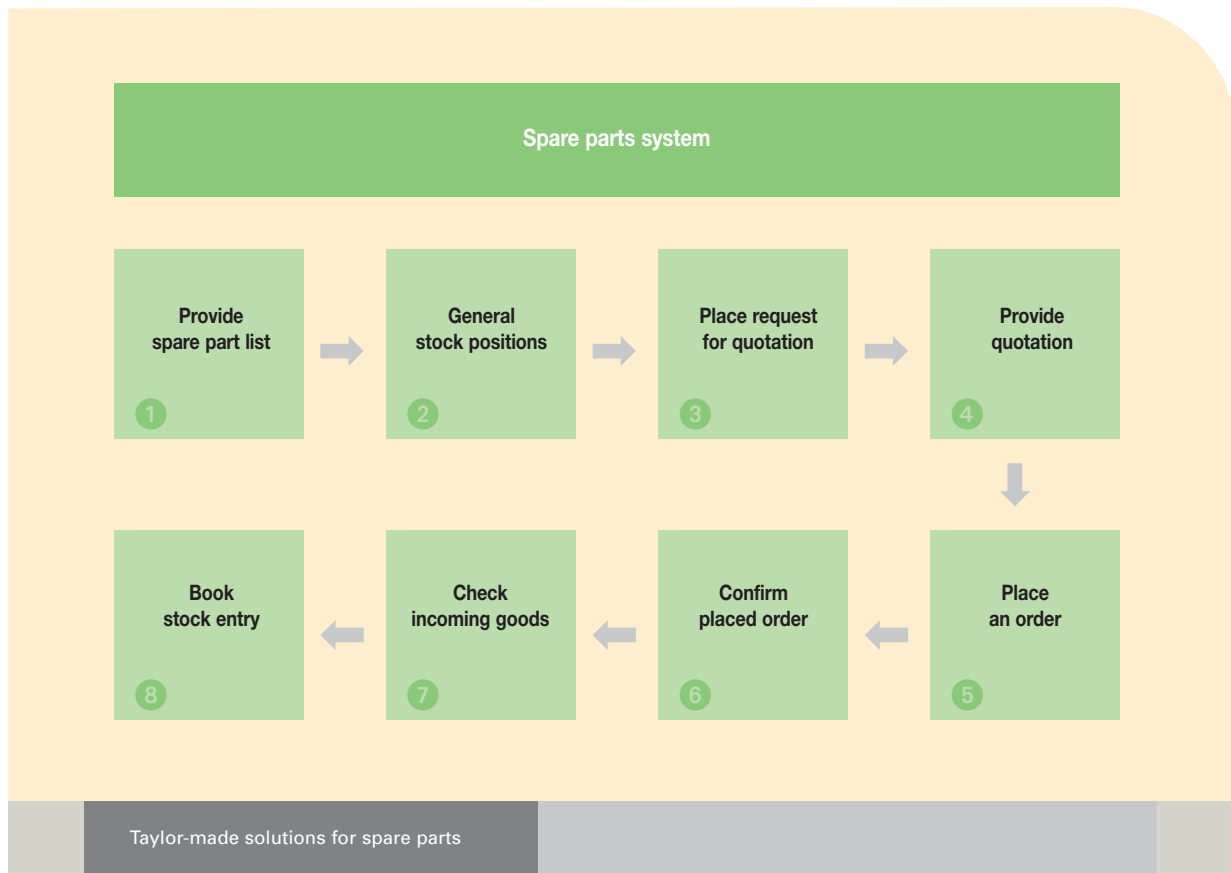
- Compile spare part lists according to SMS Demag bill of materials
- Generate stock positions
- Place requests for quotes and provide quotes
- Place and confirm orders
- Check incoming spares and book stock entries

The technical implementation of the basic system consists of a multi-client/server architecture with flexible numbers of clients. This means minimum infrastructure costs for you, yet secures connections and communication between you and your servers.

The spare part management system is entirely based on computerized lists.

The screenshot displays a software window titled 'Spare part list'. On the left, there is a tree view showing a folder structure with sub-folders like 'Machine 01 (BSSM)', 'Machine 02 (BSSM)', etc. The main area contains a table with the following columns: 'No.', 'Part No.', 'Part description', 'Quantity', 'Management length', 'Management status', 'Inventory quantity (current)', 'Inventory quantity (desired)', 'Order quantity (current)', and 'Order quantity (desired)'. The table lists several spare parts with their respective details.

No.	Part No.	Part description	Quantity	Management length	Management status	Inventory quantity (current)	Inventory quantity (desired)	Order quantity (current)	Order quantity (desired)
1	00000001	Oil filter for engine oil	1	1	OK				
2	00000002	Timing belt for engine	1	1	OK				
3	00000003	Timing belt for engine	1	1	OK				
4	00000004	Timing belt for engine	1	1	OK				
5	00000005	Oil filter for engine	1	1	OK				
6	00000006	Timing belt for engine	1	1	OK				
7	00000007	Timing belt for engine	1	1	OK				
8	00000008	Timing belt for engine	1	1	OK				
9	00000009	Timing belt for engine	1	1	OK				
10	00000010	Timing belt for engine	1	1	OK				



## WHAT YOU WILL GAIN

Handling is based on an original spare part list. This ensures

- easy identification
- easy communication
- reduced data handling
- easier and more efficient spare parts processes due to explicit inquiry and order handling
- reproducible stock and store management processes
- consistent information and database for cooperation between all departments
- step-by-step growth potential due to easy customization and a range of add-ons

# Package PPMS

## PLANT AND PROCESS MONITORING SYSTEM

PPMS is the SMS Demag monitoring and diagnosis system for condition-oriented maintenance of metallurgical and rolling mill plants. It aims to detect emerging damage early to provide adequate warning so that corrective work can be prepared and carried out in good time. How? By continually monitoring the condition of key plant components and process values.

The PPMS approach is based on two principles:

- using the available process automation sensors to conduct planned test procedures
- deploying extra monitoring systems wherever the available sensors do not deliver sufficiently detailed information about the condition of the plant.

The knowledge of the plant condition gained through PPMS enables you to

- plan maintenance in advance,
- extend maintenance intervals, and
- significantly reduce the proportion of unforeseen malfunctions.

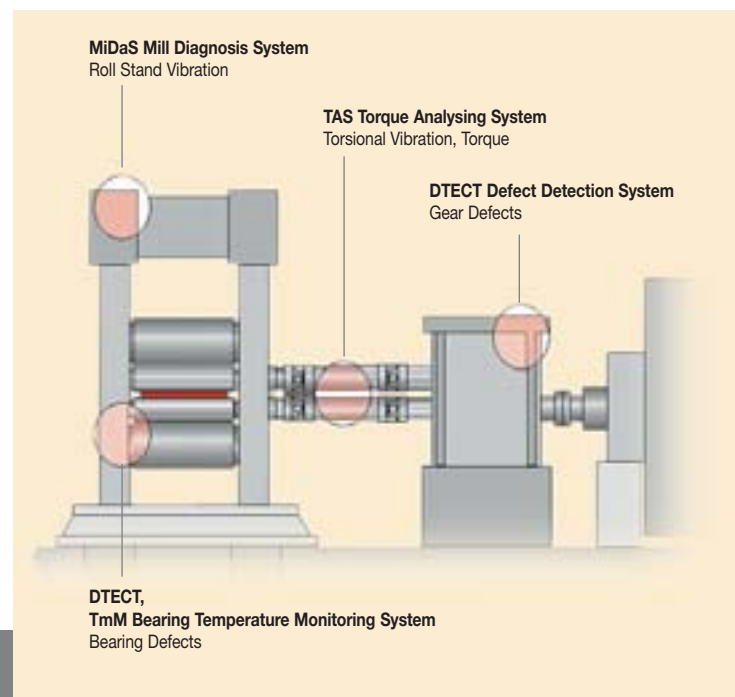
The way PPMS works depends on the particular plant condition, so it provides much greater flexibility than damage or time-triggered maintenance strategies.

All the data collected by PPMS is accessible not just on site, but also via teleservice by a service provider to

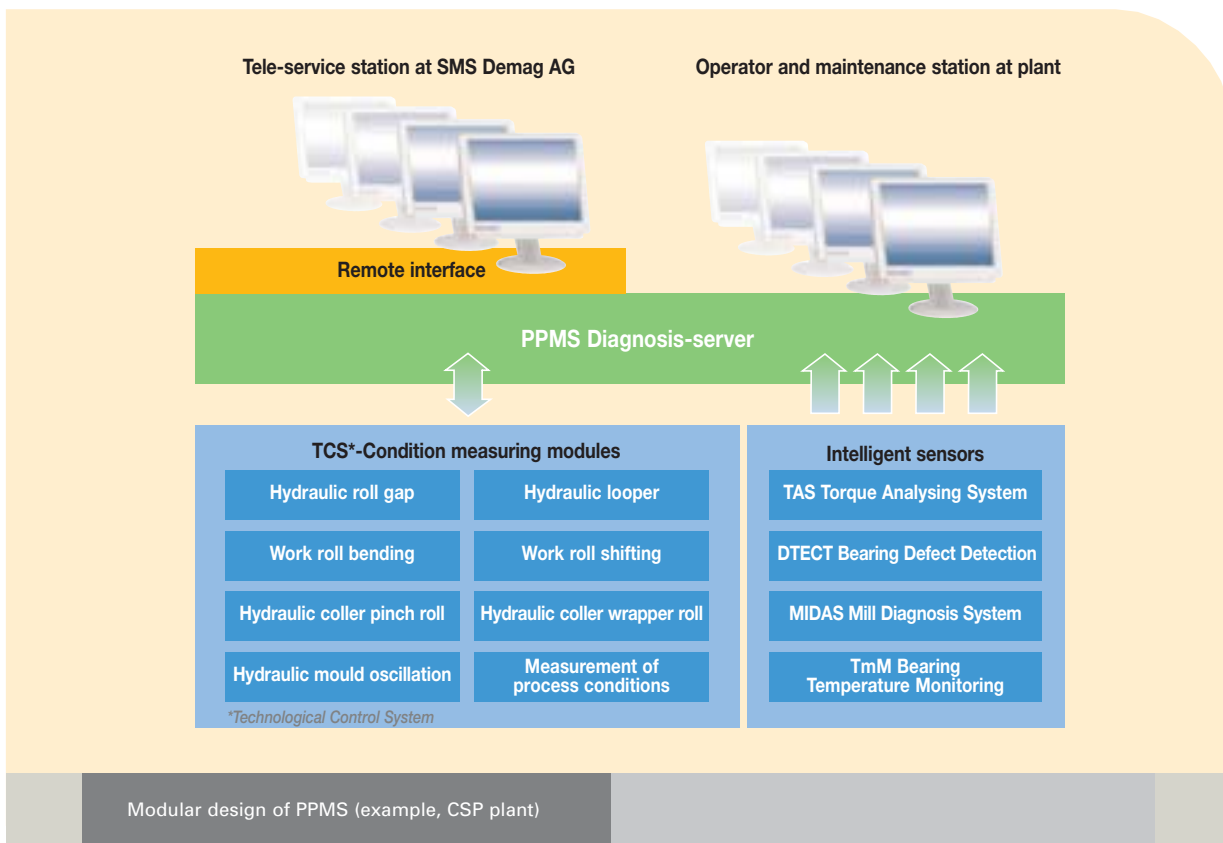
- support preventive diagnoses,
- recognize faults that arise and
- correct malfunctioning.

## YOUR KEY ADVANTAGES OF PPMS

- Plannable low-cost maintenance
- Reduced maintenance costs
- Optimized spare part stocks
- High plant availability
- Optimal product quality due to good plant condition and process flow
- Best possible utilization of the entire service life of your plant
- Forecasts on the development of your plant condition, well-founded data for weak point analysis
- Potential for process optimization provided by additional knowledge
- Rapid diagnosis in case of faults and own repairs under instruction with the help of remote access to database via teleservice and telediagnosis



Condition monitoring using intelligent sensors



## CONTINUOUS CONDITION MONITORING

PPMS records and processes information on both the condition of plants and components as well as on the process itself. It is integrated in the SMS Demag X-Pact process automation system. Continuous condition monitoring supplies not only information for maintenance, but also valuable data on plant operation, quality assurance and process optimization. Next in line is the PPMS diagnosis server that processes the source data measured. The data analysis and fault diagnosis are based on model and signal-supported methods. There is a wealth of expert knowledge in the system, and all the data collected is evaluated according to trend analysis. Whenever fault symptoms occur, PPMS structures them to support diagnosis. Furthermore, the system provides heuristic knowledge to aid fault analysis. Also available is a tele-service option so that you can directly access the central SMS Demag services.

## CONDITION MONITORING USING X-PACT

- Hydraulic mold oscillation (continuous casting). Pressure and position monitoring, servo valve

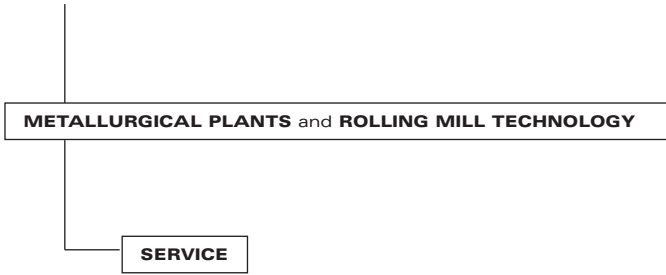
tests, determining and monitoring system friction, checking dynamic behavior

- Hydraulic loopers. Pressure and angle monitoring, servo valve tests, determining leakage in valves and cylinders, determining and monitoring system friction, recording its own weight curve, checking dynamic behavior
- Hydraulic work roll shifting. Force, pressure and position monitoring, servo valve tests, determining leakage in valves and cylinders, measuring friction, monitoring roll eccentricity, recording the stand expansion curve, checking dynamic behavior
- TAS Torque Analysing System. Modular structure of the measuring chain: conditioning, processing and analysis of the signal, diagnoses in the PPMS diagnosis server
- MiDaS vibration monitoring. Detecting and analyzing unwanted roll bearing vibrations
- DTECT bearing monitoring. Vibration monitoring of the roll bearings based on fuzzy algorithms, reliable early diagnosis of bearing or gear faults
- TmM bearing temperature monitoring. E.g. for gears or mill stands.



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# MAINTENANCE AUDIT



# MAINTENANCE AUDIT

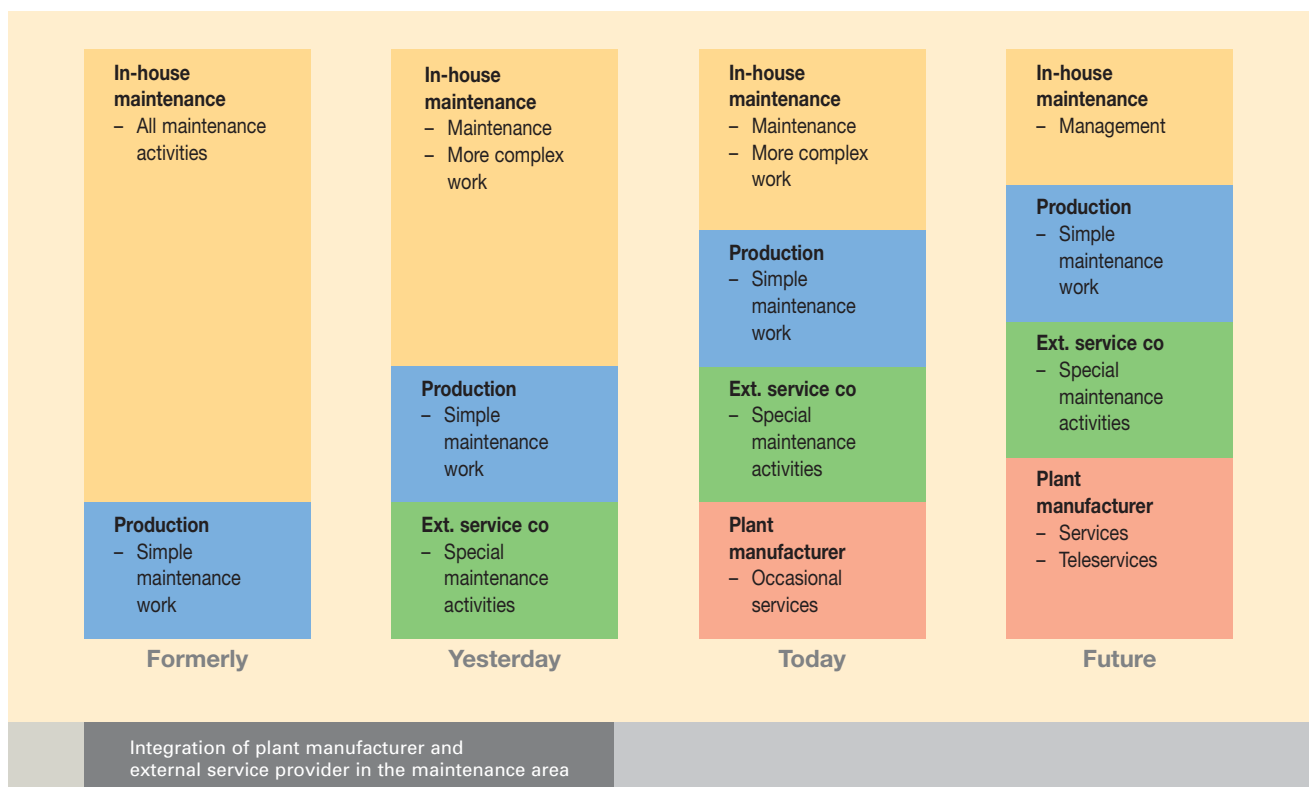
## INTRODUCTION

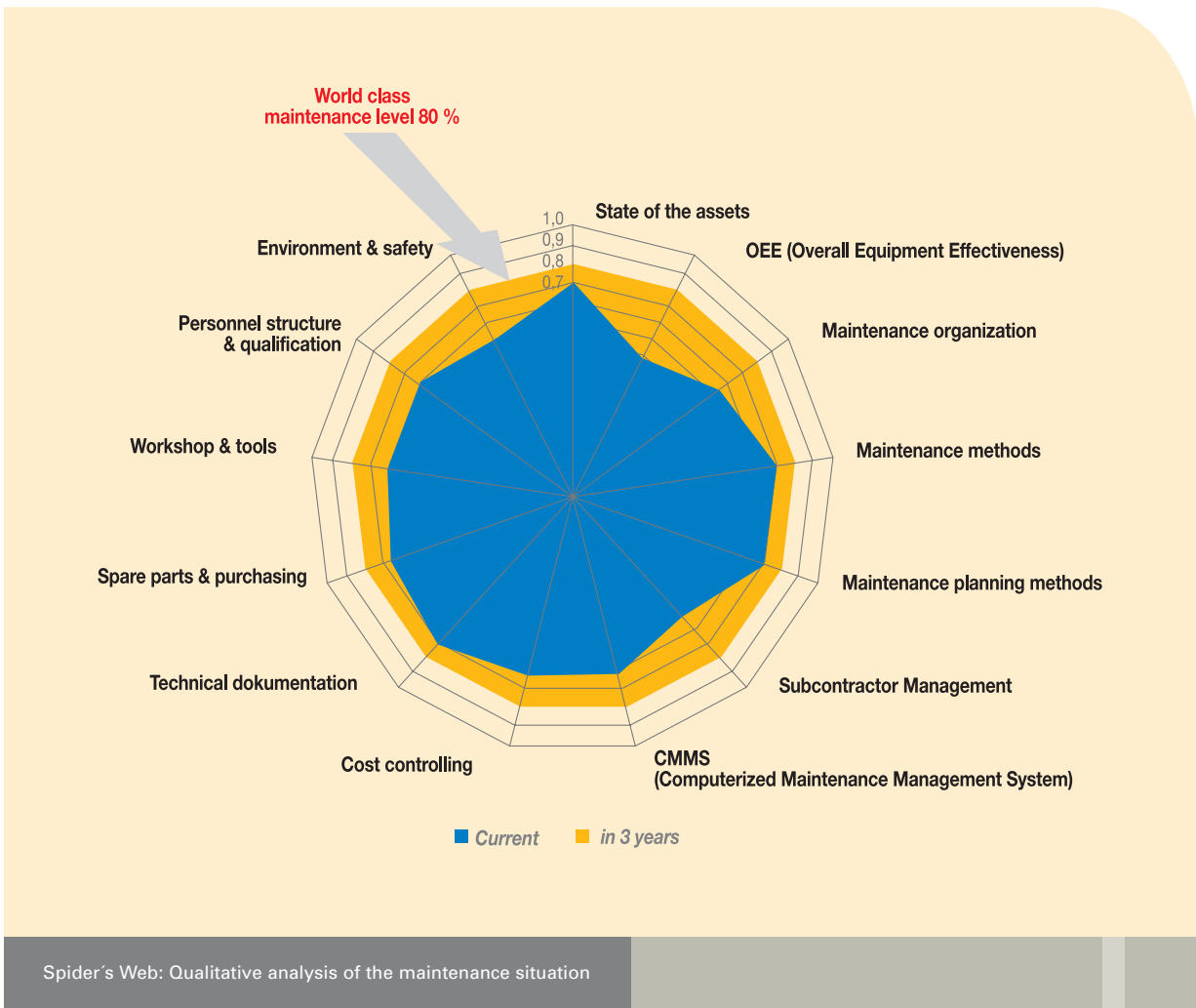
As an independent module, the maintenance audit provides you with objective findings on your options for a customized Integrated Maintenance Management System (IMMS). Included are extensive current situation analyses, measurements and evaluations of the entire maintenance process condensed into valid, quantifiable statements. These give you straight-talking information about concrete savings potentials and the best way to exploit them. Experience has taught that these potentials are usually considerable.

Determining your current positions and comparing them with gradually achievable targets clearly shows you the scope of action for your future Maintenance Management System. This is how the maintenance audit helps you reach decisions on making the most of the potentials it identifies.

Using this tool, you systematically link your Continuous Improvement Process (CIP) with your Maintenance Management System. All you need to know how to realize the untapped potential and to be more aware that you can transform it into market opportunities is detailed in the maintenance audit: it is about higher productivity, more predictable processes and lower maintenance costs.

Starting from careful examination of your plant, we may recommend that you implement packages from our Integrated Maintenance Management System.





## WHAT WE CAN DO FOR YOU

SMS Demag examines how maintenance units interact with production and other areas, focusing on strategic, economic and technical aspects.

We outline starting points for recommended revision and optimization measures.

There is a special emphasis on formulating steps for achieving maximum efficiency and effectiveness in the coming years.

You also see the savings potential, as outlined in the maintenance audit.

Here are the main issues and interfaces to be examined:

- Plant/ancillary equipment/condition
- OEE (Overall Equipment Effectiveness)
- Interface between production and maintenance – Total Productive Maintenance (TPM)
- Maintenance strategy/methods for production facilities and ancillary equipment
- Maintenance planning/preparation and computerized management system, job scheduling, job processing
- Disturbance data collection and management
- Spare parts/materials management
- Subcontracting services management
- Human resources environment

# OBJECTIVES and PROCEDURES

## ACHIEVING YOUR PRIME OBJECTIVE

We aim to examine the maintenance unit and then create a plan of action. Important here is to improve maintenance activities by formulating a Maintenance Management Master Plan (MMMP).

This takes place in three phases:

- Preparation and preliminary audit
- In-depth audit
- Implementation

You are probably keen to improve the effectiveness and performance of your production unit maintenance systems by applying an adequate maintenance strategy. That gives you two advantages:

1. it helps organize maintenance services to increase the availability and reliability of your equipment,
2. there is plenty of scope for high production of quality products at optimum operating cost levels.

Ultimately, you aim to reduce maintenance costs by a defined volume.

## HOW WE PROCEED SO YOU SUCCEED

It starts with an audit to determine the current maintenance situation of your plants. This, in turn, enables us to advise you on future maintenance.

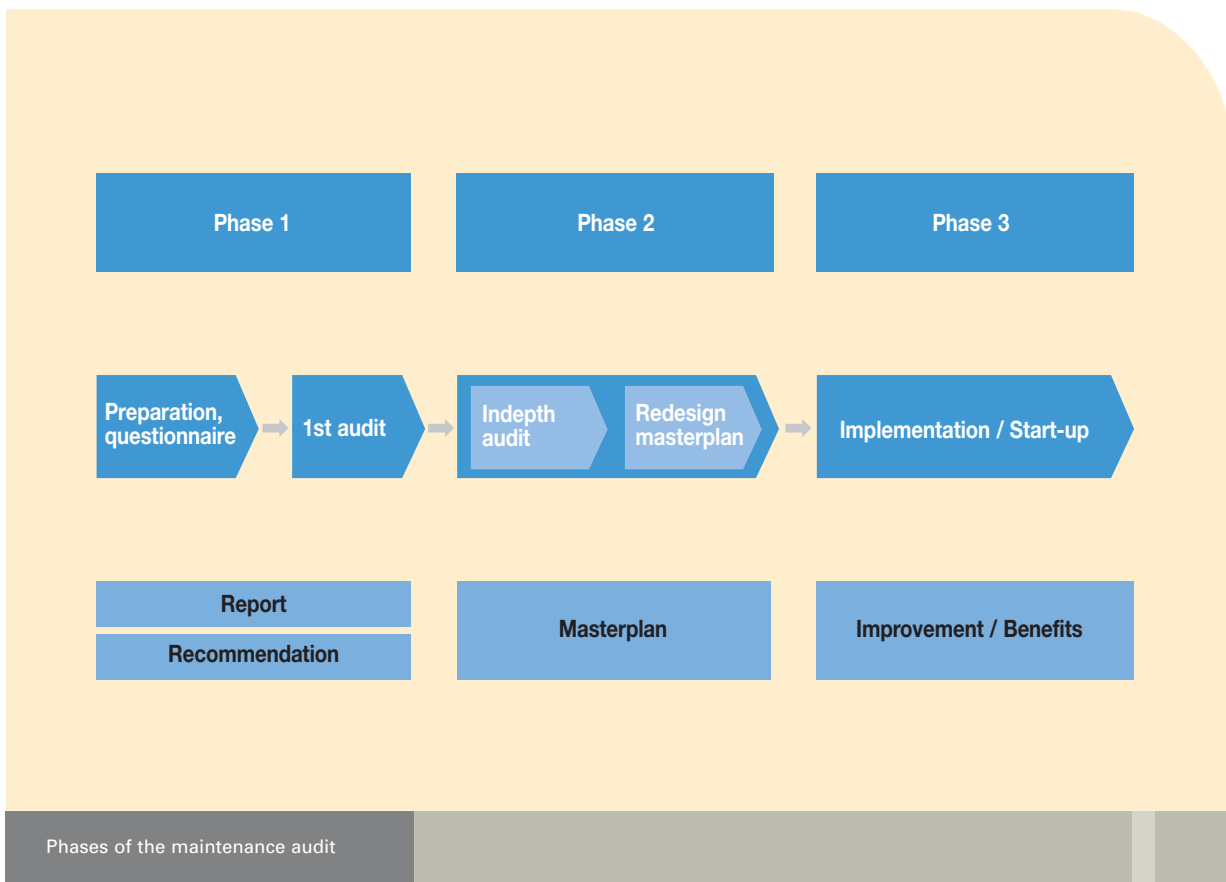
The audit identifies strengths and weaknesses, which form the basis for recommendations and actions designed to improve maintenance.

## MASTERPLAN ELEMENTS

Next, we hold a seminar with all members of the project team to discuss the findings of the maintenance audit. There, the participants determine the major MMMP elements to be examined and improved.

That coincides with setting up working groups for the various elements. Each one identifies the objective for its element and develops a plan of action with methods and ways of measuring results. They also decide on the priorities of the actions and whether they are long, medium or short-term.





## WHAT'S IN IT FOR YOU

The audit report gives you the results of the qualitative analysis of your maintenance situation (spider's web).

This is the basis for defining which issues your MMMP must focus on.

The so-called MMMP form shows you how to create and formulate the content and actions of your Maintenance Management Master Plan.

Finally, we estimate your possible savings and improvement potentials.

## APPLICATION

Suitable for all maintenance units with the goals mentioned above.

### HERE ARE THE RESULTS OF THE COMPLETE MAINTENANCE AUDIT

- Qualitative analysis results (spider's web)
- MMMP as a concept catalog
- Quantitative analysis results
  - improvement potential
  - possible savings after implementation of the MMMP measures

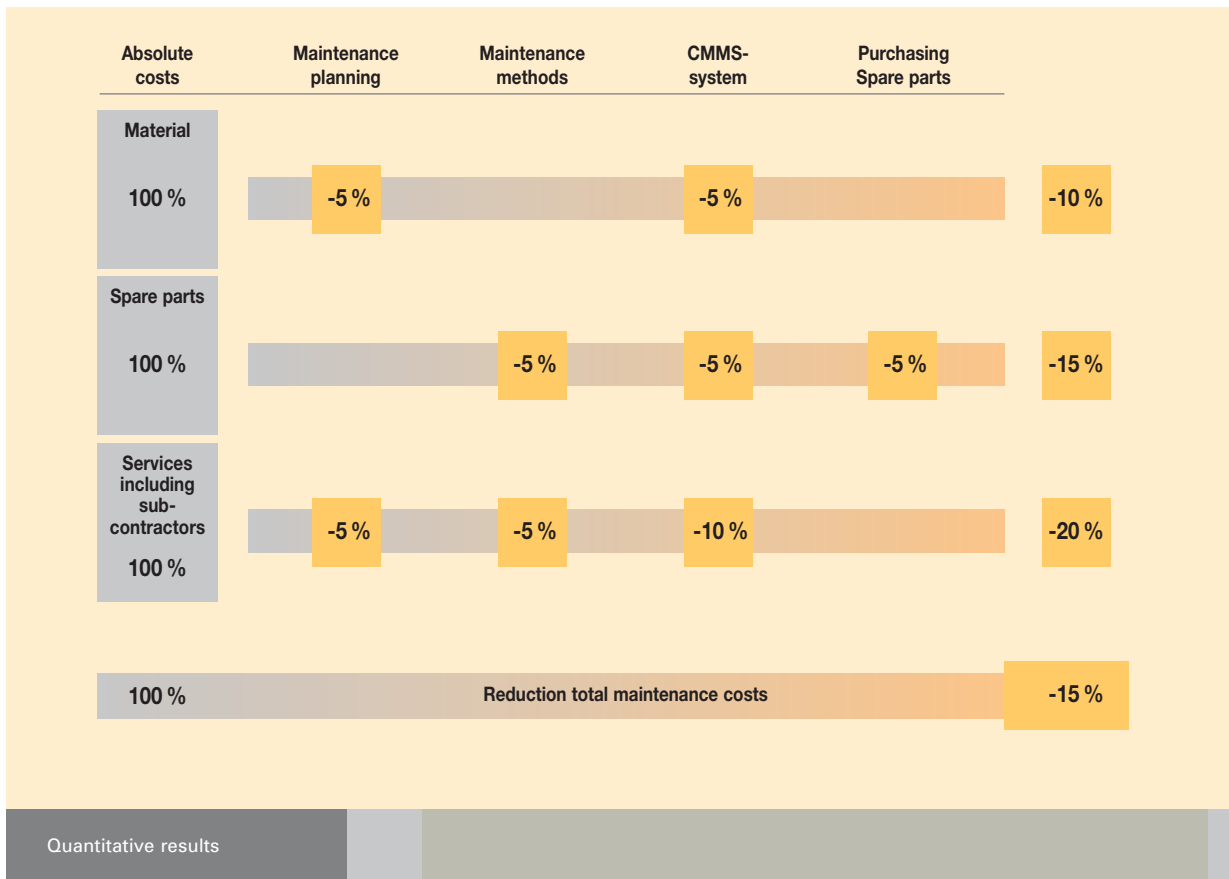
# CONVINCING RESULTS

## EXAMPLE: REDUCTION OF TOTAL MAINTENANCE COSTS

Experience shows that substantial savings potentials are almost always available and waiting to be tapped. You may be surprised at the amounts you can save. Just look at the example given here that reveals a savings potential of over 15%, even for a small area. It results especially from lower expenditure on external services, material and in-house services.

Extrapolated to the total maintenance costs of a whole plant, further current examples show that two-figure savings potentials are usually possible after implementation of preventive maintenance packages. Added to this is the increased availability that comes from largely plannable downtimes of plants.

All this makes a maintenance audit a major contributor to growing productivity.



## AVAILABILITY, FAST ACTION, QUALITY

You derive three benefits from your maintenance audit:

- Qualitative results shown by positions on the spider's web
- Assessment of the quantitative savings that you can achieve
- Substantial reporting including executive summary, maintenance quality rating and well-founded recommendations for the improvement process

The Maintenance Management Master Plan (MMMP) drawn up for you details how you can eliminate crucial loss factors relating to availability, speed and quality. So, by careful planning and control of the maintenance process, it will be possible for you to realize your untapped economic potential and strengthen your competitiveness.

## SUMMARY AND CONCLUSION OF YOUR BENEFITS

The maintenance audit represents best practice and is a systematic way of analyzing maintenance units to see how they mesh with production and other areas in terms of

- strategic,
- economic and
- technical aspects.

It suggests starting points for possible revision and optimization steps and defines how to achieve improvements.

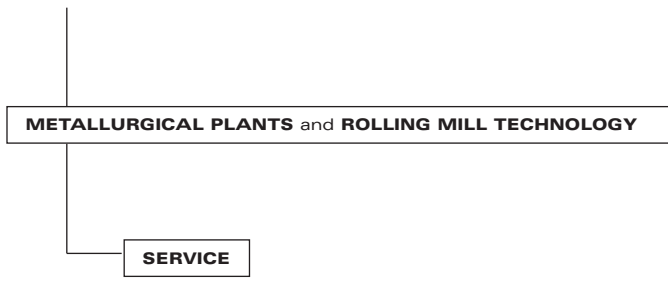


Experts assessing the current situation



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# SERVICE for TECHNOLOGICAL CONTROL SYSTEMS and LEVEL 2 SYSTEMS



# SERVICE AGREEMENTS for Automation Systems

## YOUR BENEFITS

- Clear cost structure – what you see is what you get
- Service modules can be combined easily to meet your specific needs
- Individual service contracts meet your specific requirements

Basic service agreements can be either all-inclusive contracts, optionally with case-to-case payment for on-site support, or flat-fee agreements for implementing the necessary infrastructure plus case-to-case payment for both calls and on-site support.

## FLAT-FEE PLUS CASE-TO-CASE PAYMENT

The flat fee covers the license for the tele-service tool, the manpower for preparing the client-specific data and for installing it at the plant.

Case-to-case payment applies to calls as well as on-site support. Calls are charged at different rates depending on their length and time of day.

The daily rate for a specialist providing on-site support is fixed. Extra hours will be billed additionally after eight hours' working time, on weekends and holidays.

There is the option of offsetting the costs for on-site support against those for the preceding call.

Also available is a reduced daily rate for deploying a specialist to the plant for maintenance, consulting or training, while the costs and conditions of supply of functional critical spare parts can be fixed.

## ALL-INCLUSIVE CONTRACT

The flat fee covers the license for the tele-service tool, the manpower for preparing the client-specific data and for installing it at the plant. No call will be charged.

You can opt to have a certain number of on-site support deployments included. If this option is not selected, you pay for deployment of a system specialist on a case-to-case basis at a fixed daily rate.

Where on-site support is included, **system specialists** can be designated as **plant specialists**, if required. That means you have direct access to plant specialists you know by name. Our experience shows that customers appreciate this "service with a personal touch".

Also available is a reduced daily rate for deploying a specialist to the plant for maintenance, consulting or training, while the costs and conditions of supply of functional critical spare parts can be fixed.



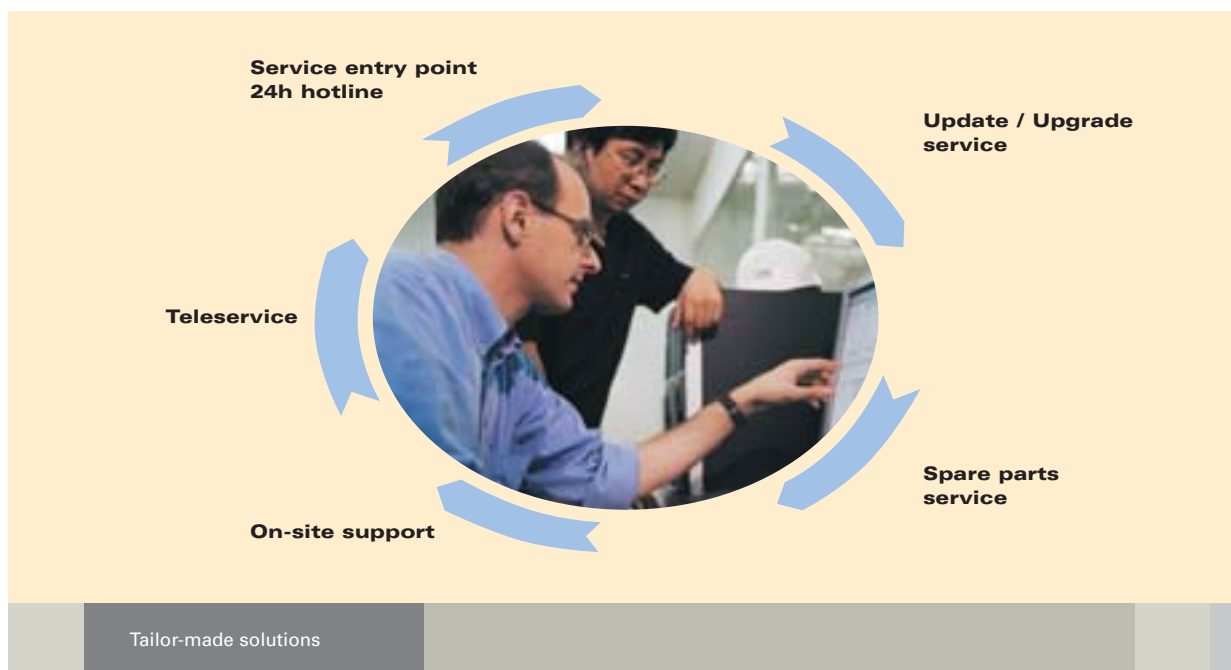
# SERVICE for TECHNOLOGICAL CONTROL SYSTEMS and LEVEL 2 SYSTEMS

## INTRODUCTION

Automation and control systems must be continually available so that metallurgical plants and rolling mills meet demands and achieve the necessary high performance. To be able to react optimally to whatever fault may occur, they require specific service packages.

Customized to your needs, our service packages provide broad support for your automation and control systems. That applies especially to Level 2 systems, technological controls (TCS) and CPUs. Tailor-made combinations of tele-services and on-site services make sure the SMS Demag specialists can take immediate action to identify and correct faults. You can use these services around the clock.

Forward-looking inspection and maintenance help you continually ensure the availability of your automation system. This process reduces the risk of breakdowns and enables you to keep maintenance costs down. And, of course, constant plant availability supports a high quality level so you feel satisfied.



# Your REQUIREMENTS and BENEFITS

## IN GENERAL

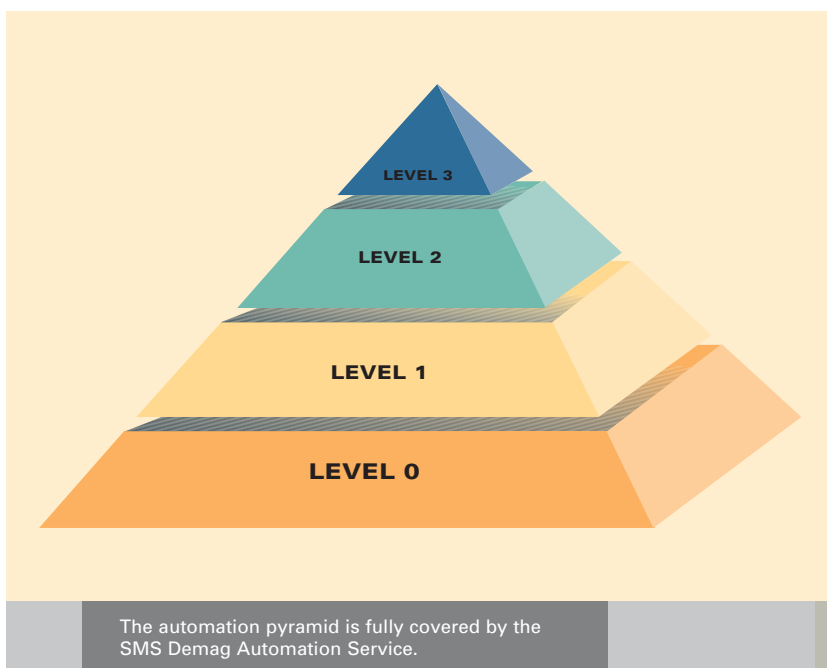
- Cut operational costs to a minimum
- Use the budget in the most effective way
- Calculate the means required in advance
- Obtain a "visible" return on investment
- Limit operation risks

## AFTER A MALFUNCTION

- Receive hassle-free help
- Return to normal operation asap
- Reduce production losses asap

## YOUR BENEFITS

- Quick access to specialists familiar with the TCS and Level 2 automation systems in case of malfunctioning, disturbance or questions
- Service management system with knowledge database. This effectively handles questions about the automation systems.
- Remote access to automation systems via safe network connections
- Communication tools for clients and SMS Demag specialists included
- Security against unauthorized manipulation of the automation systems by logging all actions and events
- Limited risk because electrical equipment is well maintained
- 24-hour availability



# SCOPE OF SERVICES from SMS DEMAG

## BASIC SERVICES

Our services focus on maintaining TCS and Level 2 automation systems and troubleshooting. You can also rely on further support for components such as CPUs, sensors, etc. (replacement, calibration).

**Both hotline and tele-service are available 24/7**, and if the situation escalates, we will provide rapid-response on-site support at fixed rates.

The system specialist assigned to the **hotline** will first evaluate the question and propose initial solutions. He works with a service management system supported by an embedded knowledge database. That contains answers to FAQs, known problems and their solutions as well as information specific to your plant.

If a problem cannot be solved easily, the system specialist links up to the plant using a **specially developed tele-service tool**. Implemented here are the key plant data, such as configuration and equipment tree. This offers not only quick access to a specific system, but also safe external access to your network using the "Infonet or Internet" provider and a virtual data tunnel shielded from the environment.

Communication tools for the specialists at both ends of the tunnel are included, and all events and actions are logged.

Should your experts and the SMS Demag specialists still not manage to solve the problem, they will agree to continue the support on site. That means an SMS Demag specialist will travel to your facility as quickly as possible.

## ADDITIONAL SERVICES

All it takes is a little advance notice, and we will send a specialist to your plant for maintenance, consulting or training at any time.

Typical automation system maintenance tasks are: revision of switchboards and components, cleaning and replacing components, checking regulators (software, parameter settings, actors, sensors), checking the CPU utilization, checking and creating archives of the log files, creating backups of systems and databases, checking communications.

You can bundle services with supplies of functional critical spare parts. SMS Demag always keeps a certain number of pre-configured and tested spare parts in stock.

They can be dispatched within a guaranteed, pre-specified time.





SMS group

# TRAINING



# TRAINING

## KNOWLEDGE, INFORMATION, SUCCESS

Well-trained employees are key contributors to corporate success. Securing both production and maintenance is always reliant on qualified and motivated members of staff at modern workplaces.

Due to our many years of experience, SMS Demag fulfills today's demands and wishes for increased qualifications by providing extensive training. Central to this training is our philosophy of a close, cooperative dialog with multiple customer groups, which explains why our training courses stand out for their reliable, practical relevance.

This ensures our training programs meet varied expectations in a very concrete way. Our goal is to qualify employees so they are well equipped to master current and future challenges.

## EXPERTS INSTRUCT

Our training programs are presented by experienced, highly qualified experts. They come both from the corporate world of SMS Demag as well as from closely related areas. All our programs combine direct, hands-on work with theoretical background.

We regularly update our range of courses and their content so that they always comply with cutting-edge technology. This ensures that course participants are perfectly prepared for the growing technological challenges they face in their work.



Group training using simulation software



Maintenance training



## SUBJECT AREAS OF TRAINING COURSES

- Technology
- Operating
- Elektrics and Automation
- Equipment
- Hydraulics
- Maintenance

The courses take place both in our SMS Demag training rooms as well as on-site and at comparable facilities of our customers – in whatever language is desired.

## YOUR ADVANTAGES OF SMS DEMAG TRAINING COURSES

- Extensive, process-based training units
- Direct link to practice
- Use of customer-specific simulation software
- Advanced, tried-and-tested training programs
- Expert, experienced trainers
- Easy-to-follow training material
- Best practice
- Current state of knowledge
- E-learning

## EXAMPLE

### Classroom training using a rolling mill simulator

To make the training as closely related to real life as possible, the participants work on two monitors simultaneously. The input data supplied by the computer consists of real pass schedules and authentic data from the rolling mill, while the software simulates the basic functions and rolling processes.

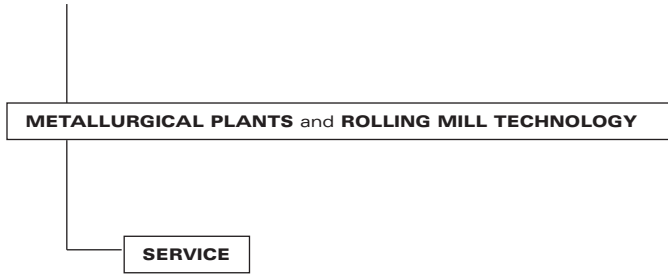
These are dealt with in the training sessions in such a way that the participants learn whatever is necessary to reliably control the processes in daily practice. There is a further focus on simulating faults and effective countermeasures. Invaluable here are experienced trainers who guide the trainees through each step.

This simulation enables participants to train important applications before trying them out in the works. It also covers all sorts of rolling processes so that exact controllability is practiced. The learning goal is perfect mastery of what has been learnt in daily practice.



SMS group

# INSPECTION and REPAIR



# INSPECTION and REPAIR

## INTRODUCTION

Inspection and repair are elements of a comprehensive program for improved maintenance management. Applied as a package, they help keep the technical plant condition manageable, predictable and highly functional – at all times.

Inspection services are on offer for the equipment of the entire process chain. They focus especially on plant components subject to high strain and crucial to the availability of the entire system.

Repairs are carried out above all when parts subject to wear are due for replacement. As a feature of our Integrated Maintenance Management System (IMMS), we mainly perform inspections and repairs according to a plan. Their intensity and frequency are determined by the manufacturing program, the utilization degree of the plants and the defined quality level.

Inspection and repair packages planned in advance help you avoid unexpected and therefore expensive faults. This reduces your staff requirement, procurement costs and external service costs to a minimum.

Instead, precise routines and fault-free operations ensure a constantly high quality level at significantly reduced maintenance costs.

## YOUR REQUIREMENTS

- Avoid downtimes due to equipment breakdown
- Operate your equipment efficiently and reliably (high availability)
- Enhance the service life of your equipment and components
- Use planned downtimes effectively
- Limit operation risks



## **THIS IS WHAT SMS DEMAG CAN DO FOR YOU**

- We plan shutdown activities and advise you on required inspections and maintenance
- We evaluate spare part stocks and logistics
- We verify alignment of all equipment and compare it with the required tolerances
- We inspect the condition and functionality of your equipment in the entire production line, followed by reworking, replacement or updating as necessary
- We measure vibration
- We give you in-depth reports after inspections with recommendations for spare parts as well as additional repairs and inspections

## **YOUR BENEFITS**

- Short response time in case of equipment failure, resulting in reduced downtime
- Qualified personnel, application of SMS Demag technical expertise and know-how combined with many years' experience to achieve best practice / experience-based solutions
- We bring in experiences of many similar applications.
- Root cause analysis based on inspection findings
- Inspection of equipment before faulty operation interferes with production reduces follow-up losses
- Inspections eliminate or limit the breakdown risk for strategic, critical equipment
- Our state-of-the-art machine shop is the perfect solution for re-machining or manufacturing spare parts
- Quick response due to large stock of materials and parts
- Concrete recommendations
- Improvement and modernization possible during repairs

# GEAR BOX INSPECTION



## INSPECTION AND REPAIR

Plant lifetimes and productivity are directly related to the quality of maintenance and equipment upgrades. Inspecting vital gearboxes takes only a little effort and ensures availability.

We also know that today's drive components are subject to much heavier loads than they were originally designed to withstand without an equipment upgrade.

The final users of your rolled products require more stringent specifications than ever before. To achieve these advanced qualities, there is a tendency to overload the drive components, including gear units and spindles. This makes it imperative to check for premature wear that can lead to expensive, unplanned stoppages. An inspection would help prepare for this kind of situation.

Should you anticipate that your plant will have to cope with higher strains than it was designed for, we support you with subsequent calculations. You will also benefit from planning a material change, e.g. from heat-treated to case-hardened material of the same geometry, which is often an effective solution.

Here is our service range, which includes:

- Service inspections, maintenance and spare parts
- Measurement of
  - bearing clearance
  - gear backlash and wear
  - gear teeth contact patterns and required adjustment
  - coupling alignment
- Monitoring
  - temperature
  - vibration
  - torque
  - bearings
- Crack detection on gears
- Inspection of drive spindles
- Analyses of oil samples
- Recalculation of the actual load and comparison with design specifications
- Replacement of heat-treated gears with case-hardened gears of the same geometry

As a designer and manufacturer of the largest gear units in the mill sector, we also revamp entire drive and subsystems.



# COILER and MANDREL INSPECTION



## INSPECTION AND REPAIR

It is true for most plants that mandrels (pay off reel and coiler) are crucial to the production of the line.

Downtimes of this type of equipment usually shut down the entire line, so preventive maintenance is essential here.

We inspect mandrels on site to determine their actual condition and ensure your equipment functions perfectly. To ensure the quality of your products, we also verify and correct the alignment of the reels and related equipment.

There is even more you can expect from us, such as offline inspections and revamps of all mandrels in our state-of-the-art workshop. We inspect, evaluate and replace or re-machine all components as required to transform your machine back to its "as new" condition. Next in line, after assembly and testing, we give you a warranty for the equipment we have maintained.

