

Maintenance Solutions

Asset reliability and plant productivity
at a guaranteed cost



The challenge: To achieve high asset availability and process improvements at the right cost



The solution: ANDRITZ results-oriented maintenance services

The concept is simple, really. When your process equipment is up and working properly, you produce more. When you produce more, your unit costs decrease. Decreased costs lead to higher margins. Every production facility in the world strives for this. For mills producing commodities lowering the cost of delivering high asset availability can be critical for survival.

Results-oriented maintenance: a sustainable business approach?

ANDRITZ Maintenance Solutions is in the business of ensuring that your mill's production equipment is available, reliable, and working at high utilization rate.

Our proposal differentiates from just selling man-hours. Of course, we also plan, manage inventories, train and develop personnel, carry out preventive

programs, and deliver agreed-upon results for your production line. And, our link to the world's leading process and product experts, through the ANDRITZ global network, gives us the added ability to suggest continuous improvements to your mill's equipment and processes.

Maintenance is core

At ANDRITZ Maintenance Solutions, maintenance is our core competence and the focus of everything we do. Chances are maintenance is not the core competence at your mill. An important activity, certainly, but not what you live and breathe 24/7.

So, you focus on what you do best – we focus on what we do best. Combining our knowledge of equipment, processes, and maintenance into your business targets just might be a great partnership.

Millwide or modular

We are not the type of service organization

that forces you into a fixed way of working. We are very flexible in creating, together with you, a maintenance program that fits your way of working. We are happy to start in just one production area (e.g. recovery & utility or fiberline) or with one type of equipment (e.g. valves, motors, instruments). Once you see the results, we know you will want us to do more.

Yes, we have long-term millwide maintenance contracts in some industries with the largest greenfield mills on the planet. But, we also have dozens of contracts with mills that were built before any of us were born. Our business model was started and honed at smaller, older mills in the late 1980's and has expanded – as ANDRITZ's global capabilities have expanded.

Maintaining the status quo is not good enough. Daily improvements are necessary in order to remain competitive.

Brownfield or greenfield – or any color in-between



▲ Veracel millwide maintenance and optimization contracts

One of our main tasks is to keep your mill's equipment running continuously and in good condition. We emphasize asset management, preventive maintenance planning, and regular inspections to avoid unplanned shutdowns, decrease the time

for scheduled shuts, and extend the time between shuts.

Another main task is improving your process performance. This is where our link to ANDRITZ's process and product experts comes in. Through structured communications with these experts, we are the first to learn of improvements in machinery or procedures that can be applied at your mill – helping you extract the highest performance, and longest life, from your equipment.

Benefits of our results-oriented maintenance program:

- Millwide (full responsibility) or modular (specific areas or equipment)
- Multi-disciplined specialists (mechanical, electrical, instrumentation and automation)
- Safety and environmental performance
- Maintenance + process + machinery experts
- You pay for results (Key Performance Indicators) or for agreed assignments
- Can include shutdowns, materials, sub-contractors, repairs, purchasing and inventory management
- Cost control – guaranteed budget/price
- Modern technology and tools
- Quick access to the latest innovations
- Personnel development and training



The tip of the iceberg

The cost of maintenance is more than personnel, tools, and materials. An inadequate maintenance program contributes to lost production, decreases in product quality, increases in chemical and energy consumption, degrading of the assets, and excessive inventories. The affected costs are estimated to be in the range of two-three times the direct cost of maintenance.



Results-oriented maintenance

A balanced, sustainable approach with two goals



The main targets are to increase the asset reliability and capacity utilization as well as to optimize the cost of delivering commonly agreed asset reliability during the asset life time in a sustainable way.

Increasing asset reliability and capacity utilization

The paths to increasing asset reliability are through activities such as predictive and preventive maintenance, inspections, lubrication programs, maintenance engineering, and asset upgrades/improvements. We provide all these services.

Optimizing the cost of delivering reliability during the asset life time

In addition, driving down the cost of delivering these services is a function of improving the productivity of the maintenance organization.

This we do through a proven procedure for: 1) targeting and selecting the right individuals, 2) preparing them with the training and tools they need to succeed, 3) proper supervision to ensure they are using best practices, 4) focus on reducing the source of maintenance cost, and 5) benchmarking the organization's performance within the ANDRITZ global network.

Ensuring sustainability

Sustainability comes from repeatability and accountability. And safety. Early in the process of working with you, we discuss the most important measures of success for your mill (Key Performance Indicators). We report these on a monthly basis, and take corrective actions immediately when necessary. We insist that all personnel follows safe practices and adheres to your mill's regulations. By continuous improvement, the progress is sustained.

Typical scope of a maintenance agreement

- Maintenance engineering
- Preventive, predictive, scheduled and emergency maintenance
- Operational maintenance planning: routine and shutdown
- Systems and tools: CMMS, materials management, document management, reliability management
- Disciplines: mechanical, electrical, instrumentation, automation
- Investments: equipment, tools, transport vehicles, lifting equipment, etc.
- Supply chain analysis and programming
- Inventory management: replacement parts, wear parts, consignment stocks

A unique approach to guaranteed costs

Millwide maintenance at guaranteed budget

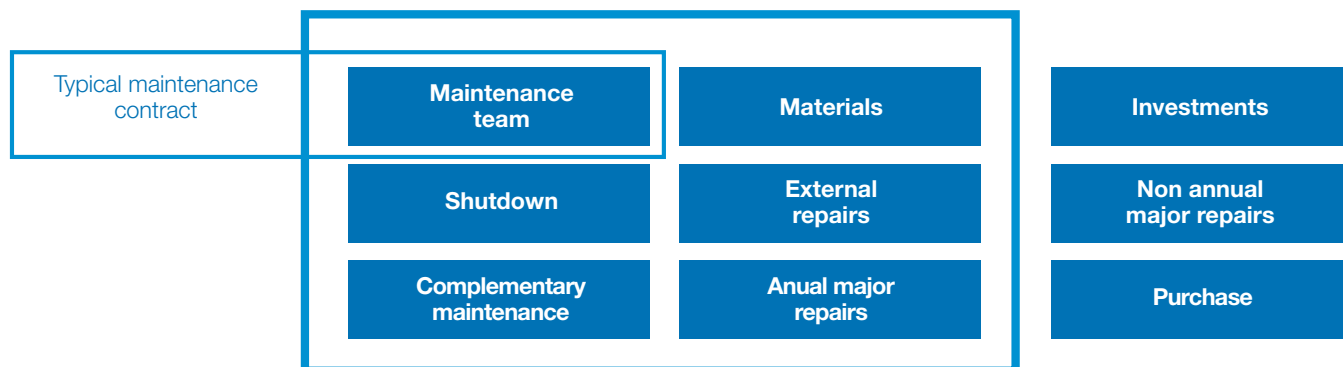
You and your team get paid for results – not for effort. You are expected to produce a certain output, at a certain quality, and at a certain price.

Shouldn't the people who maintain your assets be compensated the same way? That is why we base our compensation on delivering results, rather than delivering man hours. Results are achieved when effort (man hours) is combined with intelligence (skills, product and process knowledge).

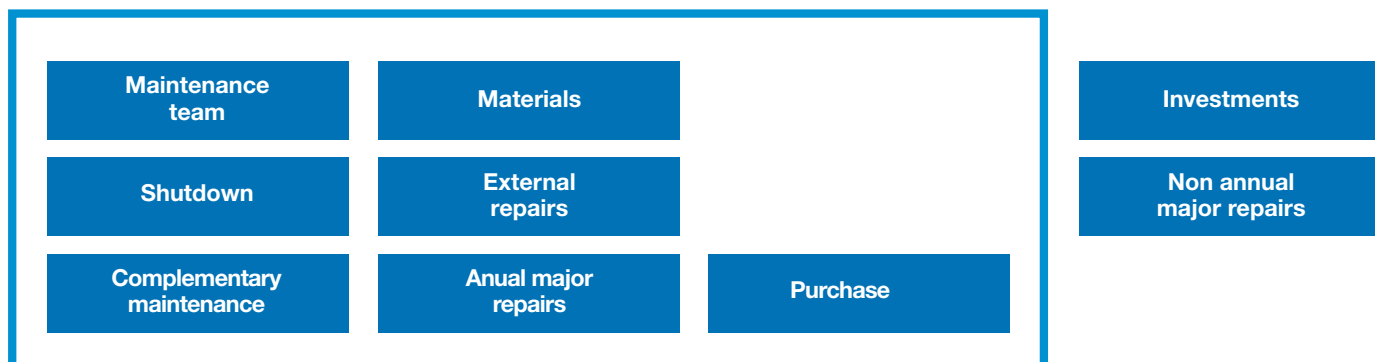
So, rather than a simple maintenance contract (bodies and man hours), what you will see from us is a comprehensive budget – guaranteed pricing that you can count on – that takes into account your total maintenance activities: including shutdowns, external repairs, purchasing, inventories, etc.



Maintenance budget



Millwide maintenance = Guaranteed budget contract



ANDRITZ as your maintenance partner

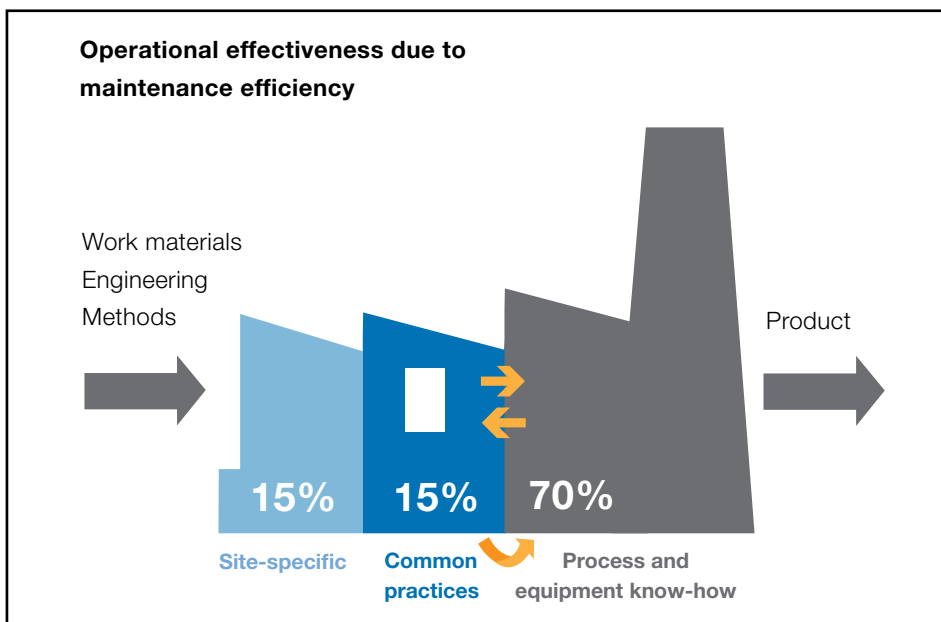
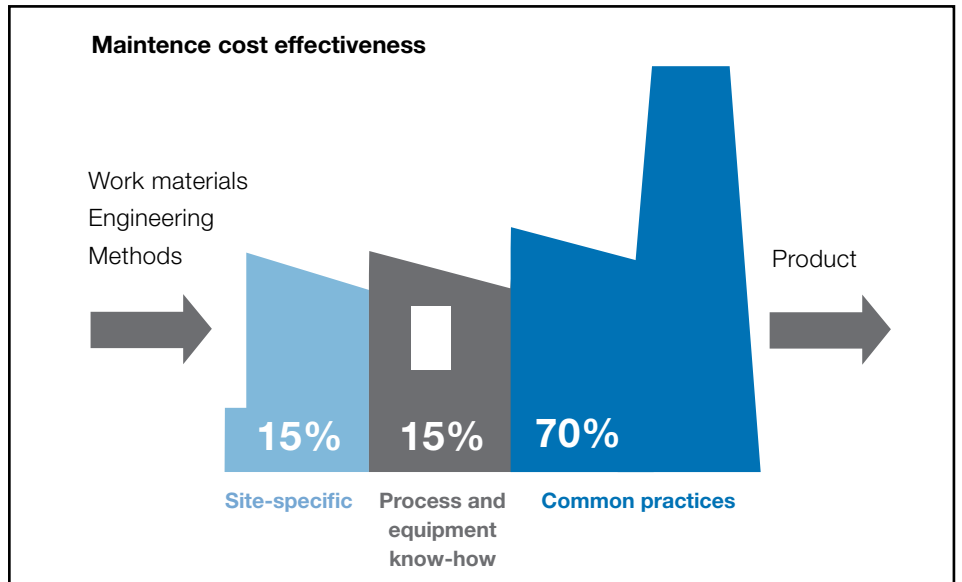
Process and machinery know-how, technology and focus on results



Can you make money from maintenance?

Yes, but only indirectly. The actual maintenance activities are a cost center. The impact of maintenance – your operational effectiveness – is where money is made or lost.

A typical maintenance provider with multiple skill disciplines can walk into any factory or plant and be about 70% effective, due to mastery of common maintenance practices (valves, motors, vibration analysis, bearings, lubrication, etc.). You can see this in the illustration on the right.



What about operational effectiveness due to maintenance efficiency?

Experience shows here is where big portion of the results are and also that, in here, 70% of the contributions come from process and equipment know-how and not from common maintenance practices. This explains why ANDRITZ Maintenance Solutions is an excellent choice to take care of your maintenance, for its access to ANDRITZ global presence and knowledge in several process and machineries.

Backed by the strength of a global ANDRITZ network

The ANDRITZ GROUP has more than 23,700 employees worldwide. ANDRITZ operates over 220 production sites, as well as service and sales companies all around the world. The company is well-equipped

to handle complete projects, from design to long-term maintenance. ANDRITZ has the financial strength and global experience to deliver fully integrated systems and services to virtually any location in the

world. Our experts know how to extract the maximum performance of production equipment over its long lifetime.



Differentials

Outsourcing experience

Greenfield and brownfield experience
20 years experience and 22 contracts
Outsourcing from customer team and competitors
Mostly repeats/renewals

Process & machinery know-how

- Lifecycle management
- Critical standard procedures
- Production technology
- Process
- Critical procedures management
- Safety environmental impact

specialization

Millwide maintenance
E I A contracts
Valves, motors, analyzers contracts
Online Academy for training/development
Career paths/career opportunities self-managed teams

Technology & innovation

- Process diagnostics
- Online/remote experts
- Millwide efficiency and utilization
- Process optimization
- Modern tools and workshops
- Online asset managing tools

Customers benefits

Smooth and safe transition
Maintenance best practices
Maintenance team motivation (better career op.)

- Machinery reliability
- Maximum process performance
- Lifecycle extension and cost management

High degree of specialization
Up to date technology in each area
Equipment's reliability

- Decrease the process variability
- Lower the production cost: chemicals, energy, etc.
- Mill debottlenecking

ANDRITZ Maintenance Solutions

brings added value to mills

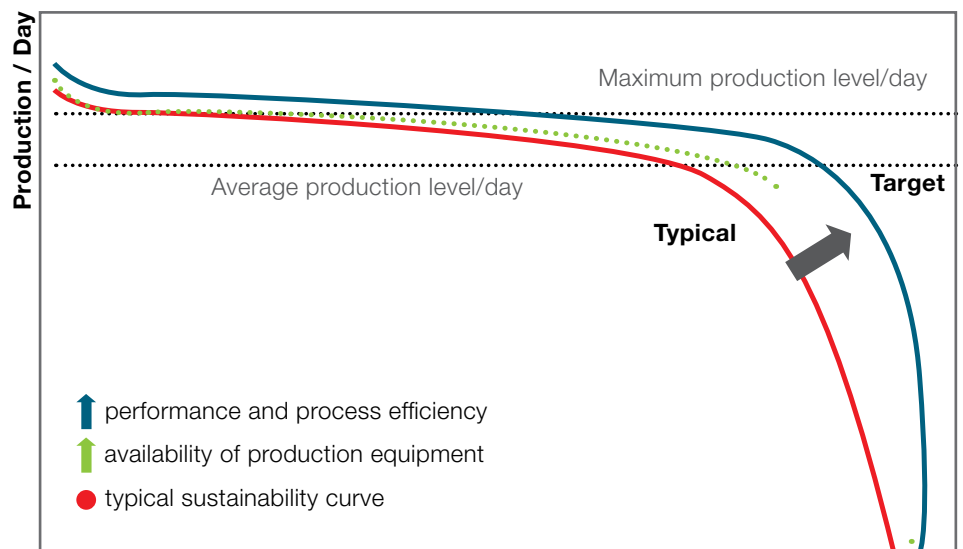
While it is virtually impossible to run at maximum production every day of the year, it is very possible to come much closer than most mills do today.

Greenfield mills running fast start-up curves demonstrate this potential. In a matter of weeks, they can achieve design production rates – and often exceed them. But, come back a year later and you begin to see the gap as performance begins to slip into a predictable, sustainable level. Often, this level is within expectations and allowed to continue. But from our view, that is leaving money on the table.

First effort is to reverse the “sustainability slip” by enhancing the availability of all production assets. If the equipment is available, it has the potential to improve its performance.

Next effort is to enhance the production process. This requires intimate knowledge of the machinery, chemistry, and operations to eliminate bottlenecks, change operating procedures, retune control loops, rebuild or upgrade specific components, etc.

ANDRITZ Maintenance Solutions, as part of the ANDRITZ global network, has the expertise in both of these areas to help you improve asset availability and production efficiency.



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