



Sumitomo Drive Technologies

MASTERING MAINTENANCE

Essential Maintenance Strategies
For Your Industrial Equipment

Mastering Maintenance: Essential Maintenance Strategies for Your Industrial Equipment

This guide is built to give maintenance professionals like you the tools and knowledge to keep production running smoothly, safely, and reliably.

No matter the industry, the job of maintaining complex equipment comes with high expectations and daily challenges. Whether you're working to reduce downtime, support safety, or extend the life of your machines, your role is essential to keeping operations moving.

Inside, you'll find practical strategies, proven methods, and helpful tips to strengthen your approach to maintenance—and support long-term success on the floor.



Chapter 1: Assessment and Planning.

This section is dedicated to helping Operation Maintenance personnel methodically assess their current maintenance needs and plan their schedules to align with production demands. It emphasizes the importance of a thorough evaluation of equipment condition, maintenance history, and operational priorities to establish a maintenance schedule that minimizes downtime and ensures consistent product quality.



Chapter 2: Creating a Maintenance Calendar.

This segment provides a step-by-step approach to crafting a preventive maintenance calendar, detailing how to determine the frequency of inspections, servicing, and part replacements. It aims to equip maintenance teams with the knowledge to develop a proactive maintenance regimen that prevents equipment failures and maximizes operational efficiency.



Chapter 3: Leveraging Technology for Scheduling,

This offers an overview of the latest software and tools designed to streamline the creation and management of maintenance schedules. This section highlights how integrating technology into maintenance planning can enhance accuracy, improve communication among maintenance teams, and facilitate real-time adjustments to the maintenance schedule, ensuring that the production line operates at its optimum capacity with minimal interruptions.

By adhering to the principles and practices outlined in these chapters, you will be equipped to tackle the maintenance challenges unique to the food and beverage production industry, enhancing your operational reliability and contributing to the overall success of your facility.

Mastering Maintenance: Essential Maintenance Strategies for Your Industrial Equipment

Overview of Maintenance and Reliability

Maintenance and reliability are essential to keeping industrial operations productive and predictable. Maintenance involves the routine tasks, inspections, and repairs needed to keep equipment functioning as intended. Reliability focuses on ensuring that equipment operates consistently over time, without unplanned failures or disruptions.

Key strategies include:

- Preventive maintenance – scheduled service to avoid breakdowns
- Predictive maintenance – using data to anticipate issues before they occur
- Corrective maintenance – efficient response to fix problems when they arise

Together, these practices help reduce downtime, extend equipment life, and improve overall operational efficiency.

Why Maintenance and Reliability Matter

No matter the industry, unplanned equipment failures can cost time, money, and safety. Strong maintenance and reliability practices ensure:

- Fewer disruptions to production and output
- Improved performance from machines and systems
- Safer working conditions for operations and maintenance teams
- Longer asset life and better return on equipment investments

Reliable equipment keeps operations running smoothly, reduces costly surprises, and supports long-term productivity.

Benefits of Effective Maintenance and Reliability Practices

Implementing robust maintenance and reliability practices offers several benefits:

- **Reduction in Downtime and Production Interruptions:** Proactive maintenance strategies reduce unexpected equipment failures, minimizing downtime and production halts.
- **Enhanced Equipment Performance and Lifespan:** Regular maintenance ensures that equipment operates at peak efficiency, reducing wear and tear and extending its operational life.
- **Improved Safety and Regulatory Compliance:** Consistent maintenance helps meet safety standards and regulatory requirements, reducing the risk of non-compliance penalties.
- **Cost Savings:** Optimized maintenance schedules and predictive maintenance technologies reduce repair costs and resource waste, contributing to overall cost efficiency.

Introduction to Maintenance Assessment

Developing an effective maintenance schedule is foundational to ensuring the reliability and efficiency of your equipment. The first step in this process is a thorough assessment of your current maintenance needs. This assessment serves as the groundwork for informed decision-making, enabling you to identify critical equipment, understand its role in your production processes, and prioritize maintenance tasks based on the equipment's condition and importance.

A systematic approach to assessing your maintenance needs not only helps in minimizing downtime but also contributes to longer equipment life and reduced operational costs. By evaluating each piece of equipment's criticality, historical issues, and current condition, you can create a maintenance schedule that is both proactive and responsive to your facility's unique demands.

This section includes a Maintenance Assessment Chart designed to guide you through collecting and organizing the necessary information about your equipment. Following the chart is a Glossary providing detailed descriptions of each item in the chart, ensuring clarity and consistency in how you document your maintenance assessment. Together, these tools will help you lay a solid foundation for developing a maintenance schedule that enhances operational efficiency and ensures the longevity of your equipment.

What Does This Chart Cover?

- **Inventory Assessment:** Begin by conducting a comprehensive inventory of all equipment, focusing on identifying each piece's role in production, its maintenance history, and any manufacturer-recommended maintenance schedules. You can also contact your mechanical Distributors to assist in taking inventory. For gearboxes, incorporate any specific maintenance guidelines provided.
- **Criticality Analysis:** Evaluate the criticality of each piece of equipment to production processes. Identify which gearboxes or machinery, if failed, would significantly impact production. This analysis helps prioritize maintenance efforts based on the potential risk and impact of equipment failure.
- **Maintenance History Review:** Analyze the maintenance history of your equipment. Look for patterns or recurring issues that may indicate a need for more frequent inspections or specific preventative measures.
- **Resource Evaluation:** Assess the availability of internal maintenance resources, including personnel and budget. Determine if there are gaps in skills or resources that need to be addressed to meet maintenance objectives.

Maintenance Assessment Terms & Suggestions

- **Equipment ID:** A unique identifier for each piece of equipment.
- **Equipment Name:** Name or type of the equipment.
- **Location:** Physical location of the equipment within the facility.
- **Role in Production:** Brief description of the equipment's role and importance in the production process.
- **Manufacturer's Recommended Maintenance:** Summary of the maintenance guidelines provided by the equipment's manufacturer.
- **Last Maintenance Date:** The date when the equipment last underwent maintenance.
- **Maintenance Frequency:** How often maintenance is currently performed on the equipment.
- **Criticality:** The equipment's importance to production operations, rated as High, Medium, or Low.
- **Historical Issues:** Any known recurring issues or past failures associated with the equipment.
- **Current Condition:** The current operational condition of the equipment, rated as Excellent, Good, Fair, or Poor.
- **Resource Requirements:** The resources needed for maintaining the equipment, including specific skills, tools, and parts.
- **Notes:** Any additional observations or relevant information about the equipment.

Criticality Rating Guide:

- High: Equipment whose failure would cause a stoppage in production or significant operational impact.
- Medium: Equipment whose failure would disrupt operations but not cause a complete stoppage.
- Low: Equipment whose failure would have minimal impact on operations.

Condition Assessment Guide:

- Excellent: No signs of wear or issues, operates at full efficiency.
- Good: Minor signs of wear, operates near full efficiency with no significant issues.
- Fair: Visible wear and/or occasional issues, may not operate at full efficiency.
- Poor: Significant wear and/or frequent issues, operates below acceptable efficiency.

Using This Chart

Once you've completed this chart for all critical equipment, you will have a comprehensive overview of your current maintenance needs. This information is crucial for planning your maintenance schedule, prioritizing tasks based on criticality and equipment condition, and allocating resources effectively. Remember to update this chart regularly as equipment conditions and maintenance needs change.

Maintenance Assessment Chart | Date: _____

Equipment Name/ID _____	
Equipment Name	
Location	
Role in Production	
Manufacturer's Recommended Maintenance	
Last Maintenance Date	
Maintenance Frequency	
Criticality	
Historical Issues	
Current Condition	
Resource Requirements	
Notes	

Maintenance Assessment Chart | Date: _____

Equipment Name/ID _____	
Equipment Name	
Location	
Role in Production	
Manufacturer's Recommended Maintenance	
Last Maintenance Date	
Maintenance Frequency	
Criticality	
Historical Issues	
Current Condition	
Resource Requirements	
Notes	

Maintenance Assessment Chart | Date: _____

Equipment Name/ID _____	
Equipment Name	
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Manufacturer's Recommended Maintenance	
Last Maintenance Date	
Maintenance Frequency	
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Resource Requirements	
Notes	

Maintenance Assessment Chart | Date: _____

Equipment Name/ID _____	
Equipment Name	
Location	
Role in Production	
Manufacturer's Recommended Maintenance	
Last Maintenance Date	
Maintenance Frequency	
Criticality	
Historical Issues	
Current Condition	
Resource Requirements	
Notes	

Introduction to the Planning Phase of Maintenance Scheduling

Transitioning from a thorough assessment of your maintenance needs to the planning phase is a pivotal step towards achieving operational excellence. This stage is where the insights gained from evaluating your equipment's condition, criticality, and maintenance history are transformed into a strategic, actionable maintenance plan. The Planning Phase is designed to guide you in setting clear maintenance objectives, developing effective strategies, and prioritizing maintenance tasks to ensure your equipment operates reliably and efficiently.

Creating a detailed Planning Phase Table enables you to systematically organize and outline your maintenance activities. This process not only helps in minimizing equipment downtime but also plays a crucial role in extending the lifespan of your machinery, optimizing resource allocation, and reducing maintenance-related costs.

The goal is to provide you with the tools and knowledge needed to build a maintenance plan that is both comprehensive and adaptable, capable of responding to the ever-changing demands of the food and beverage production environment. Let's dive into the process of converting your maintenance assessment insights into a robust plan that supports the long-term success and sustainability of your operations.

How to Fill Out the Worksheet

- **Objective/Strategy:** Based on the assessment, define clear maintenance objectives (e.g., minimize downtime, extend equipment life) and strategies (preventative, predictive, corrective).
- **Priority Level:** Assign a priority level (High, Medium, Low) to each objective or strategy based on criticality analysis and impact on production.
- **Equipment ID/Name:** Specify the equipment identifier or name this plan targets, as listed in your Maintenance Assessment Chart.
- **Maintenance Tasks:** List the specific maintenance tasks required for each piece of equipment to achieve the objective. Include both routine and condition-based tasks.
- **Frequency:** Determine how often each maintenance task should be performed (daily, weekly, monthly, quarterly, annually) based on manufacturer recommendations and past maintenance data.
- **Responsibility:** Assign a team member or department responsible for executing each maintenance task.
- **Required Resources:** Identify any tools, parts, or external services required to complete each maintenance task.
- **Start Date:** Specify when the maintenance schedule for each task will begin.
- **Notes:** Include any additional information, observations, or considerations relevant to the maintenance planning for each piece of equipment.

Maintenance Planning Worksheet

Objective or Strategy	Priority Level	Equipment ID/Name	Maintenance Tasks	Frequency	Responsibility	Required Resources	Start Date
Example: Extend Equipment Life	High	GBX-1234 / Summitomo Gearbox	Lubrication, Vibration Analysis	Quarterly	John Doe, Maintenance Tech	Lubricants, Vibration Analysis Tool	12/22/24

Instructions: Utilize the findings from your Maintenance Assessment Chart to fill out this Planning Phase Table. This will help you define your maintenance objectives, develop strategies, and prioritize tasks for creating an effective maintenance schedule.

Creating a Preventative Maintenance Calendar

In the rigorous landscape of food and beverage production, establishing a preventive maintenance (PM) calendar is not merely an operational necessity—it's a strategic imperative. This chapter delves into the technical facets of constructing a PM calendar, aiming to furnish Operation Maintenance personnel with a methodical framework for preempting equipment malfunctions and bolstering plant efficiency.

Through a systematic approach, we'll navigate the intricacies of scheduling inspections, servicing, and the replacement of parts, tailored to the unique demands of the food and beverage industry.

Sample Preventative Maintenance Calendar

Below is a simplified version of what such a calendar might look like. For practical use, this calendar should be adapted to the specific needs of the facility and the equipment in question, utilizing digital tools or specialized software for flexibility and real-time updates.

This example assumes a hypothetical facility with critical equipment including pumps, conveyors, and packaging machines. Maintenance tasks are scheduled based on operational hours and manufacturer recommendations. The calendar is for one month to illustrate scheduling.

Month: January			
Week 1	<u>Week 2</u>	<u>Week 3</u>	<u>Week 4</u>
<u>Gearbox & Motor Inspection</u> Check seals and bearings. Responsibility: Matt H.	<u>Conveyor Lubrication</u> Apply food-grade lubricant to moving parts. Responsibility: Karlaa G.	<u>Packaging Machine Calibration</u> Verify accuracy of fill levels. Responsibility: Matt H.	<u>Pump Vibration Analysis</u> Conduct analysis to predict potential failures Responsibility: Karlaa G.
<u>Safety System Check</u> Test emergency stops on all lines. Responsibility: Karlaa G.			<u>Conveyor Belt Inspection</u> Check for wear and alignment. Responsibility: Eduardo F.

How to Effectively Complete This Worksheet & Use The Data in Your Operation.

Step 1: Inventory and Categorization

Begin with the production asset data you gathered in Sections 1 & 2. You should have cataloged each piece of equipment with its corresponding make, model, and serial number and classified these assets based on their criticality to production continuity, susceptibility to wear and tear, and historical maintenance data. This classification serves as the backbone for prioritizing maintenance tasks.

Step 2: Establishing Maintenance Frequencies

Leverage OEM (Original Equipment Manufacturer) guidelines alongside historical performance data to determine the optimal frequency for PM tasks. Consider factors such as cycle times, and condition monitoring indicators to tailor maintenance intervals. This step often involves calculating MTBF (Mean Time Between Failures) and MTTR (Mean Time To Repair) to inform scheduling decisions.

Step 3: Developing Maintenance Protocols

For each classified group of equipment, develop detailed PM protocols. These should encompass standard operating procedures (SOPs) for inspections, lubrication schedules, calibration routines, and parts replacement guidelines. Incorporate technical specifications and safety standards to ensure comprehensive coverage of maintenance requirements.

Step 4: Scheduling and Documentation

Utilize CMMS (Computerized Maintenance Management System) software or our PM calendar below to input and schedule your PM tasks. Ensure that each task is accompanied by a detailed work order, outlining the scope of work, necessary tools and parts, safety precautions, and estimated completion time. This digital documentation facilitates real-time tracking and accountability.

Step 5: Integration with Production Schedules

Coordinate with production planning teams to integrate the PM calendar with plant operation schedules. This collaboration is critical to minimizing downtime and aligning maintenance activities with production lulls or shutdown periods, thereby mitigating the impact on production output.

Step 6: Continuous Improvement

Adopt a dynamic approach to your PM calendar, allowing for adjustments based on equipment performance feedback, technological advancements, and changes in production demands. Regularly review maintenance data analytics through your CMMS to identify trends, predict potential failures, and refine your maintenance strategies accordingly. If gearbox life is less than 2 years, then contact the manufacturer for warranty considerations.

Preventative Maintenance Calendar

Month: _____

Week 1	<u>Week 2</u>	<u>Week 3</u>	<u>Week 4</u>

Notes

Month: _____

Week 1	<u>Week 2</u>	<u>Week 3</u>	<u>Week 4</u>

Notes

Preventative Maintenance Calendar

Month: _____

Week 1	<u>Week 2</u>	<u>Week 3</u>	<u>Week 4</u>

Notes

Month: _____

Week 1	<u>Week 2</u>	<u>Week 3</u>	<u>Week 4</u>

Notes

Preventative Maintenance Calendar

Month: _____

Week 1	<u>Week 2</u>	<u>Week 3</u>	<u>Week 4</u>

Notes

Month: _____

Week 1	<u>Week 2</u>	<u>Week 3</u>	<u>Week 4</u>

Notes

Leveraging Technology for Scheduling

In the ever-evolving landscape of food and beverage production, the integration of advanced technology into maintenance scheduling processes stands as a critical determinant of operational efficiency and reliability. This chapter delves into the array of contemporary software and tools engineered to refine the creation and administration of maintenance schedules.

Emphasizing the technical nuances and industry-specific applications, we explore how these technological solutions can elevate maintenance planning, enhance team coordination, and enable dynamic adjustments to the maintenance agenda, thus assuring that production lines function at their zenith with negligible disruptions.

Mobile Maintenance Applications

Mobile technology has significantly enhanced the accessibility of maintenance information, enabling personnel to view schedules, submit work orders, and update task statuses from anywhere on the production floor. These applications foster improved communication among team members, streamline the flow of information, and expedite response times to maintenance needs, thereby enhancing overall productivity.

Integration Platforms

The seamless integration of maintenance scheduling tools with other enterprise systems, such as Enterprise Resource Planning (ERP) software and Manufacturing Execution Systems (MES), creates a cohesive operational ecosystem. This interconnectedness ensures that maintenance schedules are fully aligned with production plans, inventory levels, and quality control measures, optimizing resource utilization and minimizing the impact of maintenance activities on production continuity.

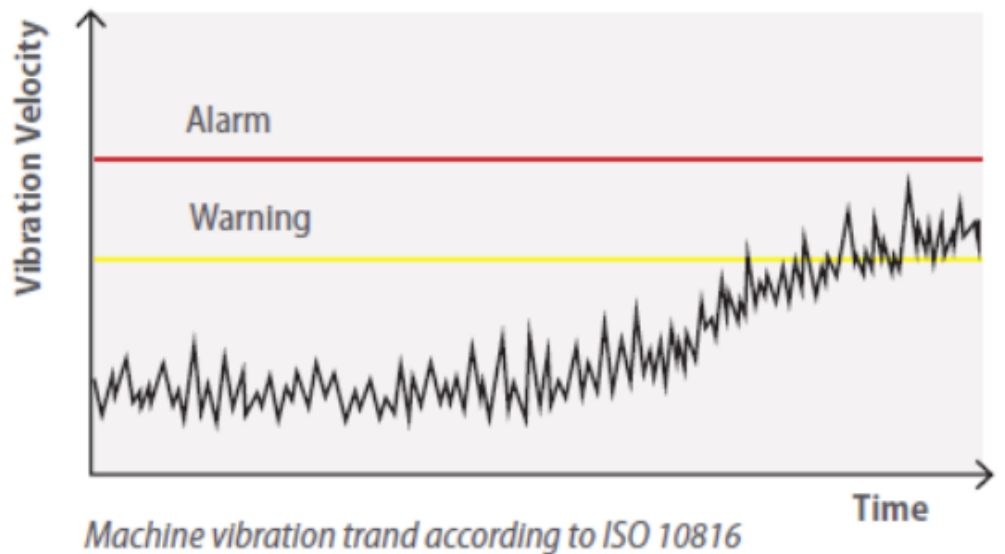
Collaborative Platforms

Collaborative platforms and software enhance the coordination of maintenance activities by providing a centralized communication hub for maintenance teams. These platforms support file sharing, real-time updates, and collaborative planning, ensuring that all team members are informed and engaged in the maintenance process.

IoT and Predictive Analytics

The advent of the Internet of Things (IoT) has ushered in a new era of predictive maintenance strategies. By outfitting machinery with IoT sensors, maintenance teams can continuously monitor equipment parameters such as temperature and vibration levels, in real-time. This influx of data, when processed through predictive analytics algorithms, facilitates the anticipation of potential equipment failures, allowing for preemptive maintenance actions that drastically reduce unplanned downtime.

A prime example of this technology in action is Sumitomo's CycloSmart™ system. By outfitting gearboxes with sensors, CycloSmart™ collects real-time data on temperature and vibration, which is then processed using advanced analytics. This system not only provides immediate insights into the gearbox's condition but also predicts potential issues before they lead to breakdowns.



In conclusion, the application of technology in maintenance scheduling is indispensable for production facilities aiming to achieve operational excellence. By embracing these technological advancements, maintenance teams can ensure their production lines are maintained with precision, efficiency, and minimal interruption, thereby safeguarding product quality and maximizing uptime in this highly competitive industry.



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Downtime In the Past?**

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How Long Does It Take You to Bounce Back from a Breakdown?

Every minute your line is down, you're losing money.

And if you don't have a fast repair plan in place, that downtime stretches out—costing more in labor, lost production, and missed targets.

Sumitomo Drive Technologies' Maintenance & Inspection Contracts are built to reduce your MTTR—so when something breaks, you recover faster and with less disruption.

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