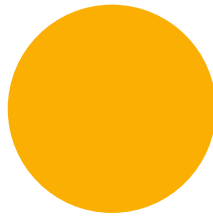


# Preventive Maintenance Optimization



Service Case Study:

PMO for USA quarries  
and cement plants



**Tiepsa.**

# A thorough overhaul of CEMEX USA's maintenance strategy.

The successful partnership between CEMEX USA and Tiepsa underscores the transformative potential of preventive maintenance optimization for the cement industry. This collaboration yielded significant improvements in reliability by updating, designing and refining maintenance plans across ten plants nationwide

CEMEX USA, a subsidiary of global building materials leader CEMEX, provides high-quality construction materials across the United States. With ten cement plants and , the company plays a vital role in the nation's construction industry.

Cement production plants face a myriad of obstacles regularly. These challenges were exacerbated by the impact of COVID-19 and macroeconomic phenomena such as “The great resignation” of 2022, which were prevailing at the onset of the project.

Addressing these challenges requires a strategic approach that integrates leveraging technology, sustainable practices, and a commitment to excellence in every aspect of the maintenance process. Some of the challenges that CEMEX was facing at the time were:

Tiepsa led the creation and update of more than **11,000 maintenance plans**

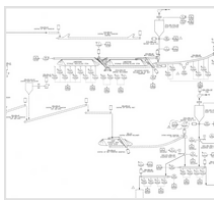
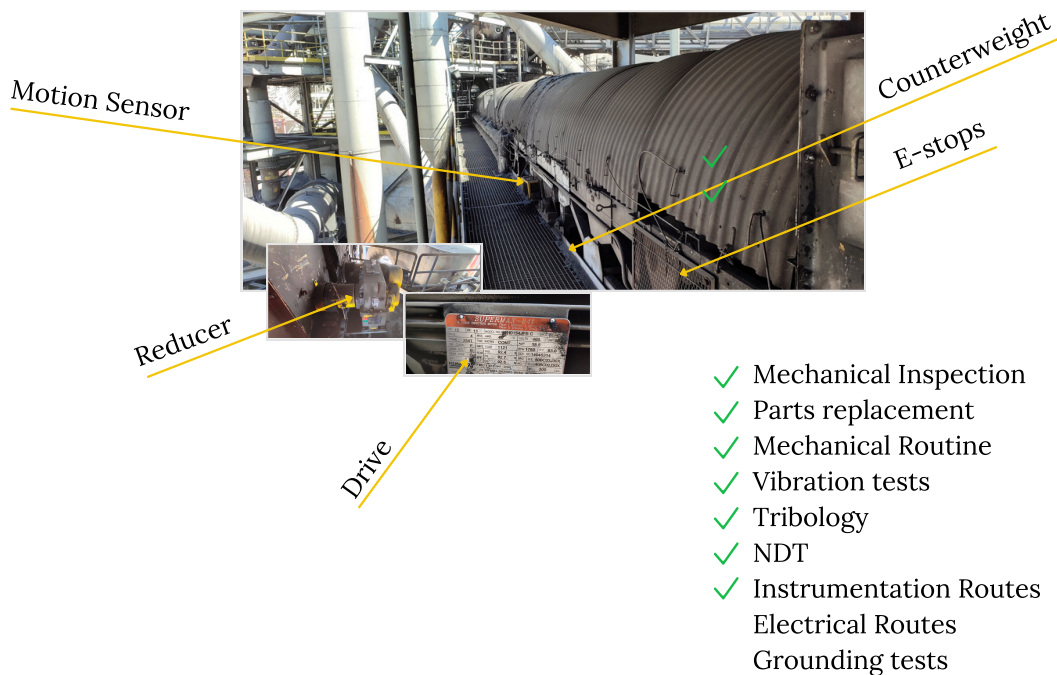
- **Limited Time for Maintenance Strategy Improvement:** Given the impact of COVID, existing maintenance teams were stretched thin and lacked the resources or dedicated time to comprehensively review and update their preventive maintenance (PM) strategies and tasks.
- **Outdated PM Strategies and Tasks:** Many of the existing PM plans had not been reviewed or updated for an extended period. This could lead to inefficiencies, missed opportunities for early problem detection, and potentially unnecessary maintenance tasks.
- **Post-COVID Personnel Rotation:** Following the COVID-19 pandemic, increased personnel turnover within the maintenance teams presented a challenge. New staff may not have had a complete understanding of the existing PM practices or the rationale behind specific tasks, potentially leading to inconsistencies in maintenance implementation.
- **Lack of Standardization in PM Practices:** Given acquisitions and mergers, there was a diversity in the scope and configuration of PMs for similar equipment. This inconsistency led to a difficulty in creating well-defined KPIs and hindered proactivity in related efforts.

# Methodology

Tiepsa's commitment to comprehensive coverage began with a meticulous assessment of 7787 individual pieces of equipment across all plants. By examining production metrics, maintenance records, and equipment history, Tiepsa identified gaps in existing PM strategies and pinpointed areas for improvement. This thorough approach ensured that no critical assets were overlooked during the optimization process.

The initial assessment provided valuable insights not only into the overall asset inventory but also into the unique characteristics of each CEMEX USA plant. A consistent methodology was designed and implemented across all ten locations. This methodology involved a field inventory, in-depth data analysis, and collaborative development of optimized PM plans.

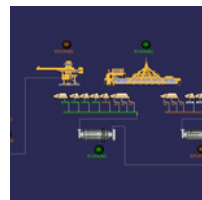
1. Centralized Database and Equipment Assessment: Establishing a centralized database, Tiepsa conducted a thorough on-site assessment of equipment. This ensured accuracy in SAP with the correct identification of components and the capture of relevant parameters for each item.



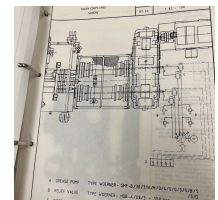
P&ID



Field Photos



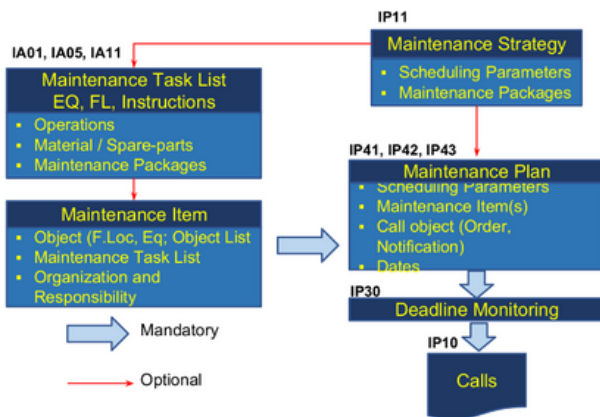
SCADA



Manuals

# Methodology

This data-driven approach enabled Tiespa to tailor PM plans, addressing diverse maintenance requirements. For standardized equipment, streamlined PMs were optimized, incorporating essential tasks based on component analysis. Where contractors or specialized maintenance were required, Tiespa ensured proper integration with the plant's overall PM strategy. Additionally, Tiespa optimized existing specialty maintenance routes, ensuring individual equipment tracking for enhanced data collection and analysis, even within the context of established routines.



**2. Data and PM Strategy Analysis:** Utilizing historical maintenance records (from SAP) and insights from the initial assessment, Tiespa analyzed existing PM strategies, tasks, and specialty routes (as applicable).

**3. PM Plan Development and Optimization:** Based on the analysis, Tiespa crafted tailored PM strategies, optimizing the frequency and scope of tasks. Existing plans were reviewed, updated, or entirely replaced as needed.

**4. Client Collaboration:** Tiespa presented proposed PM plans to CEMEX USA plant personnel for review, feedback, and approval. This collaborative process ensured alignment with plant-specific needs.

*During the project, Tiespa engaged in extensive consultations with personnel at each plant: maintenance managers, planners, reliability engineers, supervisors, and superintendents.*

*This open dialogue ensured that plant-specific needs, concerns, and experiences with the equipment were incorporated into the optimized PM strategies.*



# Project Results and Impact

Tiepsa's PMO implementation resulted in a significant expansion of preventive maintenance coverage across the CEMEX USA plants. Through the project, over 11,000 maintenance plans were updated, deleted, or newly created. This integral approach ensured that a significantly higher percentage of critical equipment received optimized, proactive maintenance.

The comprehensive PMO intervention delivered a range of operational improvements for the CEMEX USA plants. Perhaps the most immediate benefit was enhanced compliance. As Tiepsa ensured that PM tasks were closed at the appropriate intervals. This eliminated the burden of managing a backlog of outdated plans, significantly improving reporting accuracy and compliance.



Tiepsa's focus on equipment codification facilitated easier asset identification and categorization. This streamlined approach allowed for the generation of accurate and detailed maintenance logs for each piece of equipment. Route optimization ensured comprehensive coverage as well, eliminating the uncertainty of whether all critical equipment was included in routine maintenance routines.

By splitting routes as needed, and aligning their planning with work schedules, Tiepsa ensured that PM tasks were conducted at appropriate times, avoiding wasted effort or potential safety hazards that could occur if inspections were attempted on running equipment during downtimes (or vice versa).

These combined improvements - enhanced compliance, streamlined equipment identification, optimized maintenance routes, and aligned work team schedules - contributed to a more efficient and reliable operational environment across the CEMEX USA plants.

# Preventive Maintenance Optimization Stages

## 1.1

### Field Asset Inventory

We meticulously catalog and track your critical equipment, creating a centralized, comprehensive database. This detailed inventory serves as the cornerstone for effective maintenance planning, analysis, and decision-making.

## 1.2

### Customized PM Strategy Design

Our experts analyze your assets, operational goals, and historical data to develop custom-designed maintenance plans. These plans are optimized to maximize equipment lifespan, minimize unnecessary interventions, and align with your unique operational requirements.

## 2.1

### Systems Integration

We work closely with your team to ensure the smooth implementation of your optimized PM strategies. This includes integrating maintenance plans, schedules, and protocols into your existing CMMS or ERP systems for streamlined task management and tracking.

## 2.2

### BI Insights

We delve into your historical and ongoing maintenance data to identify patterns, pinpoint inefficiencies, and optimize maintenance intervals. This data-driven analysis empowers continuous improvement and refinement of your PM strategies.

## 2.3

### Data Quality Auditing

We rigorously assess the accuracy, consistency, and completeness of incoming work order data (durations, spare parts, equipment codification, cost information, etc.). This ensures that the data you rely on is reliable, aligns with your business model, and supports informed decision-making.



Contact us for a  
**free diagnostic** on  
PM strategies.

Tiepsa is able to provide actionable results thanks to our multidisciplinary team of engineers and management experts, with mature knowledge of the mining industry and maintenance management, we have proudly helped clients in the U.S., México and Perú to achieve new levels of organization, planning and compliance.

Start your journey towards proactive maintenance excellence with **a complimentary diagnostic analysis** of your current PM strategies. Our experts will assess your existing plans and data, identifying areas for improvement and potential savings.

***Tiepsa.***

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