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IS A FACILITIES PREDICTIVE
MAINTENANCE PLAN
RIGHT FOR YOU?

REPAIR NOW OR REPLACE LATER

The Payoffs of a Facilities Predictive Maintenance Plan

Because they operate as small cities, infrastructure can comprise a large percentage of an industrial sites' budget. When systems are installed, they are functioning at peak performance. Over time, however, performance naturally degrades.

As this happens, you have two choices: let performance slowly deteriorate until the system requires full replacement/restoration ... or invest smaller amounts of money over time to maintain high performance levels for as long as possible.

Pay now or pay later: You can spend pennies on the dollar today for preventive maintenance, or spend much, much more for a new system down the road.

DEVELOPING A FACILITIES PREDICTIVE MAINTENANCE PLAN

A facilities predictive maintenance plan can help industrial sites make smart infrastructure investments at the right times to get as much operating life as possible out of each system.

To develop a facilities predictive maintenance plan, the existing industrial infrastructure is assessed, and a roadmap for each system is created to:

- Pinpoint system deficiencies and shortcomings
- Calculate projected system lifecycles
- Propose improvements to lengthen system lifecycles
- Prioritize repairs and improvements





Pay Now or Pay Later

PAY NOW: MAINTAIN THE INFRASTRUCTURE

- Systems are maintained for efficiency and better operating conditions
- Downtime risk is lower
- Problems are detected and addressed early on
- System lifecycles are extended for as long as possible
- Reduce expenditure by investing over time to sustain performance

PAY LATER: NEGLECT THE INFRASTRUCTURE

- Systems aren't maintained or kept in prime operating condition
- Processes become inefficient
- Downtime risk is higher
- Problems aren't caught early (if caught at all)
- System lifecycles are shorter
- Large capital investments are necessary to replace or restore systems



INDUSTRY LETTER

A Checklist EVERY Industrial Site Should Have

The warning signs on this checklist could signal potential infrastructure problems – and what may be causing them. Use it to conduct a quick overview of your systems.

ELECTRICAL

Look for:

- Dimming or flickering
- Switches/receptacles hot to the touch
- Visible sparks
- Exposed wires
- High energy bills
- Frequent power loss

Causes:

- Heavy power draw
- Poor electrical circuit design
- System faults
- Aging/undersized systems
- Lack of redundancy
- Overloaded circuits or outlets

PLUMBING

Look for:

- Gurgling noises
- Strong odors
- Sewage backups
- Low water flow or pressure
- Pooling water
- Leaks, drips or wet areas

Causes:

- Poor plumbing design
- Inadequate floor drainage
- Pipe corrosion or damage
- Drains that aren't trapped
- Incorrect piping size
- Inadequate backflow protection

MECHANICAL

Look for:

- Moisture condensation or leaking ducts
- Inadequate airflow and poor IAQ
- Fluctuating/uneven temperatures
- High heating/cooling costs
- Humming, vibrating, or rattling

Causes:

- Dirty/clogged filters or lines
- Lack of preventive maintenance
- Leaking refrigerant
- Thermostat/building control malfunctions

STORMWATER SYSTEM

Look for:

- Backups or flooding
- Diseased landscape material
- Uneven pavement
- Exposed tree roots

Causes:

- Debris caught in storm drains or catch basins
- Concrete failure in drain systems
- Lack of erosion control
- Undersized storm drains
- Adverse slopes in storm lines

WATER MAIN SYSTEM

Look for:

- Pipe bursts
- Streams of water on property or roadway
- Water seeping out of the ground near fire hydrants
- Hissing/rumbling noises
- Pressure loss

Causes:

- Soil erosion
- Pipe corrosion
- Age of materials
- Accidents (utility workers hitting a pipe, heavy equipment opened/closed too quickly)

SANITARY SEWER SYSTEM

Look for:

- Cross contamination
- Defective manholes (misalignment, missing bricks, etc.)
- Trees planted over sewer lines
- Toilets filling and overflowing

PARKING LOTS

Look for:

- Potholes
- Cracks
- Standing puddles
- Crumbling
- Divots
- Bubbling

WALKWAYS

Look for:

- Uneven surfaces
- Failed joints
- Crackling or crumbling
- Sagging or heaving
- Reports of trips/falls
- Displaced curb ramps

EXTERIOR LIGHTING

Look for:

- Uneven lighting levels
- Dark/unlit areas

BUILDING ENVELOPE & STRUCTURE

Look for:

- Damaged columns
- Missing bolts, broken welds, bowing roof steel
- Damaged floor slab and slab joints
- Corrosion of roof steel

Causes:

- Earth movement and rain
- Tree-root infiltration
- Cracked or undersized pipes
- Misaligned and open pipe joints

Causes:

- Poor drainage
- Heavy trucks on thin pavement
- Utility cuts
- Seasonal temperature fluctuations
- Extreme weather conditions

Causes:

- Inadequate removal of snow, ice, sand, vegetation, etc.
- Poor curing
- Tree root infiltration
- Debris accumulation

Causes:

- Burned-out lamps
- Corrosion
- Flickering
- Dirty luminaires
- On-and-off cycling
- Mismatched lamps and fixtures
- Debris or water inside luminaires
- Defective lamps/ballasts

Causes:

- Impact from moving equipment
- Leaks in building envelope
- Fatigue or overloading

How Facilities Predictive Maintenance Plans Work

1. Shive-Hattery assesses infrastructure conditions and potential problems on your industrial site
2. Your team is provided with a customized capital improvement plan
3. Ideas are presented about how (and where) to make room in your budget for maintenance
4. Shive-Hattery acts as an extension of your staff, following and regularly updating the capital improvement plan





Successful Implementation of Facilities Predictive Maintenance Plan

When manufacturers rightfully focus on their primary business – producing products – it’s easy to see how necessary maintenance is sometimes overlooked.

EXAMPLE 1: STORMWATER SYSTEM

A large manufacturer was experiencing problems inside and outside its plant: manhole lids were blowing off and water was infiltrating facilities during periods of heavy rain.

Shive-Hattery conducted a full analysis of the site’s stormwater system, including hydrologic and hydraulic studies to pinpoint constriction points, system deficiencies (lack of manhole access, breaks in the piping system, etc.), and possible upgrades to prevent water infiltration.

To alleviate the stormwater system problems and prevent issues from getting worse, manholes were installed and pipes were relined. The system was returned to a better operating condition, so the manufacturing plant no longer has to worry about unplanned downtime and equipment failure due to water intrusion. The site’s facilities predictive maintenance plan now ensures that its stormwater system will be reviewed and continue to perform as expected for years to come.

EXAMPLE 2: PARKING LOTS

A manufacturing plant built in the 1940s had done little to maintain its original parking lot, which had fallen into disrepair and needed to be replaced.

After installing a new seven-acre parking lot at a significant cost, a facilities predictive maintenance plan was created for the new parking lot – along with several other existing lots – to maximize the lot life with less financial pain. The onsite pavement was assessed, necessary maintenance tasks were

identified, and a plan was developed to gain as many useful years as possible out of each parking lot.

EXAMPLE 3: ROOFS AND BUILDING ENVELOPES

A 1980s plant had neglected its roofing system. Years of deterioration and water infiltration caused irreversible damage to the structural deck and supporting steel framing.

After repairing the structural steel and replacing portions of the structural roof deck, existing roof systems were assessed. Based the findings, maintenance tasks were identified and prioritized, a plan was developed to extend the life of existing roofing systems, and a new EPDM roof was installed over a portion of the plant where deterioration had caused too much damage.

With an ongoing predictive roof maintenance program in place, the plant will not experience structural system risk and keep production rolling.

EXAMPLE 4: ELECTRICAL SYSTEMS

In one plant, the electrical system supporting the paint line lacked redundancy and had many aging components. Due to other priorities, the problems were never addressed. As a result, the electrical system failed and halted production for a long period of time. After this event, the manufacturer remedied the system’s shortcomings, and a plan was put in place to keep up on necessary maintenance and upgrades so it wouldn’t happen again.

KEY TAKEAWAY

Developing and implementing a facilities predictive maintenance plan will help leverage your facilities investment and budget. With a plan in place, you stay focused on your primary business.

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