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Introduction

Objective
The Industrial Maintenance study was conducted by Plant Engineering to evaluate the maintenance practices and strategies currently in place in manufacturing facilities and the effects of maintenance on productivity and profitability.

Sample
The sample for this study was selected from qualified subscribers of Plant Engineering with valid email addresses. Only respondents responsible for maintenance for all or part of their facilities were asked topic-related questions.

Methodology
Subscribers were sent an email from Plant Engineering asking them to participate in this study. The email included a URL linked to the questionnaire.

- Data collected: Jan. 22, 2021, through Feb. 8, 2021
- Number of respondents: 203
- Margin of error: +/-6.9% at a 95% confidence level
- Incentive: Drawing for one $100 Amazon.com eGift Card
Industrial Maintenance

Summary of Findings

- Eighty-eight percent of industrial facilities follow a preventive maintenance strategy; 52% have a computerized maintenance management system (CMMS) and 51% use a run-to-failure method.

- Forty-six percent of facilities allocate up to 10% of their annual operating costs to maintenance processes; 41% devote more than 10% of this budget to maintenance. The average facility spends 33 hours each week on scheduled maintenance, up from 20 hours over 2020 data.

- Production equipment, rotating equipment (motors, power transmission, etc.) and fluid power systems (air, hydraulic, etc.) are the three areas where facilities dedicate the most maintenance support, followed by material handling equipment and internal electrical distribution systems.

- Eighty-eight percent of facilities outsource some or all maintenance operations; the average facility outsources 23% of their maintenance operations. Leading causes for outsourcing are an existing agreement with a manufacturer or supplier, lack of skills among current staff and lack of time/manpower to dedicate to maintenance.

- Maintenance teams are mostly trained on basic mechanical and electrical/electronic skills, as well as safety. Other types of training include motors, gearboxes, bearings and lubrication.

- The most common technologies facilities use to monitor and/or manage maintenance are CMMS, in-house created spreadsheets/schedules and automated maintenance schedules.

- The leading cause of unscheduled downtime within industrial facilities remains aging equipment, followed by mechanical failure, operator error and lack of proper training. More than half of facilities are planning to upgrade their equipment in order to decrease unscheduled downtime.

- The top challenge for improving maintenance at industrial facilities is aging equipment. Other obstacles include a lack of understanding of new options and technologies, lack of resources or staff and outdated technology.

- Forty-eight percent of facilities allow the use of connected devices when monitoring production equipment for machine data capture, analysis and improvements across maintenance, engineers and/or OT/IT.

- The Industrial Internet of Things and related technology has helped facilities to better understand machine health, improve reliability, and better predict and prevent equipment breakdowns.
Industrial Maintenance

Respondent Background
Which of the following best describes your job title?

- **General Management** 20%
- **Engineering, Maintenance & Supervisory** 79%
- Purchasing, Purchasing Management, Other Title 1%

**Engineering, Maintenance & Supervisory** includes the following job titles: Engineer, Manager, Superintendent, Foreman, Other Plant Engineering/Maintenance title

**General Management** includes the following job titles: President, VP, Secretary, Treasurer, GM, Owner, Partner, Other General Management title
Industrial Maintenance

Industry Experience

For approximately how long have you worked in the manufacturing industry?

- Fewer than 5 years: 7%
- 5 to 9 years: 10%
- 10 to 19 years: 25%
- 20 to 29 years: 26%
- 30 to 39 years: 21%
- 40 years or longer: 11%

32% of survey respondents have worked in the manufacturing industry for 30 years or longer. The average respondent has worked in the industry for 23 years.
Industrial Maintenance

Facility Size by Number of Employees

How many people work at your location?

- **1,000 or more**: 20%
- **100 to 249**: 21%
- **50 to 99**: 12%
- **250 to 499**: 8%
- **500 to 999**: 8%
- **20 to 49**: 13%
- **Fewer than 20**: 18%

36% of industrial facilities employ 250 people or more; the average number of employees is 384.

On average, 21% of a plant’s operations team is part of its maintenance department.
Industrial Maintenance

Primary Business Served

What is the primary business at your location?

- Fabricated Metal Mfg: 10%
- Utilities: Electric, Gas, Tele, Water: 8%
- Food, Beverage, Tobacco Mfg: 7%
- Miscellaneous or Other Mfg: 6%
- Plastics & Rubber Mfg: 6%
- Automotive and Other Transportation Equipment Mfg: 5%
- Government or Military: 5%
- Plant/Facility/Eng or Maint Service: 5%
- Wood, Paper Mfg and Related Printing Activities: 4%
- Instrumentation, Control Systems, Test, Measure: 4%
- Machinery Mfg: 4%
- Oil, Gas and Petroleum, including Refining: 4%
- Computers, Communication, Consumer Elec: 3%
- Pharmaceutical Mfg: 3%
- Chemical Mfg: 3%
- Primary Metal Mfg: 3%
- Aircraft, Aerospace or Defense Mfg: 2%
- System Integration, Consulting, Business, Tech: 2%
- Distribution Centers, Warehousing: 2%
- Electrical Equipment, Appliance and Component Mfg: 2%
- Hospitals, Healthcare Facilities: 1%
- Textiles, Apparel and Leather Products Mfg: 1%
- Information, Data, Software: 1%
- Other: 4%
Industrial Maintenance

Industrial Maintenance
Industrial Maintenance

Maintenance Strategies & Tools in Use

Which of the following maintenance strategies and tools are present within your plant? Check all that apply.

- Preventive maintenance program: 88%
- Computerized maintenance management system (CMMS): 52%
- Reactive maintenance (run-to-failure): 51%
- Predictive maintenance (PdM) using analytical tools: 40%
- Reliability-centered maintenance (RCM) using operational data analysis: 24%
- Other: 5%

88% of plants have a preventive maintenance program in place.

Half of plants have implemented three or more maintenance strategies and tools to protect operations, personnel and production.

- Autonomous maintenance
- Building RCM as part of maintenance strategy
- Condition-based maintenance
- E-Maint system
- ISO 55001 standards documented
- Maximo, SAP
- Monitoring online parameter condition equipment rotating and static
- Safety maintenance system
- TPM
Advantages to the Top 3 Maintenance Strategies & Tools

What are the advantages to the maintenance strategies and tools in place at your plant? Check all that apply.

- Preventive maintenance
- Computerized maintenance management system
- Reactive maintenance

<table>
<thead>
<tr>
<th>What are the advantages to the maintenance strategies and tools in place at your plant? Check all that apply.</th>
<th>Preventive maintenance</th>
<th>Computerized maintenance management system</th>
<th>Reactive maintenance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cost effective overall</td>
<td>66%</td>
<td>75%</td>
<td>6%</td>
</tr>
<tr>
<td>Decreases downtime</td>
<td>83%</td>
<td>11%</td>
<td>6%</td>
</tr>
<tr>
<td>Ease of use</td>
<td>59%</td>
<td>48%</td>
<td>23%</td>
</tr>
<tr>
<td>Energy savings</td>
<td>61%</td>
<td>38%</td>
<td>15%</td>
</tr>
<tr>
<td>Fewer maintenance staff involved</td>
<td>57%</td>
<td>39%</td>
<td>19%</td>
</tr>
<tr>
<td>Flexibility</td>
<td>40%</td>
<td>47%</td>
<td>16%</td>
</tr>
<tr>
<td>Improved productivity</td>
<td>63%</td>
<td>60%</td>
<td>6%</td>
</tr>
<tr>
<td>Improved safety</td>
<td>70%</td>
<td>57%</td>
<td>20%</td>
</tr>
<tr>
<td>Increased component safety</td>
<td>59%</td>
<td>40%</td>
<td>33%</td>
</tr>
<tr>
<td>Low initial cost</td>
<td>11%</td>
<td>40%</td>
<td>13%</td>
</tr>
<tr>
<td>Minimize overhaul frequency</td>
<td>17%</td>
<td>63%</td>
<td>10%</td>
</tr>
<tr>
<td>Overall efficiency</td>
<td>6%</td>
<td>6%</td>
<td>95%</td>
</tr>
<tr>
<td>Reduced probability of failure</td>
<td>10%</td>
<td>13%</td>
<td>6%</td>
</tr>
<tr>
<td>Remote monitoring</td>
<td>6%</td>
<td>10%</td>
<td>93%</td>
</tr>
</tbody>
</table>
What percentage of your plant’s annual operating budget is spent on maintenance?

- Less than 5%: 17%
- 5% to 10%: 29%
- 11% to 15%: 24%
- More than 15%: 17%
- Don’t know: 13%

**Average**: 10.1%

41% of plants allocate more than 10% of their annual operating budget to maintenance tasks, services and equipment.
Industrial Maintenance

Hours Spent on Scheduled Maintenance per Week

Approximately how many hours per week does your plant spend performing maintenance-related tasks?

- Fewer than 10: 11%
- 10 to 19: 20%
- 20 to 29: 12%
- 30 to 39: 9%
- 40 or more: 44%
- Don't know: 4%

31% of plants spend fewer than 20 hours per week performing maintenance-related tasks; the average among those surveyed is 33 hours per week.
How often are the following areas of your plant shutdown for scheduled maintenance?

- **Conveyor and production line systems (automated):**
  - Daily: 9%
  - Weekly: 22%
  - Monthly: 22%
  - Every other month: 7%
  - Quarterly: 17%
  - Twice a year: 10%
  - Yearly: 10%
  - Other: 4%

- **Specialized production machinery (automated):**
  - Daily: 8%
  - Weekly: 19%
  - Monthly: 32%
  - Every other month: 5%
  - Quarterly: 9%
  - Twice a year: 12%
  - Yearly: 12%
  - Other: 3%

- **Standard machinery used in production (automated):**
  - Daily: 9%
  - Weekly: 16%
  - Monthly: 31%
  - Every other month: 9%
  - Quarterly: 9%
  - Twice a year: 11%
  - Yearly: 12%
  - Other: 3%

- **Less automated (manual) systems:**
  - Daily: 8%
  - Weekly: 15%
  - Monthly: 23%
  - Every other month: 7%
  - Quarterly: 15%
  - Twice a year: 14%
  - Yearly: 14%
  - Other: 5%

- **Materials handling equipment:**
  - Daily: 7%
  - Weekly: 16%
  - Monthly: 29%
  - Every other month: 7%
  - Quarterly: 16%
  - Twice a year: 8%
  - Yearly: 13%
  - Other: 4%

- **Packaging systems:**
  - Daily: 8%
  - Weekly: 17%
  - Monthly: 27%
  - Every other month: 7%
  - Quarterly: 15%
  - Twice a year: 9%
  - Yearly: 16%
  - Other: 4%

- **Robotics:**
  - Daily: 10%
  - Weekly: 21%
  - Monthly: 14%
  - Every other month: 6%
  - Quarterly: 7%
  - Twice a year: 19%
  - Yearly: 19%
  - Other: 4%
# Industrial Maintenance

## Maintenance Support

**How much maintenance support do the following areas of your facility receive?**

<table>
<thead>
<tr>
<th>Area</th>
<th>A great deal</th>
<th>Sufficient</th>
<th>Some (little)</th>
<th>None at all (or N/A)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fluid power systems (air, hydraulic, etc.)</td>
<td>17%</td>
<td>52%</td>
<td>26%</td>
<td>5%</td>
</tr>
<tr>
<td>Internal electrical distribution systems</td>
<td>17%</td>
<td>46%</td>
<td>33%</td>
<td>4%</td>
</tr>
<tr>
<td>Material handling equipment</td>
<td>19%</td>
<td>47%</td>
<td>23%</td>
<td>11%</td>
</tr>
<tr>
<td>Production equipment</td>
<td>34%</td>
<td>51%</td>
<td>12%</td>
<td>3%</td>
</tr>
<tr>
<td>Rotating equipment (motors, power transmission, etc.)</td>
<td>25%</td>
<td>47%</td>
<td>25%</td>
<td>3%</td>
</tr>
</tbody>
</table>
Outsourcing Maintenance Operations

Which factors led to the outsourcing of maintenance operations at your plant? Check all that apply.

- Agreement with manufacturer/supplier: 44%
- Lack of skills among current staff: 40%
- Lack of time, manpower to dedicate to maintenance: 39%
- Lack of necessary equipment available: 36%
- Too many specialized skills required: 32%
- Skilled individuals hard to find: 31%
- Desire to lower overall costs: 29%
- Insufficient budget to hire/retain skilled individuals: 24%
- Union considerations: 9%
- Other: 4%
- Don't know: 1%

88% of plants outsource some or all of their maintenance operation.

Top reasons for outsourcing include having an agreement in place with a manufacturer/supplier (44%), a lack of skills among staff (40%) and a lack of time or manpower to dedicate to maintenance (39%).

- Company policies
- Not routine maintenance activity
- Remote site
- Safety certifications
- Software monopolies
What kind of training does your maintenance personnel receive? Check all that apply.

- Food safety
- Hands on
- Kaizen techniques
- Machinery alignment, vibration analysis, infrared thermography
- Office software
- On the job? Not much. Off the clock constant keeping up through journals, blogs, forums, and books.
- Regulatory
- Robotics
Monitoring & Managing Maintenance

What technologies are used to monitor or manage maintenance within your plant? Check all that apply.

<table>
<thead>
<tr>
<th>Technology</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Computerized maintenance management system (CMMS)</td>
<td>54%</td>
</tr>
<tr>
<td>In-house created spreadsheets/schedules</td>
<td>49%</td>
</tr>
<tr>
<td>Automated maintenance schedule</td>
<td>44%</td>
</tr>
<tr>
<td>Clipboards/paper records of maintenance rounds</td>
<td>38%</td>
</tr>
<tr>
<td>General computerized calendar</td>
<td>28%</td>
</tr>
<tr>
<td>Enterprise asset management (EAM)</td>
<td>16%</td>
</tr>
<tr>
<td>Industrial Internet of Things (IIoT)/SAS/Cloud computing</td>
<td>8%</td>
</tr>
<tr>
<td>Other</td>
<td>3%</td>
</tr>
<tr>
<td>None</td>
<td>2%</td>
</tr>
<tr>
<td>Don't know</td>
<td>2%</td>
</tr>
</tbody>
</table>

54% of plants use a computerized maintenance management system to oversee maintenance tasks. Other systems in use include in-house created spreadsheets and schedules (49%) and automated maintenance schedules generated by a manufacturing scheduling system (44%).

- Access database
- Emergency situation
- METS, Primavera
- Manual inspections
Leading Cause of Unscheduled Downtime

What is the leading cause of unscheduled downtime in your plant?

- Aging equipment: 42%
- Mechanical failure: 21%
- Operator error: 11%
- Lack of proper training: 7%
- Lack of maintenance: 6%
- Shortage of skilled technicians: 5%
- Poor inventory management of parts storeroom: 3%
- Poor equipment design/engineering: 3%
- Other: 1%
- Don’t know: 1%

42% of respondents fault aging equipment as the leading cause of unscheduled downtime in their plant, up from 34% over 2020 data.
How do you plan to decrease unscheduled downtime in your plant? Check all that apply.

- **Upgrade equipment** 56%
- **Improve training, increase frequency** 47%
- **Evolve to a predictive maintenance strategy** 45%
- **Expand monitoring capabilities** 38%
- **Increase scheduled downtime** 19%
- **Implement automated analytics/machine learning** 18%
- **Hire additional maintenance technicians** 10%
- **Outsource maintenance services** 8%
- **Other** 1%
- **Don’t know** 1%
- **None** 2%

56% of plants plan to upgrade their equipment in order to combat unscheduled downtime. Other actions include improving training and increasing training frequency (47%) and evolving to a predictive maintenance strategy (45%).
Where do you go to get the information needed for proper maintenance management? Check all that apply.

- Manufacturers/suppliers/vendors: 77%
- Training classes: 46%
- Trade publications, websites, enewsletters: 44%
- Leaders, colleagues, peers: 34%
- Resources (e.g., white papers, case studies): 34%
- Blogs, websites: 29%
- Webcasts, webinars: 23%
- Videos (e.g., YouTube): 21%
- Trade shows: 18%
- Social media (e.g., LinkedIn, Facebook, Twitter): 6%
- Podcasts: 4%
- Other: 1%
- Not applicable: 3%

77% of respondents rely on manufacturers, suppliers and vendors to provide the information necessary for proper maintenance management. Other sources include training classes (46%) and trade publications (44%).
Industrial Maintenance

Attitude Towards Maintenance

Which of the following statements best describes your attitude toward maintenance?

- It’s a profit center in delivering actionable insights, measurable results, and ROI to our plant. 32%
- It’s a cost center that will become profitable through the use of predictive technologies. 22%
- It’s a cost center, but provides value through improved uptime. 46%

32% of respondents view maintenance as a profit center, one that delivers actionable insights, measurable results and return on investment (ROI) to their plant.
What are the key challenges for improving maintenance at your facility? Check all that apply.

- Aging equipment: 67%
- Lack of understanding of new options/technologies: 37%
- Lack of resources or staff: 34%
- Outdated technology: 34%
- Lack of budget: 29%
- Lack of training: 28%
- Lack of support from management: 26%
- Employee buy-in: 23%
- Poor scheduling, rarely followed through: 20%
- Other: 2%
- Not applicable: 1%

The top challenges to improving facility maintenance are aging equipment (67%), a lack of understanding of new options and technologies (37%), a lack of resources or staff (34%) and outdated technology (34%).

- Availability of skilled trades people
- Culture
- Lack of downtime
- Material handling
To what extent is your plant using connected devices for remote monitoring of production equipment?

- **51%** of plants use handheld and/or mobile devices for remote monitoring of production equipment.
- **48%** We use them for some machine data capture, analysis and improvements across maintenance, engineers and/or OT/IT.
- **30%** We do not use them now but are looking into and may consider their future use.
- **14%** The devices are fully integrated into a plant-wide IIoT system.
- **5%** Don’t know
- **3%** We do not use them and have no plans to use them in the future.
Impact of IIoT on Maintenance Operations

How is IIoT-related technology impacting plant maintenance operations? Check all that apply.

- It helps us better understand machine health and improve reliability: 32%
- It helps better predict and prevent equipment breakdowns: 31%
- It improves productivity and on-time deliveries: 26%
- It is having no impact: 24%
- It changes the skills maintenance technicians need to have to use new technology: 19%
- It controls maintenance spend and lowers labor costs: 19%
- It improves profitability: 18%
- Don't know: 20%

32% of respondents shared that IIoT-related technology has helped them to better understand machine health and improve reliability; 31% said it helps better predict and prevent equipment breakdowns.
Improving Maintenance Processes

The following information is proprietary to Advanced Technology Services, Inc. (ATS), sponsor of the 2021 Industrial Maintenance Report.
Summary of Findings

• Productivity is most often affected by aging equipment, machines breaking or downtime at respondents’ plants, followed by finding and recruiting technically skilled workers and addressing the retiring workforce and skills gap.

• Hiring and training people, as well as overall plant culture, is the top challenge in managing maintenance programs, according to respondents.

• Ninety-three percent of companies/plants need to improve maintenance processes and ownership.

• When adding sensors to production equipment to monitor machine health, two-thirds of respondents would expect enabled predictive maintenance/insights/analytics.

• Thirty-six percent of companies plan to collect, analyze and act on machine data over the next 1 to 3 years through a combination of outsourcing to a technology provider and in-house employees.

• Seventy-two percent of plants have plans to implement new or increased technologies.

• When asked about their familiarity of 11 technology providers, survey respondents most recognize SKF, Machine Sense and Amazon Industrial AI Services.

• Bonus: Fifty-six percent of survey respondents are familiar with Advanced Technology Services (ATS) as an industrial maintenance and MRO service provider; 6% are current customers, 13% former customers and 37% are aware of ATS but never used.
The largest contributor to decreased plant productivity is **aging equipment, machines failure and/or downtime**, according to survey respondents.

Other challenges include finding and recruiting a technically skilled workforce (49%), the retiring workforce/skills gap (36%) and integrating technology into legacy equipment (35%).

- Operations centric culture
- Parts and scheduling
- Tribal knowledge loss
Industrial Maintenance

Challenging Aspects of Plant Maintenance Programs

People
(hiring, training, culture)

Very challenging 46%
Somewhat challenging 27%
Least challenging 27%

Process
(planning/scheduling, reporting, continuous improvement)

Very challenging 29%
Somewhat challenging 41%
Least challenging 30%

Technology
(buy-in, implementation, data analytics)

Very challenging 25%
Somewhat challenging 32%
Least challenging 43%
### Maintenance Processes That Require Improvement

**Is there a need at your company and/or plant to improve maintenance processes and ownership?**

If needs improvement, what specifically? Check up to three (3) options below.

<table>
<thead>
<tr>
<th>Area</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accountability</td>
<td>32%</td>
</tr>
<tr>
<td>Lack of skilled personnel</td>
<td>32%</td>
</tr>
<tr>
<td>Data analytics, decision-making</td>
<td>28%</td>
</tr>
<tr>
<td>Maintenance strategies/long-term growth</td>
<td>28%</td>
</tr>
<tr>
<td>Communications</td>
<td>25%</td>
</tr>
<tr>
<td>Training</td>
<td>24%</td>
</tr>
<tr>
<td>Downtime</td>
<td>21%</td>
</tr>
<tr>
<td>Employee/management buy-in</td>
<td>18%</td>
</tr>
<tr>
<td>Management of work backlog</td>
<td>16%</td>
</tr>
<tr>
<td>Procedure documentation</td>
<td>16%</td>
</tr>
<tr>
<td>No improvement needed, good as is</td>
<td>7%</td>
</tr>
</tbody>
</table>

93% of respondents report a need at their company and/or plant to improve maintenance processes and ownership.

The top areas in need of improvement are **accountability** (32%), **lack of skilled personnel** (32%), **data analytics and decision-making** (28%) and **maintenance strategies/long-term growth** (28%).
What benefits would you expect as a result of adding sensors to your production equipment to monitor machine health? Check all that apply.

- Enable predictive maintenance/insights/analytics: 66%
- Improve equipment effectiveness: 58%
- Utilize data over instinct to improve uptime and meet production goals: 53%
- Enable us to digitally transform our maintenance program: 34%
- Provide strong data governance: 27%
- No benefits expected: 8%

66% of respondents would expect predictive maintenance/insights/analytics to be enabled as a result of adding sensors to their production equipment to monitor machine health; 58% also expect improved equipment effectiveness.
Industrial Maintenance

Collecting, Analyzing & Acting on Machine Data

Which of the following best describes how your operations plans to collect, analyze and act on machine data in the next 1 to 3 years?

- Fully outsource to a technology provider: 5%
- Through a combination of outsourcing to a technology provider and in-house employees: 36%
- With an in-house team of employees: 36%
- We do not have any plans: 23%
- Other: 5%

Over the next couple of years, 36% of respondents' companies plan to collect, analyze and act on machine data through a **combination of outsourcing** to a technology provider **and a team of in-house** employees; another 36% will keep these tasks in-house entirely.
Does your plant have plans to implement new or increased technologies? Check up to three (3) options below.

<table>
<thead>
<tr>
<th>Technology</th>
<th>Plan</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Predictive maintenance/analytics</td>
<td></td>
<td>38%</td>
</tr>
<tr>
<td>Sensors/remote monitoring</td>
<td></td>
<td>36%</td>
</tr>
<tr>
<td>CMMS</td>
<td></td>
<td>25%</td>
</tr>
<tr>
<td>Machine learning</td>
<td></td>
<td>18%</td>
</tr>
<tr>
<td>Robotics</td>
<td></td>
<td>18%</td>
</tr>
<tr>
<td>Artificial intelligence</td>
<td></td>
<td>11%</td>
</tr>
<tr>
<td>Digital/smart factory</td>
<td></td>
<td>9%</td>
</tr>
<tr>
<td>Augmented reality</td>
<td></td>
<td>5%</td>
</tr>
<tr>
<td>Digital twin</td>
<td></td>
<td>2%</td>
</tr>
<tr>
<td>Other</td>
<td></td>
<td>1%</td>
</tr>
<tr>
<td>No plans this year</td>
<td></td>
<td>28%</td>
</tr>
</tbody>
</table>

72% of plants have plans to implement new or increased technologies in the near future. The top systems being implemented include predictive maintenance/analytics (38%), sensors/remote monitoring (36%) and CMMS (25%).
To what extent are you familiar with the following technology providers?

- **Amazon Industrial AI Services (AWS Thor)**
  - Currently use: 2% (blue)
  - Formerly used: 32% (yellow)
  - Aware of but never used: 63% (grey)
  - Not familiar: 10% (red)

- **Augry**
  - Currently use: 4% (blue)
  - Formerly used: 15% (yellow)
  - Aware of but never used: 79% (grey)
  - Not familiar: 2% (red)

- **Machine Sense**
  - Currently use: 4% (blue)
  - Formerly used: 7% (yellow)
  - Aware of but never used: 31% (grey)
  - Not familiar: 58% (red)

- **Maverick Technologies**
  - Currently use: 5% (blue)
  - Formerly used: 27% (yellow)
  - Aware of but never used: 67% (grey)
  - Not familiar: 6% (red)

- **Nikola Labs**
  - Currently use: 5% (blue)
  - Formerly used: 25% (yellow)
  - Aware of but never used: 67% (grey)
  - Not familiar: 6% (red)

- **Opto 22**
  - Currently use: 5% (blue)
  - Formerly used: 8% (yellow)
  - Aware of but never used: 21% (grey)
  - Not familiar: 66% (red)

- **Petasense**
  - Currently use: 18% (blue)
  - Formerly used: 21% (yellow)
  - Aware of but never used: 79% (grey)
  - Not familiar: 2% (red)

- **PTC**
  - Currently use: 4% (blue)
  - Formerly used: 6% (yellow)
  - Aware of but never used: 22% (grey)
  - Not familiar: 68% (red)

- **Rapid Miner**
  - Currently use: 18% (blue)
  - Formerly used: 18% (yellow)
  - Aware of but never used: 78% (grey)
  - Not familiar: 4% (red)

- **SKF**
  - Currently use: 22% (blue)
  - Formerly used: 11% (yellow)
  - Aware of but never used: 27% (grey)
  - Not familiar: 40% (red)

- **Trend Miner**
  - Currently use: 4% (blue)
  - Formerly used: 22% (yellow)
  - Aware of but never used: 73% (grey)
  - Not familiar: 2% (red)
To what extent are you familiar with [Advanced Technology Services (ATS) as an] industrial maintenance and MRO service provider?

- Currently use: 6%
- Formerly used: 13%
- Aware of but never used: 37%
- Not familiar: 44%
For this section of the report, survey respondents were asked to indicate their familiarity with 12 industrial maintenance and MRO service providers.
# Industrial Maintenance

## Industrial Maintenance & MRO Service Providers

To what extent are you familiar with the following industrial maintenance and MRO service providers?

<table>
<thead>
<tr>
<th>Service Provider</th>
<th>Currently use</th>
<th>Formerly used</th>
<th>Aware of but never used</th>
<th>Not familiar</th>
</tr>
</thead>
<tbody>
<tr>
<td>Advanced Technology Services (ATS)</td>
<td>6%</td>
<td>13%</td>
<td>37%</td>
<td>44%</td>
</tr>
<tr>
<td>Amentum</td>
<td>4%</td>
<td>13%</td>
<td>81%</td>
<td></td>
</tr>
<tr>
<td>Cushman &amp; Wakefield</td>
<td>7%</td>
<td>30%</td>
<td>61%</td>
<td></td>
</tr>
<tr>
<td>Fluor</td>
<td>4%</td>
<td>9%</td>
<td>24%</td>
<td>63%</td>
</tr>
<tr>
<td>Jacobs Engineering</td>
<td>6%</td>
<td>9%</td>
<td>30%</td>
<td>55%</td>
</tr>
<tr>
<td>K+S</td>
<td>6%</td>
<td>19%</td>
<td>73%</td>
<td></td>
</tr>
<tr>
<td>Leadec</td>
<td>6%</td>
<td>20%</td>
<td>75%</td>
<td></td>
</tr>
<tr>
<td>Manufacturing Maintenance Solutions (MMS)</td>
<td>10%</td>
<td>7%</td>
<td>36%</td>
<td>47%</td>
</tr>
<tr>
<td>Motion Industries</td>
<td>27%</td>
<td>12%</td>
<td>26%</td>
<td>35%</td>
</tr>
<tr>
<td>Quant</td>
<td>4%</td>
<td>27%</td>
<td>67%</td>
<td></td>
</tr>
<tr>
<td>SDI</td>
<td>6%</td>
<td>28%</td>
<td>63%</td>
<td></td>
</tr>
<tr>
<td>Synovos</td>
<td>4%</td>
<td>25%</td>
<td>68%</td>
<td></td>
</tr>
</tbody>
</table>

**Note:** The percentages represent the proportion of respondents familiar with each service provider, with categories ranging from currently use, formerly used, aware of but never used, to not familiar.