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Industry news

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Serdar Uckun, Chief Technology Officer

## What is Predictive Maintenance for Process Industries?

Unplanned downtime is one of the costliest challenges in process industries. A single occurrence of equipment failure can bring a plant to a standstill for hours, wasting valuable production time that cannot be recouped, and possibly resulting in loss of raw materials and / or causing health or safety hazards to personnel. The impacts to the bottom line are immediate and immense.

The intelligent way to stay ahead of forced shutdowns is predictive maintenance prognostics. These tools leverage machine learning and IoT (Internet of Things) sensors. Their powerful analytics can provide advance warning of maintenance requirements and calculate remaining useful life. Predictive maintenance prognostics afford plants a critical efficiency edge – the ability to proactively schedule repairs and replacements rather than react to them.

### Value of improved OEE and Predictive Maintenance Prognostics

*"Everyone has unplanned downtime – the question is how severe. Would you rather have one planned shutdown or four unscheduled ones?" – Bharat Vats*

All processing plants face the same issue – unexpected stop time. It's rare to find a site that has [an overall equipment effectiveness (OEE) above 60%] (<https://www.oee.com/world-class-oee/>). Mechanical malfunctions can take hours to detect and repair, resulting in availability loss. Because a third of the OEE score is based on [availability] (<https://www.oee.com/world-class-oee/>), lost production is not only a revenue leak but significantly compromises OEE. Active maintenance and scheduled upgrades are key to improving the OEE score as well as KPIs such as reduction of false alerts, higher accuracy of Remaining Useful Life (RUL), and others. Predictive maintenance prognostics will monitor assets for repair notices as well as compute when replacement is necessary. These valuable insights are pulled from data sets such as production capacity, ramp-up rate, usage, current and last year's operating expenses (OPEX), repair expenses, and failure frequency and duration. Combined with individual machine models, predictive maintenance prognostics can flag which assets will require attention and when.

*"If you can't plan for downtime, you can't produce and you can't save" – Bharat Vats*

While many plants have a wealth of equipment performance data, a robust tool to interpret this stream of information has not been readily available until now. The world of IoT has finally advanced to offer more accurate predictive maintenance prognostics for process industries. Novity's TruPrognostics™ solution is a confluence of IoT sensors, physics-based models, and a platform that forecasts when upkeep, repair, or replacement is warranted.

### 3 Applications for Predictive Maintenance

*"Why deal with a recurring fault with no resolution? Finding the root cause is a better use of resources" – Bharat Vats*

Any process industry is ripe with opportunities to employ predictive maintenance prognostics. There is an abundance of critical assets that can benefit from continuous monitoring and forecasting. These tend to create the greatest bottlenecks on the production line when they are out of commission. Here are three examples of common assets used in process industries that stand to benefit from a predictive maintenance practice.

- 1. Motors** – Three-phase induction motors are widely used with conveyor belt drives. However, detecting and classifying motor faults is a major blind spot, especially if there are multiple configurations and operating speeds. Faults can take disparate forms such as insulator breakdown, shaft misalignment, bearing defects, or load imbalance. At one site, Novity was able to detect and diagnose these issues with a greater than 94% accuracy.
- 2. Heat Exchangers** – These devices are prone to fouling when they become coated with material deposits or fine particles: mineral scale, sludge, insoluble salts, suspended solids, and biological growth. Even a fine layer compromises energy efficiency as well as product quality; corrosion also lessens the heat exchanger's lifespan. Routine cleaning is necessary but also comes at the expense of downtime and labor. For example, at a Xerox production facility, heat exchanger

maintenance required half a day of preparation, 30 minutes of cleaning, and a 6-person team. Cleaning was scheduled once a month based on batch volume alone, totaling 12 half days of downtime. After implementing Novity, the algorithm reduced cleaning frequency by 90% with no loss in product quality. The elimination of 6 full days of downtime directly improved the plant's OEE.

3. **Nozzles** – Nozzles often spray abrasive substances, which cause metal degradation over time. Proper calibration of these instruments is critical to consistent material flow. However, many processing facilities either prematurely replace nozzles or wait until failure.

By contrast, Novity calculated a six-month Remaining Useful Life (RUL) with a 95% accuracy in one field trial. Rather than universally using each nozzle 30 times before disposal, the customer was able to maximize longevity, in some instances by up to 20%. Extending RUL also reduced the cost and waste associated with unjustified replacements.

Shutdowns are a reality for process industries – but they don't need to be an emergency every time. A pro racing driver doesn't run their car nonstop while ignoring signs of wear and tear. They rely on strategic pit stops to keep the driver and their machine at peak performance. Planned stop time enabled by Novity follows the same logic – stay ahead of problems so production doesn't come to a complete halt at an inopportune time.

Interested in learning more about how predictive maintenance solution like Novity's can support your operational goals? We'd love to connect to learn more about your business and help you assess if Novity meets your plant's operational needs.



Novity is a predictive maintenance solution designed to see into the future. Our technology predicts the remaining lifespan of mission-critical assets for process industries such as Chemicals and Oil & Gas.

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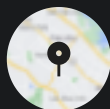
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Contact Us



3333 Coyote Hill Road  
Palo Alto, California 94304

info@novity.us

+1-919-907-8150

