CUSTOMER PRESENTATION BRIEF
As presented at the 2016 Users Conference

OSIsoft.

SUMMARY

Syncrude Canada Ltd.

Syncrude
Securing Canada's Energy Future

INDUSTRY

Oil Sands, Mining, Transportation

BUSINESS VALUE

- Mobile Equipment Monitoring
- Predictive Information
- OT-IT Integration
- Safety & Compliance
- Business Intelligence
- Preventative Maintenance
- Knowledge Transfer

PI SYSTEM™ COMPONENTS

- PI Server™
  - Data Archive
  - Asset Framework (AF)
  - Notifications
  - Event Frames

PARTNERS

dexcent

Syncrude's Mobile Equipment Events Synthesis Solution increases equipment uptime

Syncrude is one of the largest operators in Canada's growing oil sands industry. In Northeast Alberta, Syncrude operates two large-scale surface mines using truck and shovel techniques. Kyle Gogolinski, Process Control and Automation leader at Syncrude and Peter Wright, Head of the Industrial Information team at Dexcent, introduced Syncrude's Mobile Equipment Events Synthesis solution for analysis and reporting of mechanical events and discussed its impacts on mobile equipment uptime, safety and operating costs.

Gogolinski began by describing the challenges their solution addresses. They run a 136-unit heavy hauler fleet with supporting equipment including shovels, graders and dozers. At the site, oil sand ore deposits are remote resulting in long distances for haul trucks to cover. Operating conditions are harsh. In the winter, the temperature drops to minus 30°C or below, while in the summer, it rises to plus 35°C. Oil sand ore is essentially unbreakable when it's cold. When warm, the ore is sticky and quite malleable, but it's always abrasive. The wear factor on shovel teeth and buckets and even the haul truck body is significant. Syncrude recognized that the knowledge seasoned reliability engineers had gained would not be easily transferred without a data-driven solution.

Operationalizing Syncrude's Reliability Knowledge Base

Syncrude has collected data from their haul trucks since the mid-1990s. Prior to implementing their Mobile Equipment Event Synthesis (MEES) solution, business stakeholders still used spreadsheets to analyze large sets of truck data. The process was too cumbersome and effort-intensive to generate **timely** information and intervention. The overall goal of the MEES solution was to create an automated system that would leverage their reliability knowledge base to generate near real-time information that could be integrated with workflows to improve equipment uptime and reduce maintenance costs.

Syncrude realized that unless the business unit trusted MEES data, they would continue using their current procedures. In addition to delivering actionable information, some of the requirements that were identified included the ability to:

1. **Control when calculations were executed.** Syncrude's haul trucks constantly move in and out of coverage areas. To ensure that there were no gaps in event computation, Syncrude needed to process data only when they were sure that the trucks were in a coverage zone and all necessary data could be retrieved.
2. **Process large amounts of data.** The average processing volumes during a pilot study were 1716 values/second with surge volumes that are even higher. The supporting systems had to scale to ensure that the processing kept up with the incoming data flow.

3. **Create standalone components for each use case** to create independent evaluation, schedule tuning and overall solution maintenance.

Building and Validating Syncrude's MEES Solution

With Dexcent and OSIsoft®, Syncrude conducted a pilot program with the intent to overload supporting systems to gauge performance. After the pilot concluded, Syncrude determined that all risks and concerns were successfully addressed. The PI System was able to process the large volumes of data, and all use cases were successfully implemented. Events raised were inserted into a database, and single- or multiple-instance condition notifications were produced.

After the pilot proved system capability, the production phase of the project validated the solution and use cases and then focused on the solution's:

1. **Efficiency** - to reduce execution time and increase performance.
2. **Integrity** - to increase trust in the process and information produced.
3. **Effectiveness** - implementing additional notifications, adding cumulative event handling and integrating maintenance and systems and processes.

Control Panel

- Asset Health
- Log access
- Event access
- Notifications
- Report access

Use Cases, Initial Benefits and Future Plans

Wright described some of the initial use cases that were addressed including the engine, powertrain, frame, steering areas and braking. For example, a use case could include a torque converter overheat with the GPS location so that road maintenance needs could be tracked, or monitoring of the dynamic structural forces on the frames as the trucks are moving. Wright also described an unexpected use case. The safety team came to them with concerns about dumping procedures. They were seeing injuries caused by operators not following procedure properly. The MEES team examined the sequence of events involved in the procedure and added the use case to the production release.

Syncrude calculated that fleet operating expense savings came to $16.75 per hour per unit, which equates to a **$20 million annual operating cost avoidance,** not including lost production hours that would have occurred. From a safety perspective, monitoring dumping procedures improved compliance and **reduced non-procedural operator dumping incidents by 85%.**

Gogolinski confirmed that Syncrude had effectively leveraged their reliability knowledge base and transformed reactive, time-intensive processes into automated and near real-time analysis, enabling them to achieve a higher level of mining equipment efficiency even in their harsh operating environments.

"We focused primarily on use cases that ensured business value. We weren't looking for this low-hanging fruit. We went for the expensive stuff at the top of the tree."

- Peter Wright, Manager of Industrial Information, Dexcent

Gogolinkski, K and Peter Wright. *Mining Equipment Event Synthesis: Early Intervention for Increased Efficiency.* OSIsoft.com. Apr. 2016. Web. 19 May 2016. <http://www.osisoft.com/Presentations/Mining-Equipment-Event-Synthesis/>.