



Leverage digitalization at the operational level with self-service analytics at ARLANXEO

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Use-case by Jeroen De Wolf, TrendMiner



Leverage Digitalization at the Operational Level with Self-Service Analytics of TrendMiner

Agenda

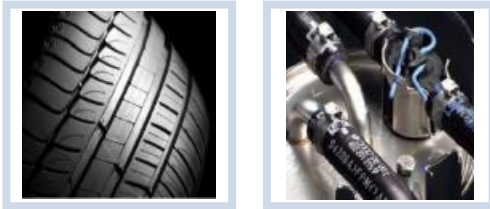
- Arlanxeo Overview
- Digitalization focus
- Implementation challenges for analytics in production
- Lessons learned with TrendMiner
 - Example: Valve leak monitoring
- Next Steps



ARLANXEO
Performance Elastomers

 **TrendMiner**

ARLANXEO is a key global player in the synthetic rubber market



Background:

- ARLANXEO: Joint venture formed by LANXESS and Saudi Aramco; Start-up April 1, 2016
- A world-leading synthetic rubber company: development, manufacturing and marketing of high-performance rubber

Global set-up:

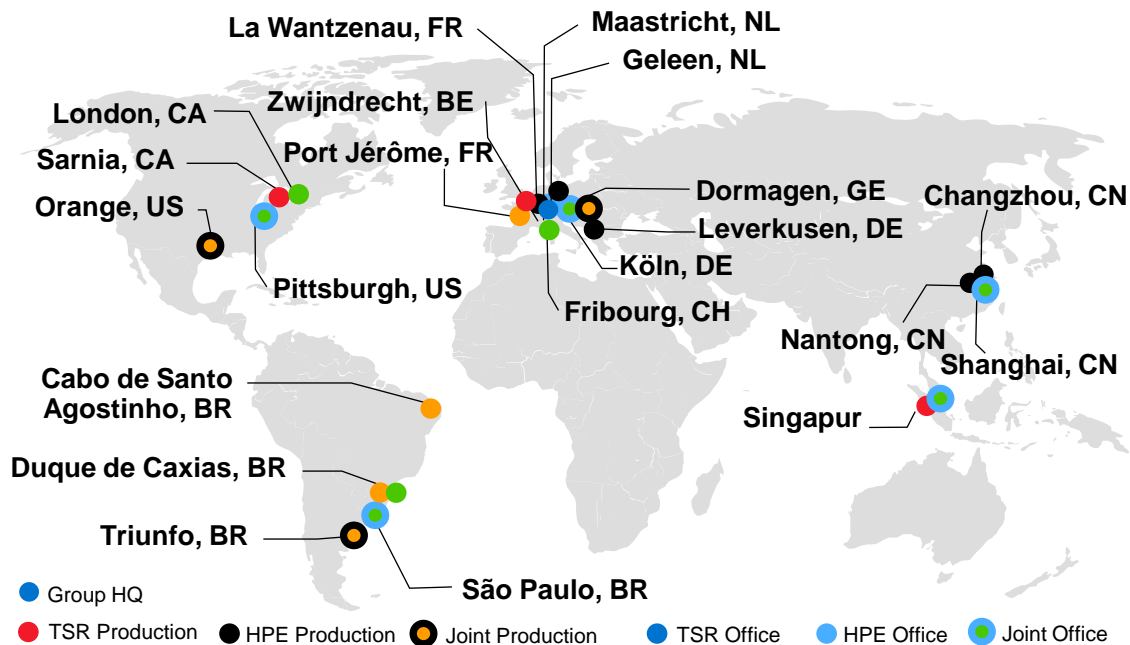
- 20 plants in nine countries
- ~3,800 employees worldwide
- Global sales of ~2.7bn € in 2016, EBITDA of ~ 340m €
- Corporate Headquarters: Maastricht, Netherlands

Business Units:

- Tire & Specialty Rubbers
- High Performance Elastomers



ARLANXEO has a broad and innovative portfolio with a truly global footprint



- Broad and innovative product portfolio for various rubber applications
- Truly global footprint in all regions featuring state of the art production facilities
- Proximity to major markets, especially Asia including a strong recently built asset base

Continuously improving process maturity is essential for critical premium customers

Focus on process capability to have consistent product properties



Global harmonization of process control parameter



Achieve global product equivalence



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Production process analytics are as well an essential part of a comprehensive digitalization framework

How will digitalization affect our business models ?



- Distribution model changes
- Service offerings

How will digitalization affect our current processes ?



- Changes in Customer Experience (e.g. in Customer Portals)
- Cross functional process integration (e.g. in Supply Chain)
- Analytics in production and supply chain mainagement

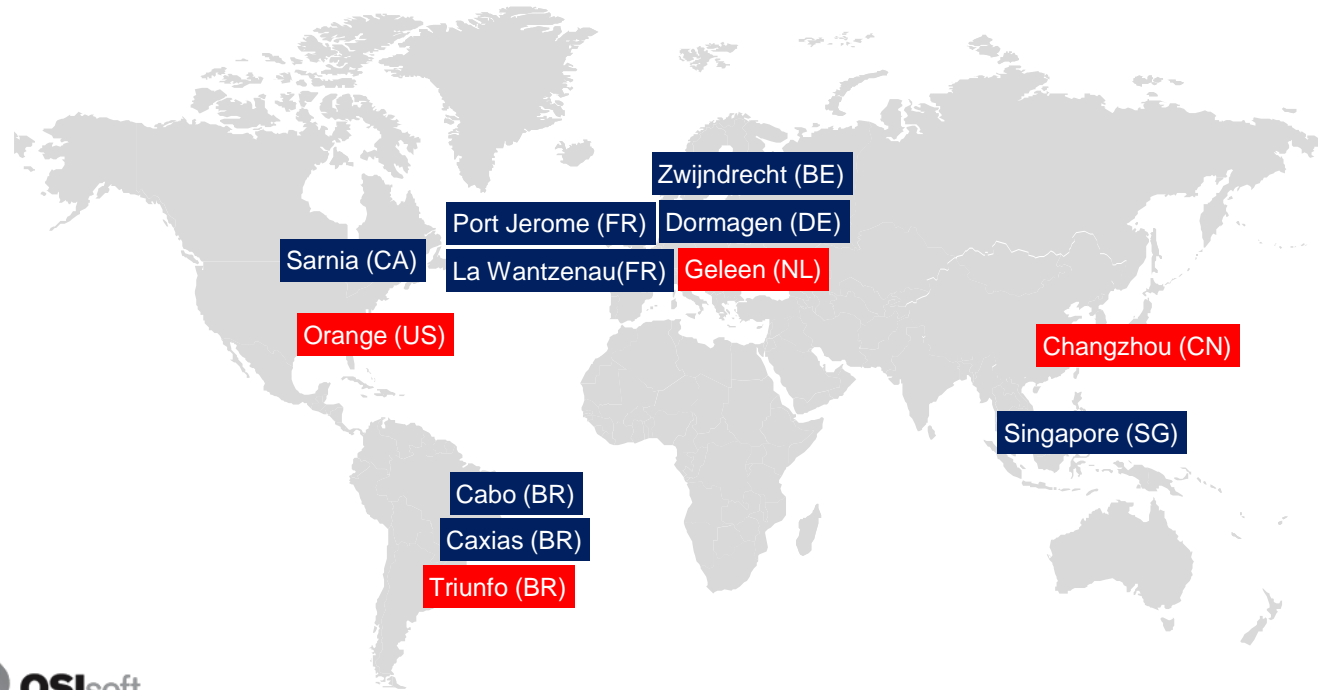
How will digitalization affect our day to day work ?



- Cultural changes
- Mobile workplace
- Collaboration

FOCUS

Usage of analytics in production processes needs to account for a partially fragmented source application landscape

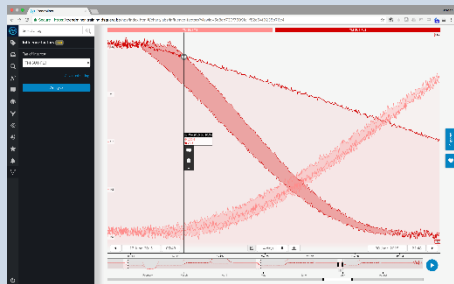


Sites with usage of OSisoft PI System

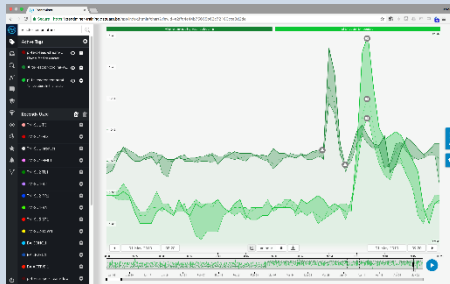
Sites with usage of other solutions



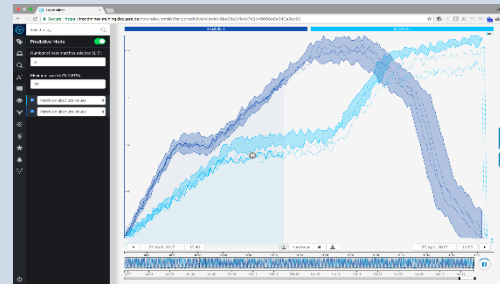
TrendMiner has been selected as platform for analytics in production processes



Analyze



Monitor



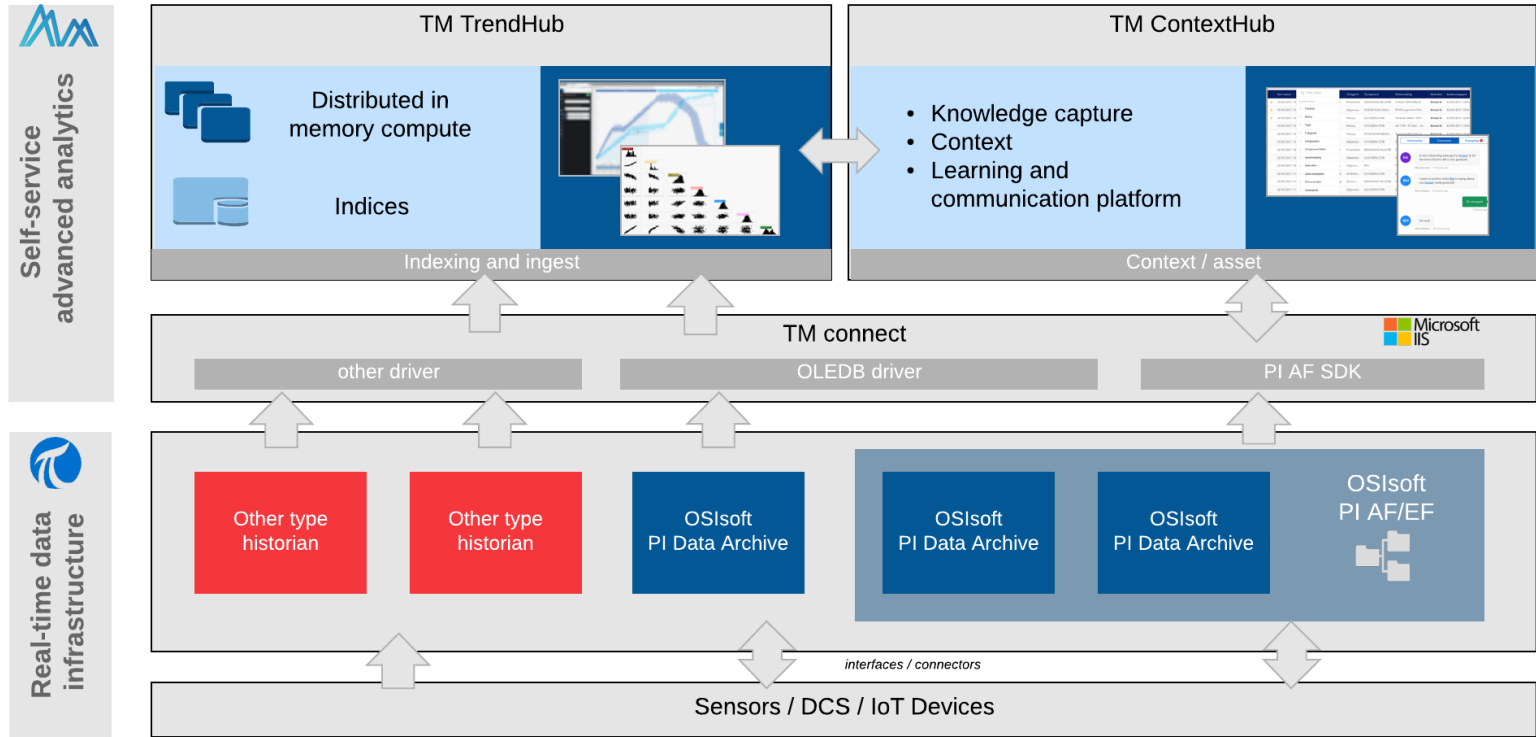
Predict

- Focus on process industry
- Usability for process experts
- Rapid setup / implementation

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Real-time data architecture



Based on analytics requirements, we started to implement TrendMiner ca. 2 years ago in pilot sites

Region	Country	Site	System	2016	2017	2018	2019
America's	Brazil	Caxias	OSIsoft PI System				
	Brazil	Cabo	OSIsoft PI System				
	Brazil	Triunfo	OSIsoft PI System				
	Canada	Sarnia	OSIsoft PI System				
	US	Orange	Other				
APAC	China	Changzhou	Other				
	Singapore	Singapore	OSIsoft PI System				
Europe	Belgium	Zwijndrecht	OSIsoft PI System				
	France	Port Jerome	OSIsoft PI System				
	France	La Wantzenau	OSIsoft PI System				
	Germany	Dormagen	OSIsoft PI System				
	Germany	Dormagen	OSIsoft PI System				
	Netherlands	Geleen	Other				



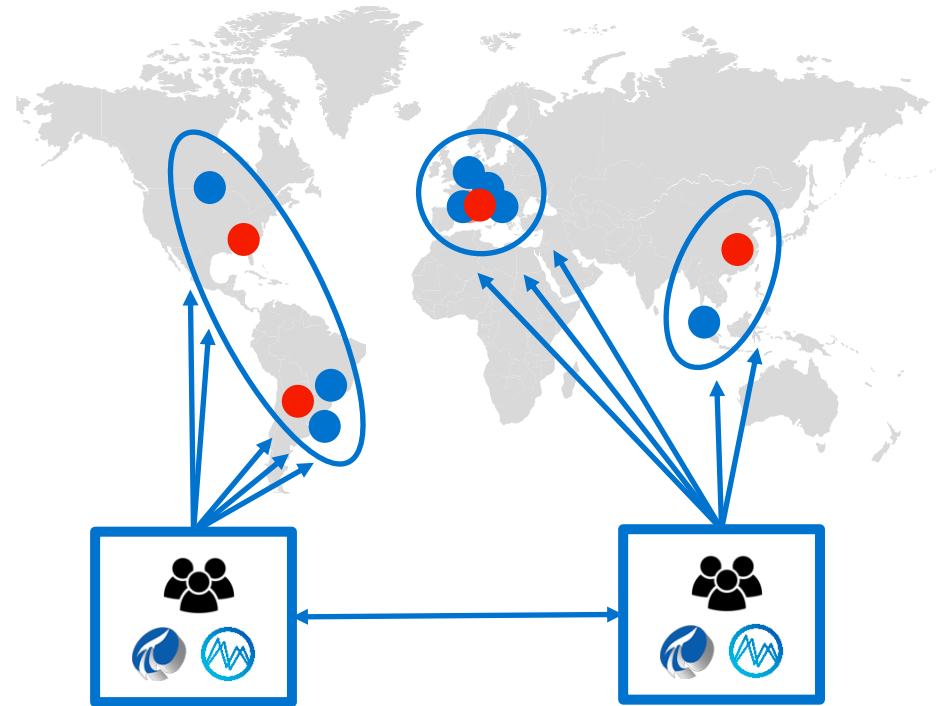
ARLANXEO Support concept solution is based on the setup of regional competence centers

Support concept

- Process experts
- IT experts
- Data science experts

- Share Knowledge
- Train on-site people

- **Central process data storage**
- **Self-service Analytics**

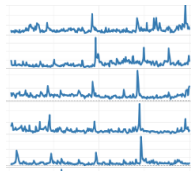


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Lessons learned so far: What can production analytics deliver after implementation?

More comprehensive analysis (history and data sets)



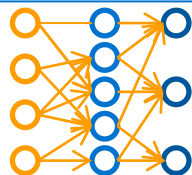
Better quality of analysis by using more comprehensive sets of data:

- easy access to historical data (longer timeframe used for analysis)
- filtering on similarities

EXAMPLE

- Impact of overhaul efforts on performance of compressors in a specific site

Gaining complex process insights



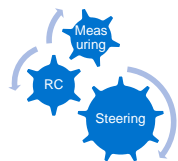
Analysis across a larger set of indicators / parameter becomes feasible e.g.

- across multiple steps in process
- with multiple parameter changes

EXAMPLE

- Impact of using a new raw material (from a new supplier) on reactor run time / quality indicators

Integrating root cause analysis and process monitoring



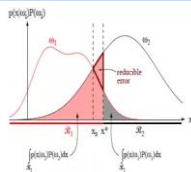
Improved root cause analysis (more historical data, multiple data sets) can be used to define future alerts within the process

EXAMPLE

- **Impact of valve leaks on a regeneration process for dryers**
- **setting alerts as early as possible**



Making scenarios comparisons available



Comparing different scenarios (e.g. campaigns) to determine decision points or to define focus of further investigation

EXAMPLE

- Determining optimal dryer switch time as a trade off between different parameters

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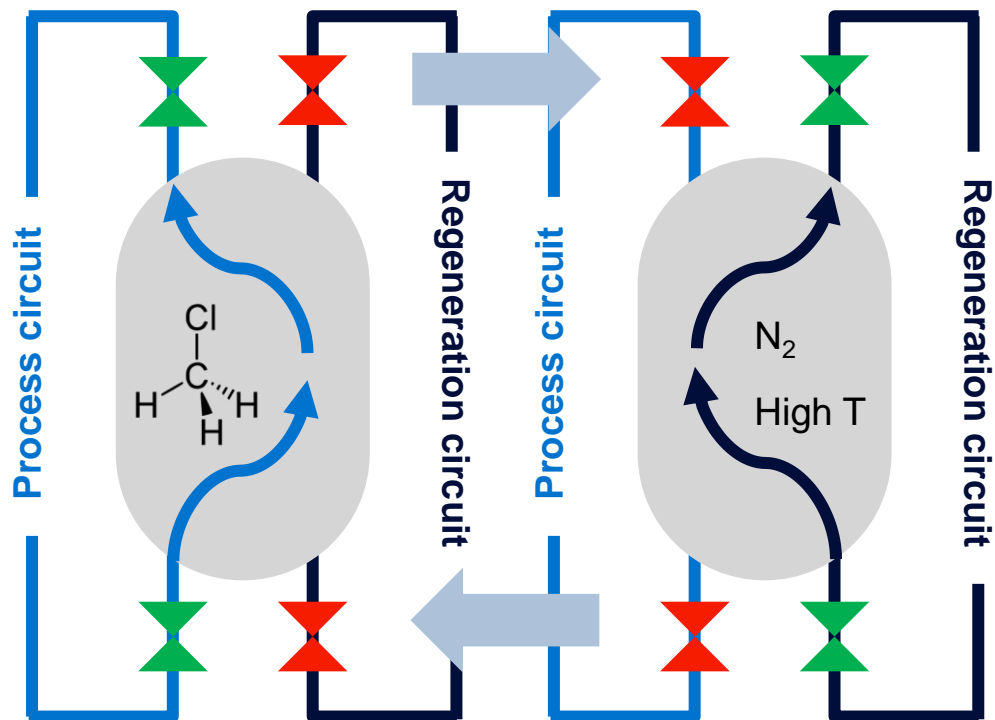


Example case

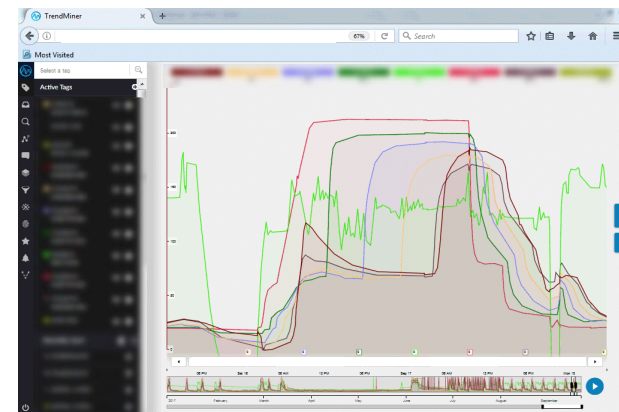
TrendMiner

Valve leaks during regeneration of a dryer

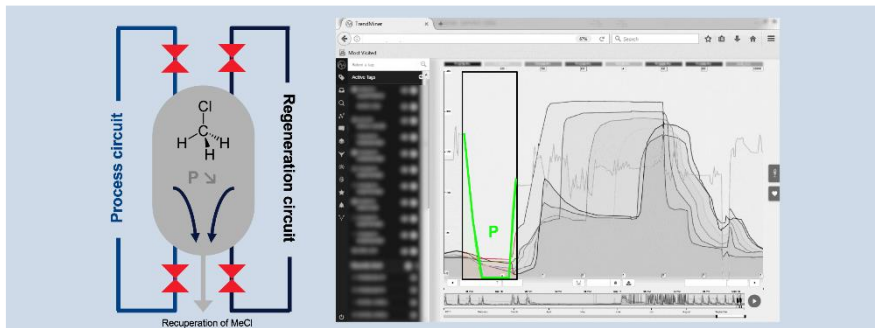
Regeneration of dryer



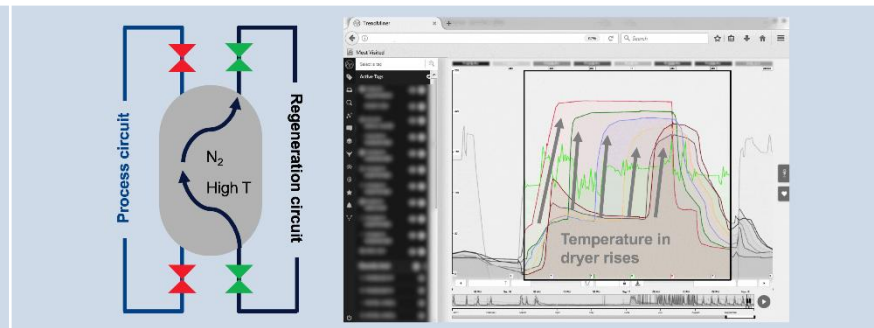
- Process stream: Dryer removes H₂O from MeCl process stream
- Regeneration of dryer: H₂O is knocked off with hot N₂



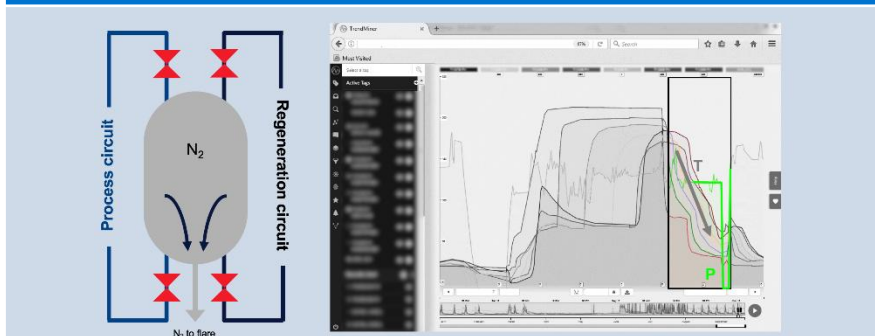
Regeneration of dryer



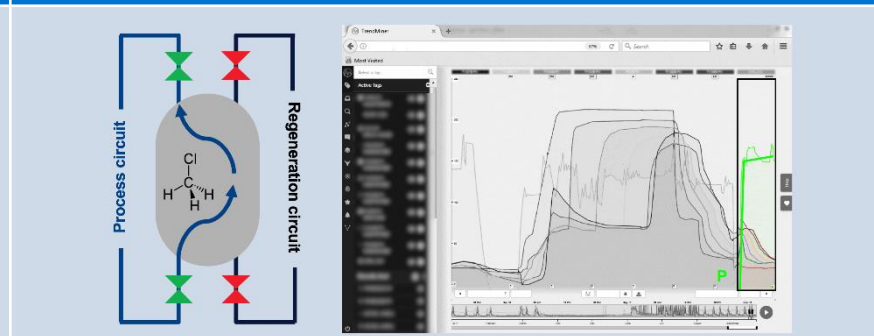
1 - Vacuum to remove product



2 - Purge with hot N₂ to dry and remove H₂O

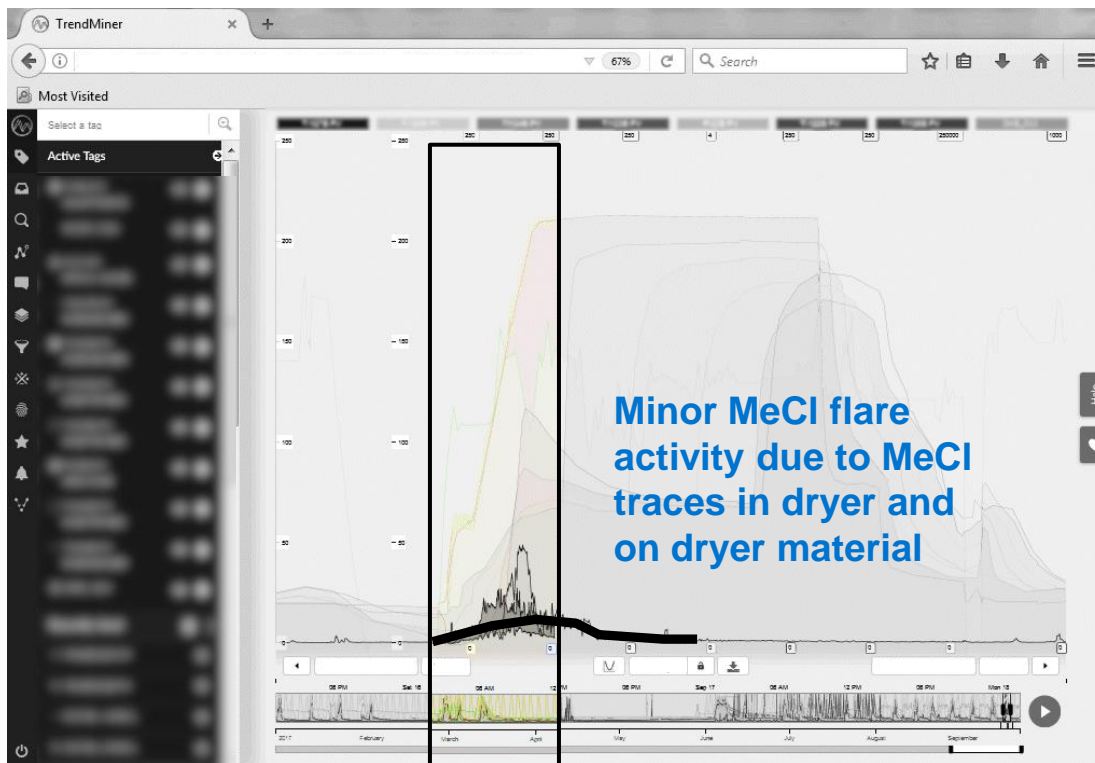
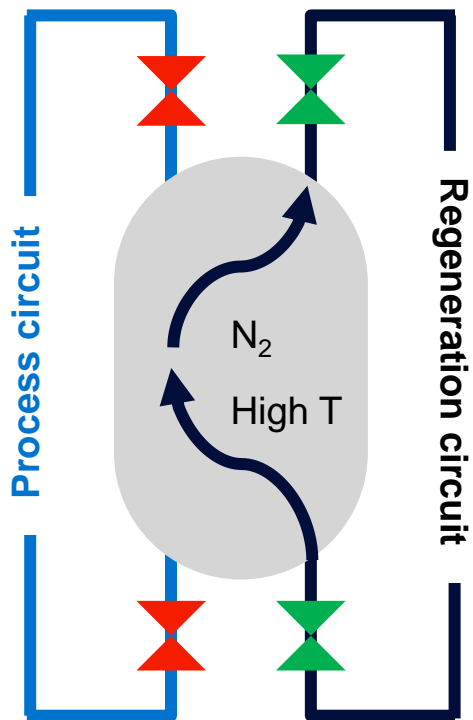


3 - Cool down and remove N₂ with vacuum



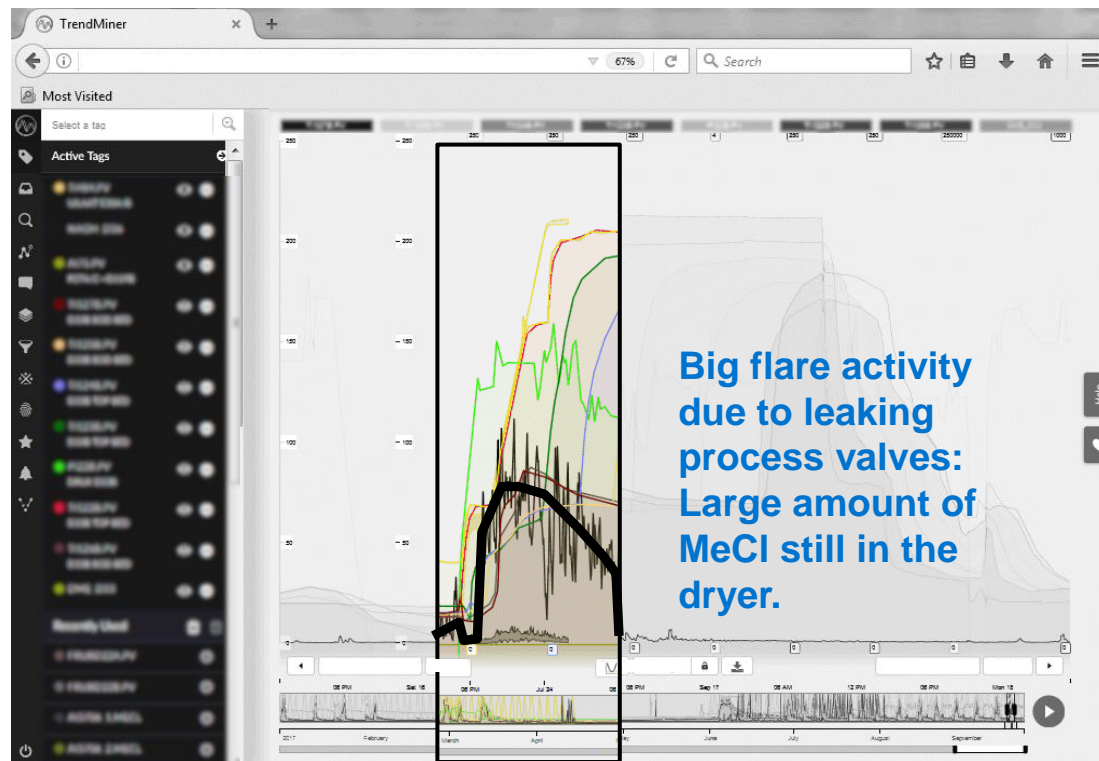
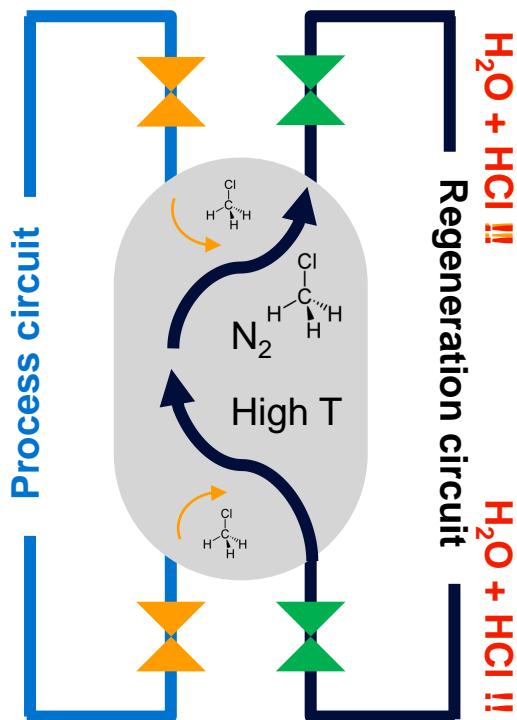
4 - Restart process

MeCl flare analyzer: Normal behavior

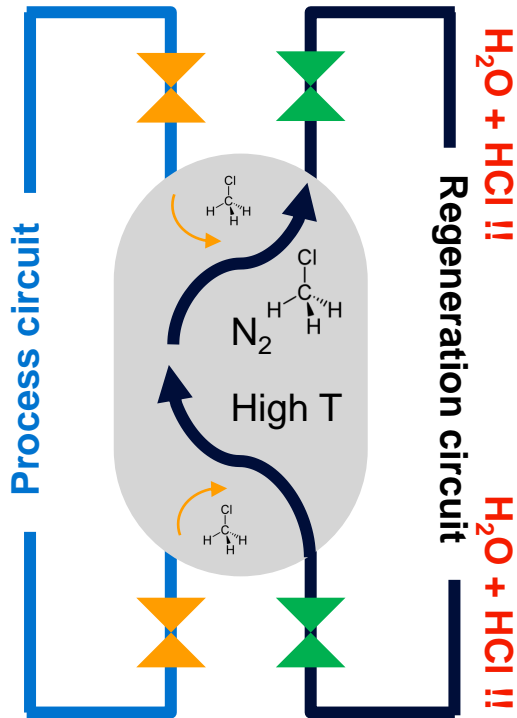


MeCl flare analyzer:

If process valves leak => specific pattern

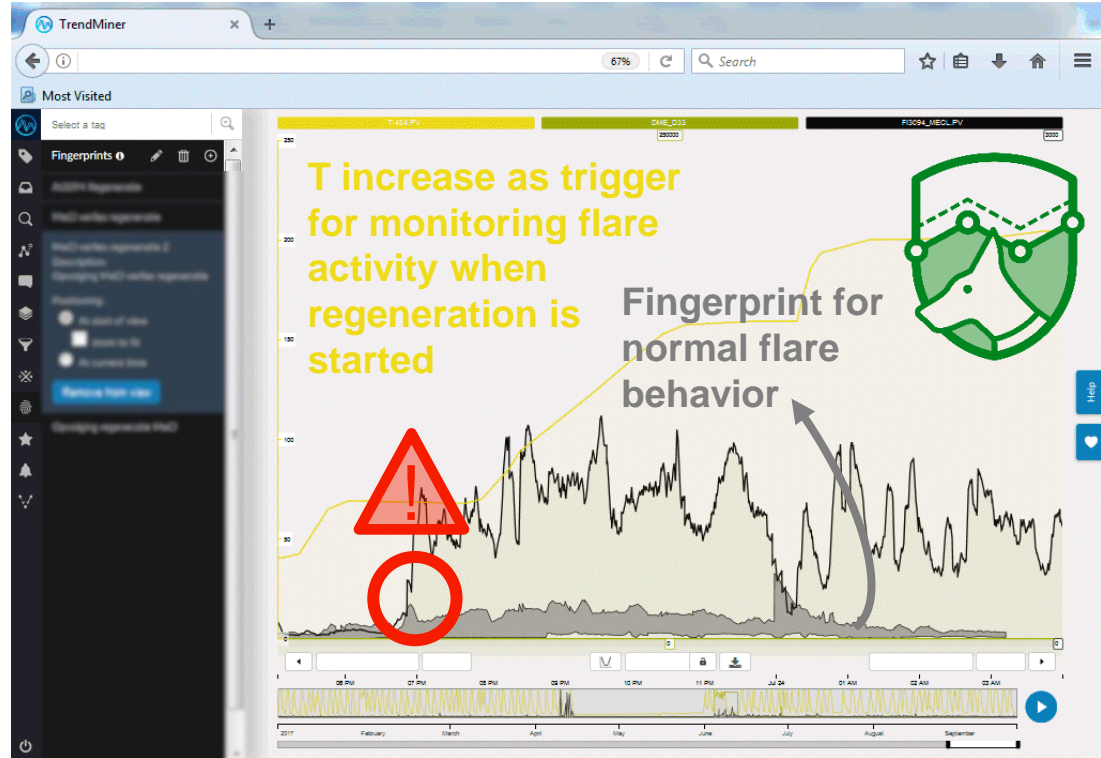
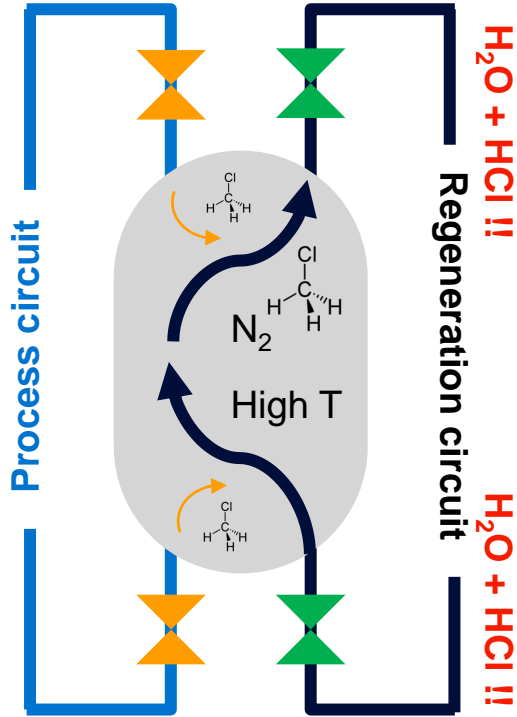


Regeneration process: Consequences of leaking process valves

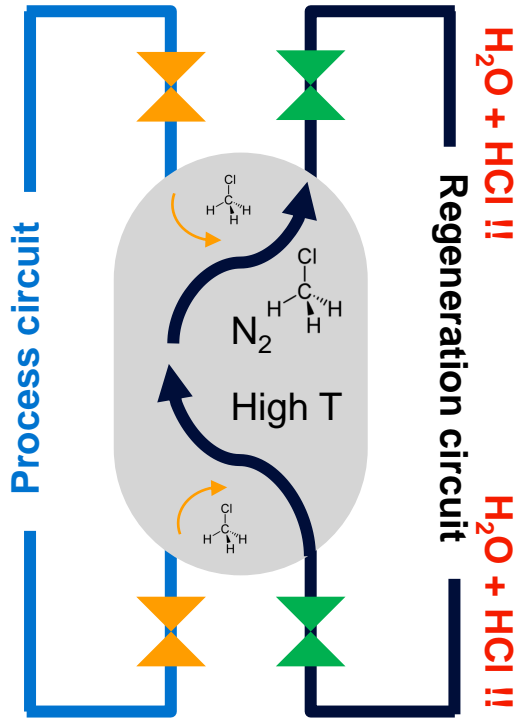


- Huge losses of expensive MeCl
- **Severe corrosion** in the regeneration circuit:
 - $MeCl + H_2O \rightarrow MeOH + HCl$
 - Extremely corrosive for C-steel of expensive assets:
 - Big shell and tube heat exchanger
 - Piping
 - (Scrubber)

Solution: Monitor MeCl flare analyzer to detect valve leaks during regeneration



Regeneration process: ROI of TrendMiner



- Find back regeneration cycles very fast with **TrendMiner search**.
- Create a **Fingerprint** of normal flare behavior during regeneration



Return:

- TrendMiner has detected valve leaks several times last year. **Maintenance** on valves has been optimized.
- Quick detection of valve leaks has significantly **reduced corrosion** in the regeneration circuit
- Less MeCl flaring which has multiple benefits:
 - Direct **MeCl cost savings**
 - Environmental benefit:** less flaring

What are next steps beyond the further implementation in our sites?



Expanding the base for analytics

- **Adding data sources for analysis / further expanding digital basis**
- Combining analysis with data sources outside of production (e.g. quality related, supply chain related)

From site applications to global setup

- Implementing regional competence centers and global responsibility
- Creating exchange forums / projects and communities within the group
- Generalizing and sharing use cases across sites

Combining ad-hoc with standard reporting

- Integrating with standard reporting systems (e.g. global production reporting)
- Technical alignment on interfaces and data exchange concept

Hermann Schuster

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Chief Digital Officer

Arlanxeo



Jeroen de Wolf

Trendminer

Questions

Please wait for the **microphone** before asking your questions

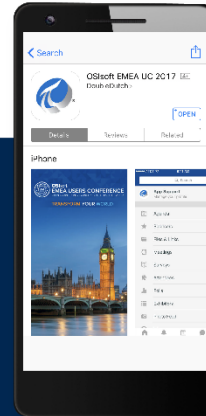


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Danke

谢谢

Merci

Gracias

Thank You

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Obrigado

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