



# PREEM SOLVES A PERSISTENT REFINERY CORROSION PROBLEM USING ONLINE CORROSION MONITORING

## Customer

Preem conducts extensive refinement of crude oil and the sale of petroleum products to oil companies active in Sweden and on the international market, mainly in north-western Europe.

## Application

This case study focuses on a specific instance of severe corrosion identified on the top of a main crude distillation column in Preem’s Lysekil refinery in Sweden. The problem was located near a complex arrangement of pressure relief valves, and attempts were made to alleviate the corrosion through redesign of the piping in that area and the installation of a new injection quill. However, despite initial success, corrosion began to reoccur.

## Challenge

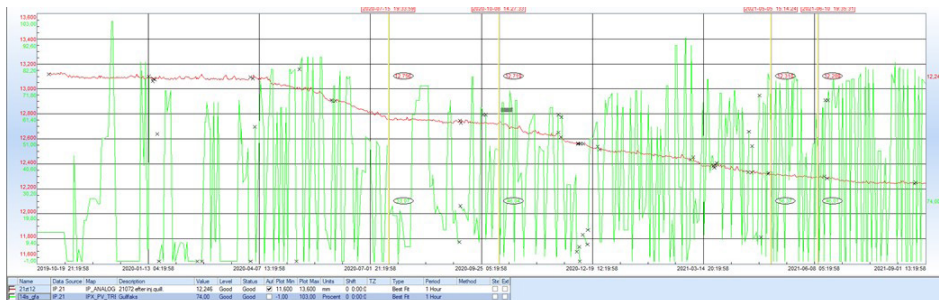
Severe corrosion was identified on the top of the main crude distillation column near a complex arrangement of pressure relief valves. The corrosion was found to be caused by a broken injection quill that was used to inject a neutralising amine into the pipes. Without the proper injection of the amine, the pipes were susceptible to corrosion, leading to the elevated corrosion rates observed. The team installed a new quill and the corrosion stopped, but after some months, corrosion began to reoccur at a high rate.

## Results

- Avoided unexpected shutdowns as a result of the increased corrosion rate
- Allowed an effective preventative maintenance strategy, saving time and money
- Ensure the longevity and integrity of fixed equipment using quantitative corrosion calculation



**Image 1.** Several Rosemount Wireless Permasense sensors were deployed next to the



**Image 2.** Periods of high corrosion (red trend line) could be clearly correlated with periods of crude slate blending (green trend line).

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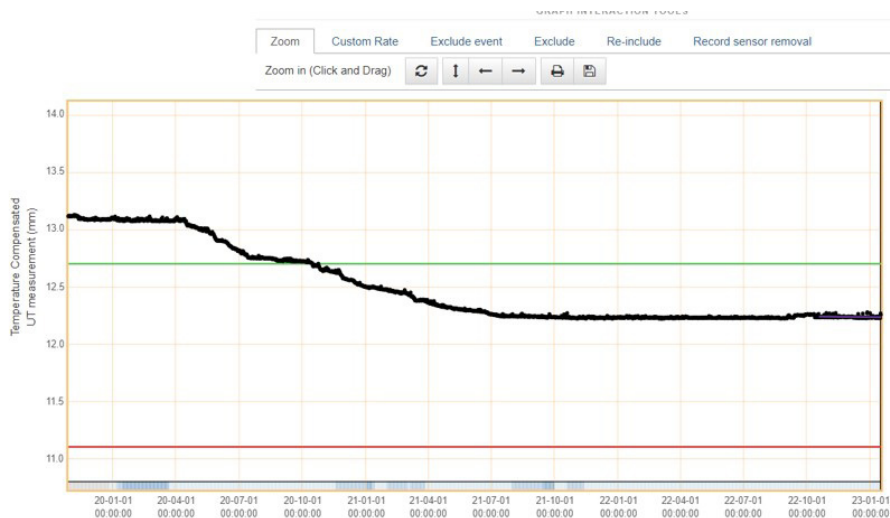
## Solution

The corrosion engineer installed a Rosemount Wireless Permasense corrosion monitoring system from Emerson to continuously monitor the corrosion rate and identify the root cause of the corrosion.

The corrosion data was correlated with process data using AspenTech IP.21 software (see image 2). The corrosion was caused by a specific crude slate which was high in salts, causing corrosion further down the process. However, when this new crude was blended back out, the corrosion did not stop occurring. The team performed an inspection of the injection location where the issues initially occurred and found out that the injection quill was broken once again, likely causing inhibitor to spread along the pipe wall where the non-intrusive sensors were located.

## Conclusion

In July 2021 the injection of neutralising amine was stopped and the corrosion rate was significantly reduced (see image 3). In September 2021 another new injection quill was installed. The refinery was able to prevent further corrosion and ensure the longevity and integrity of the pipes by using advanced monitoring and diagnostic tools such as Permasense and AspenTech IP.21 software. This also helped to perform effective predictive maintenance and avoid unexpected shutdowns. Although not certain, it is likely that a combination of the high salt crude blend as well as the broken injection quill were causing the corrosion.



**Image 3.** Since replacing the quill in September 2021 the corrosion was virtually eliminated. Continuous monitoring ensures any recurrence would be picked up quickly.

“  
 Using Permasense and AspenTech IP.21, we quickly detected and diagnosed the root cause of corrosion, and took effective measures to prevent it from happening again. This avoided further unplanned outages, saving time and money.  
 ”

**Joakim Nilsson**  
 Corrosion Engineer, Preem

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## Resources

Emerson Automation Solutions Industries  
[Emerson.com/Refining](https://emerson.com/Refining)

Rosemount  
[Emerson.com/Productpage](https://emerson.com/Productpage)

For more information, visit  
[Emerson.com](https://emerson.com)

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