Reducing the Cost of Curiosity
Digital Transformation and Remote Monitoring at Guardian Glass

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Background on Guardian Glass

- Remote Monitoring covering 44 assets with 5 engineers

One World. Global Locations.

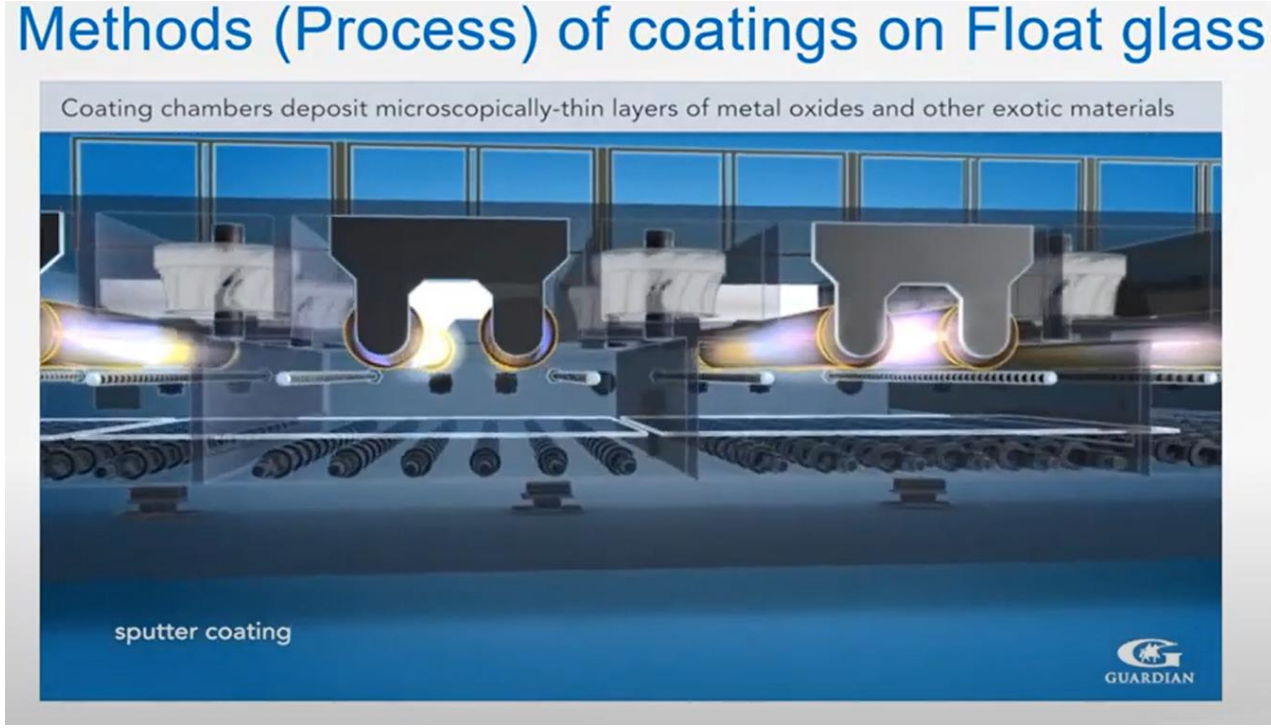
Guardian operates in 26 countries and serves customers in over 100. Guardian, its subsidiaries and affiliates employ over 14,000 people. We work as one team, across borders and continents, and across our companies. We leverage our capabilities on a global scale, while embracing diversity and individual contribution.

15,000 Employees

5 Continents

1 Vision and Culture

Glass and Coating Manufacturing Process



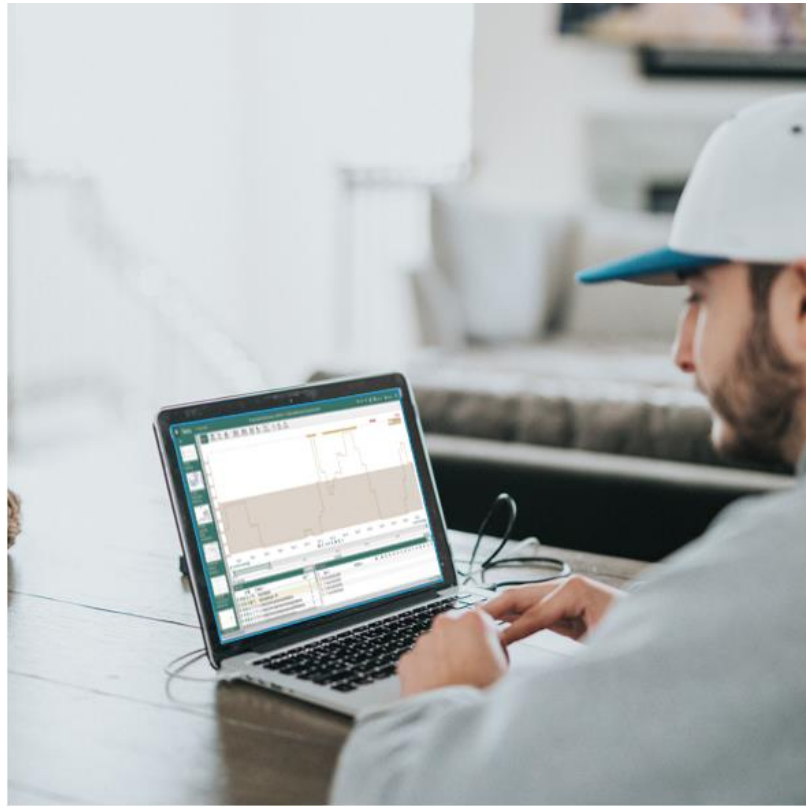
How Glass is Made

How Glass is Coated

The Pandemic Accelerated Guardian's Path to Remote Monitoring

- **From On-Site Firefighting**
  - Siloed data at each site
  - Extended Upsets
  - Traveling SMEs
  - Painful Data Analysis
- **To focusing on Remote Capabilities**
  - Enterprise Data Available via PI System
    - Widespread access
    - Real-time
  - Managing by Exception for well-defined issues
  - Easy Data Analysis

PI did not address all needs, however



Source: Photo by Nathan Dumlao on Unsplash

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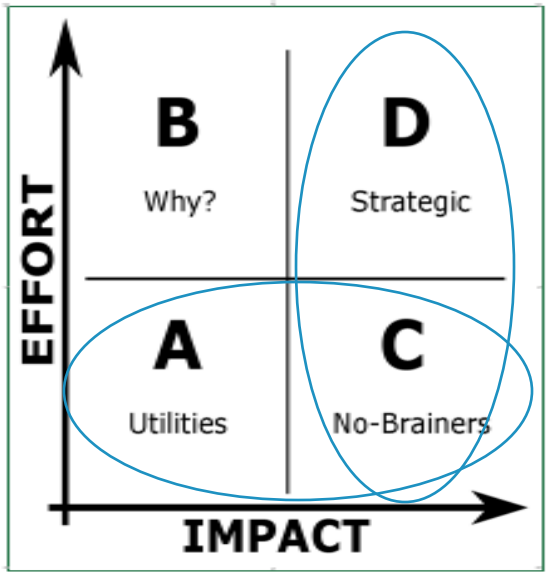
How We Identified the Need for Seeq

Good ideas are not always well-defined projects

- **Small Remote Monitoring Team/Busy Plants**
  - Efficiency is key
- **Difficulty analyzing periodic conditions**
  - Thickness, Color, Product, Settings…
- **Not all data is in the PI System**
  - *"I have this data! Can you help?"*- Plant Engineer
  - Chemistry
  - Production run dates
- ***Didn't know we needed it until we started using it***



Seeq®

Low Cost of Curiosity = reduced barrier to explore

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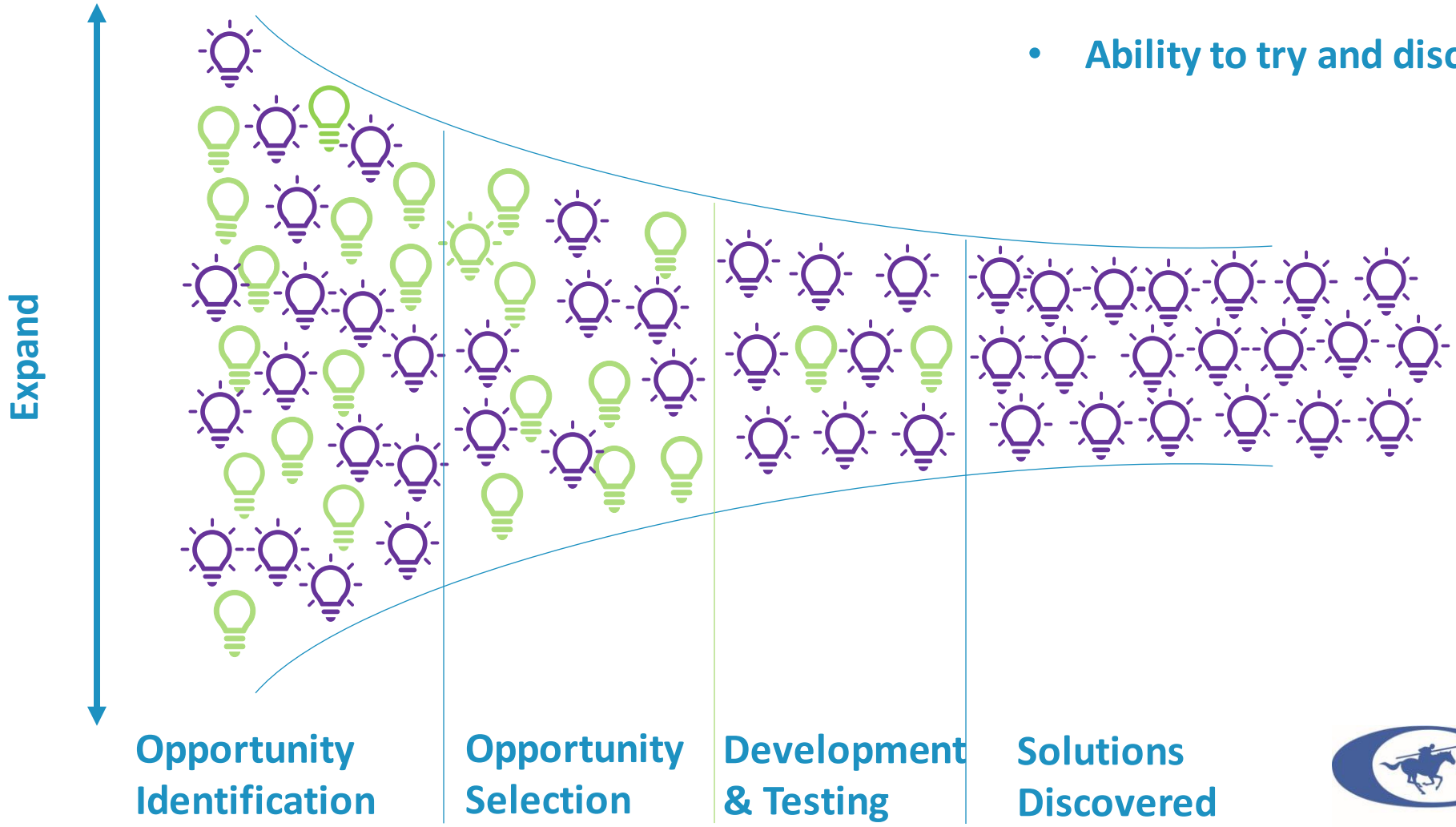
Narrow Innovation Funnels are Expensive to Screen!
Widen Front End & Chances of Finding Value Go Up

Goal: Widen front end of Funnel

- Ability to try and discard a lot of ideas



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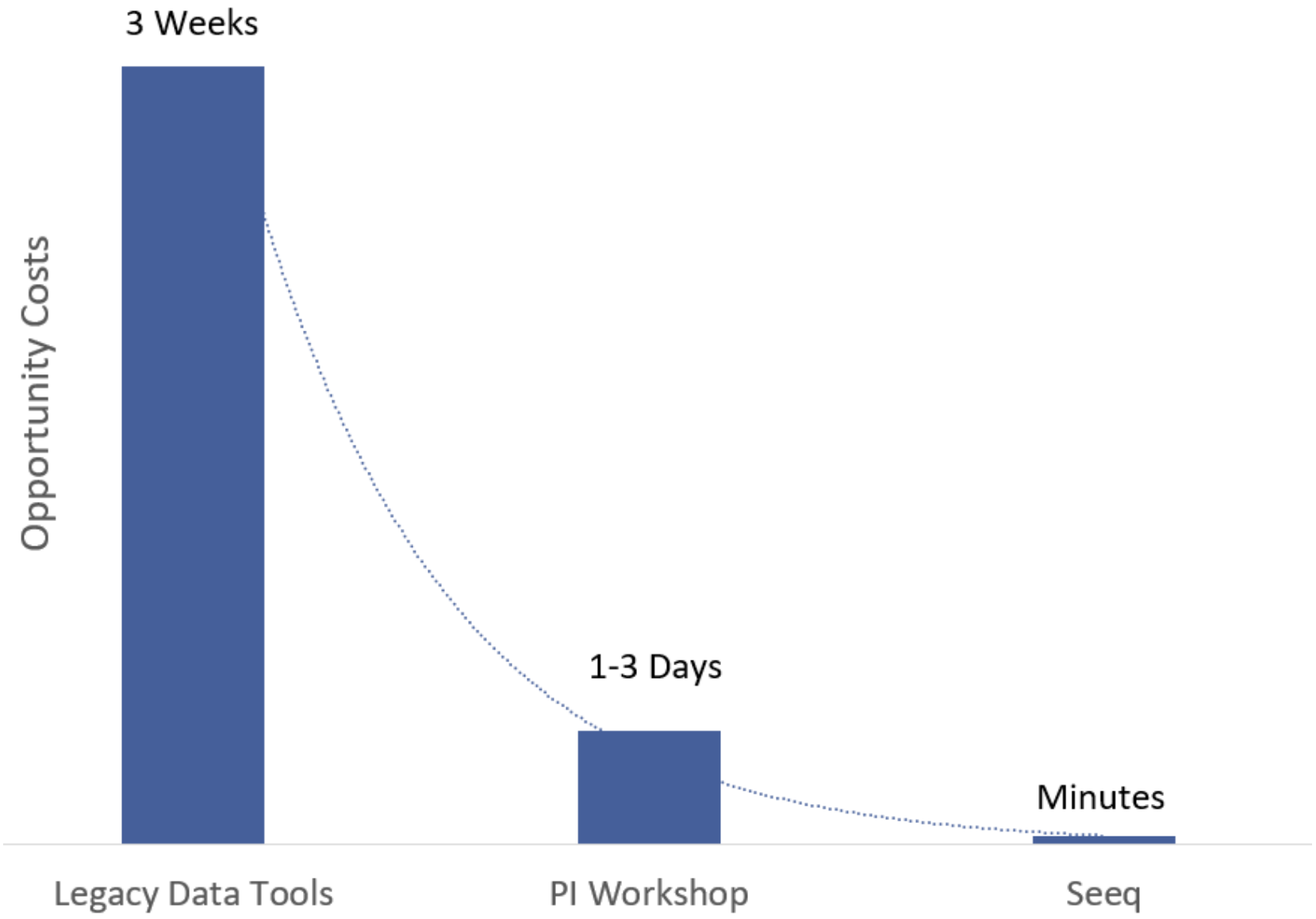
Observations: Tasks That Previously Took Weeks to Complete Can Now be Completed in Minutes



Source: Photo by Nathan Dumlao on Unsplash

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Glass Transitions Easy to Analyze

CHALLENGE

- Difficulty in comparing run-to-run for products that are run infrequently~2x/yr
- Previous efforts took months to analyze
- Opportunity >$1MM/Plant (5 Plants)

SOLUTION

- Deep dive analysis in Seeq
- Chain View and Capsule View to compare runs
- Multiple data sources: PI System, CSV Files, SQL Database

RESULTS

- 3.5 years' worth of data analyzed in a few days- 1 Person
- Engagement from plants on remote monitoring
- Positive results to date. Quantification TBD

Guardian UltraClear® vs. Standard Clear Glass

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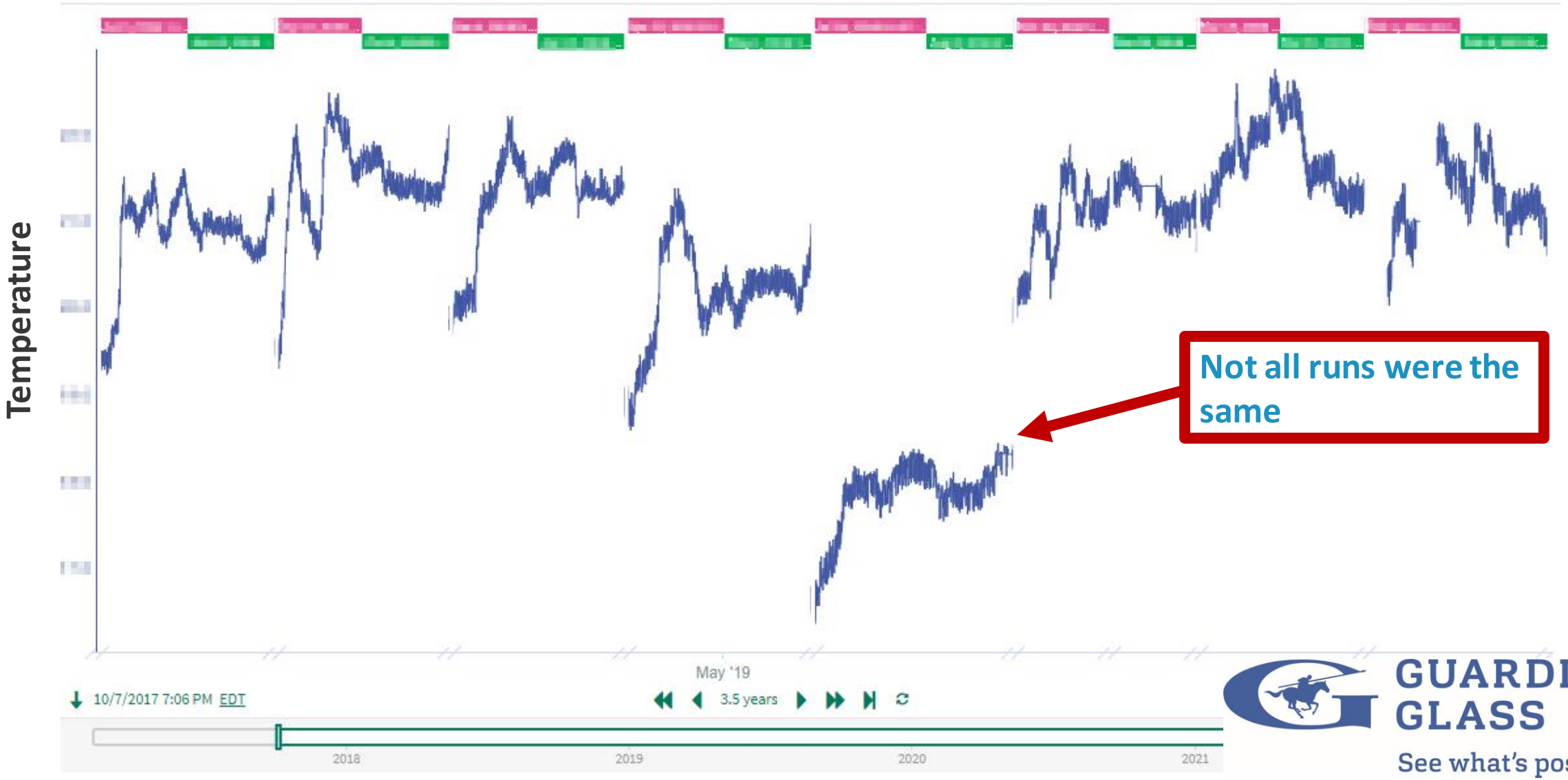
Seeq's Chain View of Different Product Campaigns- 3.5 Years



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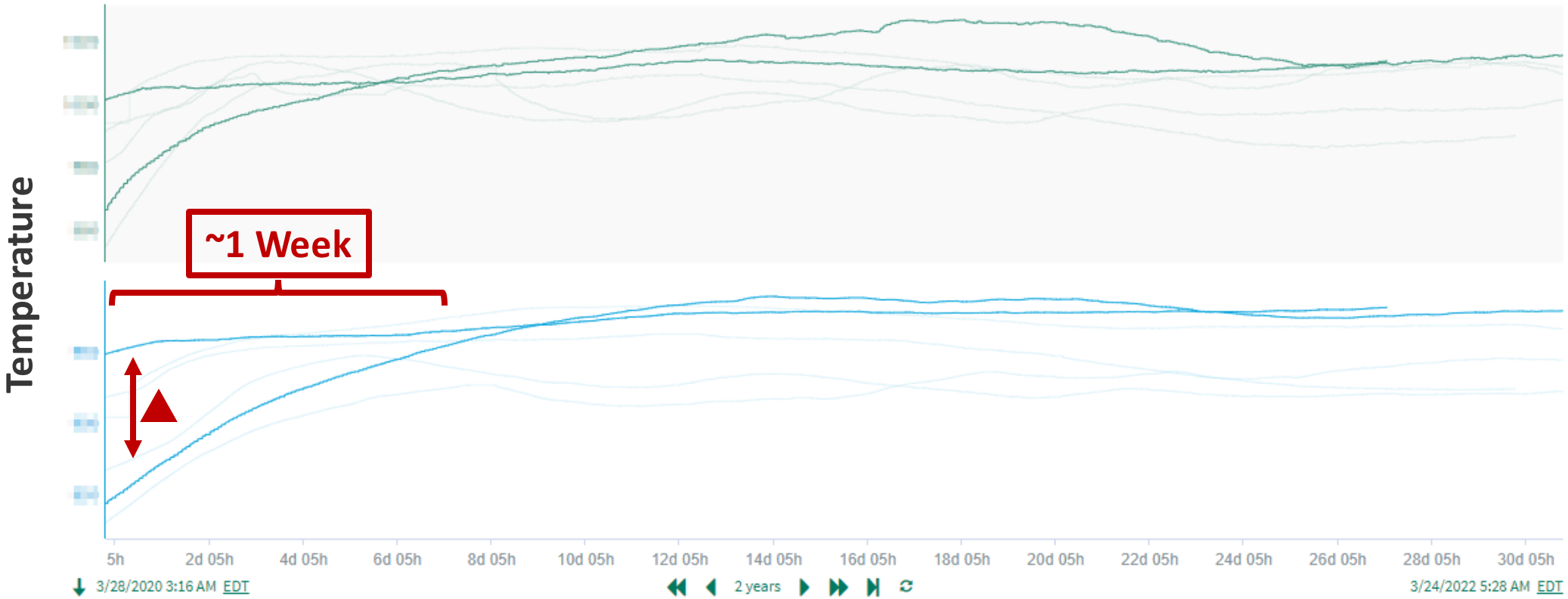
Seeq's Capsule View Run to Run



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Coater Operating Pressures- Looking for Clues Before Upsets

CHALLENGE

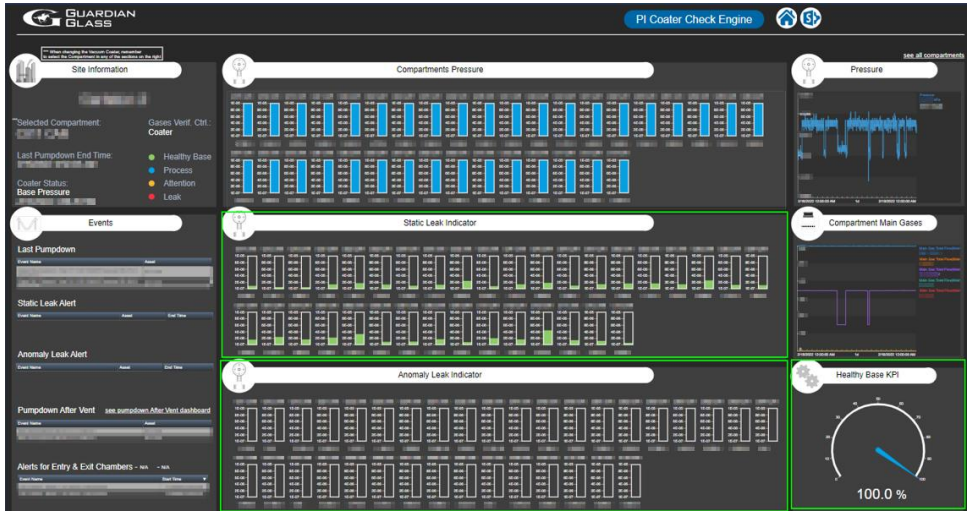
- Unexpected downtime without flagging issues in our PI Vacuum Integrity tools. When examining the data, there were small signs of the issues that would normally be seen as noise in the data.

SOLUTION

- Used Seeq to flag specific conditions in Operating Pressure when everything is expected to be stable.

RESULTS

- Several small issues flagged, reported to the plant, and *fixed without incurring any bad product or unplanned downtime*. The same asset had a 1 Million Dollar upset prior to the PI System and Seeq for a similar issue that was undetectable.



PI Vision Coater Check Engine Tool

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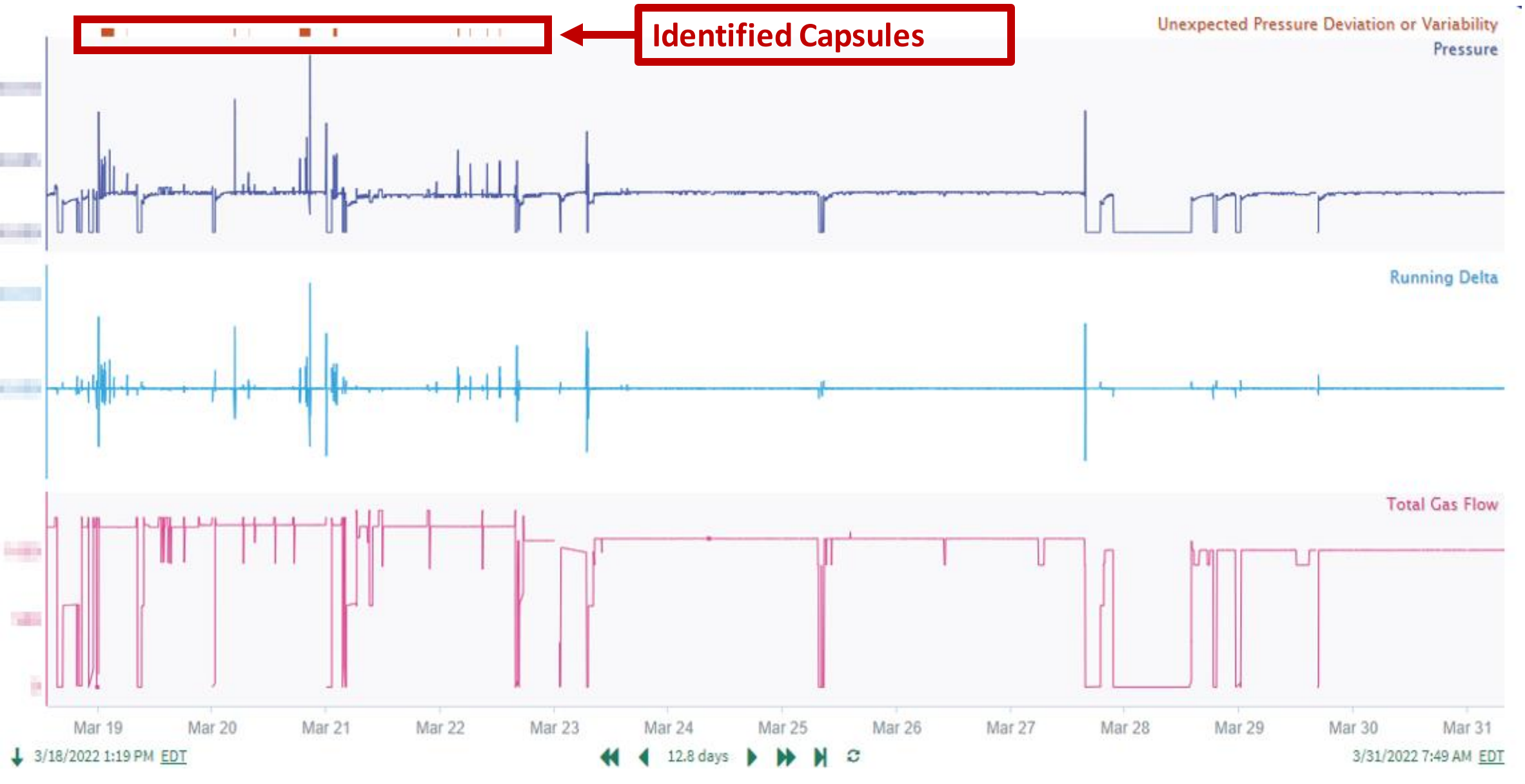
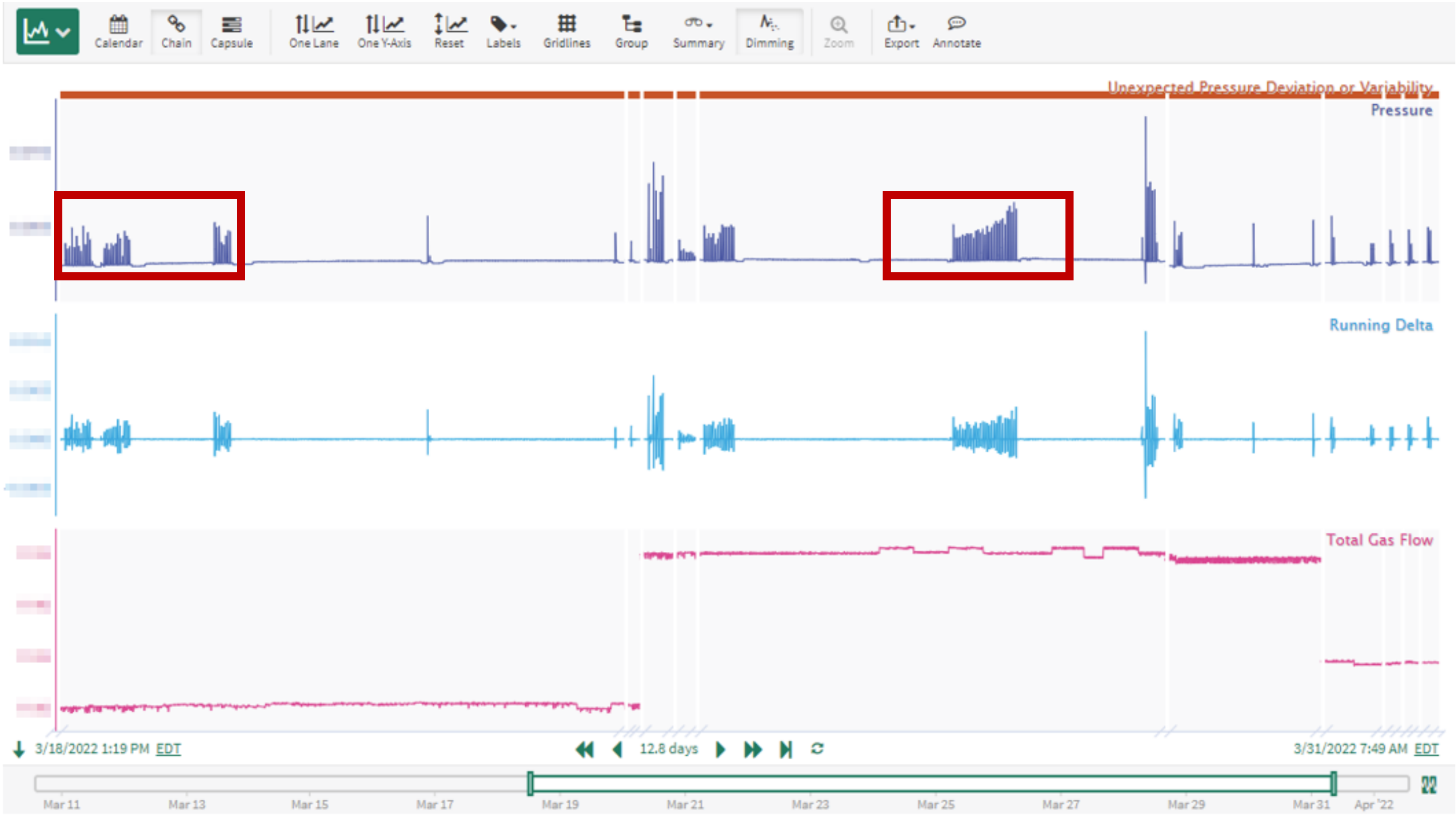
Seeq Identified Periods of Unexpected Variation in Pressure



Seeq's Chain View of Capsules Clearly Showed the Issue



Coater Operating Pressure Results- Issue Fixed With No Downtime or Bad Product

Lessons Learned in Remote Monitoring

- *"I'm from Corporate and I'm here to help…"* ✖
- **Solving issues= Plant Buy-in** ✓
- **Be a good listener- plants know pain points** ✓
- **Investigate overlooked areas** ✓
- **Look for problems that scale** ✓
- **Use right tool for right job** ✓
  - No single solution fits all
- **Document/Share Results** ✓
  - Monthly knowledge shares

Source: Photo by Marcos Paulo Prado on Unsplash

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