



StoneThree

The Future of Work. Now.™

Unlocking Peak PGM Performance Data-Driven Process Optimization



ISO/IEC
27001
Information Security
Management
CERTIFIED

ISO/IEC
27701
Privacy Information
Management
CERTIFIED



StoneThree

The Future of Work. Now.™

STAIRWAY to VALUE

1

To Measure
is to Know

Difficult Measurements with Smart Sensors

Truck

PSD | Oversize



Conveyor

PSD



Conveyor

FOD



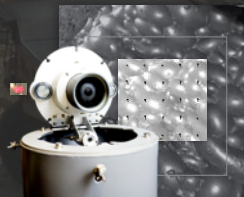
Conveyor

Volume



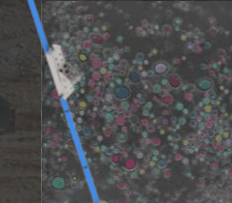
Froth

Velocity | Height | Stability |
Bubble Size & Color



Pulp

J_g | Bubble Size | Gas-
Holdup



Grade

No Nuclear | Sources
Slurry XRF Analyzer



2

Automated
Actions

Process Optimization

Advanced Process Control



Critical Interventions

Interlocks

3

Expert
Augmented
Actions

Monitoring & Diagnostics

Tailored solutions utilizing domain knowledge

RESTRICTED

SmartROC



PGM Concentrator Success Story

Stone Three Microtrace® XRF gives real time visibility of performance



Commodity

- Platinum Mine

Location

- Limpopo

Solution

- MicroTrace®



Savings per year on assays

Increased Recovery

Other quantitative benefit

Customer Challenge:

PGM Minerals Processing plants typically operate blind as manual samples take time to be assayed, and this is always after the fact. A leading PGM producer in Limpopo was looking for a better way of controlling and managing their concentrator.

Stone Three Solution: Microtrace® Rollout

Stone Three has deployed the MicroTrace® online grade analyzer for real-time metal grade measurement in slurry. The patented MicroTrace® Analyzer, an advanced XRF system, accurately assesses PGM tail grades with minimal manual intervention and no need for recalibration. It features a robust, fully automated sample handling system, including cleaning and flushing, ensuring consistent performance. Prioritizing safety, it operates without nuclear isotopes. Since installing their first unit in 2021, the client has expanded their grade measurement capabilities with four additional MicroTrace® Grade Analyzers, including the latest dedicated to cleaner tails analysis.

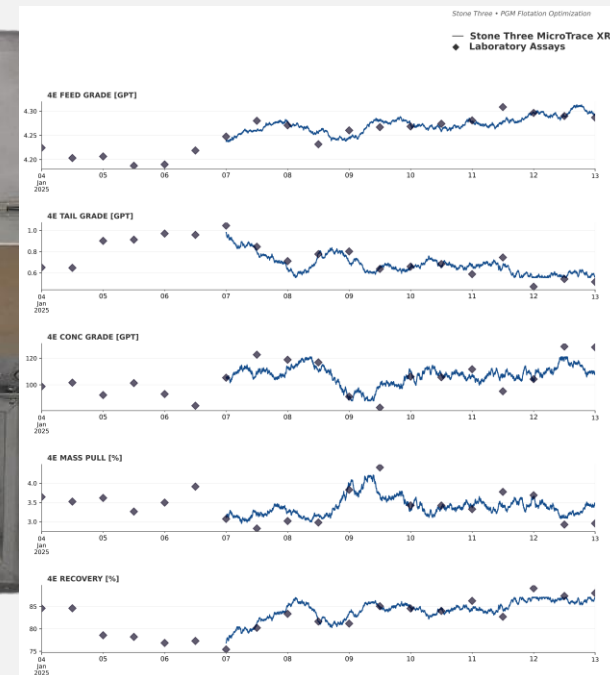
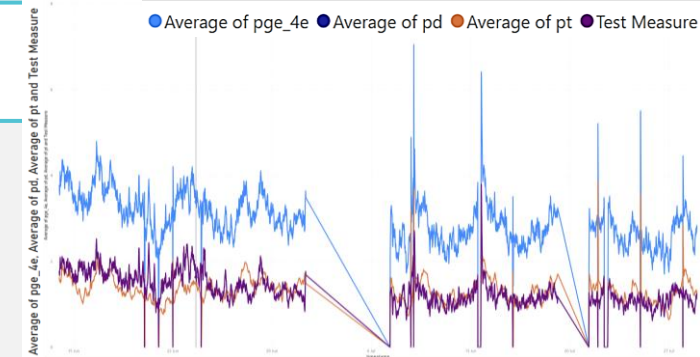
Benefit Estimation:

The ability to detect & rapidly resolve suboptimal and unstable Recovery, Reagent dosing and Gangue in final concentration.

- ✓ Recovery Optimization
- ✓ Mass pull control / optimization
- ✓ Reagent dosing optimization

Evidence

Same day real-time trends



Froth State & Advisories

RESTRICTED



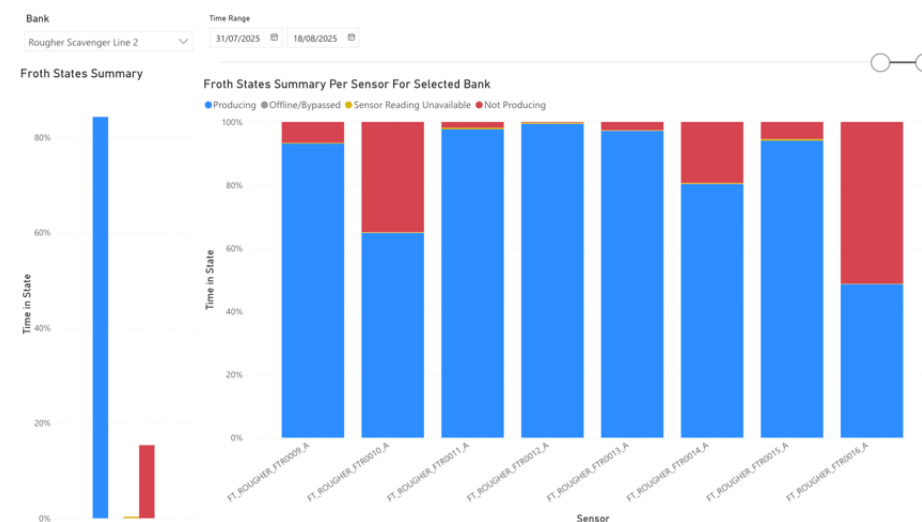
Performance tracking – producing over time

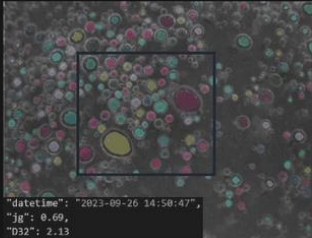
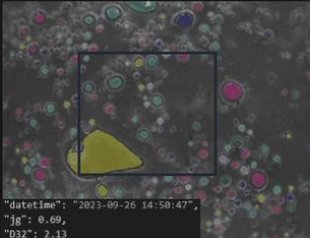
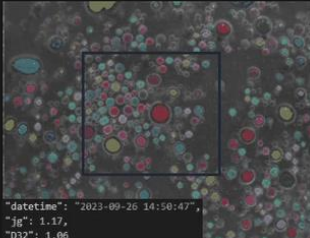
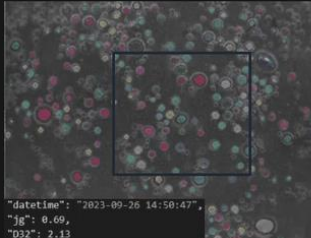
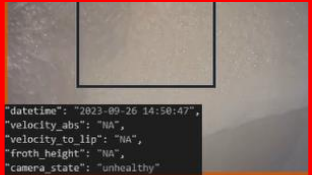
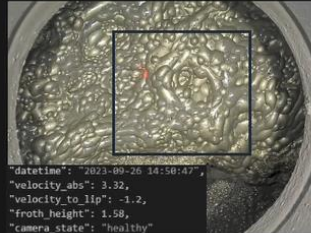


Performance tracking – Shift comparison

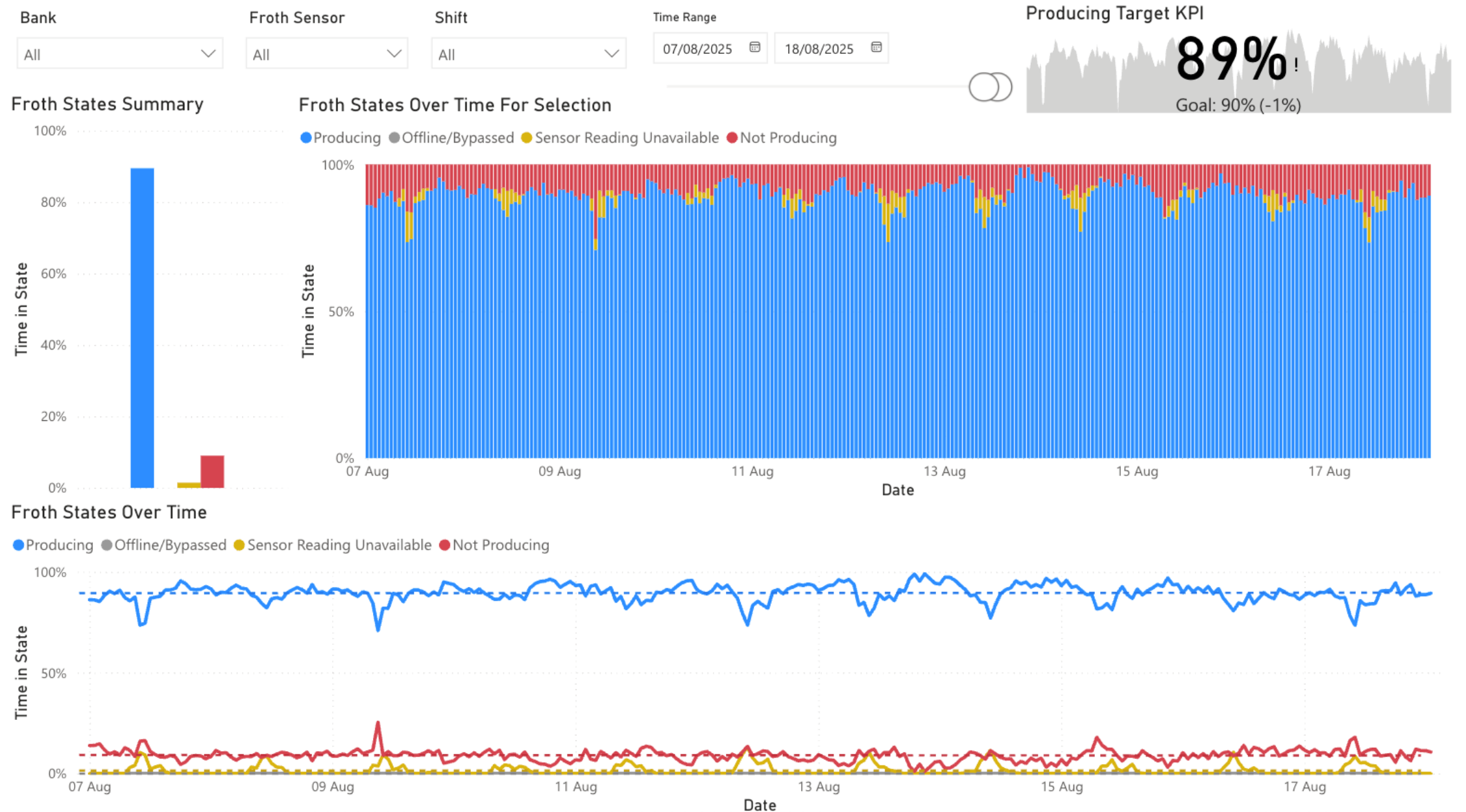


Per bank – sensor drill down



Rougher Froth	R1C1  "datetime": "2023-09-26 14:50:47", "velocity_abs": 22.06, "velocity_to_lip": 18.17, "froth_height": 418.57, "camera_state": "healthy"	R1C2  "datetime": "2023-09-26 14:50:47", "velocity_abs": 14.14, "velocity_to_lip": 16.5, "froth_height": 598.6, "camera_state": "healthy"	R1C3  "datetime": "2023-09-26 14:50:47", "velocity_abs": 14.14, "velocity_to_lip": 16.5, "froth_height": 598.6, "camera_state": "healthy"	R1C4  "datetime": "2023-09-26 14:50:47", "velocity_abs": 34.44, "velocity_to_lip": 23.05, "froth_height": 469.72, "camera_state": "healthy"	R1C5  "datetime": "2023-09-26 14:50:47", "velocity_abs": 22.06, "velocity_to_lip": 18.17, "froth_height": 418.57, "camera_state": "healthy"
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Scavenger Froth	S1C1 CELL NOT PRODUCING  "datetime": "2023-09-26 14:50:47", "velocity_abs": "NA", "velocity_to_lip": "NA", "froth_height": "NA", "camera_state": "unhealthy"	S1C2  "datetime": "2023-09-26 14:50:47", "velocity_abs": 34.44, "velocity_to_lip": 16.5, "froth_height": 469.72, "camera_state": "healthy"	S1C3 CELL NOT PRODUCING  "datetime": "2023-09-26 14:50:47", "velocity_abs": 14.14, "velocity_to_lip": 16.5, "froth_height": 598.6, "camera_state": "healthy"	S1C4  "datetime": "2023-09-26 14:50:47", "velocity_abs": 14.14, "velocity_to_lip": 16.5, "froth_height": 598.6, "camera_state": "healthy"	S1C5  "datetime": "2023-09-26 14:50:47", "velocity_abs": 14.14, "velocity_to_lip": 16.5, "froth_height": 598.6, "camera_state": "healthy"
	C1C1  "datetime": "2023-09-26 14:50:47", "velocity_abs": 34.44, "velocity_to_lip": 23.05, "froth_height": 469.72, "camera_state": "healthy"	C1C2 CELL NOT PRODUCING  "datetime": "2023-09-26 14:50:47", "velocity_abs": 3.32, "velocity_to_lip": -1.2, "froth_height": 1.58, "camera_state": "healthy"	C1C3  "datetime": "2023-09-26 14:50:47", "velocity_abs": 14.14, "velocity_to_lip": 16.5, "froth_height": 598.6, "camera_state": "healthy"	C1C4 CELL NOT PRODUCING  "datetime": "2023-09-26 14:50:47", "velocity_abs": "NA", "velocity_to_lip": "NA", "froth_height": "NA", "camera_state": "unhealthy"	C1C5  "datetime": "2023-09-26 14:50:47", "velocity_abs": 3.32, "velocity_to_lip": -1.2, "froth_height": 1.58, "camera_state": "healthy"

Performance tracking – producing over time



Performance tracking – Shift comparison

Bank

All

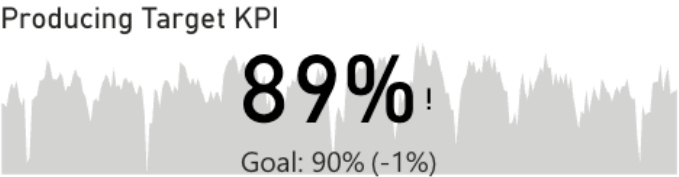
Froth Sensor

All

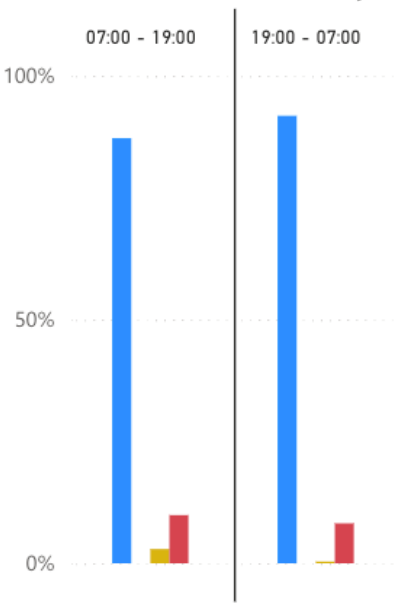
Time Range

07/08/2025

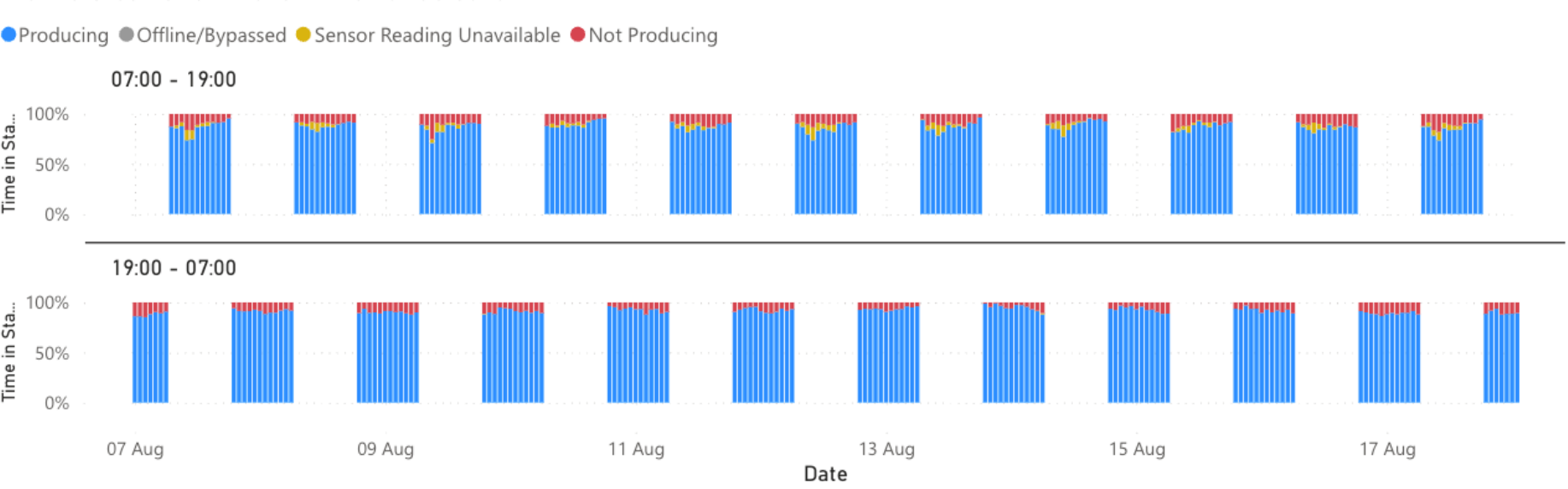
18/08/2025



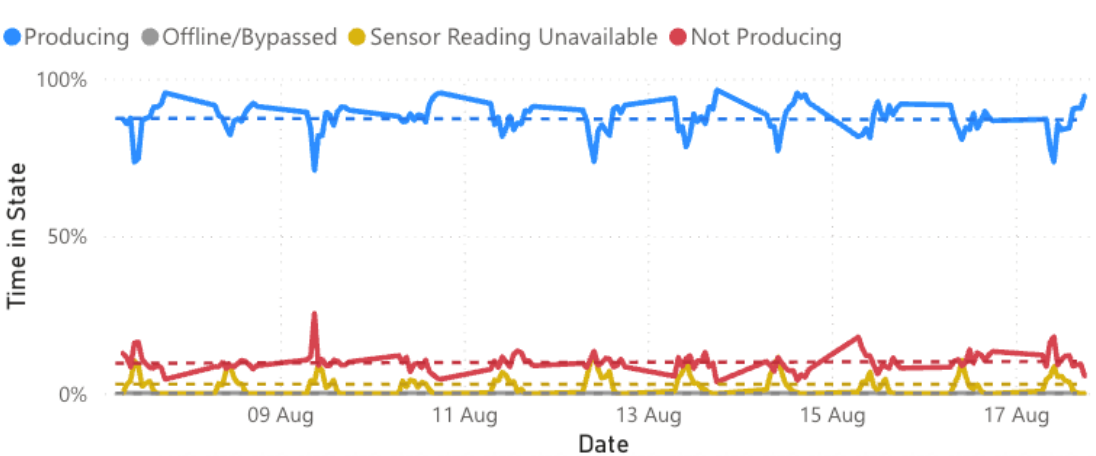
Froth States Shift Summary



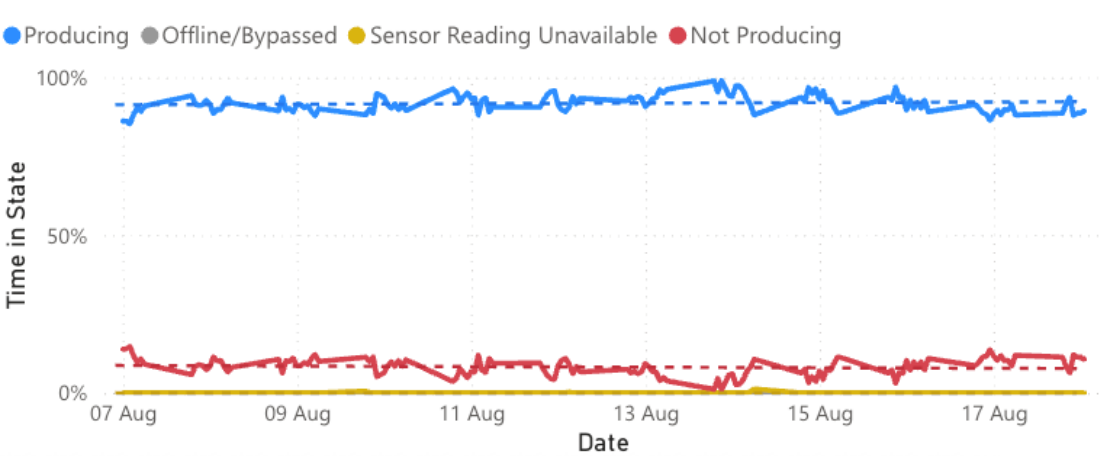
Froth States Per Shift Over Time For Selection



Froth States Over Time (07:00 - 19:00)



Froth States Over Time (19:00 - 07:00)



Per bank – sensor drill down

Bank

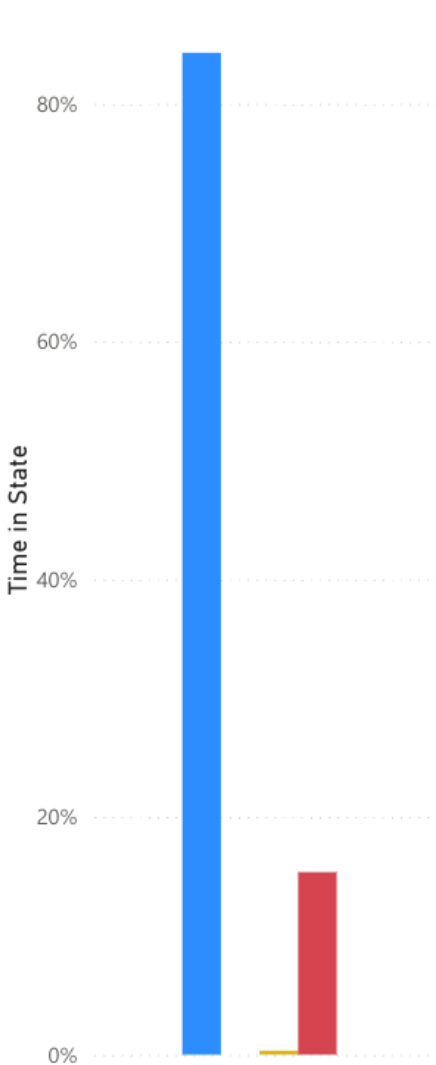
Rougher Scavenger Line 2

Time Range

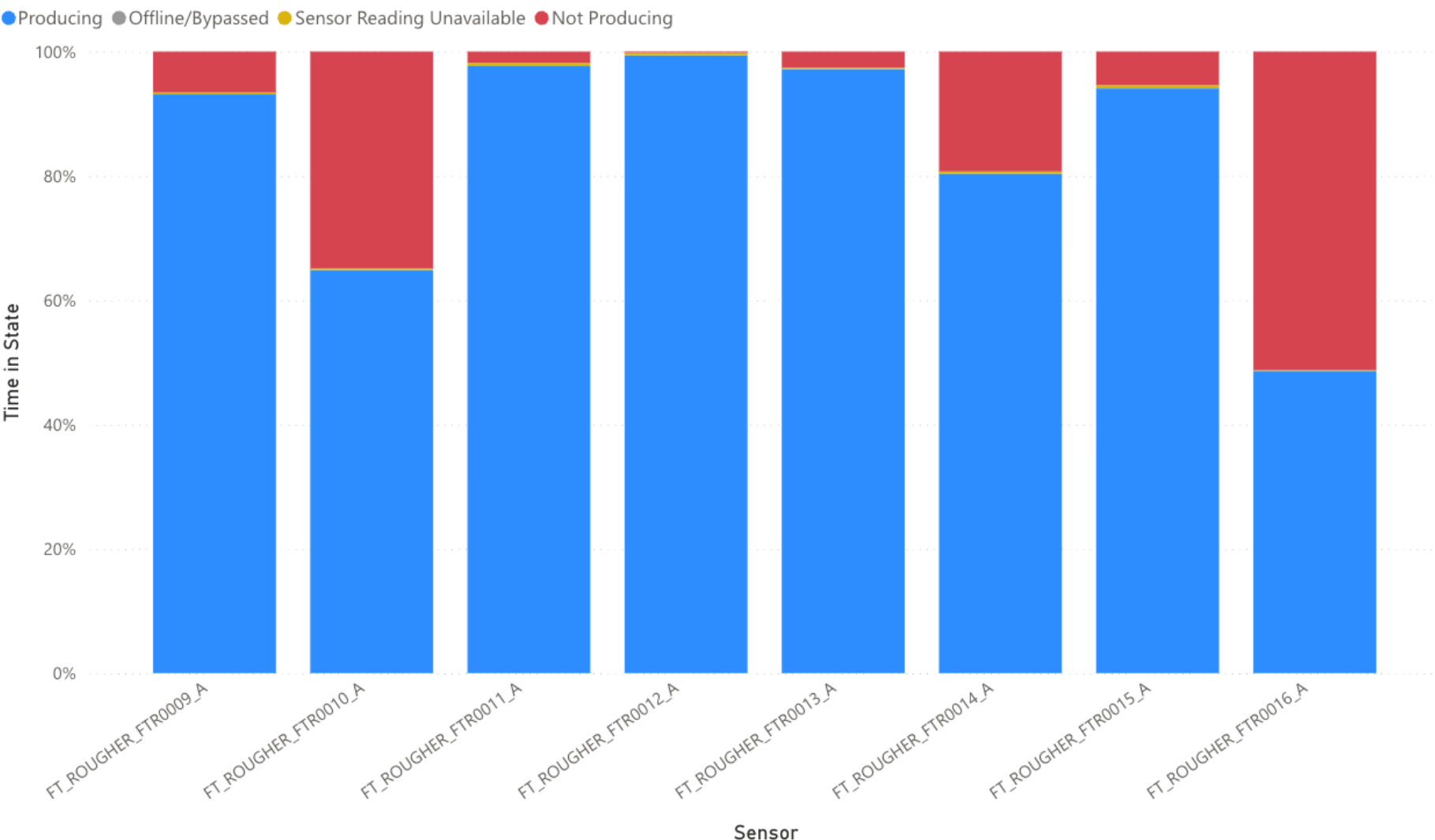
31/07/2025

18/08/2025

Froth States Summary



Froth States Summary Per Sensor For Selected Bank





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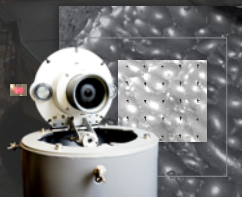
Conveyor

Volume



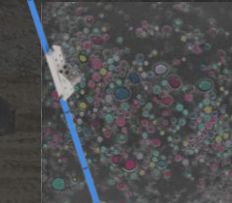
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Velocity | Height | Stability |
Bubble Size & Color



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J_g | Bubble Size | Gas-
Holdup



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Slurry XRF Analyzer



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Automated
Actions

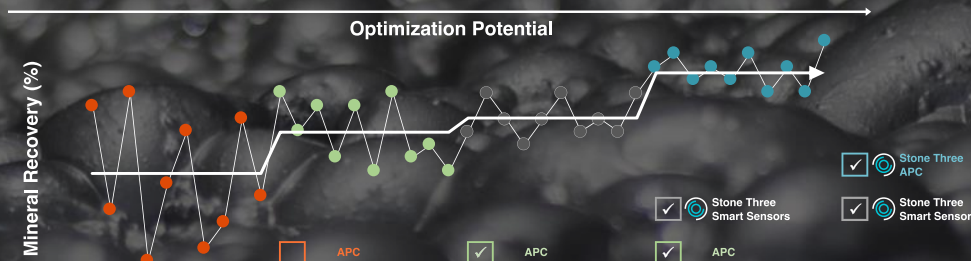
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