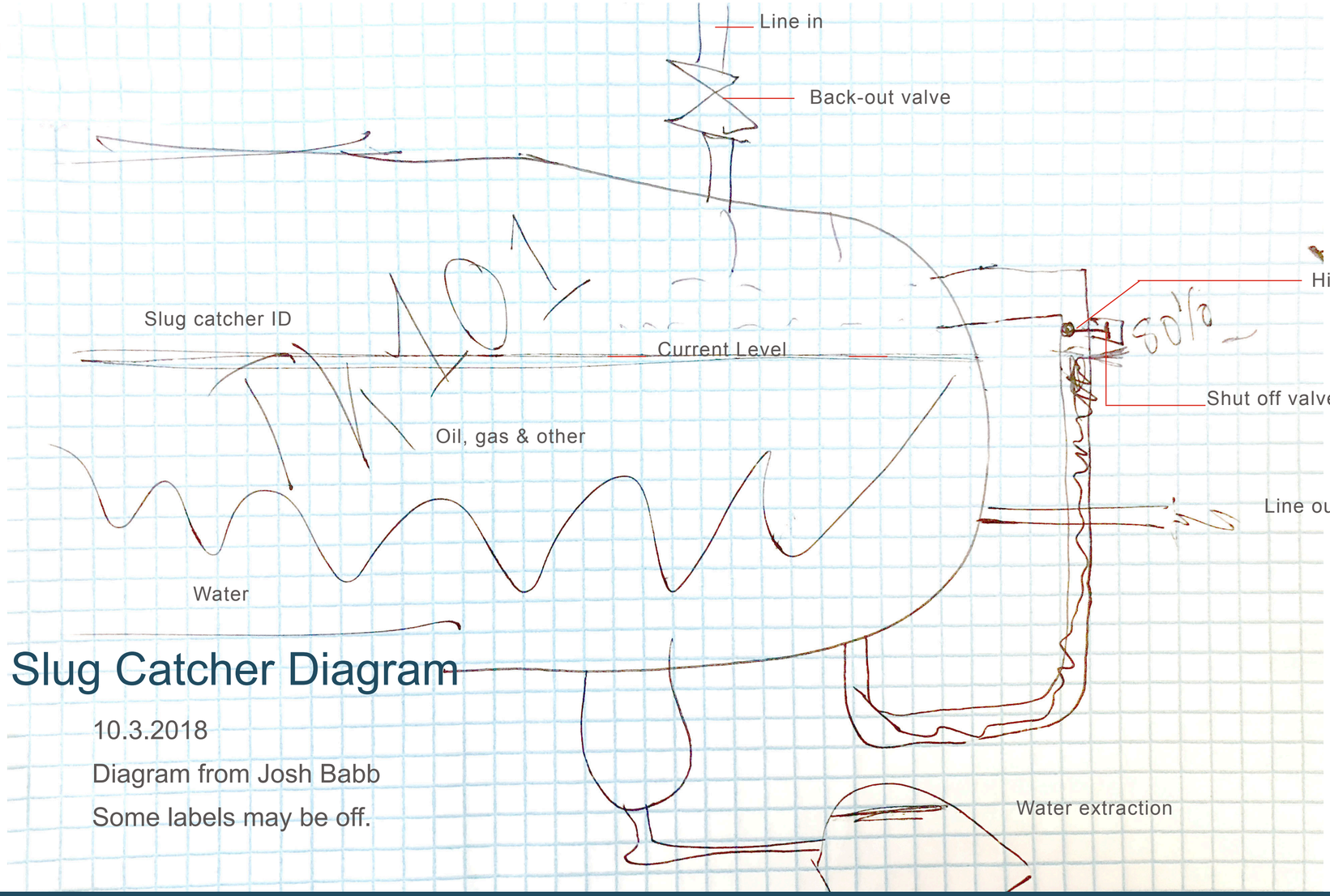


Slug Catcher Diagram

10.3.2018

Diagram from Josh Babb

Some labels may be off.

USER EXPERIENCE

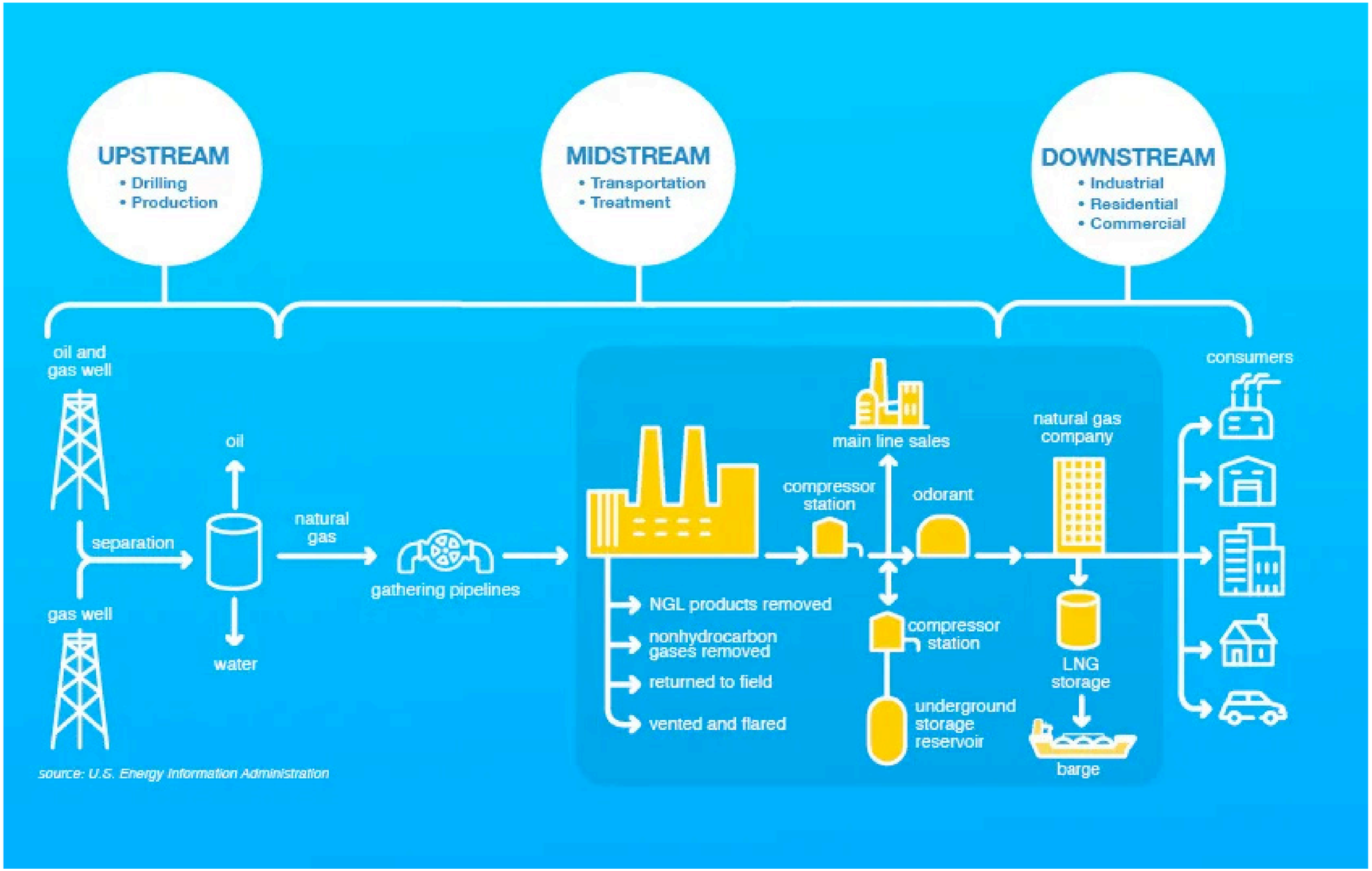
Slug Catcher Data MVP (Pigging)

Findings for MVP

Terms: Midstream

Midstream companies process and move natural gas and oil to downstream markets, by processing, transporting and storing the product.

- **Pipelines**
- **Processing plants**
- **Storage facilities.**



Terms: Slug Catcher

- A tank that holds condensate
- First piece of equipment before processing facility
- Bulk gas-liquid separation.
- Form of risk management.

Terms: PIG/PIGGING

“Pigging” a process used to clean the sides of a pipeline. It allows the passage of gas products to more efficiently travel down the pipe to the processing facility.

A **“slug”** is an uneven collection of liquid gas and solids in a pipeline. It is gas products, water, dirt, sludge, grease, etc.

Anything that comes up from the well.

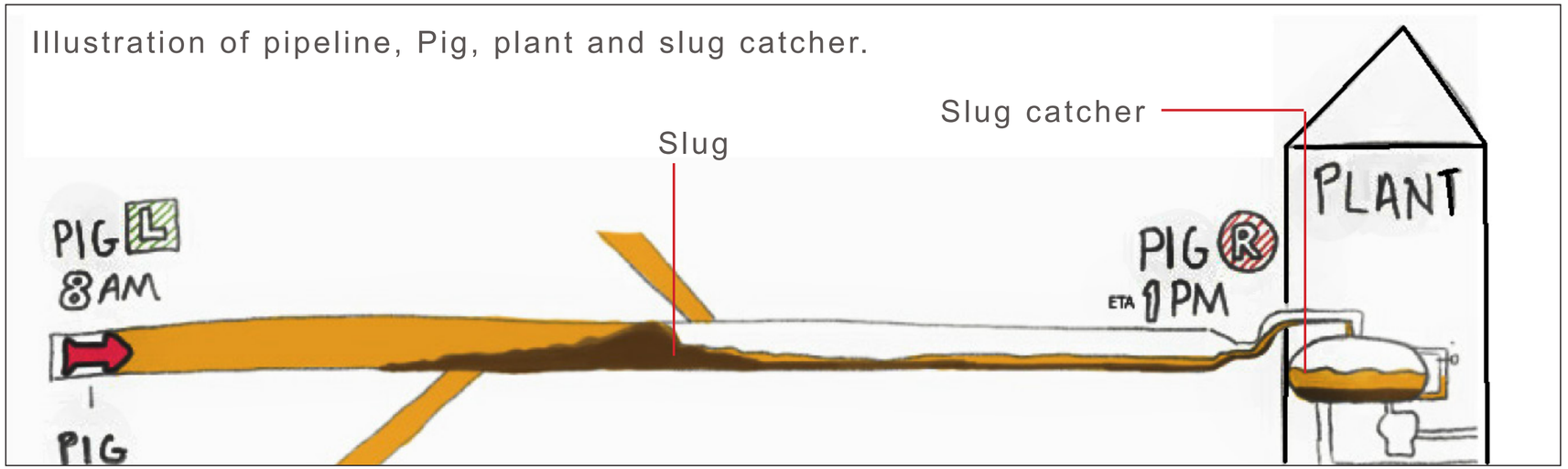


Illustration of pipeline, Pig, plant and slug catcher.

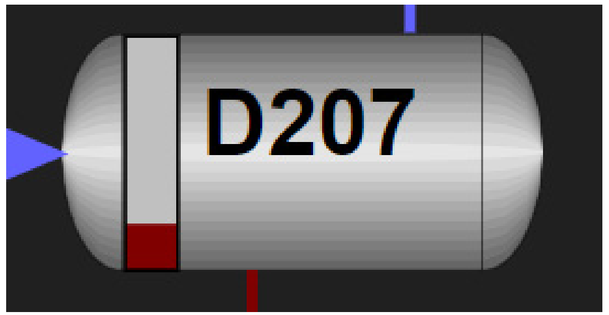

Billy Ops, putting Pig in pipeline


Billy Ops, Pig and me

Goal: Slug catcher tank visualization

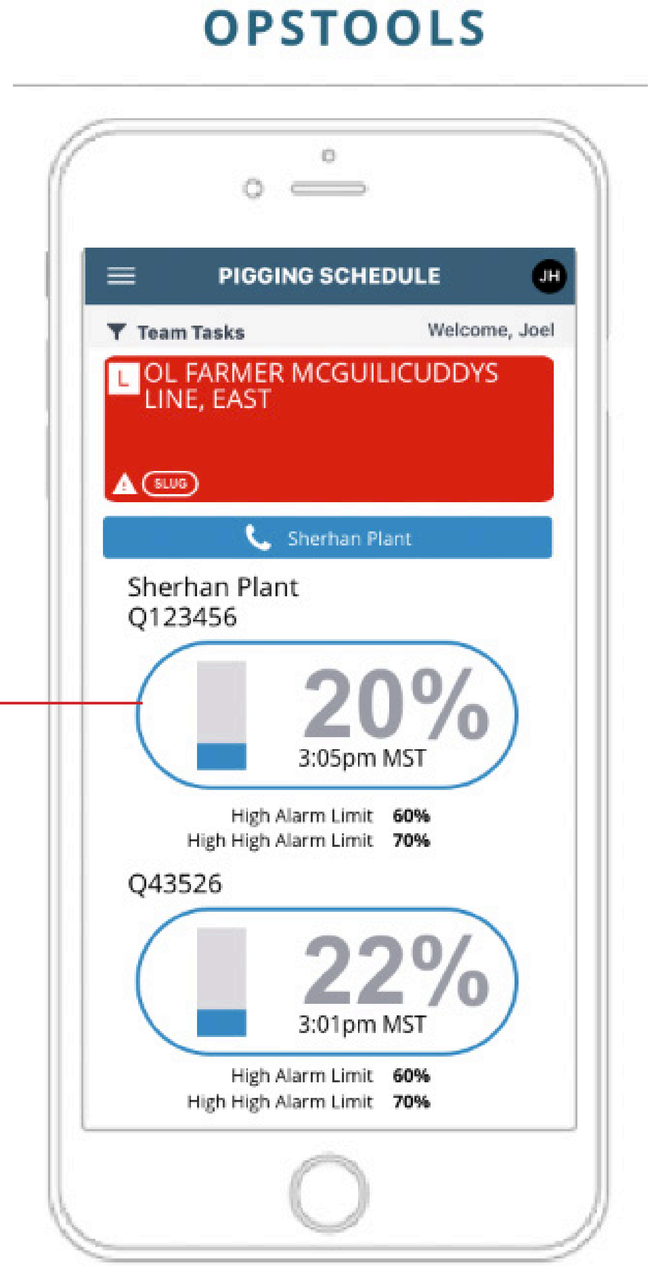
For Field OPS

Developed a real-time UI component using PI data to visualize slug catcher capacity, providing operators with immediate visibility into tank room availability for incoming liquids.



Slug Catcher capacity from PI

Slug catcher in OPS Tools showing slug catcher capacity



Additional support: Slug catcher tank visualization

For Plant Manager

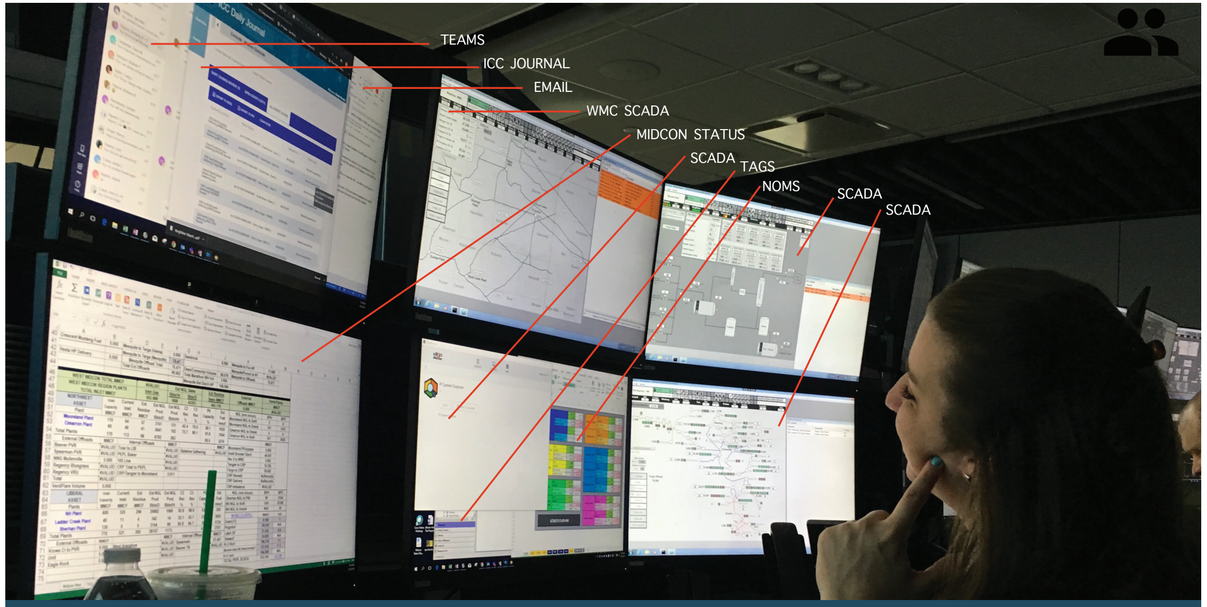
By mirroring mobile data on a new desktop dashboard, we also synchronized the feedback loop between operators and management.

This transparency validates on-the-ground pigging decisions and equips managers with real-time capacity metrics for proactive operational planning.

Slug catcher tank visualization

For Gas Controller

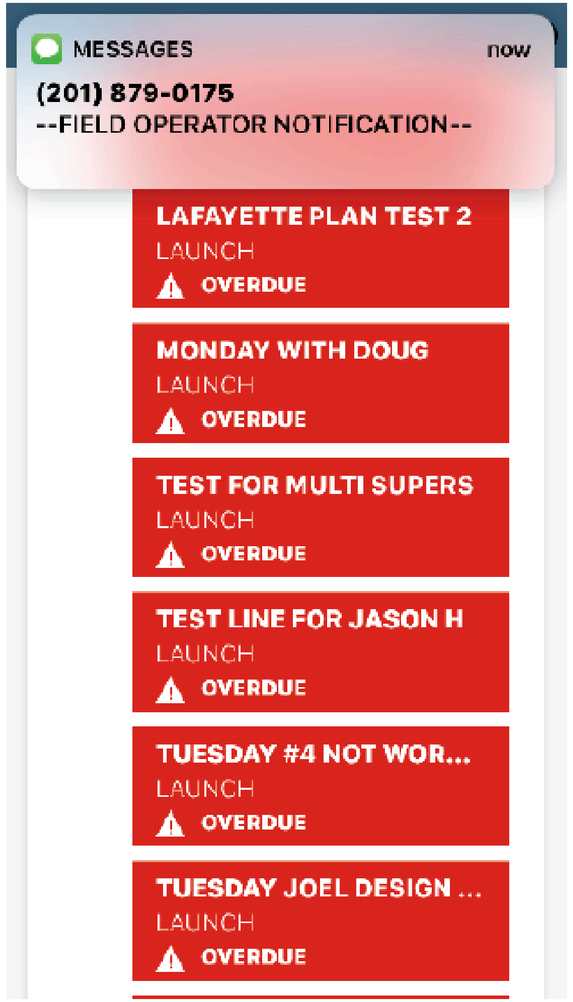
Upon pig launch submission, the system triggers automated text notifications to provide gas controllers with a real-time feed of events. This proactive loop synchronizes operations, preventing liquid surges and protecting plant infrastructure.



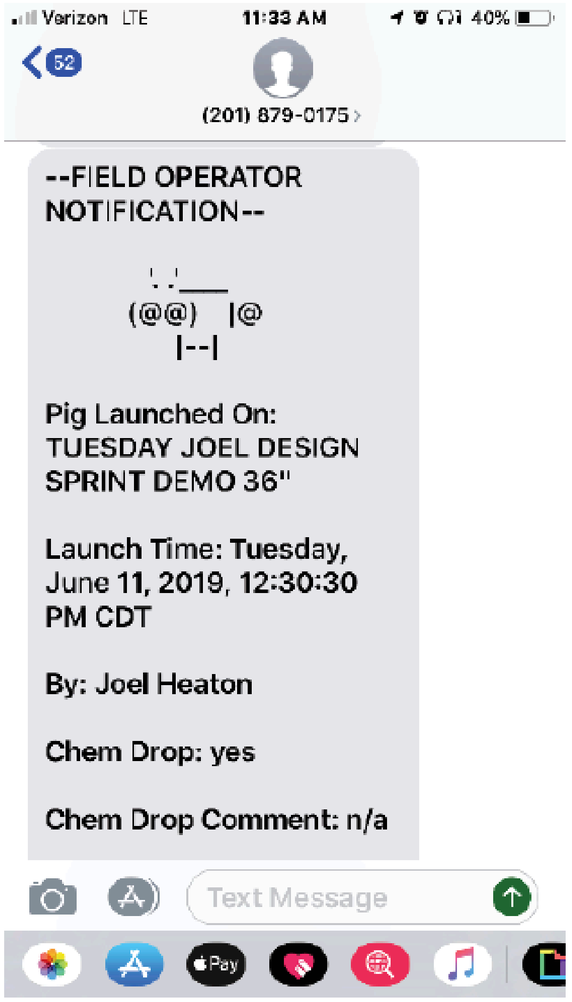
This is a Gas Controller

Allowing the Gas Controller to step away from the 10 applications on 6 screens was desired to “get out of the pipeline” and act on a text message.

Notification from PIG launch into the pipleine



ASCII message that would always hit the Gas Controller so as they were aware of PIG in pipeline



Why?

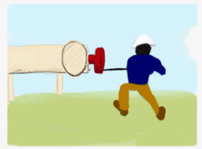
Engineered a unified real-time interface to eliminate blind operations, using data-backed capacity monitoring to prevent liquid surges.

Developed a QR code POC to digitize launch events, leveraging gamification to geo-locate pig entry and retrieval points.

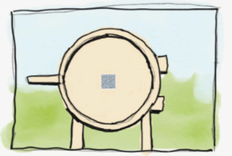
Championed a vision for a connected pipeline ecosystem years before RFID, IoT, and remote data monitoring became industry-standard or cost-effective.

Evangelized these early initiatives to build the strategic foundation for transitioning manual field activities into a proactive, tech-driven network.

Designed an early-stage POC to automate pigging workflows, proving the feasibility of QR-based tracking and real-time user alerts before such technologies were widely adopted.

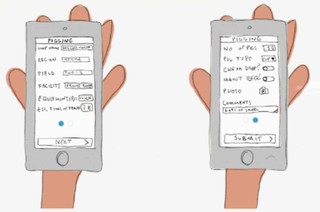


He launches the pig and closes the door.

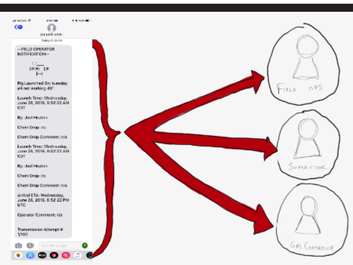


He notices the QR code on the door.

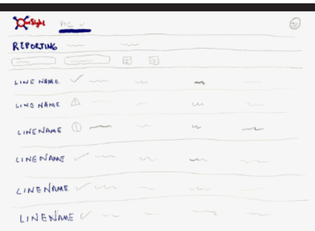
He scans the QR code.



He reviews the launch details and all maintenance tasks.



All users receive text messages for the Launch



The data is pushed through to reporting where users may reference as needed.

The User

Who

Primary:

Field Operator (Ops Tools)

Plant Supervisor (OneSight/Pigging)

Secondary:

Gas Controller - 24/7 pipeline monitor, dispatch (OneSight/SCADA/PI)

Executive management - Compliance Efficiency of Pigging Initiatives

“The Field Operator or launch operator must communicate the launch. The Plant Ops and Supervisiors “Must” know a pig is on the way.”

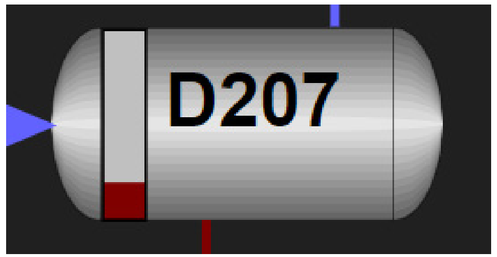
“Its go time, because if that tank is at 60% capacity 700k gallons will flood the plant! Period.”

“The operator needs to know, Is it safe?, can I send it?, is there room in the tank?”

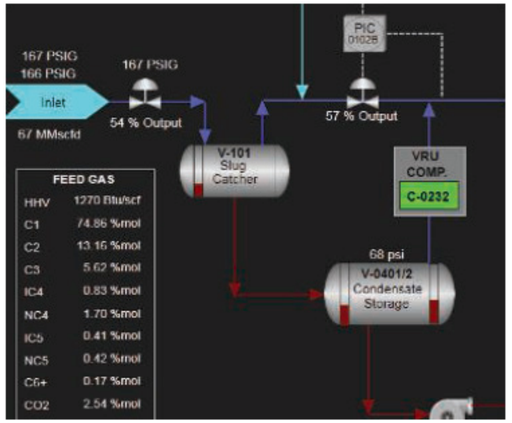
“The plant needs to handle the condensate and everything coming down the pipe”

The Complex Ecosystem (Process)

To prevent catastrophic flooding, I distilled complex SCADA and PI System metrics into a single, actionable capacity percentage. This simplified a high-stakes ecosystem by translating raw sensor data into immediate situational awareness—giving field operators the ‘go/no-go’ clarity needed to initiate pigging operations safely or trigger emergency rerouting via integrated alerts.



Slug Catcher capacity from PI



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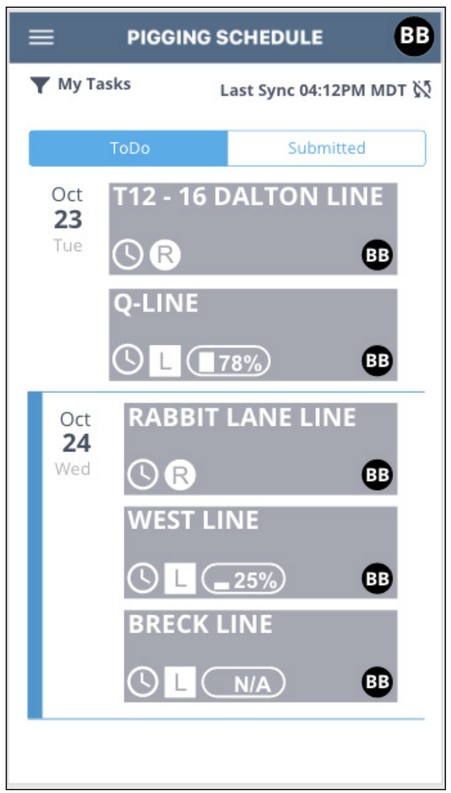
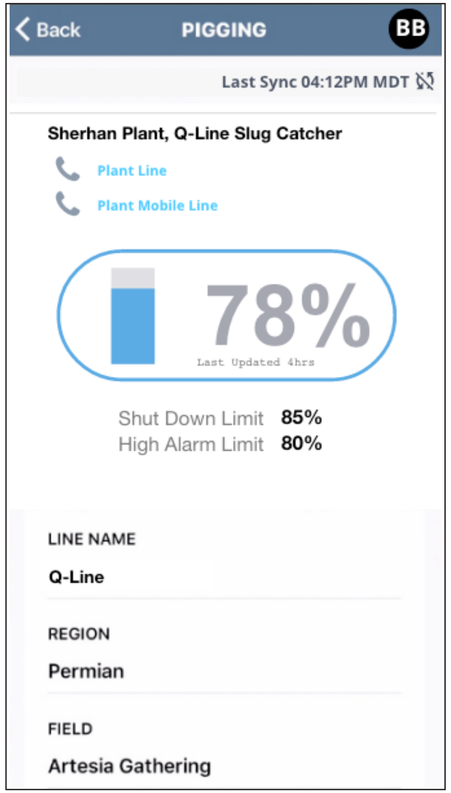
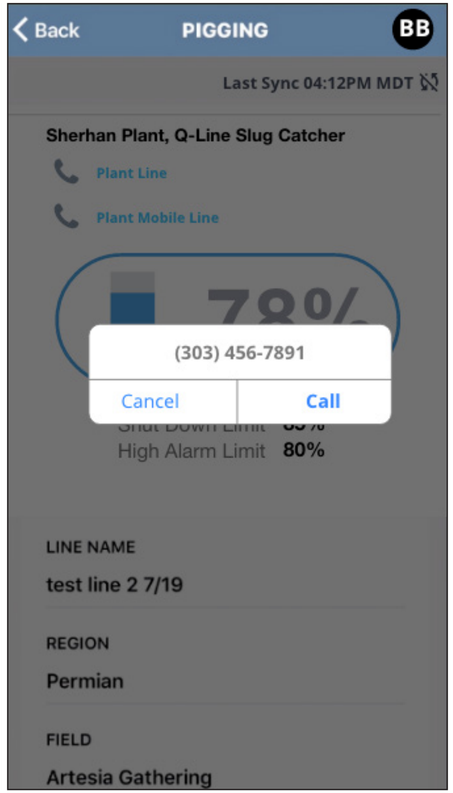






Conversation with Supervisor and Plant.

Iterative Design & Prototypes

Curent experience

1. **Pig Launch:** Operators initiate the pigging process, sending an unmonitored liquid slug toward the Sherhan Plant.
2. **Fragmented Communication:** Coordination relies on manual, “noisy” workflows—including paper logs, clipboards, and verbal handoffs—that fail to provide a single source of truth.
3. **Operational Visibility Gap:** Legacy regional technology and inconsistent scheduling leave the plant “flying blind,” creating a high-risk environment prone to flooding and shutdowns.

Key takeaway

This fragmented process is unsustainable: the lack of data-backed visibility and reliance on manual communication has proven unsuccessful, leading to disorganized workflows and high-stakes operational risks.

New experience

1. **Precision Launch:** Operators leverage real-time tank capacity data to confirm “Go/No-Go” status before initiating any pigging operation.
2. **Unified Communication:** Manual “noise” is replaced by a centralized UI component, synchronizing Field Ops, Plant Managers, and Gas Control through a single source of truth.
3. **Total Situational Awareness:** Integrated text alerts and desktop/mobile visibility eliminate the “flying blind” risk, ensuring the plant is prepared for every delivery and protected from flooding.

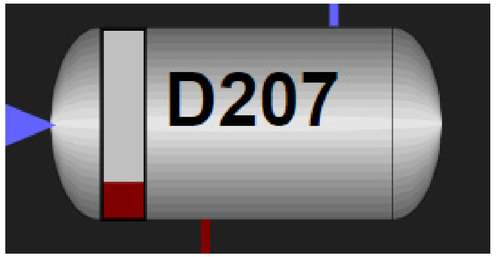
Key takeaway

Key Requirement: Implement a unified ecosystem that harvests real-time metrics from all IoT and tank-level devices immediately.

Systems Integration: Seamlessly bridge these field devices with PI and SCADA to eliminate data silos.

Single Source of Truth: Establish a live, interconnected network that synchronizes every device and user, ensuring total situational awareness across the entire operation.

Validation (The “Aha!” Moment)



Slug Catcher capacity from PI

“This is perfect! It lets the field know... they feel my pain.”

“Same as PI a diagram that shows the tank capacity in %, showing how much was in there and how much space there was.”

Technical Requirements

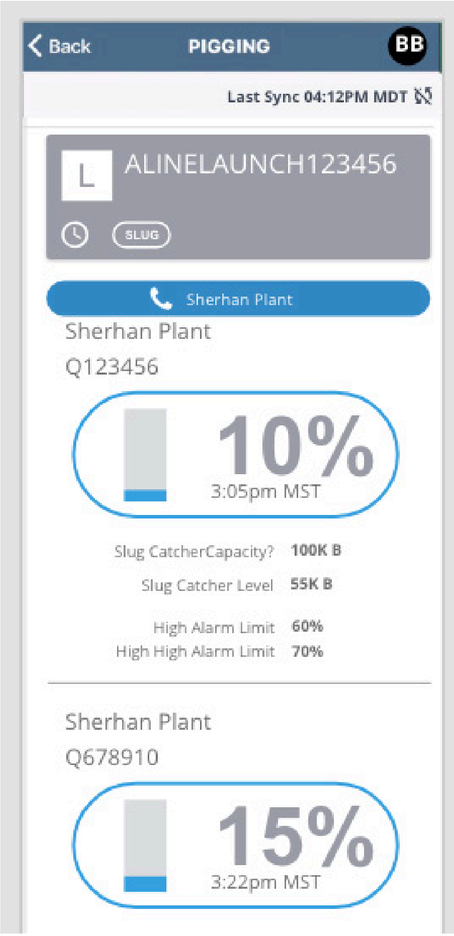
IoT Integration: Retrofit older tanks with IoT sensing units to bring legacy infrastructure into the real-time ecosystem.

Standardized Metrics: Display Slug Catcher levels by percentage to provide universal “at-a-glance” capacity awareness.

Critical Safety Logic: Implement “High-High” alarm limits; note that currently only 50% of units support this, requiring a strategic investment in additional IoT hardware.

System Mapping: Identify and integrate unique Equipment IDs for all slug catchers into SCADA for centralized tracking.

The Road Ahead: Bridging the Communication Gap



Historically, a total breakdown in communication has been the primary driver of pig-related flooding. Operators lacked a consistent method to announce launches, leaving plant personnel unaware that 798,000 gallons of liquid were surging toward them. Simultaneously, Gas Controllers and NOC technicians were forced to react to pressure spikes and line surges without any prior warning or context.

"We are constantly calling, sending text messages & emails and digging for information… Its a very active relationship… They trust us, and we have a good relationship but communication may be lacking. We have to ask them if pigs are launched… it's 50/50, some guys call… and tell us issues."

The Road Ahead: Bridging the Communication Gap

To transform this UI concept into a production-ready reality and eliminate these “blind” operations, we must:

- **Bridge the Hardware Gap:** Retrofit legacy assets with IoT devices to bring 100% of slug catchers into the digital ecosystem.
- **Integrate the Data Loop:** Map unique Equipment IDs and pipe segments directly into PI and SCADA to ensure metrics are accurate and synchronized.
- **Establish a Single Source of Truth:** Replace fragmented texts and word-of-mouth with a real-time dashboard that connects every user—from the field to the NOC—in one accountable system.
- **Prioritize Accountability:** Build a centralized scheduling and notification framework where every pig launch is visible, tracked, and confirmed by all stakeholders.

The Bottom Line

By equipping our remaining assets with modern sensors and unifying the data stream, we replace chaotic guesswork with absolute situational awareness. This investment ensures that safety, efficiency, and plant integrity are never compromised by a missed phone call or an unmonitored tank.