

Digital SOP simulation to improve operational & procedural integrity

Voovio Technologies @ PSCongres

Dordrecht

13th Mai 2026, Dordrecht

Susanna Voges

Closing knowledge and skills gaps in Operations.

Processes

Automatically performed by assets



Asset



Frontline



Procedures

Human-asset interaction

Operations

Where the frontline meets the asset

Why does operator competency matter for operational integrity?



Onboarding



Knowledge
Capture / Transfer



Scarce SMEs



Procedure
Clarity



Unplanned Equipment
Downtime



Quality
Issues



Environmental
Events



Safety
Incidents

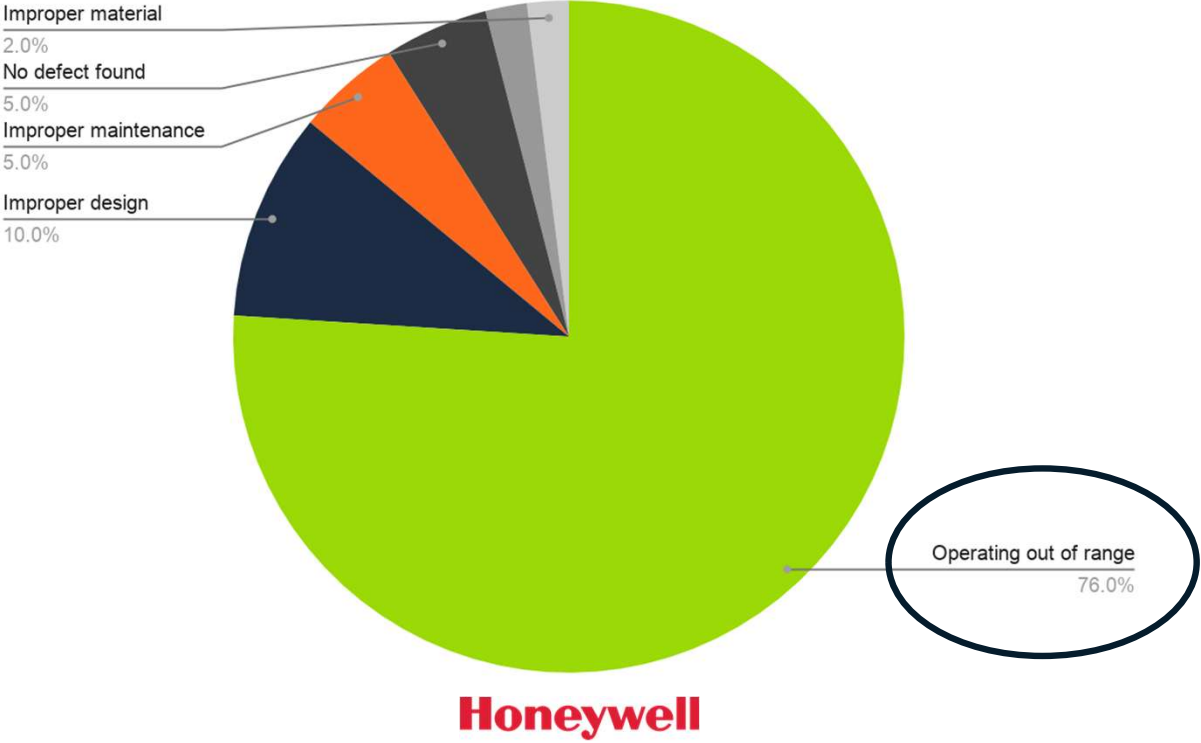
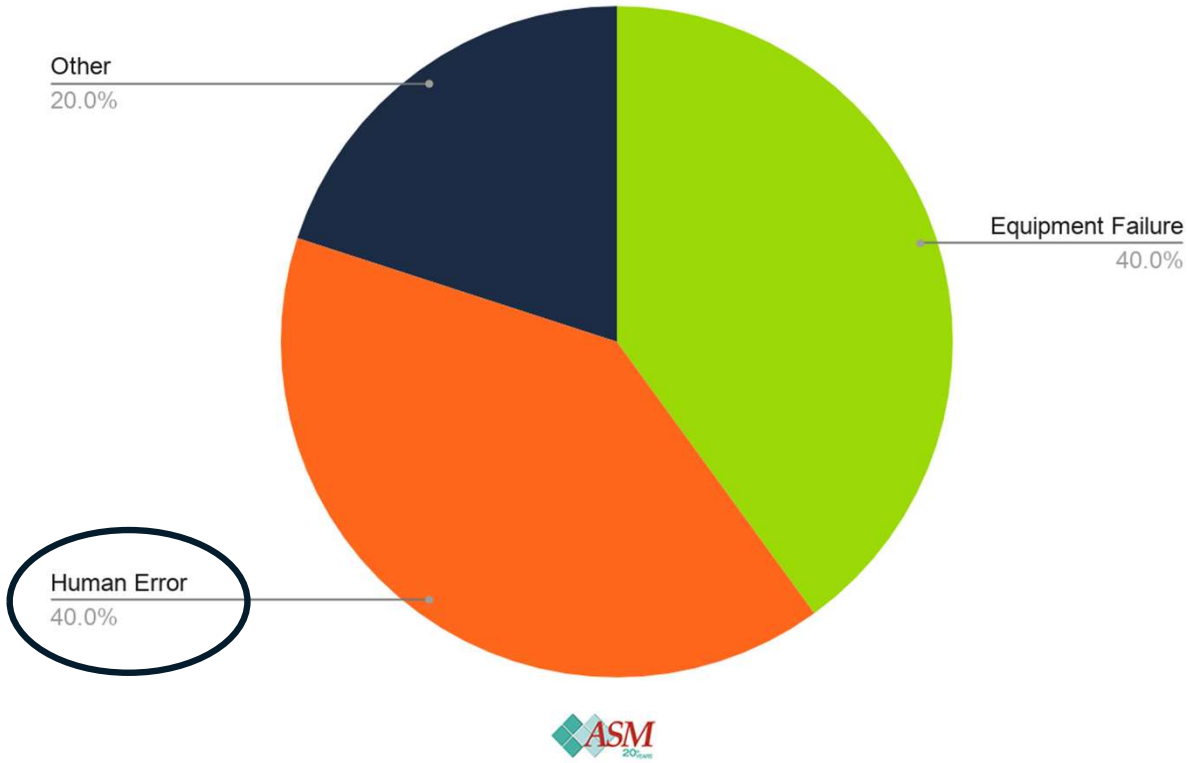
Human Reliability & Procedure Quality are major contributors to process upsets & equipment failure.



Causes of Process Upsets

Unplanned Equipment Downtime

Causes of Equipment Failure



The background of the slide is a photograph of an industrial facility, likely an oil or gas processing plant. It features a complex network of white pipes, valves, and machinery. A worker in a red protective suit is visible in the center, standing amidst the equipment. The overall scene is dimly lit, with a blueish-grey tint.

Technology & automation will not solve **human reliability issues.**

“40 - 60% of field operator tasks are not automatable.”

McKinsey
& Company

Procedure Clarity - A very common Example.



Procedure
Clarity

1 step

*Open the non-instrumented fuel gas
cock valves and air dampers.*



10 actions



Also common and very open-ended...



Procedure
Clarity

1 step



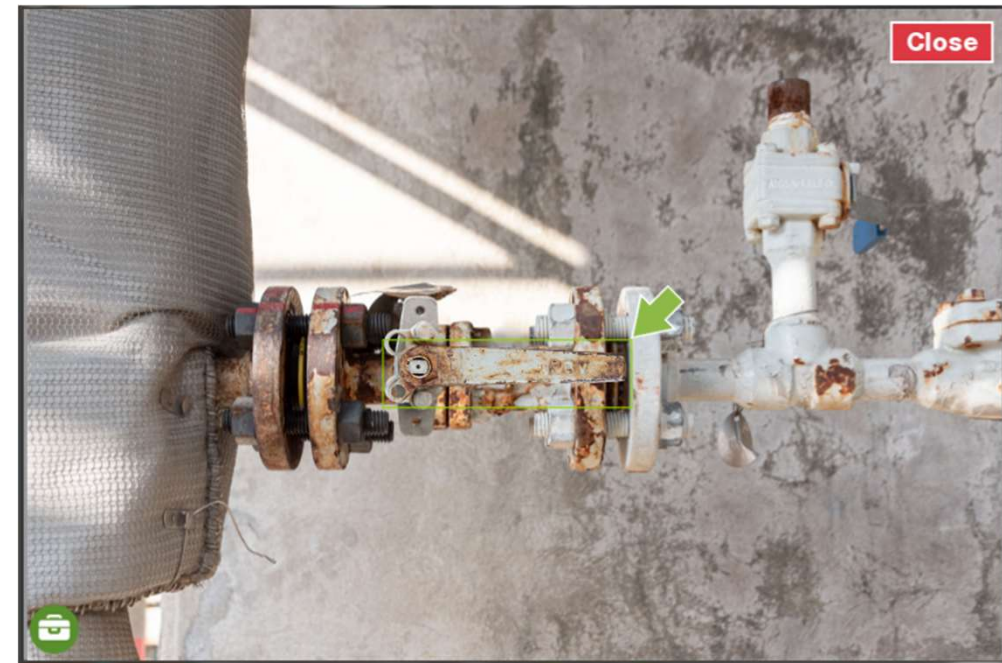
53 actions

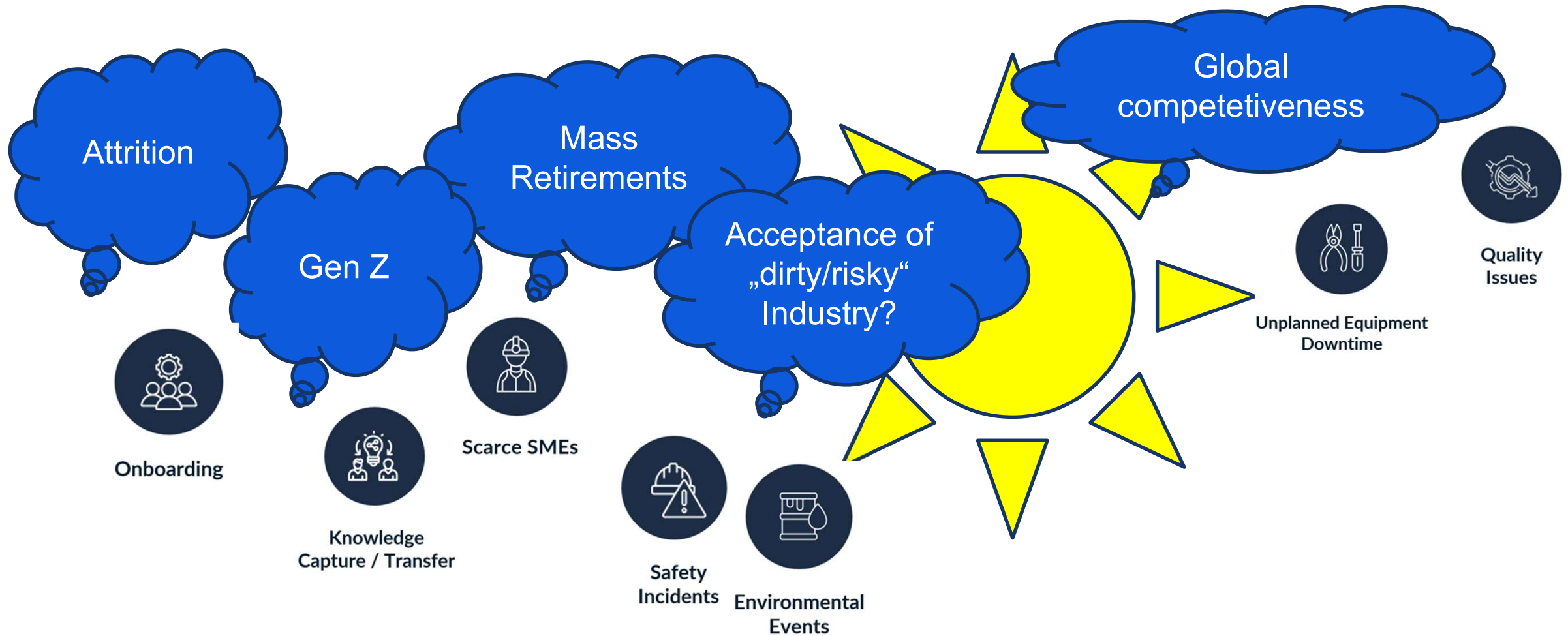
Actuating 15 different valves

MANUALLY FLUSH all CTO's, top/bottom flushes, bypasses around flush flow meters, and any other isolation flush valves

CAUTION

Failure to properly flush all CTOs may result in a reactor poisoning event

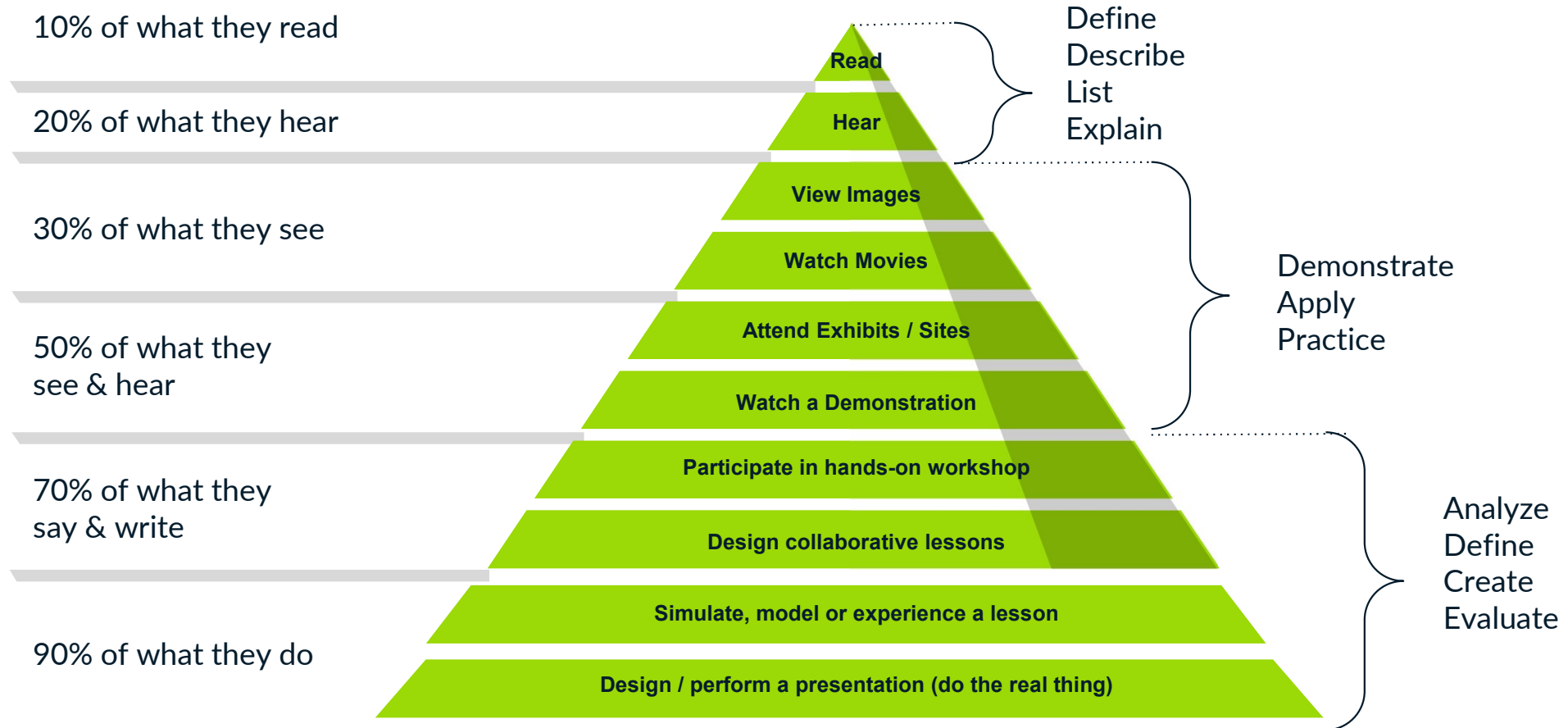




A fundamental upgrade in chemical operator qualification is needed!

The Power of Simulation.

People generally remember...



The Learning Pyramid

Let's see a demo.



YouTube video links:

[Voovio | Solving Manufacturing's Biggest Challenges](#)

[What Voovio customers say about the Skills Gap](#)

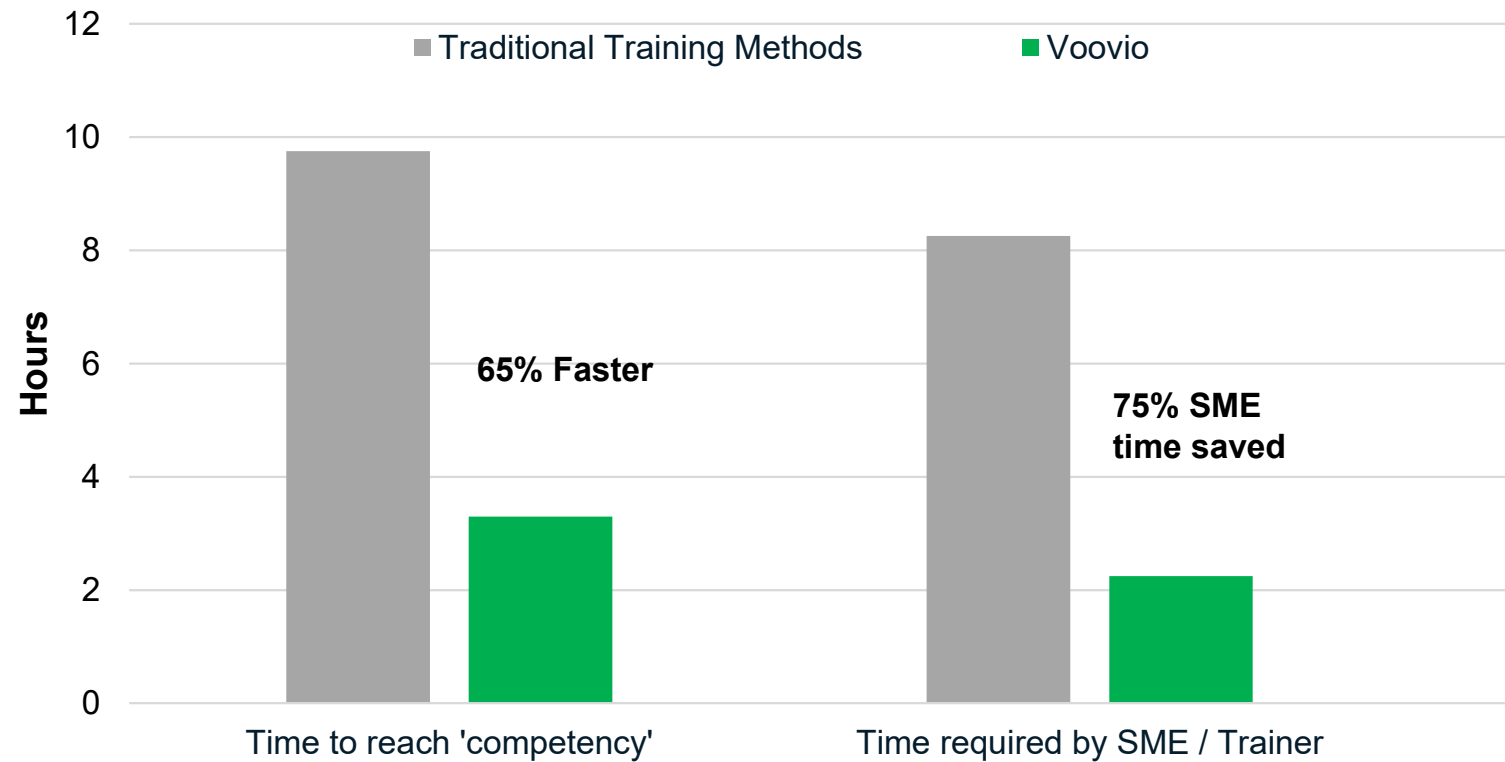
Questions? Visit us at our booth!

The image displays three maps with various company logos and lines indicating booth locations:

- North America Map:** Shows the United States and Canada with state/province abbreviations. Companies listed include: CALUMET, Big West Oil, Formosa Plastics, TESLA, Linde, covestro, GOWAN MILLING, HALLIBURTON, kuraray, LBC, Vopak, Braskem, DOW, yondellbasell, Westlake, PHILLIPS 66, Galcasieu Refining Co., calca solutions, Solstice, Honeywell, Renewable Energy Group, KRATON, BASF, ERGON, سابك (sabic), CLARIANT, PBF Energy, EASTMAN, CRODA, Celanese, East Kansas Agri-Energy, and HF Sinclair.
- Europe Map:** Shows various European countries. Companies listed include: Climax Molybdenum, Braskem, and Westlake Vinnolit.
- Middle East/South America Map:** Shows countries like Saudi Arabia, Iran, Iraq, and Argentina. Companies listed include: Borouge and HALLIBURTON.
- Other Companies:** Tecpetrol is also listed near the South America map.

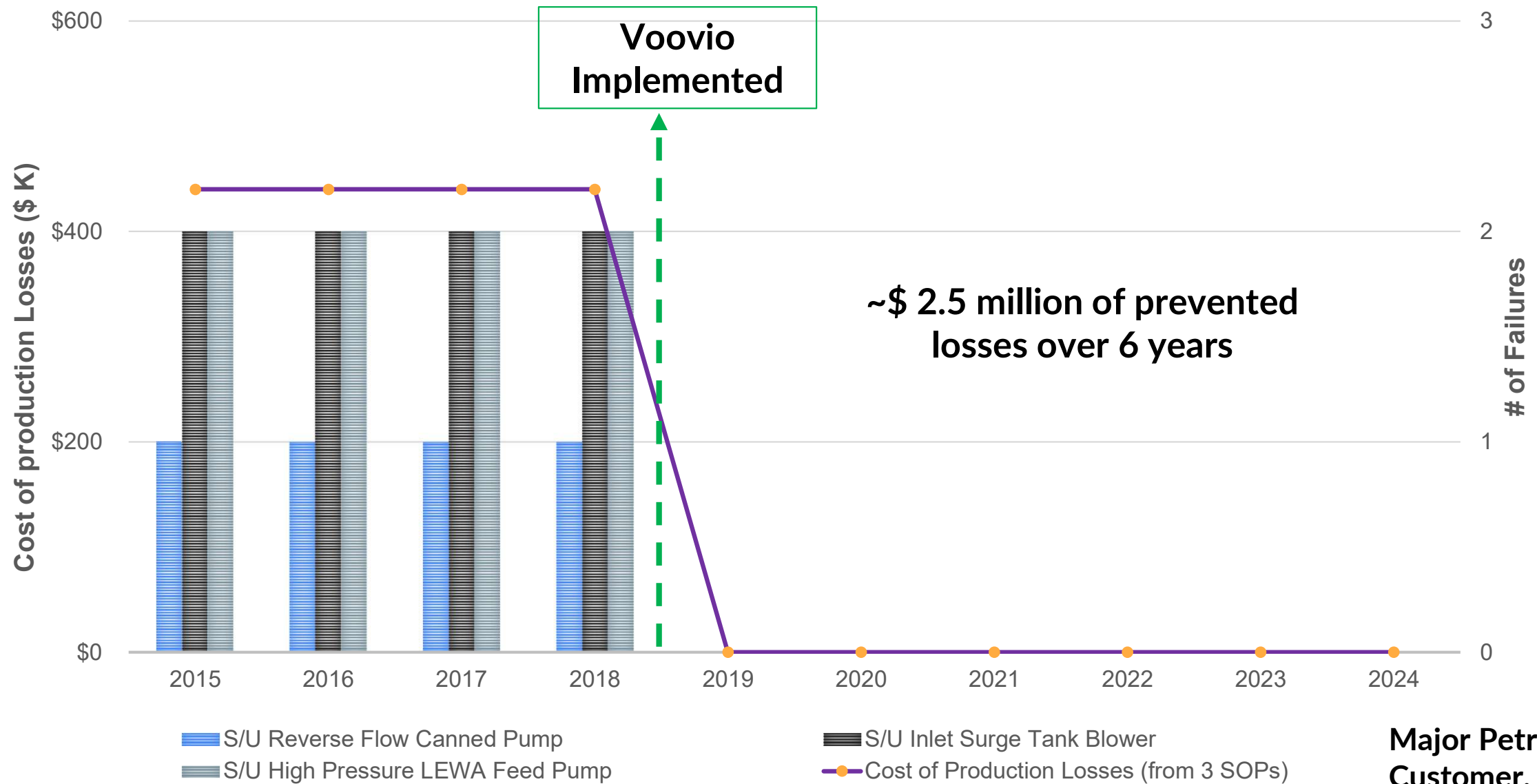
Impact.

Mastering 2 SOPs: Data from controlled evaluation.



- Controlled experiment at major Texas Petrochem facility with input from Rice university, Houston TX – June 2021.
- 24 operators, split into 2 groups, learned 2 SOPs in 2 days. No experience in that production unit prior to exercise.
- Traditional method: classroom, review P&IDs/SOP, field walkthrough
- Voovio method: Voovio Guided/ Learn, field walkthrough

Reduction in human error and production losses.

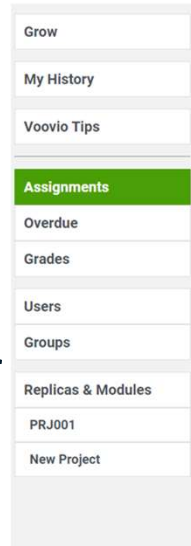


Major Petrochemical Customer, Louisiana



Refinery's Self-Loading Racks Transformed.

- ~150 trucking companies
- ~900 drivers
- Email notification of assignments.
- Practice, learn and take Test via web browser
- Content available 24/7
- Email notifications
- Documented driver records
- Gate access on successful completion of Test



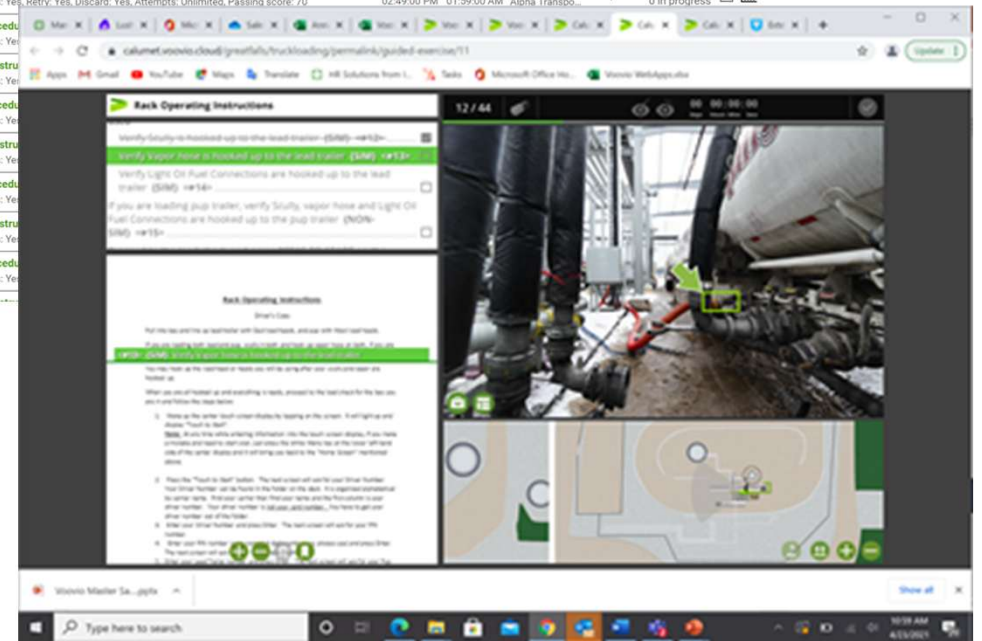
Assignments

New Assignment

Filter Apply Reset

Simulation Module: All Pages: 1 2 3 4

Assignment Information	Start Date	Due Date	Assignees	Status	Progress
Asphalt Rack Procedure and Driver Training Record Tags: No, Shortcuts: Yes, Retry: Yes, Discard: Yes, Attempts: Unlimited, Passing score: 70	04/22/2021, 02:49:00 PM	06/23/2021, 01:59:00 AM	2 Alpha Transpo...	Open	1 completed 0 in progress
Rack Operating Instructions Tags: No, Shortcuts: Yes, Retry: Yes, Discard: Yes, Attempts: Unlimited, Passing score: 70	04/22/2021, 02:49:00 PM	06/23/2021, 01:59:00 AM	2 Alpha Transpo...	Open	1 completed 0 in progress



Refinery – fewer environmental releases.

Site:

- Refinery

Challenge:

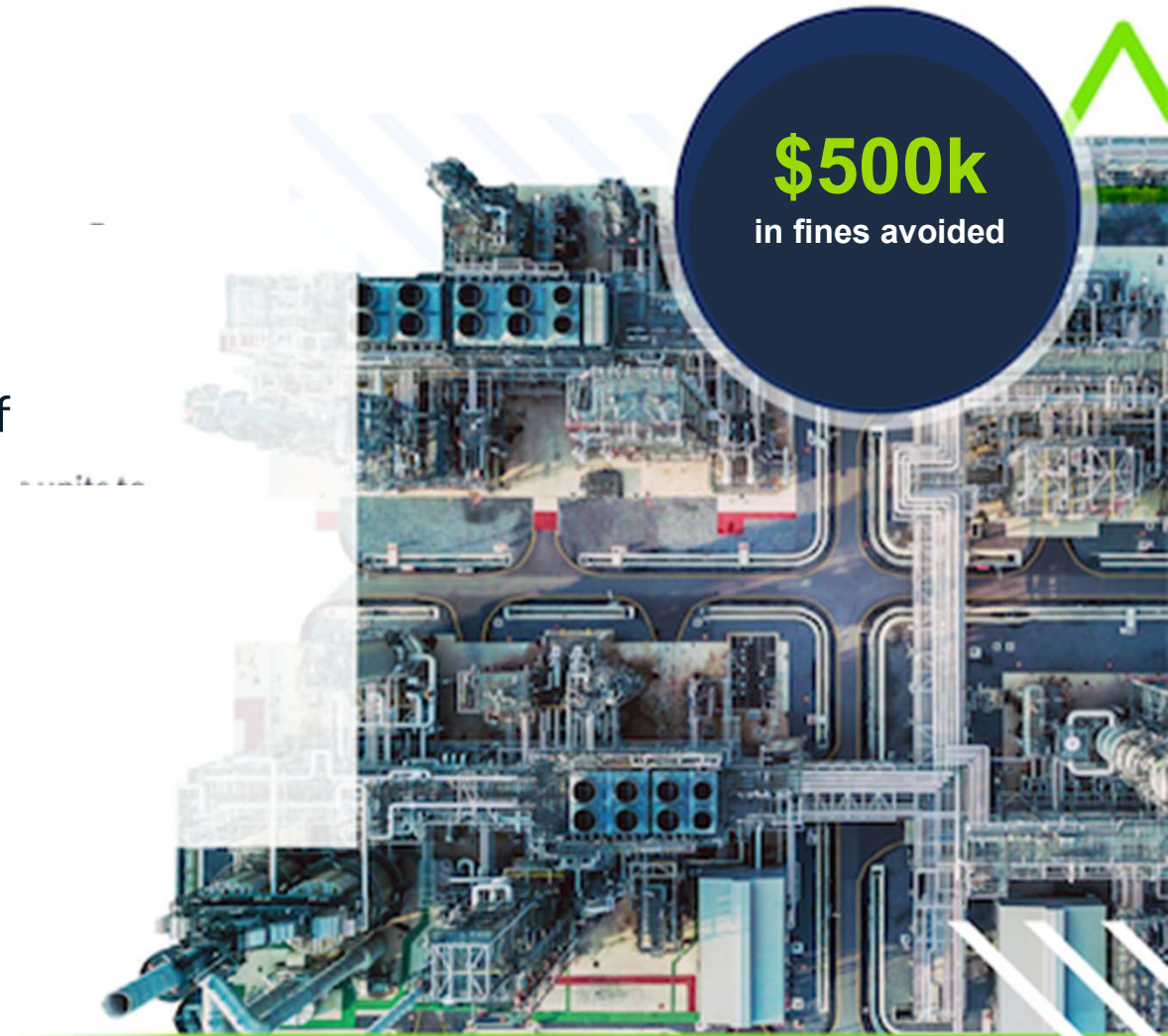
- Eliminate loss of containment of process materials resulting in reportable incidents and regulatory fines
- Procedure generalizations
- Lack of exposure to entire startup procedure and lack of competency

Use of Enhanced Reality/improved clarity:

- Line Walk process to create action checklist clearly defining all release sources
- Practice procedure simulators prior to procedure execution
- Field execution tool

Main ROI contributor:

- Elimination of environmental releases



More familiar with equipment and actions.

Major Refinery

- **Procedure:** Emergency Procedure- Feed Diversion to Hot Standby
- **Comparison:** Operators practiced Voovio simulators vs operators participating in monthly Tabletop exercises.
→ Voovio group demonstrated **70%** more accurate execution during field demonstrations.

Large Petrochemical Facility

- **Procedure:** Startup following weather event
- **Site Issue:** Sister units with similar assets were down due to the 2021 Freeze, 'Storm Uri'.
→ The unit that employed Voovio simulators restarted in a timely manner without issue days ahead of the sister unit.

