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Leveraging Emission Detection for Decarbonization

Ridha BELLAMINE

COP 28 – Dubai, 3rd of December 2023

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FORTIVE

INDUSTRIAL SCIENTIFIC CORPORATION

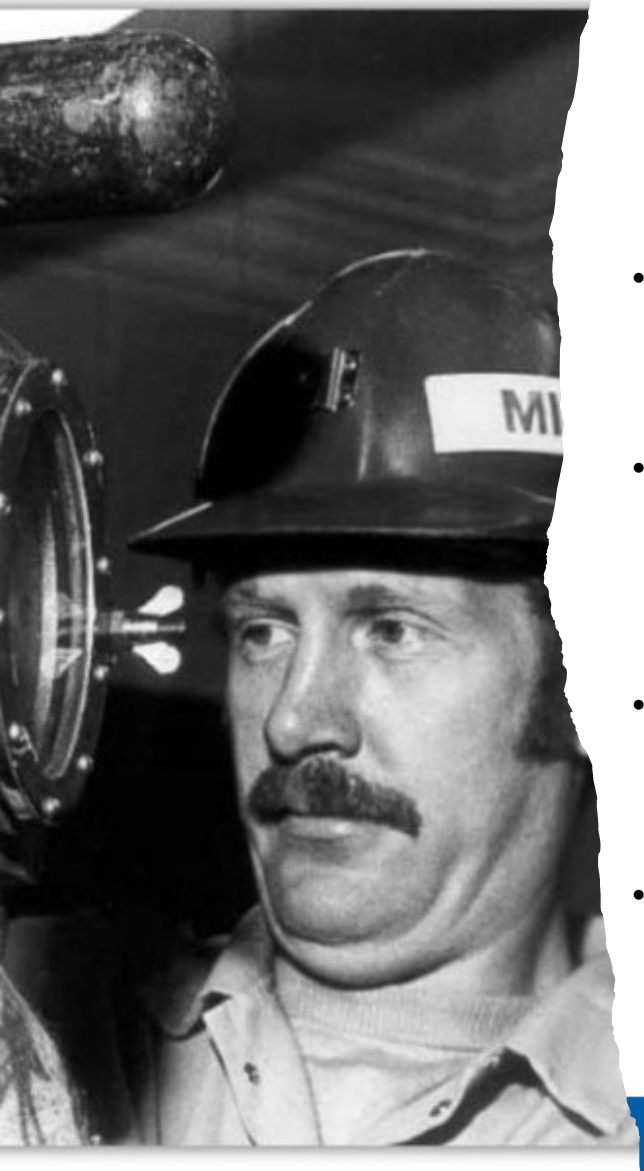
One of **Fortive** Corporation's 20+ operating companies since 2017 (FTV)

- $7B in annual revenue

Global headquarters in Pittsburgh, Pennsylvania, United States

Manufacturing in Pittsburgh (US) and Shanghai (China)

1,200+ global employees



The Evolution of Gas Detection - Canaries

- Canaries were commonly used in coal mines to detect dangerous levels of carbon monoxide and methane gas
- Canaries are more sensitive to these gases than humans and would show symptoms of distress before the gas levels became dangerous for humans
- Miners would keep a canary in a cage and if the bird died or became sick, they knew to evacuate the mine immediately
- The phrase "canary in a coal mine" originates from this practice, meaning an early warning of potential danger

The Evolution of Gas Detection – Flame Lamp

- The next type of gas detection used in mines was the flame light
- The Davy lamp is a safety lamp for use in flammable atmospheres, invented in 1815 by Sir Humphry Davy
- One benefit of using a flame light was that it provided light, enabling miners to see in the mine
- The flame was encapsulated in a flame-arrestor shell, so it couldn't ignite the outside atmosphere
- A glass piece on the outside of the flame light had three incisions running horizontally along it
- Miners started the flame in the middle line while in a fresh air environment
- If the flame dropped to the bottom line, it indicated an oxygen-deficient environment
- If the flame rose to the top line, it indicated the presence of methane or an oxygen-enriched environment

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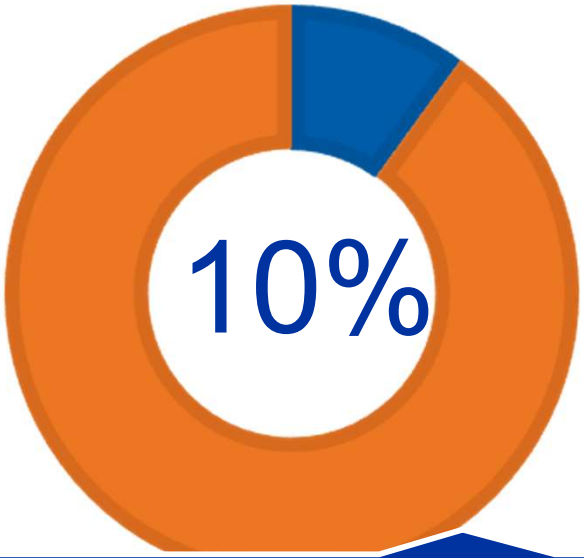
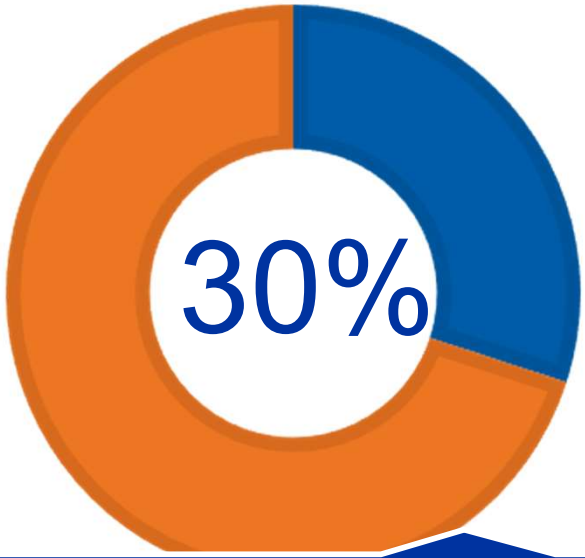
Your Community Counts on You



of residents living near chemical facilities have been trained or educated on how to respond during a chemical accident[1]



of residents believe operators have taken proper actions against chemical accidents in the past[1]

[1] - Han DH, Park MS. Survey of awareness about hazardous chemicals of residents living near chemical plants in South Korea. Ind Health. 2018;56(4):285–291. doi:10.2486/indhealth.2017-0119

Your HazMat toolkit is essential to keeping trust in your community and with local responders

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Environment, Social, Governance

Environment

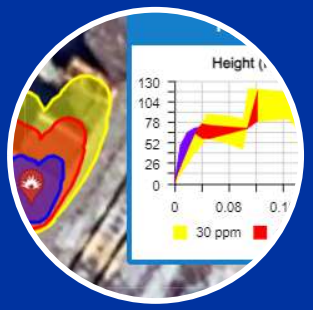
GHG Monitoring, accountability, reporting

Air Quality, odor, and toxicity

Governance

Critical Incident Management

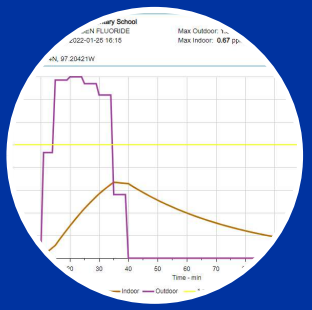
Systemic Risk Management



Practices

Supply Chain Risk Management

Chemical Lifecycle Management



Social Capital

Community Welfare and Product Safety

Customer Relations

Human Capital

Employee Health and Safety

Labor Practices

SAFER compliments any industrial ESG program

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COP28 UAE

Leading Gas & Emission Detection

SAFER SYSTEMS®

iNet

Leading Connected Safety and Dynamic Plume Modeling

Carbon-Based Gas Detection Systems and The **SAFER One Solution** emerges as a powerful tool

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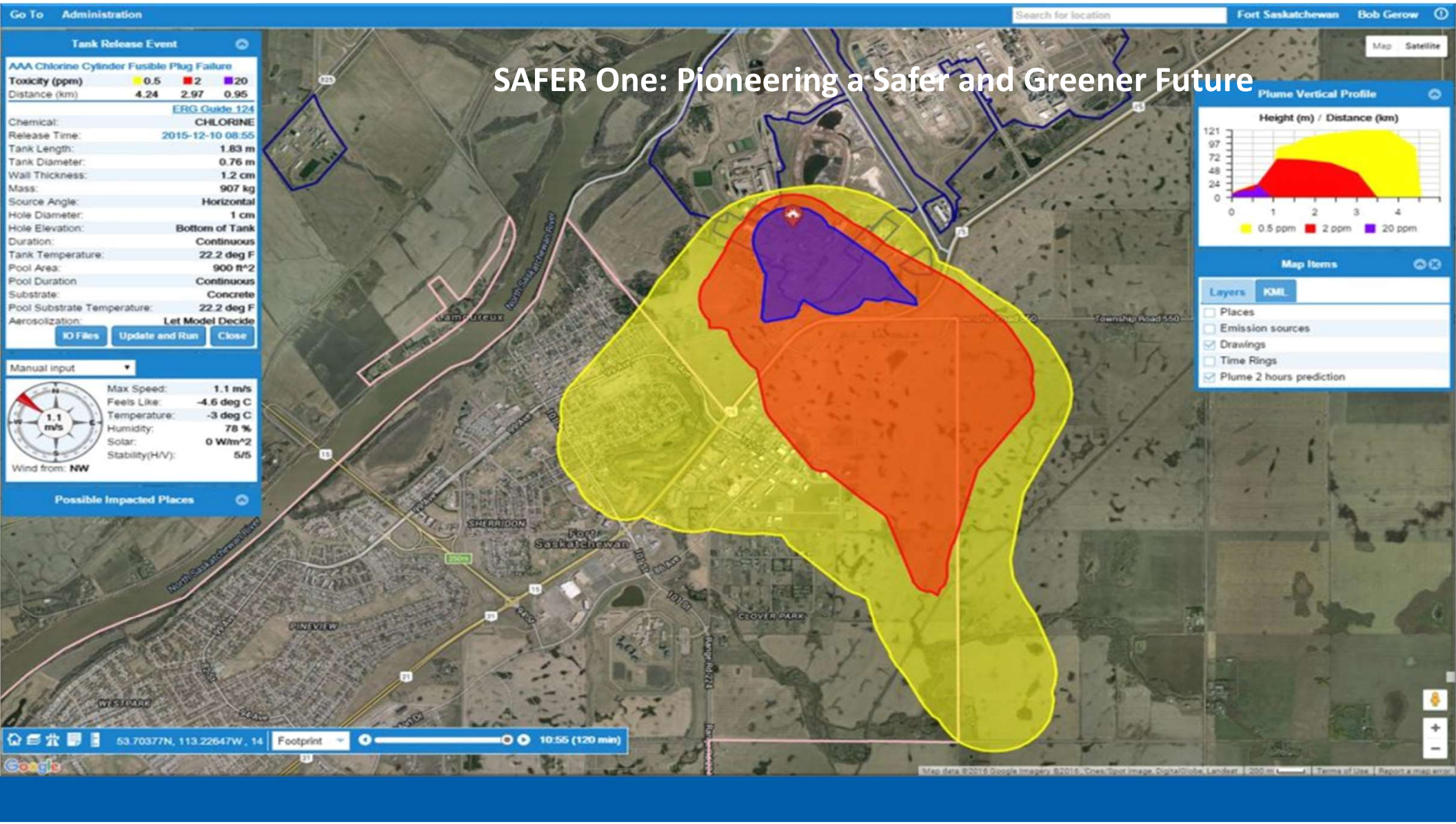
Gas and Emission Detection: A Catalyst for Change

Emission detection technologies are pivotal in aligning industrial activities with **environmental** responsibility.

SAFER SYSTEMS®


Go To
Administration
Search for location
Fort Saskatchewan
Bob Gerow
Tank Release Event
AAA Chlorine Cylinder Fusible Plug Failure
Toxicity (ppm) 0.5 2 20
Distance (km) 4.24 2.97 0.95
ERG Guide 124
Chemical: CHLORINE
Release Time: 2015-12-10 08:55
Tank Length: 1.83 m
Tank Diameter: 0.76 m
Wall Thickness: 1.2 cm
Mass: 907 kg
Source Angle: Horizontal
Hole Diameter: 1 cm
Hole Elevation: Bottom of Tank
Duration: Continuous
Tank Temperature: 22.2 deg F
Pool Area: 900 ft^2
Pool Duration Continuous
Substrate: Concrete
Pool Substrate Temperature: 22.2 deg F
Aerosolization: Let Model Decide
IO Files
Update and Run
Close
Manual input
1.1 m/s
Wind from: NW
Max Speed: 1.1 m/s
Feels Like: -4.6 deg C
Temperature: -3 deg C
Humidity: 78 %
Solar: 0 W/m^2
Stability(H/V): 5/5
Possible Impacted Places
SAFER One: Pioneering a Safer and Greener Future
Plume Vertical Profile
Height (m) / Distance (km)
121
97
72
48
24
0
0 1 2 3 4
0.5 ppm
2 ppm
20 ppm
Map Items
Layers
KML
Places
Emission sources
Drawings
Time Rings
Plume 2 hours prediction
Map
Satellite
SHERIDON
Fort Saskatchewan
CLOVER PARK
PINEVIEW
WESTPARK
53.70377N, 113.22647W, 14
Footprint
10:55 (120 min)
Google

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Dynamic Modeling

Dynamic plume models allow you to:

- Quickly calculate chemical release rates and pinpoint the leak source
- Establish control by understanding how current conditions are affecting response teams and areas of concern
- Automatically update with real-time data from on-site gas and weather sensors
- Model multiple scenarios (Flare, Stack / Jet, Pipe, etc.)

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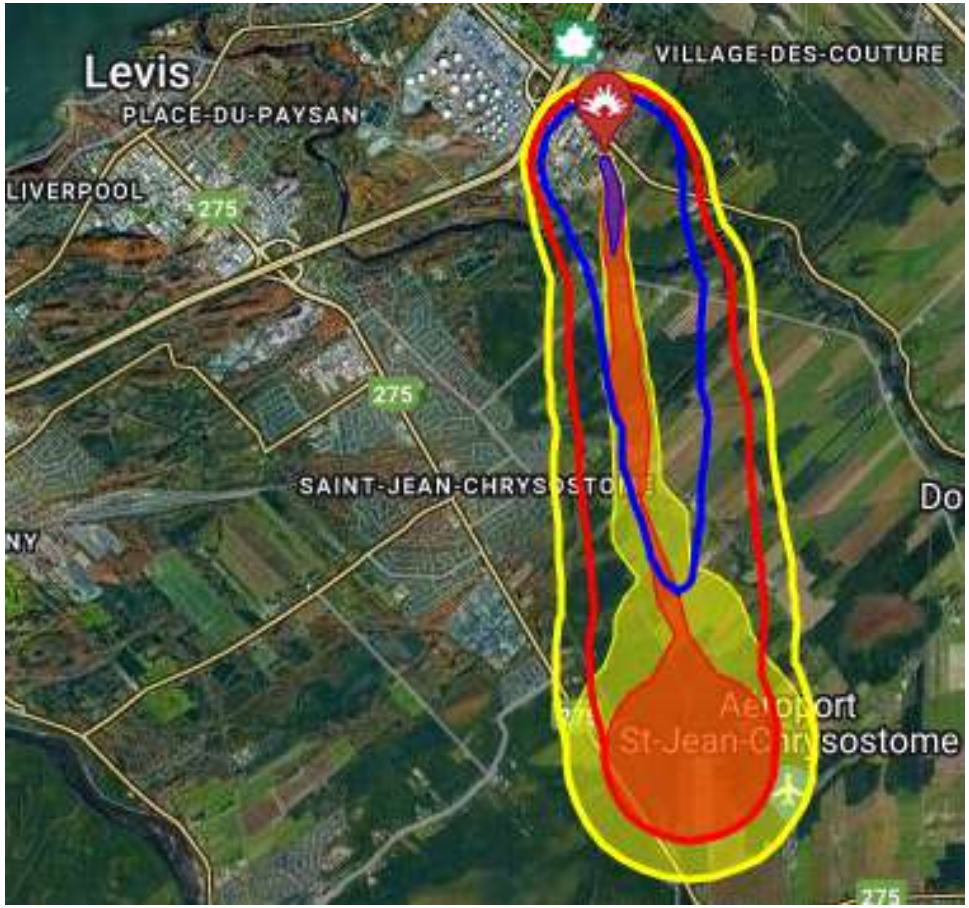
SAFER History

- Systematic Approach For Emergency Readiness
- 40+ years of business history
- SAFER One – Cloud Based (AWS) platform
  - Developed in conjunction with major players in the chemical / refinery industry
  - World recognized chemical scientists and engineers on staff today
- 2,500 + users, in 20+ countries



Implementing the Vision

Implementing **emission detection** with **SAFER One** requires a coordinated effort across sensor deployment, data aggregation, and strategic analysis.

With **Industrial Scientific's expertise**, this journey becomes not only manageable but transformative.

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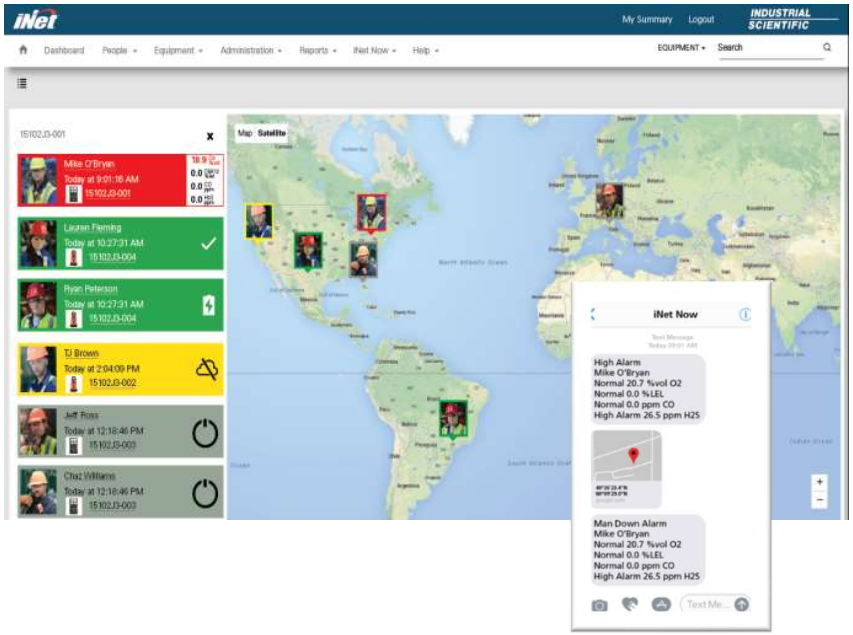

iNet Now

iNet Now Live Monitoring

Live monitoring software that provides worker location and status in real time and sends text or email alerts when incidents occur.

Live monitoring now includes Heat Maps for quick and easy, visual representation of real-time alarms.

Real-time safety alerts from anywhere improve response times and outcomes.

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SAFER One™ Dynamic Plume Modeling

Dynamic plume modeling software that alerts you of a chemical release and tell you where it is coming from, where it will be going, and who it will impact.

SAFER One, integrates with iNet Now, includes Heat Maps for quick and easy, visual representation of real-time alarms.

Real-time safety alerts from anywhere improve response times and outcomes.

Insights over time and actual conditions – what will happen?

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iNet

- Overview
- Device Management
- Emergency Readiness & Response
- Executive Account Summary
- Analytics
- Administration

Site Safety Management

Current fleet health

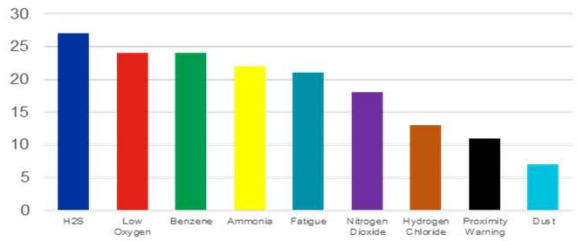
78%

Monthly Safety Index

68 %

↓ 12% from last month

Total	Critical Alarms	High Alarms	Low Alarms	Turned off in Alarm
291 (+2%/Mo.)	0	11 (0%/Mo.)	224 (+2%/Mo.)	12 (-10%/Mo.)



Emergency Readiness & Response

Downwind Places

Name	Dist
Fence Line	0.3 mile
Subdivision	0.64 mile
SHED	0.72 mile
Bethel Baptist Church	2.34 mile
North Bay Fellowship	2.75 mile
Charlie Marshall Elem…	3.77 mile
Subway	4.28 mile
Coastal Vision Care, PC	4.3 mile
Walmart Pharmacy	4.3 mile
Lowe's Home Improve…	4.36 mile

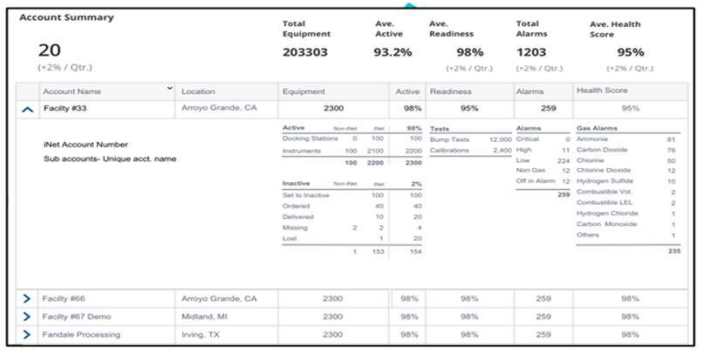
Suggested muster stations 1 2 3 4 5

Begin Mustering

Begin Training Drill

Real time Safety Dashboard

Account Summary – Executive View



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Protect your people, plant and community with SAFER One™.

SAFER One allows you to:

- ✓ Quickly identify leak source and severity
- ✓ Predict the path and concentration of the hazard in real-time
- ✓ Know when to evacuate civilians
- ✓ Operate with confidence
- ✓ Run true-to-life drills and ensure procedures are optimized
- ✓ Store key emergency response information in a single, web-based platform

Safer One is compatible/integrates with several 3rd parties including the competition

Thank You

Industrial Scientific. Since 1985.