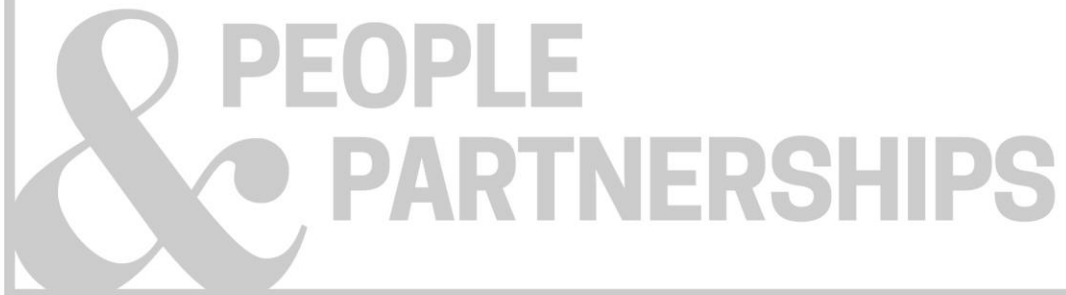


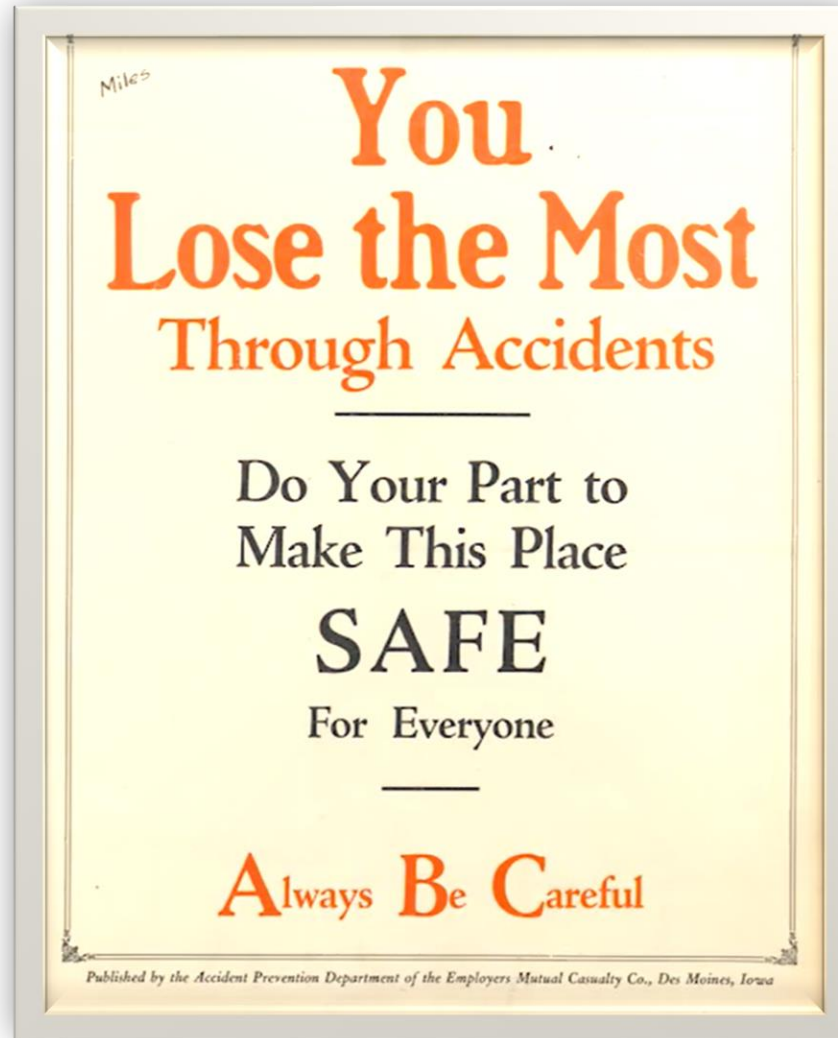


Innovation to Improve Risk and Improve Lives

Chad Veach, CSP, ARM, CPCU
Innovation Manager



Since 1926



PEOPLE & PARTNERSHIPS



Risk Improvement Innovation – Technology & Data



Aerial Intelligence



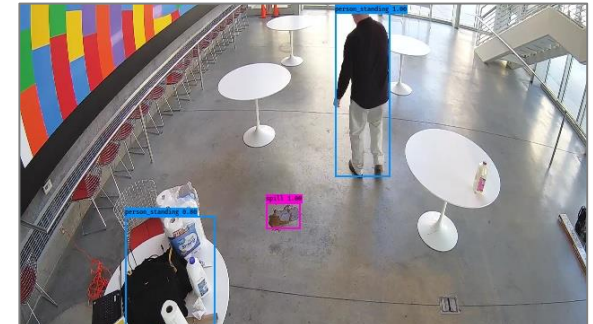
Wearable IoT



Building/Equip IoT



Machine Vision



Betterview Property Profile

- Aerial imagery from aircraft
- Machine vision detection of roof issues and calculated roof score
- Began 2020 with standard pilot, then...

The screenshot displays the Betterview Property Profile interface for a property at 3418 Blvd, Hampton, VA 23666. The main view is an aerial image of a building with a white roof, showing detected roof issues highlighted in yellow and green. A timeline on the left shows historical imagery from 2017 to 2020, with the most recent being from January 30, 2020. The right sidebar provides a summary of the roof score, which is 66 out of 100, and a table of roof conditions.

Summary of Roof Scores
Imagery: 01/30/20

66 out of 100

Summary of Roof Condition
Based on 01/30/20 imagery

ROOF CONDITION	SEVERITY	IMPACTED SQ FT	# BLDGS	BLDG ID'S
Staining	Minor	8%, 1200 Ft ²	1	1
Overhang	Medium	4%, 619 Ft ²	1	1

Building Roof Scores
Based on 01/30/20 imagery

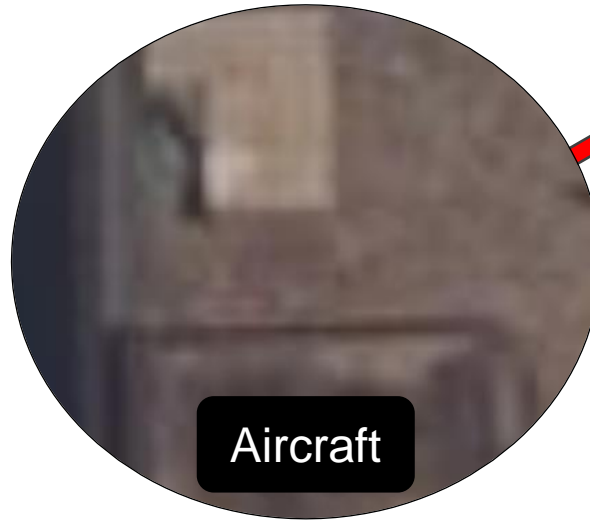
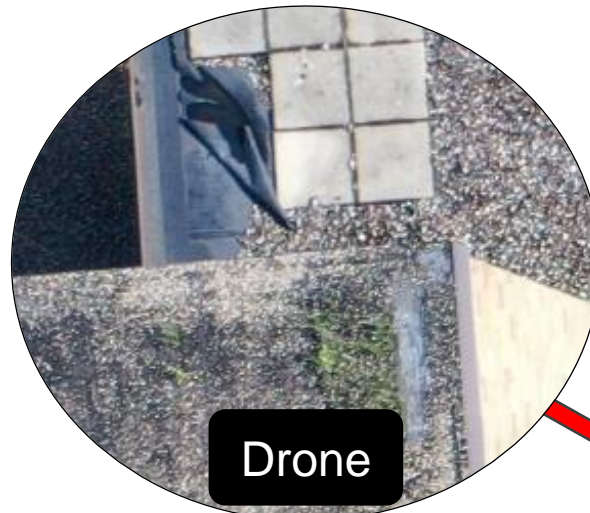
Sort by: Building Numbers

66 Building 1

Property Features
Based on 01/30/20 imagery

kespry Drone Roof Assessments

- Roof Assessment Service Reports for policyholders
- Next... “Roof Score” based on HD imagery



INFRALYTIKS Computer Vision



Current Models

- Ponding
- Displaced Ballast
- Staining/Mold
- Corrosion/Rust
- Wrinkled Membrane
- Walkway Crack



Future Models

- Patching
- Overhanging Tree
- Debris
- ???

EMC INSURANCE Risk Reports

1 Account Information 2 Report Builder 3 Tech Review 4 Grammatical Review

ReportTemplate for 3A72080 ALL ▾

- Cover Page ▾
- Rust ▾
- Ponding ▲

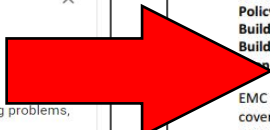
Location _____

Enter Observation Text

Ponding water or evidence of ponding water was found. Water should drain off the roof surface within a short time period. The standing water can degrade the roof surface, accelerate other roofing problems, promote water intrusion, enable mold or mildew, and lower roof lifespan.

Observation Images (10) ▲

PREVIOUS SAVE ACTIONS



EMC INSURANCE

Roof Assessment Report

Account Name	DUNAL COMMUNITY SCHOOL DISTRICT
Policy No.	1607
Building Occupancy	High School
Building Street Address	AND RD ELLON IA 52555
Image Flight Date	05/05/2021

EMC provides this Roof Assessment Report to your organization as a value-added service on top of the policy coverage promise. Our aim is to assist you in identifying controllable property risk and possible solutions to increase the lifespan and performance of the roof system, reduce the risk of a roof related claim and the associated disruption to your daily operations.

This report was created using imagery from an Unmanned Aircraft System, commonly called a drone. The drone pilot is an EMC team member, FAA licensed and trained to inspect facilities with the specific drone that was used. This service involves the combined use of HD photogrammetry, orthomosaic scans and computer vision technology to automatically identify risks to the roof system. Finally, individual comments are made on various defects to communicate what was found and possible control measures.

We believe strongly in the value that risk improvement techniques have for our mutual success. We are pleased to be able to provide this service and hope you will find it valuable for your organization. If you have any questions or feedback, please feel free to contact your EMC representative. Thank you for taking the time to review this report.

Joel Frank
 Joel.A.Frank@EMCIns.com
 5153452490



HSB Building/Equipment Monitoring

- *Sensor Systems by HSB* program for K-12 schools
- Water, Spoilage, Freeze - HVAC Failure



Beta Phase

24 months

54 locations

33 spoilage events prevented
2 HVAC & chiller issues detected
3 water damage events prevented

~\$165,000 +
~\$25,000 +
~\$50,000

Remote
Monitoring &
Reporting

Predictive
Maintenance

Disruption
Prevention

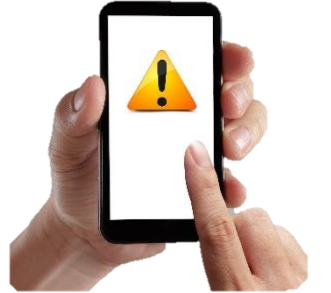
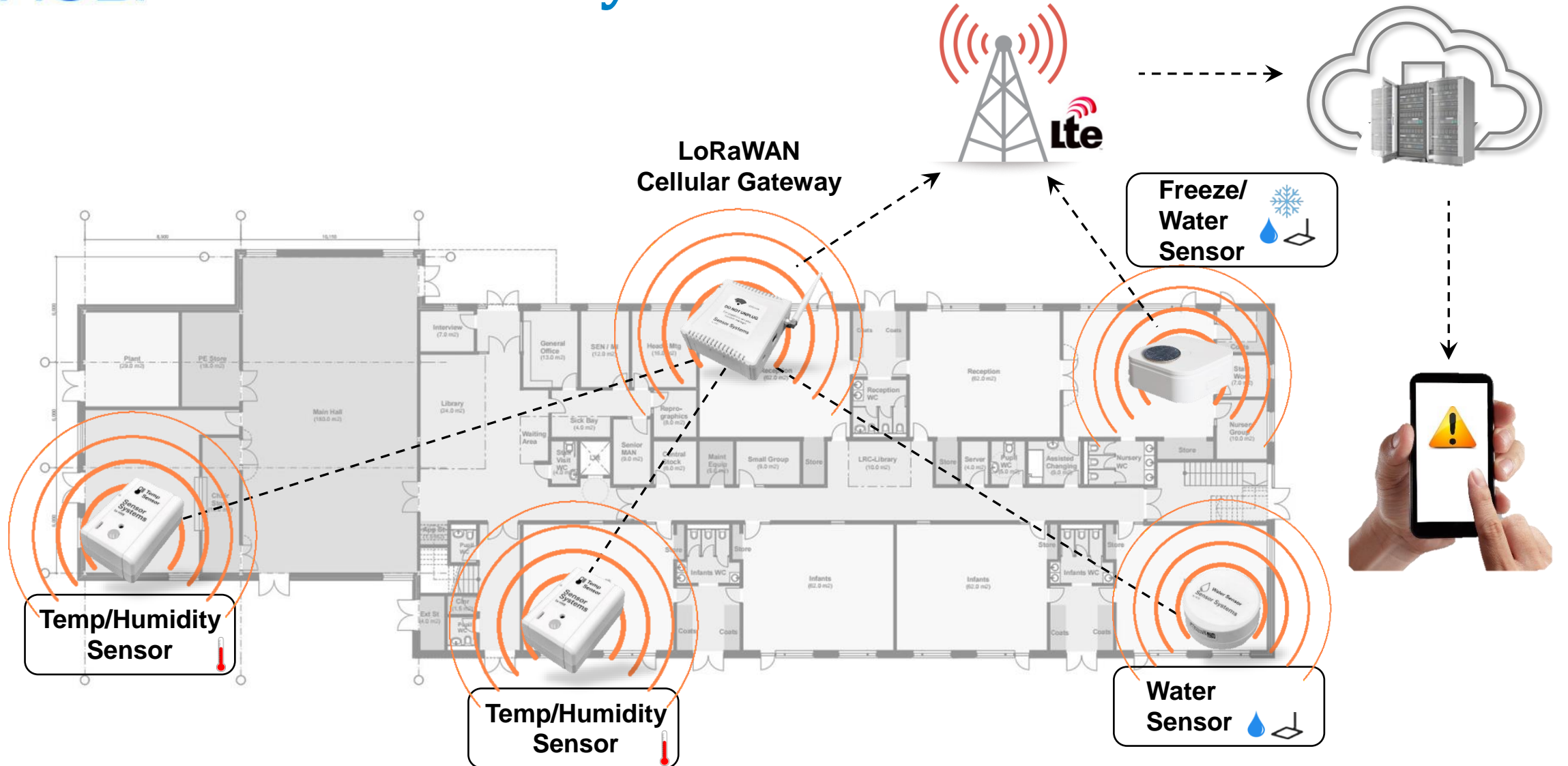


Building/Equipment Monitoring

Sensor Systems by HSB **Freeze Prevention Kit**



Stand Alone System





Pedestrian & Cyclist Collision Warning



Speed Limit Indicator

Lane Departure Warning



Forward Collision Warning

Headway Monitoring & Warning

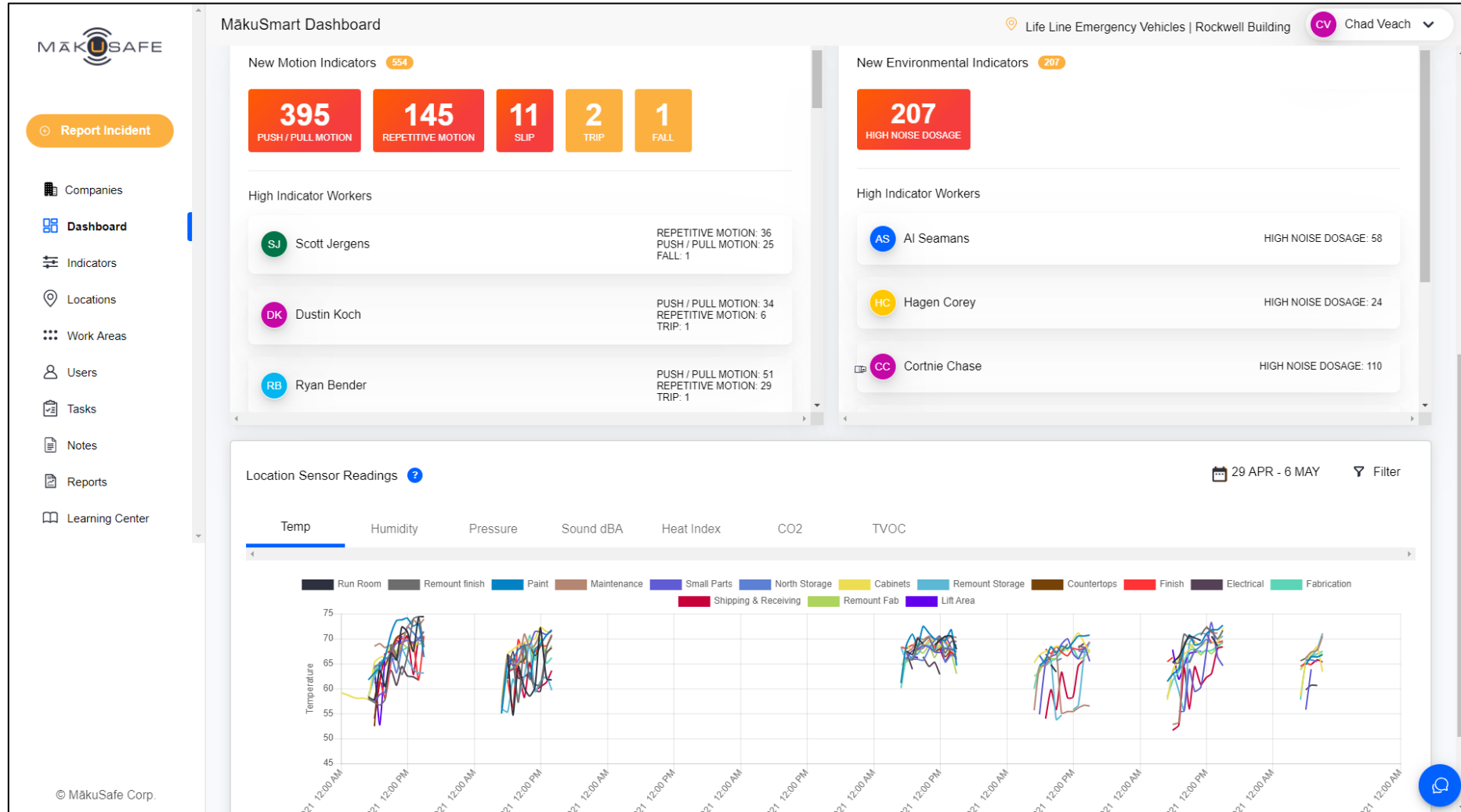


MAKUSAFE Wearable Safety Tech

- Captures motion & environmental data
- Two Pilots completed in 2019
 - >3 months & 40 devices
- Beta phase began late 2020 with 1,200 devices and 12-month no-cost trial for WC policyholders

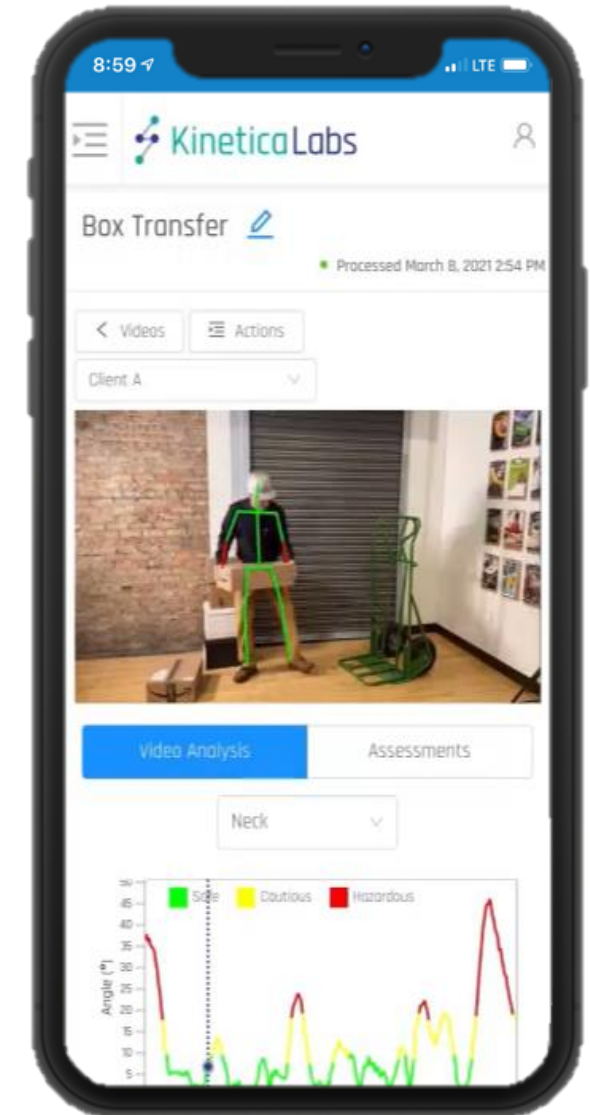


MĀKUSAFE MākuSmart Risk Intelligence Platform



Kinetica Labs Ergo Assessment Tool

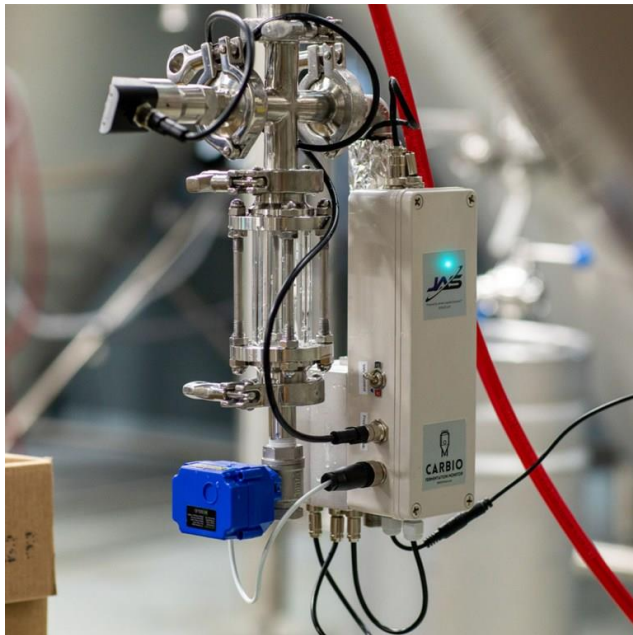
- Video motion capture
- Captured on-device or upload





Brewery Sensor Solutions

- CO₂ sensor for fermentation
- pH sensor for sour beer
- Pressure & temperature carbonation
- Temp/humidity refrigeration/freezer
- Ambient CO₂ for worker safety
- Water leak or intrusion





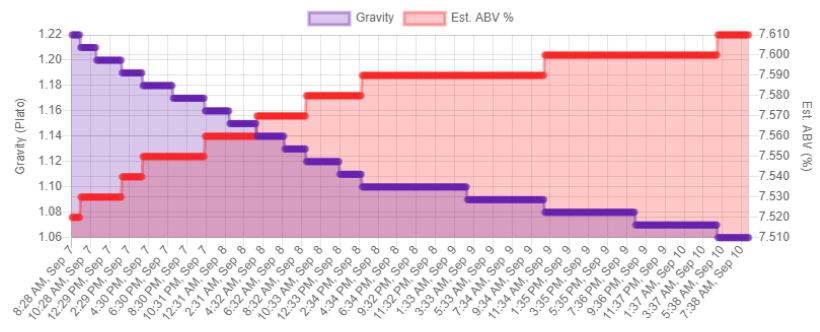
“Mission Control” – Data & Alerts



- Dashboard
- Batches
- Analysis
- Alerts
- Settings

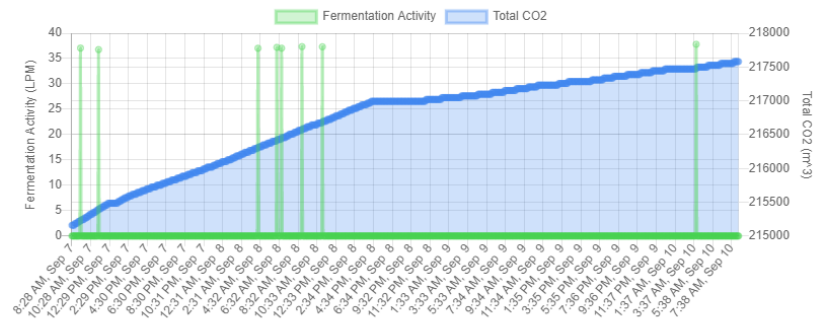
1.06 P
Gravity (Plato)

7.61%
ABV %

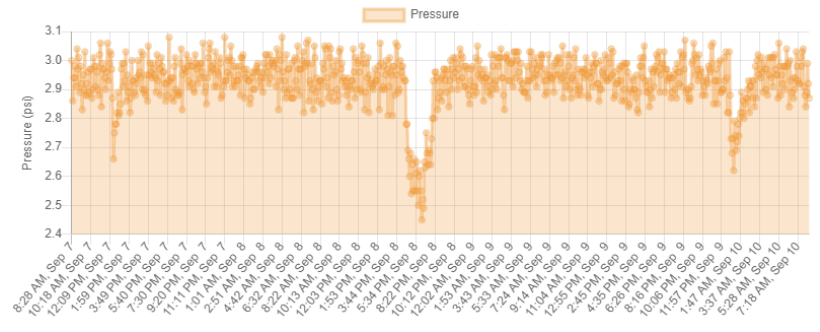


0 LPM
Fermentation Activity

217,579 L
Total CO2



2.87 psi
Pressure



IntelliSee Machine Vision on Video

Smarter surveillance for a safer world



count on



PEOPLE & PARTNERSHIPS

