



# GUARDHAT

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# AGENDA

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- Guardhat Overview
- Guardhat Solution
  - Wearables
  - Industrial IOT platform (Kyra)
  - Visualization Engine (SCC)
- Social Distancing Solution
- Deployment

## **GUARDHAT WAS BORN ON THE SHOP FLOOR**

- Ⓞ The original idea behind Guardhat was forged at a Blast Furnace melting iron at 3,000 deg F in Detroit.

## **THE TEAM BEHIND GUARDHAT**

- Ⓞ Experience in steel, mining, refining, energy, combined with top-notch technology expertise
- Ⓞ Guardhat's co-founders led turnaround of the 4th largest steel-maker in the U.S. (2,500 employees, \$5 billion in revenue)
- Ⓞ Backed by legendary names such as Caterpillar, 3M, Bedrock, among its investors

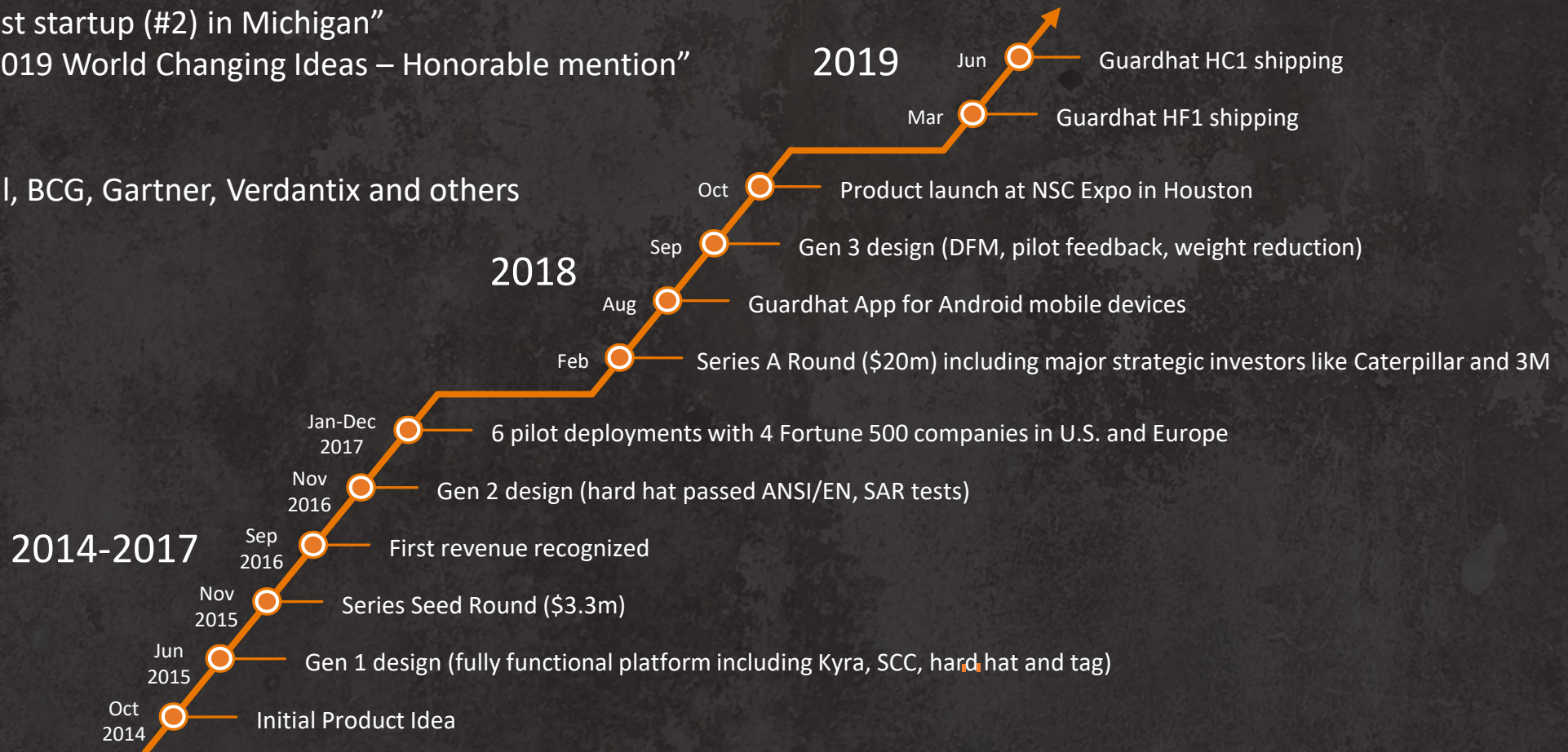


# HISTORY OF GUARDHAT

- Frost and Sullivan “North American Connected Safety Company” of the year 2019
- Frost and Sullivan “Global Connected Safety Company” of the year 2020
- Forbes – “5 transformational technologies remaking manufacturers”
- Tech Tribune: “Best startup (#2) in Michigan”
- Fast Company: “2019 World Changing Ideas – Honorable mention”

Laudable mentions:

British Safety Council, BCG, Gartner, Verdantix and others



# THE AVERAGE NUMBER OF PEOPLE WHO LOSE THEIR LIVES IN THE U.S. DUE TO INDUSTRIAL ACCIDENTS

04

**14**

EVERYDAY

**98**

WEEKLY

**392**

MONTHLY

**4700+**

YEARLY

<https://www.bls.gov/news.release/pdf/cfoi.pdf>

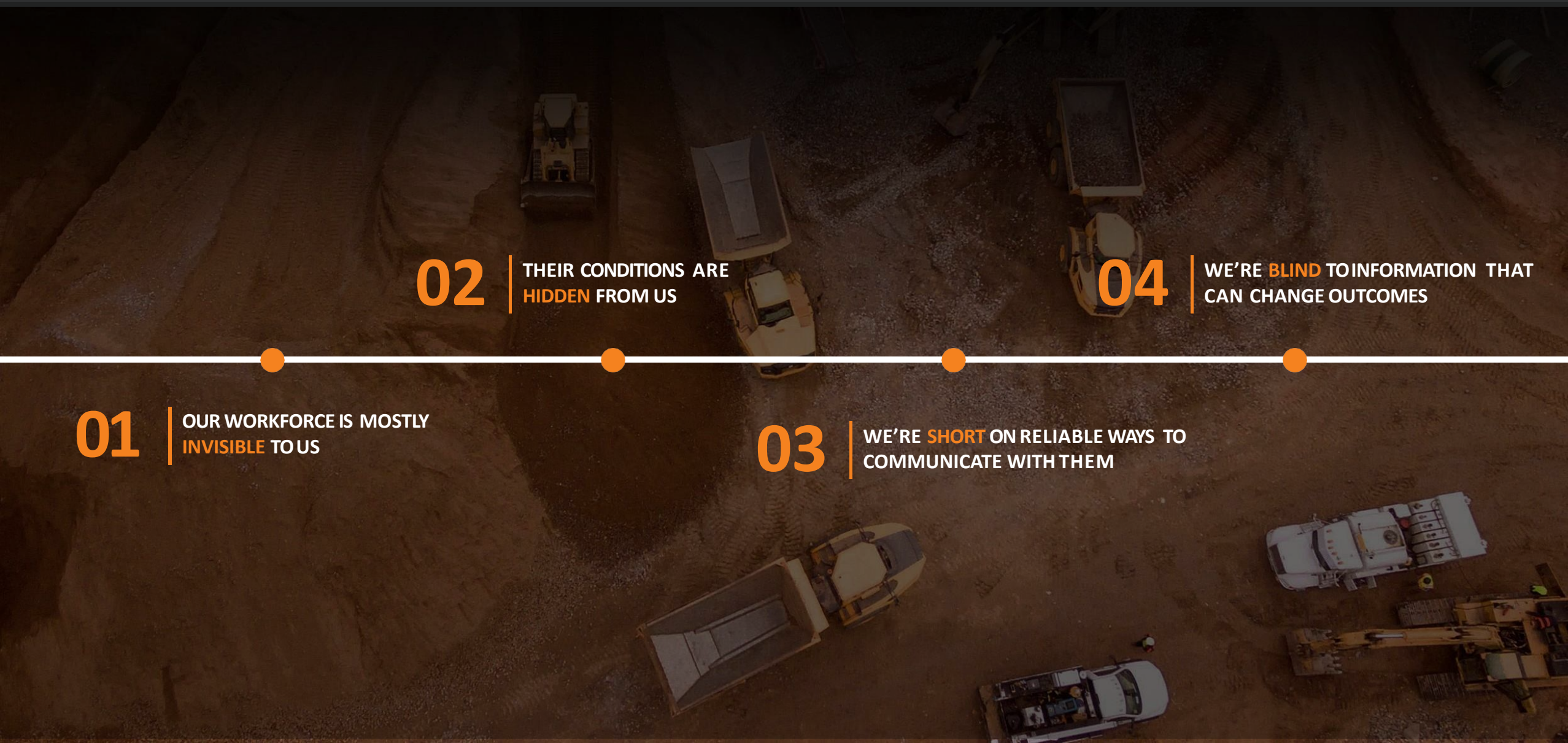


**01** | OUR WORKFORCE IS MOSTLY  
**INVISIBLE** TO US

**02** | THEIR CONDITIONS ARE  
**HIDDEN** FROM US

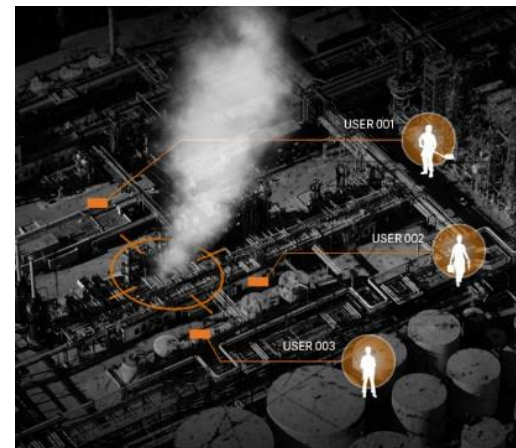
**03** | WE'RE **SHORT** ON RELIABLE WAYS TO  
COMMUNICATE WITH THEM

**04** | WE'RE **BLIND** TO INFORMATION THAT  
CAN CHANGE OUTCOMES



- ④ Precisely locate all your workers in three-dimensional space with latency less than 1 second?
- ④ Communicate directly between individuals, teams, and enterprise?
- ④ Understand the environment that workers are facing in real-time?

## GUARDHAT'S SOLUTION CAN!



### A

#### WEARABLES



TAG



MOBILE APP

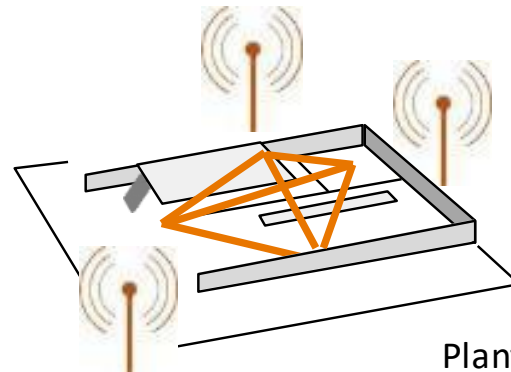


HARD HAT

- Geo-localization
- Real-time sensor data
- Audio / video communication
- Additional devices and form factors possible in the future

### B

#### INFRASTRUCTURE



- Industrial IoT Bus (Kyra), which can be deployed on-premise or Cloud
- Hardware infrastructure including RTLS and communication devices
- APIs for 3rd party integrations (SAP, Oracle, IBM Watson, etc.)

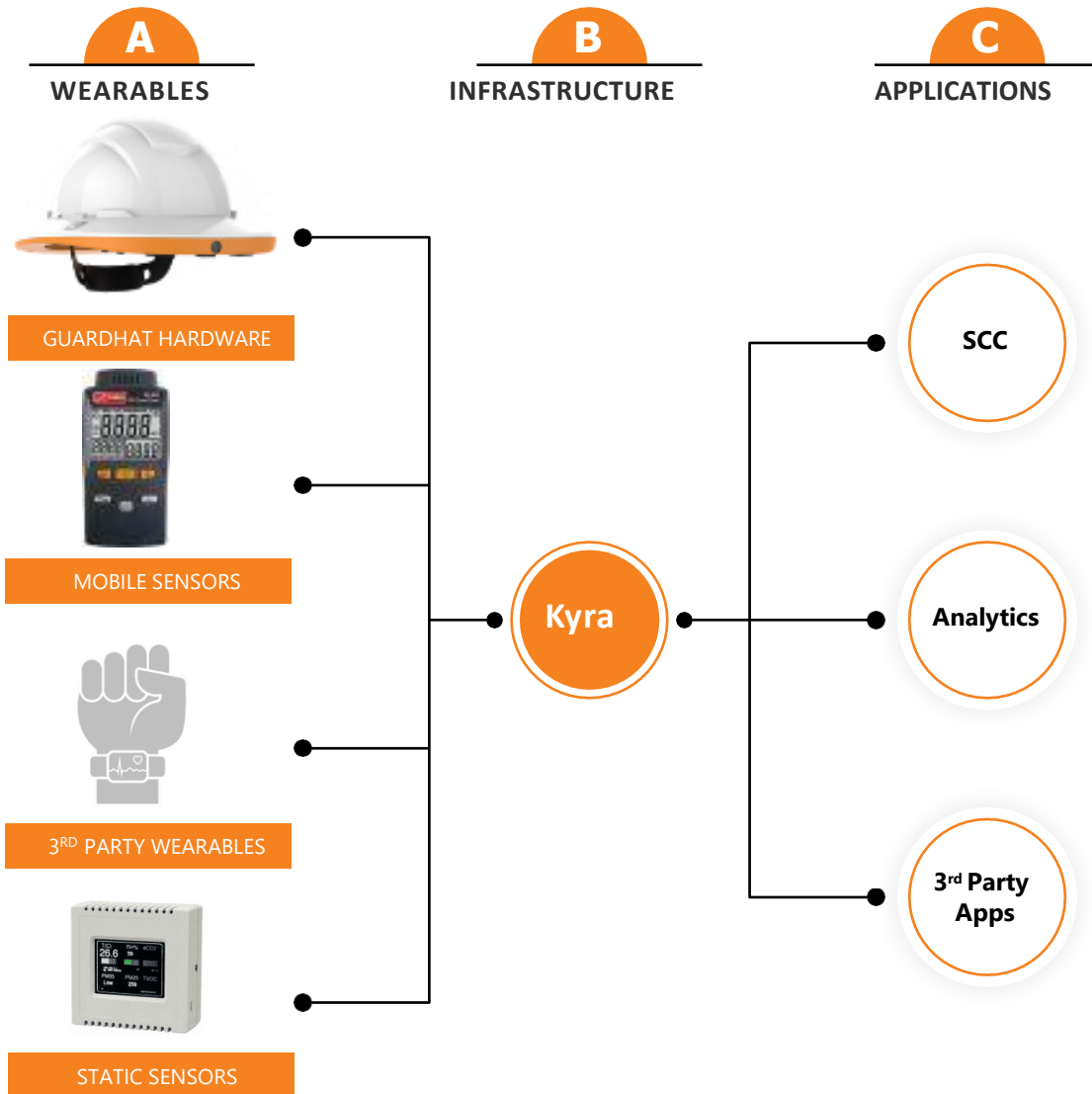
### C

#### APPLICATIONS



- Safety Control Center (SCC) application for real-time notifications and response
- Big-Data analytics engine





## Differentiation

- Single pane of glass – Manage & Monitor Guardhat or 3rd party hardware from a single interface
- Integrate with any back-end platform – from telephony systems, AI platforms, ERP platform, PLC systems, HRM system... the list is endless
- Main challenge for ERP systems is collecting data from multi-protocol systems on the operational floor
- Integrate multiple data sources and types to build a “Human Centric View”
- Raw data packets require digital data management in order to integrate, decipher, interpret at the required speed whilst performing decision allocation
- 14 Patents registered



# CONNECTED WORKFORCE SAFETY



PPE Compliance



SOS



Evacuation



Environment Monitoring



Driver/Machine Operator Monitoring



Human Condition Monitoring



Hazard Monitoring



Emergency Response



Man-Machine Interaction



Lone Worker Safety



# CONNECTED WORKFORCE PRODUCTIVITY



Real Time Situational Awareness



Real Time Multi-mode communication



Remote Troubleshooting



Walk-down Inspection



Remote Inspection/Supervision



Training



Time and Motion Studies



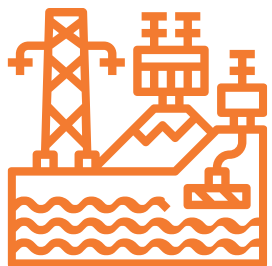
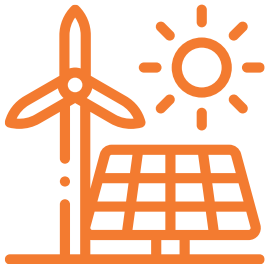
Time and Attendance



Work Procedure  
Readout/Adherence, Checklists



Real Time Remote  
Collaboration



- **PPE Compliance** – ensuring right PPE is worn in each area
- **Human Condition Monitoring** – Fall Detection, Man Down
- **SOS** – Worker summons for help, nearby worker alerts
- **Hazard Monitoring** – Gas detection, radiation, lockout zones, geo-fencing, Environment mapping
- **Evacuation** – Evacuation and Muster, Employee count, Way-finding
- **Emergency Response** – Ability to communicate with injured / nearby worker, get first responders on time
- **Environment Monitoring** – Ambient Temperature, Atmospheric Pressure, Humidity, Noise
- **Man-Machine Interaction** – crane-human, forklift-human, vehicle-human
- **Vitals Monitoring** – Heart Rate, Exertion, Core Temperature, Fatigue index
- **Driver / Machine Operator Monitoring** - Fatigue, Sleep deprivation, Speeding, unsafe operation
- **Lone Worker Safety** – Regular communication / sight, MIA alert, confirmation when return to base, employee count, safety
- **Remote Troubleshooting** – Remote expert receives request for help, video on demand, real time communication
- **Real-time Communication** – Push-to-Talk, audible alerts

## DUPONT



### Use Cases:

- 📍 PPE Compliance
- 📍 Area Safety Compliance
- 📍 Vehicle Monitoring
- 📍 Lone Worker
- 📍 Fall Detection
- 📍 SOS & Evacuation
- 📍 Preparation Activities

## TOTAL



### Use Cases:

- 📍 SOS & Evacuation
- 📍 Geofencing – Working Permits
- 📍 Lone Worker
- 📍 Fall Detection
- 📍 Virtual Coaching
- 📍 PPE Compliance
- 📍 Work Compliance

## WESTINGHOUSE



### Use Cases:

- 📍 Remote Expert Assistance
- 📍 Inspections and Walk downs
- 📍 Electronic Work Procedures
- 📍 Smart Outage Management
- 📍 Physiological Monitoring
- 📍 New workforce Training
- 📍 Mobile Sensor Data Collection

Best suited for situational awareness and safety of personnel in most demanding industrial environments



### Key Features

- Ⓞ Certified Class I (Type G) Industrial Hard Hat
- Ⓞ Indoor And Outdoor Real-Time Precise Location
- Ⓞ Wireless Connectivity (LTE, Wi-fi, Zigbee, UWB, BLE, NFC)
- Ⓞ Video/Audio Calls And Offline Recording
- Ⓞ Real-time Alerts, User Notifications, Emergency Management
- Ⓞ Offline Mode And Black Box Data Collection
- Ⓞ Environmental Sensors (Noise, Temperature, Humidity, Pressure)
- Ⓞ Integration With External Sensors, Accessories, Other IoT Devices
- Ⓞ Worn/Not Worn Detection
- Ⓞ Fall Detection
- Ⓞ Configurable Event Rules
- Ⓞ Push-To-Talk
- Ⓞ Text-To-Speech
- Ⓞ Integration with 3rd Party Software Systems

Best suited for Workforce Safety and Monitoring in Oil & Gas/ Chemical Industries (**Intrinsically Safe**)



### Key Features

- GPS-based Outdoor Location
- Wireless Connectivity based on Hardware (LTE, Wi-fi, BLE)
- Monitoring and Supervision of a team of personnel
- Video/Audio Calls and offline recording
- Push-to-Talk with large PTT Button and Channel Selector
- Text-to-Speech
- Front Loudspeaker > 105 dB
- LED Torch (90 Lux)
- 400 hr. standby on Battery
- Real-time Alerts, User Notifications, Emergency Management
- Environmental Sensors (Noise, Temperature, Pressure)
- Integration With External Sensors, Accessories, Other IoT Devices
- Fall Detection
- Integration with 3rd Party Software Systems
- Configurable Event Rules
- ATEX – zone 2/22, IECEx EX-Zone 2/22

Best suited for situational awareness and safety of mobile workers

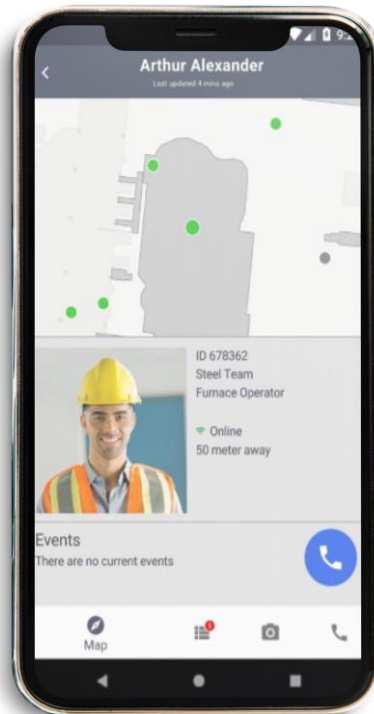


### Key Features

- 📍 GPS-based outdoor location (indoor location imprecise)
- 📍 BLE-beacon based zone-detection
- 📍 Wireless Connectivity (LTE, Wi-fi, BLE, NFC)
- 📍 GPS based geo-fence awareness
- 📍 Real-time Alerts, User Notifications, Emergency Management (SOS, Evacuation)
- 📍 Integration With External Sensors, Accessories, Other IoT Devices
- 📍 Fall Detection
- 📍 Configurable Event Rules
- 📍 Integration with 3rd Party Software Systems



Best suited for mobile supervisors who monitor and supervise a team of personnel



## Key Features

- 📍 GPS-based Outdoor Location
- 📍 Wireless Connectivity based on Hardware (LTE, Wi-fi, BLE)
- 📍 Monitoring and Supervision of a team of personnel
- 📍 Video/Audio Calls
- 📍 Real-time Alerts, User Notifications, Emergency Management
- 📍 Environmental Sensors (Noise, Temperature, Pressure)
- 📍 Integration With External Sensors, Accessories, Other IoT Devices
- 📍 Fall Detection
- 📍 Configurable Event Rules
- 📍 Integration with 3rd Party Software Systems

# SAFETY CONTROL CENTER IN REALWORLD



# EVENT-BASED MONITORING AND MAPPING

18

The interface displays a live call from Mike Mitchel and a proximity danger alert. It features a list of critical events, a detailed view of a worker's sensor readings (Heart Rate and Body Temperature), and a map showing the worker's location on Floor 1 F6. The interface also includes a list of nearby workers and a previous events log.

**Incoming call: Mike Mitchel** [IGNORE] [ACCEPT]

**Proximity Danger** Reported 4 mins ago [CALL EMS] [GET HELP] [MERGE] [RESOLVE] [CLOSE]

### 2 Critical Events

TYPE	LOCATION	ELAPSED TIME
Body Temp Spike	Floor 1 F6	0 MIN
Proximity Danger	Floor 1 F6	4 MIN
Body Temp Spike	Floor 1 F6	0 MIN

### All Events

TYPE	LOCATION	ELAPSED TIME
Handhat Taken Off	Floor 1 F3	8 min
Heart Rate High	Floor 2 A2	10 min
Battery Critical	Floor 1 B2	10 min
Battery Critical	Floor 1 C0	11 min
Battery Low	Floor 8 C0	13 min
Battery Low	Floor 4 G4	14 min
Battery Low	Floor 5 C2	15 min
Battery Low	Floor 6 A1	16 min
Battery Low	Floor 7 A3	17 min

**Live Call**

**Arthur Alexander**  
ID: 678362  
Furnace Operator  
Steel Team  
508-964-0923  
44 hours this week

### Sensor Readings

Heart Rate: 152 BPM

Body Temperature: 100°

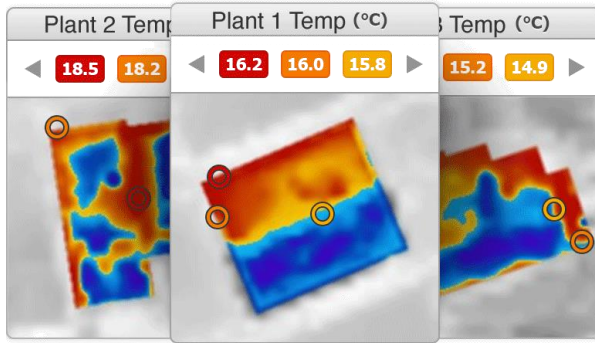
### Nearby Workers

- Mark Montard (15 ft away)
- Josh Bekmen (22 ft away)
- John Sanderson (34 ft away)
- Steven Allen (39 ft away)

**Event Log** [POST MESSAGE]

82 Active Hats  
3 MIA Hats  
Feb 3 10:58am

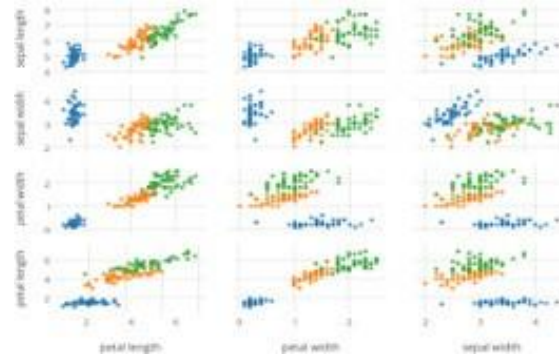
## HEAT MAPPING



Examples:

- Gas exposure
- Employee & Environmental
- Temperature
- Tech Help Requests
- SOS Calls
- Worker Clustering
- MIA
- PPE Violations

## INTERACTIVE GRAPHING



Examples:

- Emergency Response Time
- Fire Drill Evacuation Time by Minute
- Safety Compliance & Non-Compliance Statistics

## AUDIO/ VISUAL

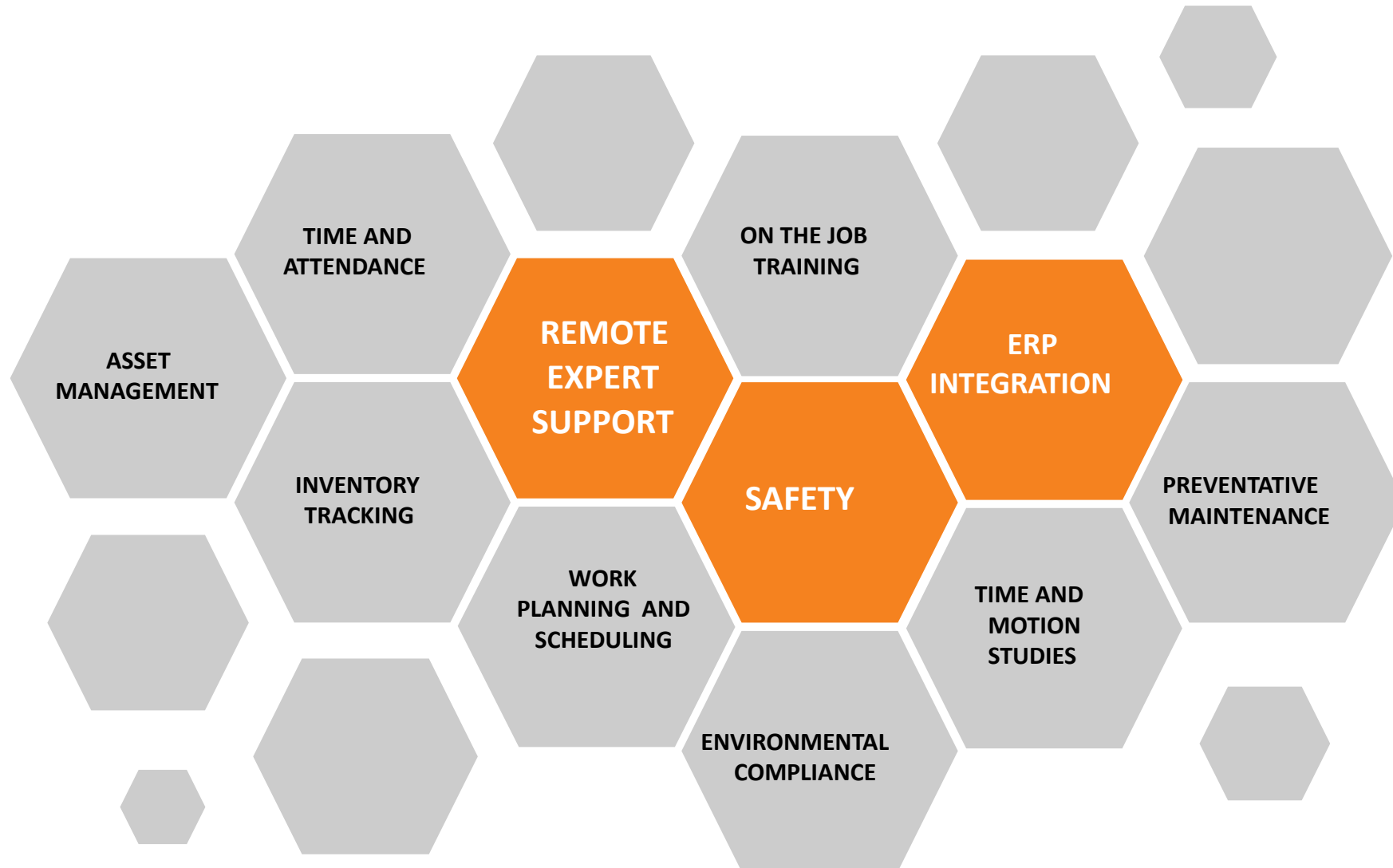


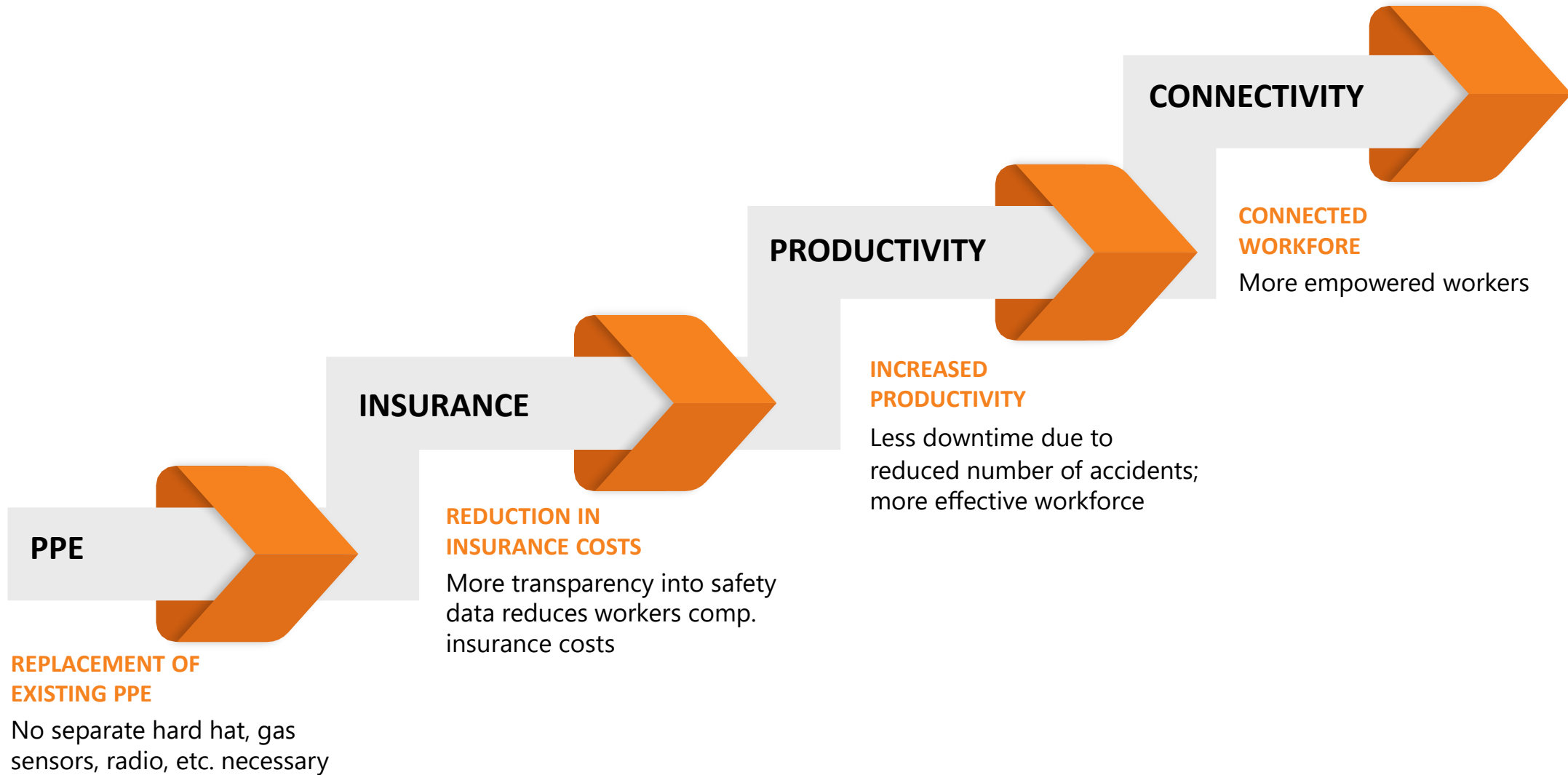
Examples:

- Worker Movement
- Animation Equipment Movement Animation
- Incident Video Feed
- Still Photographs
- Audio Feed

# GUARDHAT CAN RUN ANY APPLICATION

CONNECTING FRONTLINE WORKERS





# SOCIAL-DISTANCING SOLUTION FOR FRONT-LINE WORKFORCES

## Problem Statement

- *Ensure that onsite workers maintain CDC's six-foot social-distancing recommendation*

## Solution

- **Notify** workers in violation
- Detail and **catalog** violations and occurrences
- Provide **analysis** and **audit-reports**
- Deliver **affordably** and with scale

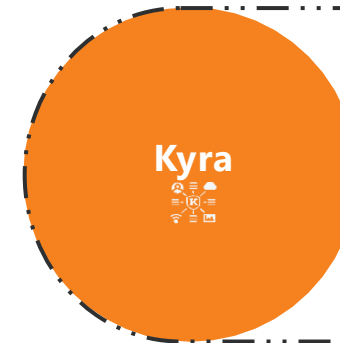


## HARDWARE

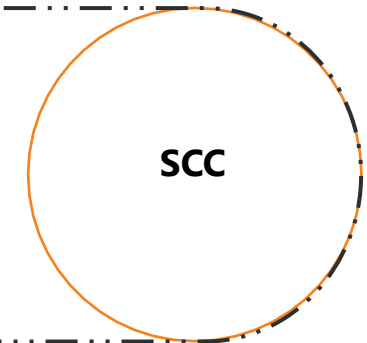


UWB/Wi-Fi/LTE

## SOFTWARE



IoT platform



Safety Control Center

- 2 form-factors available
- Generates audible, visual and haptic alert when any other ATLAS tag moves within 6-feet of its location
- Sends alerts (via Wi-Fi or LTE) to the IoT platform for memorialization and real-time display of the event on SCC
- Does *not* need connectivity for detecting social-distancing violations

- "Human-centric" Data Model
- Flexible deployment options – Edge, Data Center, Any Cloud or all-of-the-above
- Integration-ready with Enterprise Platforms, pre-built integrations available

- Web-based live safety monitoring system enabling immediate response management
- Immediate alert shown to backend operator
- Analytics report of worker interactions

a PACK-IN/PACK-OUT



b SOCIAL-DISTANCING ALERT



c REAL-TIME VISUALIZATION



d REPORTS



a

**PACK-IN/PACK-OUT**

a

**PACK-IN/PACK-OUT**

1) Remove tag from USB-charger, power-on, and slip in pocket or clip-on to clothing



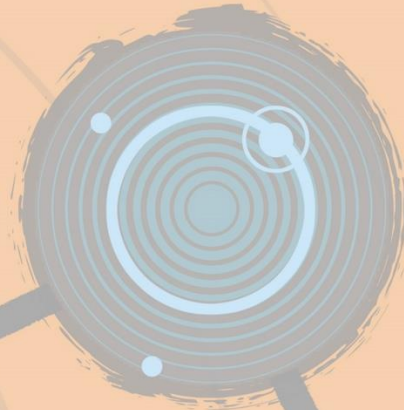
2) Worker always carries tag on person



3) Power-down and plug-in to charger at end of the shift

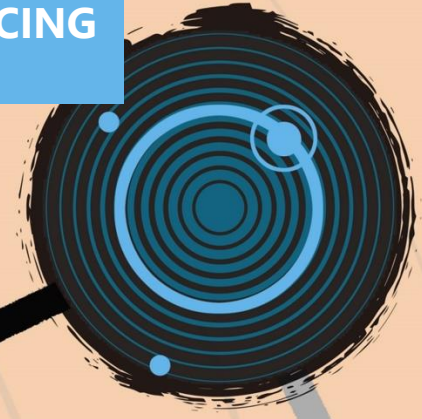


4) Repeat steps 1–3

**GUARDHAT**

**b SOCIAL-DISTANCING ALERT****b SOCIAL-DISTANCING ALERT**

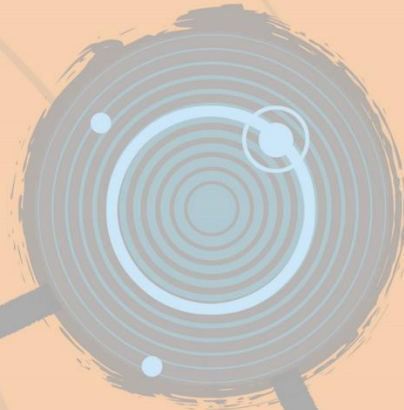
- ATLAS Tag continuously **detects** proximity to other tags
- Automatically generates audio, haptic and visual **alerts** when any other ATLAS tag comes within 6 feet
- Alerts **cease** when safe distance is reestablished
- Alert data is **also sent** wirelessly to the backend Kyra IoT platform in real-time
- The tag is **not dependent** on wireless-connectivity for detection or alerting



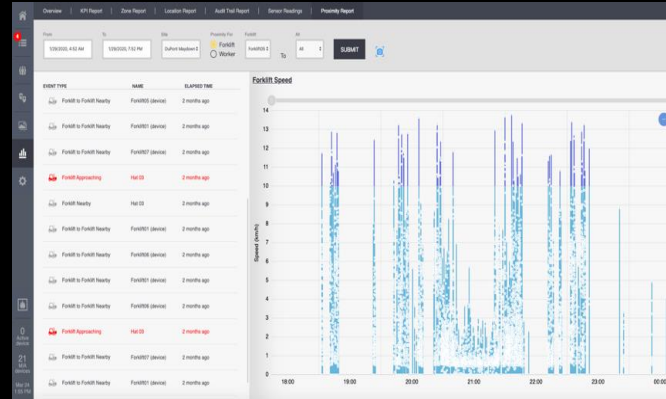


# REAL-TIME VISUALIZATION IN SAFETY CONTROL CENTER (SCC)

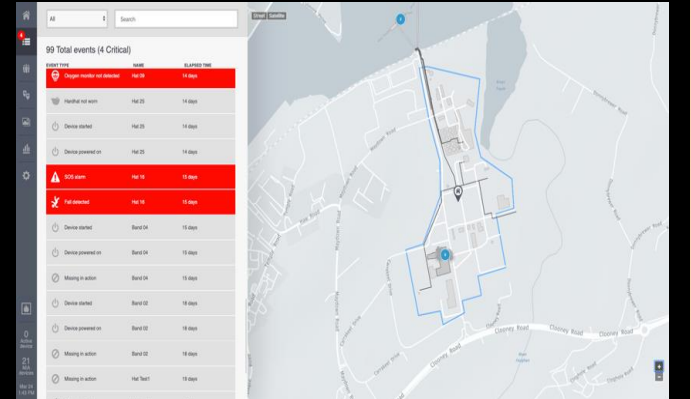
- SCC is a web-based monitoring and incident-management system
- Visualizes the detected events in real-time and on a map
- Enables immediate response management by backend operator
- Available on any web-enabled mobile-tablet or laptop/desktop



## REAL-TIME VISUALIZATION



Real-time event detection

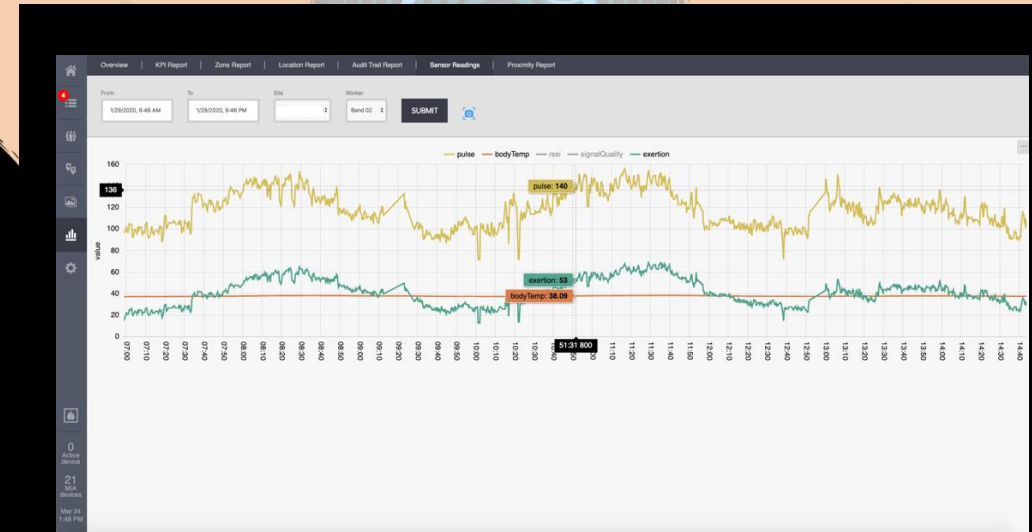


Live location data on site map



## d REPORTS AND ANALYTICS

- Detailed, downloadable reports on incident KPIs and metrics are available
- Dashboard-based analytics capabilities for drilling down to specific incident details
- Ability to send entire event history to 3<sup>rd</sup> party systems for further analysis
- And more...



d REPORTS



GUARDHAT



**THANK YOU**

[Kaushik.sarkar@guardhat.com](mailto:Kaushik.sarkar@guardhat.com)



**GUARDHAT**