• Communication is the key to maximizing efficiency and safety along with improving the ROI

• You have 3 main types of communication in use at this time

• Audio, video and data through various RF solutions and infrastructures

• Primary objective use existing infrastructure
• By using video analytics monitoring pixel light intensity

• Smoke and flame and flame reflection can be detected

• Also steam leaks and fuel spray can also been identified

• Thermal detectors can also be added to the system

• The technology we are about to discuss is in use at Duke McGuire station and Darlington
Reduce the total number of personnel required for fire watches with The I.I.S. Remote Fire Watch System.
With the use of fixed Onvif cameras and built in analytics the Video Management Software (VMS) will alert and alarm when smoke/fire is present.

- UL/FM NFPA compliant flame and smoke detection
- Permanent or Temporary remote fire watch
- Steam leak detection
- Remote video and alarm monitoring
- Records to network video recorder 24/7 and tracks events
Video Analytics in action - Effective detection area
Filter removes residual light, leaving only light that is originated from flames.
NATURAL GAS PROCESSING PLANT
TURBINE DECK SMOKE
THERMAL OIL HEATER – AXIS HD CAMERA
I.I.S. Remote Fire Watch System: Thermal Radiometry

- Detection range between -40° F to +1022° F
- Alarms on temperature increase or decrease
- Data logging of temperatures
- Relay output
Fike Thermal – Applications

Motors, rotating equipment and engine monitoring
Conveyors
Bucket elevators
Food processing, textile plants, hammer mills
Manufacturing processes, transport duct and piping
Dust collectors
Belt driven fans,
Electrical/electronic equipment
THERMAL PROCESS MONITORING
FILTER HOUSES AND MOTOR MONITORING
LIVE VIDEO/THERMAL MONITORING
• Most of the plants in our industry are spending in excess of $1,000,000 a year on fire watches

• For an investment of $350-$500K you would have a pay back of 6 months for an initial investment. This includes servers the site would require to run the analytics
REMOTE SENSORS
I.I.S. Wireless Sensor Monitoring System

- **Humidity Sensor Alerts** via text
- **Sensor Software**
- **Lasalle Drywell**
  - **Vibration**
  - **Motion**
  - **Water Detect**
- **Temperature**
- **Open/Closed**
- **Network Switch**
- **Web Server**
- **Sensor Software**
- **Sensor Alerts** via text
VIBRATION SENSOR FOR PREDICTIVE MAINTENANCE
## I.I.S. Wireless Sensor Monitoring System

Displays a list of all your deployed sensors.
Notifications page of each sensor’s readings.

<table>
<thead>
<tr>
<th>Date Sent</th>
<th>Status</th>
<th>Sent To</th>
<th>Reading</th>
<th>Acknowledged</th>
</tr>
</thead>
<tbody>
<tr>
<td>10/24/2018 11:01 AM</td>
<td>Email Sent</td>
<td>Roy Rose</td>
<td>Email 40.17% @ 78.3°F</td>
<td>Roy Rose 10/24/2018 11:02 AM</td>
</tr>
<tr>
<td>10/24/2018 11:01 AM</td>
<td>SMS via SMTP Sent</td>
<td>Stan Robinson</td>
<td>SMS 40.17% @ 78.3°F</td>
<td>Stan Robinson 10/24/2018 11:02 AM</td>
</tr>
<tr>
<td>10/24/2018 10:59 AM</td>
<td>Email Sent</td>
<td>Roy Rose</td>
<td>Email 49.76% @ 70.6°F</td>
<td>Roy Rose 10/24/2018 11:01 AM</td>
</tr>
<tr>
<td>10/24/2018 10:59 AM</td>
<td>SMS via SMTP Sent</td>
<td>Stan Robinson</td>
<td>SMS 49.76% @ 70.6°F</td>
<td>Stan Robinson 10/24/2018 11:01 AM</td>
</tr>
<tr>
<td>10/24/2018 10:00 AM</td>
<td>Email Sent</td>
<td>Roy Rose</td>
<td>Email Notification Test</td>
<td>Roy Rose 10/24/2018 10:55 AM</td>
</tr>
</tbody>
</table>
I.I.S. Wireless Sensor Monitoring System

History page of each sensor’s readings.

<table>
<thead>
<tr>
<th>Date</th>
<th>Signal</th>
<th>Battery</th>
</tr>
</thead>
<tbody>
<tr>
<td>10/24/2018 2:41 PM</td>
<td>57</td>
<td>100</td>
</tr>
<tr>
<td>10/24/2018 2:31 PM</td>
<td>70</td>
<td>100</td>
</tr>
<tr>
<td>10/24/2018 2:21 PM</td>
<td>70</td>
<td>100</td>
</tr>
<tr>
<td>10/24/2018 2:11 PM</td>
<td>57</td>
<td>100</td>
</tr>
<tr>
<td>10/24/2018 2:01 PM</td>
<td>42</td>
<td>100</td>
</tr>
<tr>
<td>10/24/2018 1:51 PM</td>
<td>51</td>
<td>100</td>
</tr>
<tr>
<td>10/24/2018 1:41 PM</td>
<td>42</td>
<td>100</td>
</tr>
<tr>
<td>10/24/2018 1:31 PM</td>
<td>62</td>
<td>100</td>
</tr>
<tr>
<td>10/24/2018 1:21 PM</td>
<td>69</td>
<td>100</td>
</tr>
<tr>
<td>10/24/2018 1:11 PM</td>
<td>66</td>
<td>100</td>
</tr>
<tr>
<td>10/24/2018 1:01 PM</td>
<td>42</td>
<td>100</td>
</tr>
<tr>
<td>10/24/2018 12:51 PM</td>
<td>21</td>
<td>100</td>
</tr>
</tbody>
</table>

Sensor Reading:

- 43.32°C @ 67.2°F: 44.1°F
- 43.87°C @ 67.7°F: 44.4°F
- 43.81°C @ 67.1°F: 44.4°F
- 44°C @ 67.1°F: 44.5°F
- 44.86°C @ 67.1°F: 45°F
- 44.51°C @ 67.1°F: 45°F
- 45.71°C @ 66.9°F: 45.3°F
- 46.35°C @ 66.4°F: 45.3°F
- 47.4°F @ 66.4°F: 45.8°F
- 49.05°C @ 66.3°F: 46.6°F
- 51.14°C @ 66.2°F: 47.8°F
I.I.S. Wireless Sensor Monitoring System

Chart display of deployed sensor
I.I.S. Wireless Sensor Monitoring System
LASALLE ELIMINATED TAKING WET BULB READINGS ON EACH OF THE 5 ELEVATIONS IN THEIR DRYWELL THIS PAST OUTAGE FOR HEATS STRESS STAY TIME CALC INFO HUMIDITY AND TEMPERATURE SAVED 800 MREM

CURRENTLY LASALLE HAS SOME HUMIDITY SENSORS DEPLOYED IN THE HEATER BAY TO ASSIST IN STEAM LEAK DETECTION
ENTERPRISE
SITE
IP COMMUNICATION
SYSTEM
Features

Calling Features:
• Call by name, function, or group
• Broadcast calls
• Locate individuals
• Conference Calls
• Call Block
• Call Forward and transfer
• Call Waiting

Telephony Features:
• Outbound calling to external numbers
• Call internal PBX extensions
• Receive telephone calls on the badge
• Outbound paging

Messaging Features:
• Voice mail
• Voice email from badge
• Text messaging
• Record messages for yourself

Remind Feature:
• Record a reminder and set intervals when you will hear that reminder played back on your badge or in your headset

Update Features:
• Dose and or Dose Rate
• Schedule status for projects
B3000n Communication Badge

Features:

• Dual band radio: 2.4 GHz and the 5GHz Wi-Fi spectrum.

• Illuminated Halo around the call button; visual indication of the Badge call status.

• A large front facing speaker provides hands-free audio in order to clearly hear the conversation without having to hold the Vocera Badge in the hand.

• Four microphone design and integrated Acoustic Noise Reduction (ANR) reduce background conversations.

• Multi-user operation (shared device) permits a Vocera Badge to be passed to another user at the end of a shift.
Headset Options

Under the hardhat high noise cancelling headset

Bone Conduction

Lightweight

Bluetooth Noise Cancelling
VOCERA BENEFITS

Multiple refueling outage successes

• **Average dose savings per outage 5-7 REM**
• **2013 TIP Award Lasalle station EST ROI $3 mil on time saved**
• **Deployed at all FP&L sites**
• **Enterprise level system no limit on # of Devices**
• **Database friendly takes a view and sends info to badge**
• **Can run as centralized system or at each site stand alone**
• **Recently deployed at Perry Plant for March outage**
• **Seabrook station planning to eliminate desk phones**
• **Using existing infrastructure planned for electronic work package**
• **Pilot currently running at PSEG 40 badges with demo software for current outage**
What’s New with Vocera:

Auto Update & V 5000 Smart Badge
What's New with Vocera: Auto Update

“Dose: 12 mrem”
“Rate: 36 mr/hr”

Workers can stay focused on the job and receive Dose and Rate Notifications right to their Vocera badge.

Anytime job status has changed in your scheduling software you will receive notification on your Vocera Badge.

“Recirc Pump Replacement: 55% complete”
ADDITIONAL UPDATE CAPABILITY

- **Vocera can also receive updates from:**
  - **The IIS Sensor System**
  - **The IIS Remote Fire Watch System**
  - Since all these systems are utilizing databases the information is easily shared.
V 5000 SMART BADGE

Texting or calling
Weighs 89 G

Active Device and Message List
Extended talk time 4 hours STBY 40