# Hands-Free Wearables for Process Safety

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P2SAC
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## Presenter – Tekin Kunt, Ph.D.

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- PSRG Director, EMEA (6+ years)
- Based in Houston, Texas (26+ years)
- Ph.D., Chemical Engineering – University of Maryland @ College Park (1993)
- Risk Assessments / Audits / Training
- Weatherford / Chevron / AspenTech / NIST
- Bridge / Macro Photography

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# About PSRG

- Established in 1997 in Houston, TX (25+ years)
- Global Process Safety, Risk Management & Plant Reliability consulting and training firm
- More than 100 technical professionals averaging 29+ yrs experience
- Diverse industry experience with more than 1000 customers in 90 countries
- Tailored solutions to meet and exceed client expectations
- Member of AIChE CCPS, IChemE PSC, P2SAC and VPPPA

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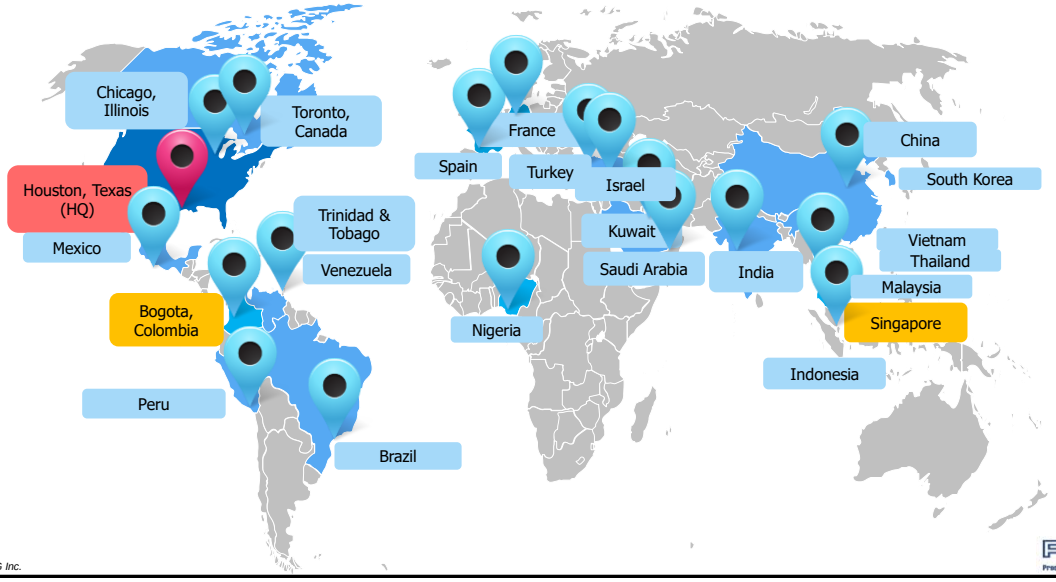
# PSRG – Global Reach

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# PSRG API/Pharma Experience

| Company | Study | Location |
|---|---|---|
| Abbvie | Conduct HAZOP Study (Procedure) | Singapore |
| Amgen | HAZOP / cHAZOP Study / PSM Audits | Singapore / Puerto Rico |
| Aventis Pharma | Provide Bowtie Training | Singapore |
| DSM | PSM/RMP Compliance Audit | USA |
| GSK Biologicals | PHA-HAZOP Leader Training / BowtieXP Licenses / EAC Assessment | Singapore |
| Johnson & Johnson/Ethicon | Boilers PHA Study - San Angelo | USA |
| LanzaTech | PHA Studies | USA |
| Merck | Conducted DHA training | China |
| Pfizer | PHA Study for API Plant in Michigan | USA |
| Zoetis | PHA Study / Audit Pilot Plant | Australia / India |

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# Agenda

- Digitalization of Process Safety Management (PSM)
- Challenges / Opportunities
- Case Studies
  - Corrosion Under Insulation (CUI)
  - Remote Inspection Support
  - Improved Workflows

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# Digitalization of Process Safety Management (PSM)

Connected Workforce
Augmented Workforce

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7



## PSM – Data → Information → Decisions

- Process Safety Management (PSM) requires making the right decisions at the right time using all the available information
- Data is readily available
- Challenge is to turn data to information and information to decisions
- Big crew change (changing workforce)

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8

# Challenges

- Workforce:
  - Agile
  - Young
  - Mobile
- PSM:
  - Heavy on Documentation
  - Subject Matter Expertise needed
  - Rules / Regulations / Standards

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# Our Approach

- Digital "hard hat" for the PSM Practitioner

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# Hands-free Wearables – RealWear

- Intrinsically Safe (IS) head mounted tablet (light weight)
- Voice activated / superb noise cancellation
- Built rugged (dust tight, drop proof, waterproof)
- Safe to operate while in the field (not obstructing the visibility)
- Fully supports MS Teams Collaboration including customizable workflows

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# DEMO

- Let's use it …

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# Case Studies and Lessons Learned

Using RealWear in the Field

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# Remote Collaboration and Training

- Compressor malfunctions in a remote location
- Noisy environment / SME not readily available / Downtime is costly
- RealWear works in the noisy environment / Easy to call a SME / Resolve issues quickly
- Hands-free / voice activated / camera for easy sharing
- Improved effectiveness and reduced downtime

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# Augmented Inspection

- Inspector in a remote location (or on a ladder)
- Remote environment / SME not readily available / Safety issues
- Take a quick picture or video / Easy to conference in SMEs
- Thermal camera / reporting function
- Improved safety and workflow

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# Digital Workflows

- Operator in the field
- Documents difficult to access / SME not readily available / Safety issues
- Open up a reference document / Follow workflow
- Support for workflows / Easy to use screen
- Improved productivity and workflow support

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# Lessons Learned

- Internet connection missing / lagging
  - Use hotspot (intrinsically safe)
  - Set the system to lower resolution
  - Use specific software to improve data transfer speed
- Communicate in noisy environments
  - Provide headphone
- Interacting with voice activation
  - Ability to pause voice activation to prevent unwanted commands
- Working at nighttime or dark areas
  - Use light on helmets or flashlight on RealWear device

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## Summary

- Need to transition from Data to Decisions
- Augmented Workforce will use wearables such as RealWear
- Hands-free, voice controlled, intrinsically safe, fully connected
- Better workflows, remote collaboration, improved inspections, and reduced downtime in the field

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20



# Thank you for your attention!

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21