



EU-OSHA Workshop: OSH as a driver of safe and healthy digital technologies for work.

## AI4EHS – Our Exiting Path of Innovation

**Regine Maegerlein**, Head of Global Environment, Health & Safety, ZF LIFETEC



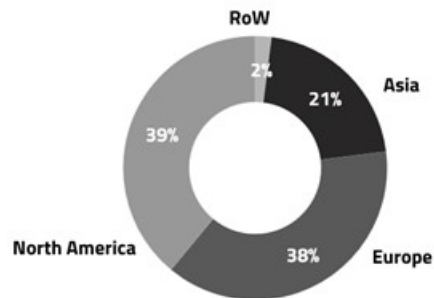
## FACTS & FIGURES 2024

### PROFILE

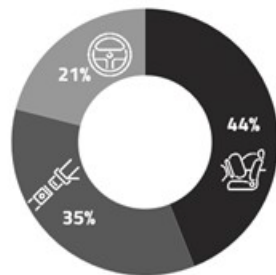
**Sales:** €4.8 billion (PY: €4.7 billion)  
**Employees:** 36.000 (PY: 36,000)  
**Locations:** 51 in 22 countries



### SALES DISTRIBUTION BY REGION



### SALES DISTRIBUTION BY SEGMENT



## ZF LIFETEC: SAVING LIVES WITH TECHNOLOGY

### INFLATABLE RESTRAINT SYSTEMS



### INFLATORS



### SEAT BELT SYSTEMS



### STEERING WHEEL SYSTEMS



# Our Path to Safety Excellence

Safety Excellence involves improvement in three key areas



## CARE

The safety of our employees is just as important to us as the safety of the people who come into contact with our products.

### Safety Leadership

Increase  
influence of Leaders  
to affect safety  
performance

### Employee Involvement

Increase employee  
participation in safety

### Continuous Improvement

Functional programs, i.e.:  
EHS Mgmt System, Audit & Safety  
Program to better address risk  
& vulnerabilities

Approach is in alignment with the ZF Lifetec Strategy, values and culture

# Enhancing warehouse Safety – Smart LED Gate

## ■ Forklift / Pedestrian Safety

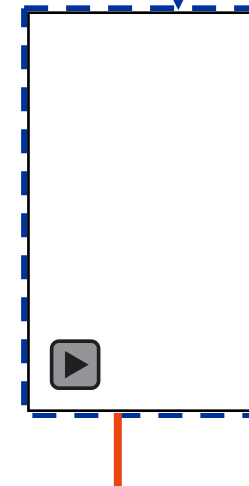
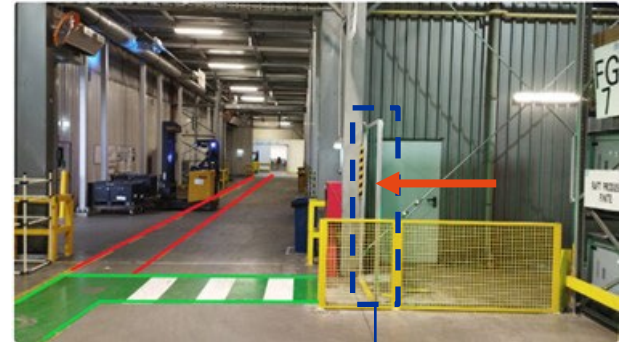
- Warehouse employees must cross the forklift route at some points in the warehouse
- Physical segregation is not fully possible at a blind spot/ poor visibility area for pedestrian crossing the way with traffic
- Forklifts can currently not be replaced

→ Remaining risk of pedestrian – forklift collision

## ■ Use of Radar Sensors – administrative control system

- A RGB LED Gate system relates to a **microwave radar system** detecting equipment on the traffic route.
- The pedestrian is warned by **red light** and a **buzzer signal** when an equipment approaches the crossing point, otherwise the gate is green

→ Risk of collision risk further reduced





# Enhancing Machine Safety – AI people detection in a robot cell

## ■ Task automatization – metal detection in airbags (product safety)

- Previously boxes containing airbags were moved manually below a metal detector
- Now a robot performs this task

→Ergonomics risks were addressed

→Process reliability was improved

But... mechanical risk introduced

## ■ Use of AI – engineering control system

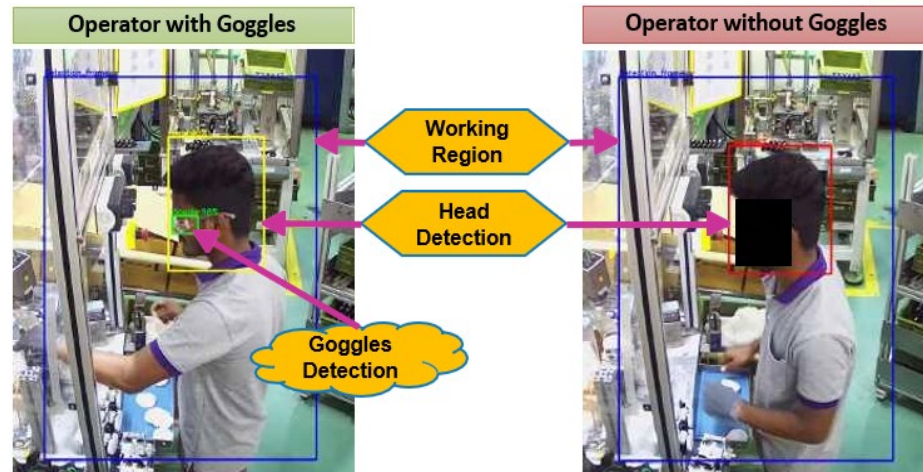
- In **addition to the door interlock system**, the robot cell is also equipped with a **people detector (AI)**
- Once a person is detected in the cell, all movement of the robot stops
- LOTO must be still applied during interventions

→Mechanical risk minimized



# Support the Employee – AI Assistance for PPE Use

- **Ensure that the right PPE is used**
  - A spring can be released during an assembly process
  - Process change not possible
- **Use of AI – Engineering Control System**
  - Machine does not start if employee does not wear eye protection→ Risk of eye injuries minimized
- **How it works**
  - Camera installed at the workstation
  - AI is analyzing the image
  - Able to distinguish between safety glasses and ordinary optical glasses
  - The machine start mechanism relates to the assistant
  - Not footage is kept



Note: Implementation as a pilot outside of EU only.

# Ergonomics Risk Assessment using AI – repacking airbag inflators



Before – manual

Localização: Pôrto de Lima - Módulos  
Ref Nº:   
Produto:   
Tempo: 20 - 40 horas  
Turno: A  
Nº de operadores: 1

Avaliação do corpo inteiro avançada  
Preencha de prioridade de ferramenta avançada  
46  
Mudar para avaliação manual do corpo inteiro

Avaliação de ferramentas avançada

| Membros                | Cabeça |      | Ombros |       | Pescos |       | Coxas |       | Pernas |       |
|------------------------|--------|------|--------|-------|--------|-------|-------|-------|--------|-------|
|                        | Esq.   | Dir. | Esq.   | Dir.  | Esq.   | Dir.  | Esq.  | Dir.  | Esq.   | Dir.  |
| Prioridade             | 4      | 4    | 7      | 6     | 7      | 7     | 1     | 5     | 8      |       |
| Classificação do risco | Alto   | Alto | Medio  | Medio | Medio  | Medio | Medio | Medio | Medio  | Medio |

Trabalho

| Nome                    | Operador       | Atividade | Valor | Risco | Ações  |
|-------------------------|----------------|-----------|-------|-------|--------|
| Transporte de materiais | União Europeia | Atividade | 12 kg | Alto  | Editar |
| Atividade               |                | Pescos    | 18 kg | Medio | Editar |



After – lifter installed

Localização: Pôrto de Lima - Módulos  
Ref Nº:   
Produto:   
Tempo: 20 - 40 horas  
Turno: A  
Nº de operadores: 1

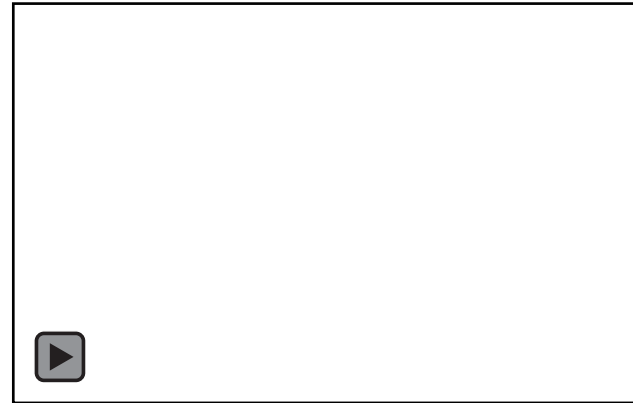
Avaliação do corpo inteiro avançada  
Preencha de prioridade de ferramenta avançada  
15  
Mudar para avaliação manual do corpo inteiro

Avaliação de ferramentas avançada

| Membros                | Cabeça |       | Ombros |       | Pescos |       | Coxas |       | Pernas |       |
|------------------------|--------|-------|--------|-------|--------|-------|-------|-------|--------|-------|
|                        | Esq.   | Dir.  | Esq.   | Dir.  | Esq.   | Dir.  | Esq.  | Dir.  | Esq.   | Dir.  |
| Prioridade             | 1      | 2     | 2      | 2     | 2      | 3     | 2     | 1     | 9      |       |
| Classificação do risco | Medio  | Medio | Medio  | Medio | Medio  | Medio | Medio | Medio | Medio  | Medio |

## How it works

- Video of the job to be assessed (employee approved)
- Upload video to the system
- Add job details
- AI analyses the video and data
- AI calculates risk scores



# Support the organization – AI Assistants for EHS

## ■ Purpose of the AI Assistants

- Make EHS information quickly and easily available
- Free up time for our EHS Community and other stakeholders
- Engage the organization to learn about EHS
- Provide EHS program support

## ■ Part of our Data and Knowledge Management Program

- A lot of EHS data and information needs to be managed
- We continuously work with our AI department to try new approaches and test new ideas

## ■ How it works

- Assistants are accessible from our EHS home page
- Users can select based on what the need is
- Users were trained and receive instructions how to use the assistant

### EHS AI Agent

JARVIS AI Agent

### EHS Buddy AI Assistant

Request access to the AI Assistant Suite

EHS-Buddy

SafetyTalks

EHSTrainer

BBSAssistant

### User Instructions

- **Be Specific:** Provide clear and detailed questions or instructions to get accurate and relevant responses.
- **Context Matters:** Include any necessary context to help the EHS-Buddy understand your query better.
- **Break Down Complex Queries:** If you have a complex question, break it down into smaller, more manageable parts.
- **Follow-Up Questions:** Feel free to ask follow-up questions if you need further clarification or more information on a topic.
- **Refine Requests:** If the initial response isn't quite right, refine your request with additional details or corrections.
- **Response Types:** EHS-Buddy can give responses in text format and providing image analysis is out of scope.

# Engaging our leaders – AI Safety Talks Generator

## ■ Purpose of the Safety Talks Generator

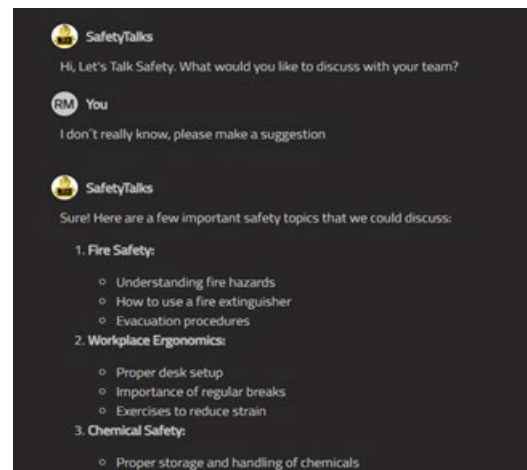
- Provide an aid to leaders and EHS professionals to generate content for Safety Talks with employees

## ■ Part of our Safety Leadership program

- Supports our leaders in implementing our Safety Leadership elements
- Leaders can emphasize the importance of Safety when talking about safety topics

## ■ How it works

- You can either directly enter a Safety topic or ask for suggestions
- Select one of the suggested topics
- The generator lists the related talking points
- Can be used by the mobile phone or copy and paste into a document

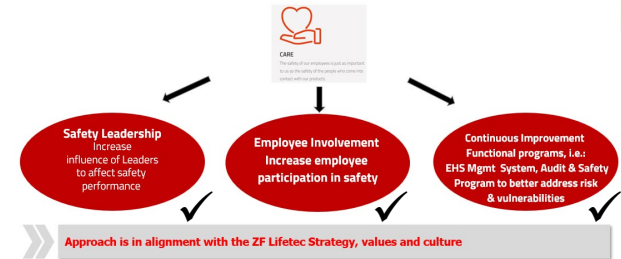


# Conclusion – AI4EHS

- **Enhance technical safety solutions**
  - Predict potential hazards and prevent accidents
  - Detect unsafe conditions
  - Take over hazardous tasks (robots and AI)
  - Support employees in safe decision making
- **Generates engagement and increases our efficiency**
  - Makes safety more exciting
  - Eases and automizes routine tasks
  - Helps to develop content for training etc.
  - Frees up time that can be spend on the shop floor to make improvements

## AI4EHS in ZF Lifetec

Safety Excellence involves improvement in three key areas







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# Q&A

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