



How can AI Improve Workplace Safety?

Today's Presenters



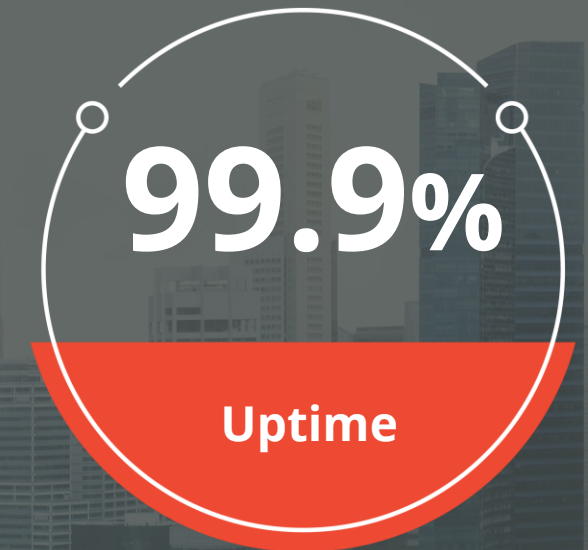
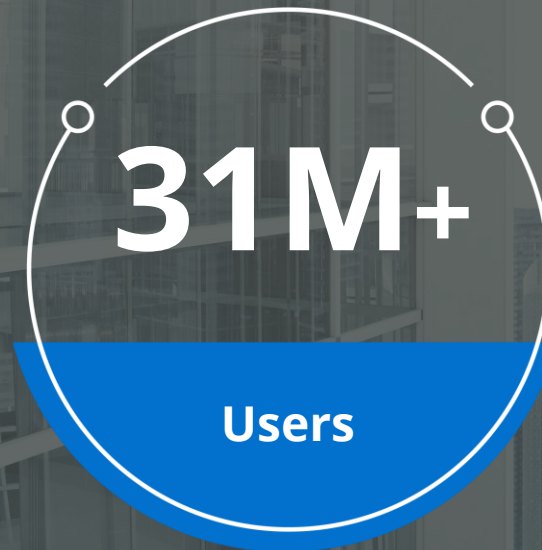
Clare Epstein

Clare.Epstein@vectorsolutions.com

General Manager
Vector Solutions

Who is Vector Solutions?

Leader in SaaS-based, compliance-driven enterprise eLearning, workforce management, and performance improvement solutions



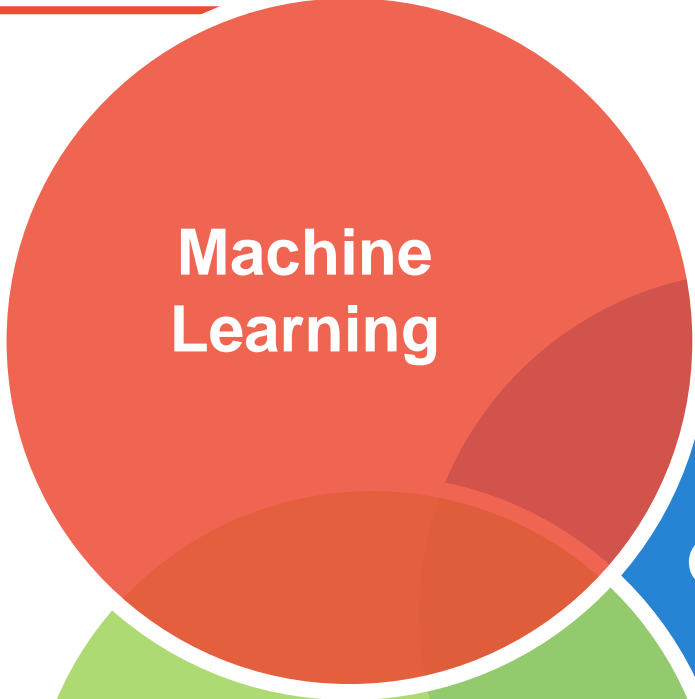
Agenda

- Defining AI for EHS
- Use Cases for AI for EHS
 - Provide standard health and safety checklists
 - Develop Award Winning Safety Training Video Case Study
 - Post Incident Corrective Actions and Training Recommendations
 - Video Machine Learning to identify unsafe acts or conditions
 - Automated translation services to deliver safety content
- Best AI practices for your organization

Artificial Intelligence for Safety

Machine Learning

Problems are solved by helping machines 'discover' their 'own' algorithms, without needing to be explicitly told what to do by any human-developed algorithms.



Natural Language Processing

Providing computers with the ability to support and manipulate speech.



Generative AI

Generative AI

Generative AI models learn the patterns and structure of their input training data and then generate new data that has similar characteristics.

Benefits and Risks of AI for Safety Applications



Benefits

- **Faster:** Can create content, insights, and analytics more quickly than humans
- **Better:** Can look at data in a systematic way with improved accuracy
- **Smarter:** Can look at data in ways that is innovative and more creative than humans alone



Risks

- **Data Privacy and Protection:** Where is your data saved and who has access to it
- **Intellectual property:** Your data being used to train models for everyone
- Who owns the generative AI created?
- **Accuracy:** Is the data accurate?

Survey Question

Which of the following best describes your use of AI in assisting with your EHS (or other job) responsibilities?

- A) I have implemented AI solutions to enhance EHS tasks
- B) I have not utilized AI in my EHS responsibilities
- C) I have explored AI options but haven't implemented them yet
- D) I'm not sure how to use AI in my EHS responsibilities

Survey Results

Which of the following best describes your use of AI in assisting with your EHS (or other job) responsibilities?

- A) I have implemented AI solutions to enhance EHS tasks -9.80%
- C) I have explored AI options but haven't implemented them yet -24.20%
- D) I'm not sure how to use AI in my EHS responsibilities -28%
- B) I have not utilized AI in my EHS responsibilities -40%

* 215 Responses from Vector OH&S webinar on 2/20/2024

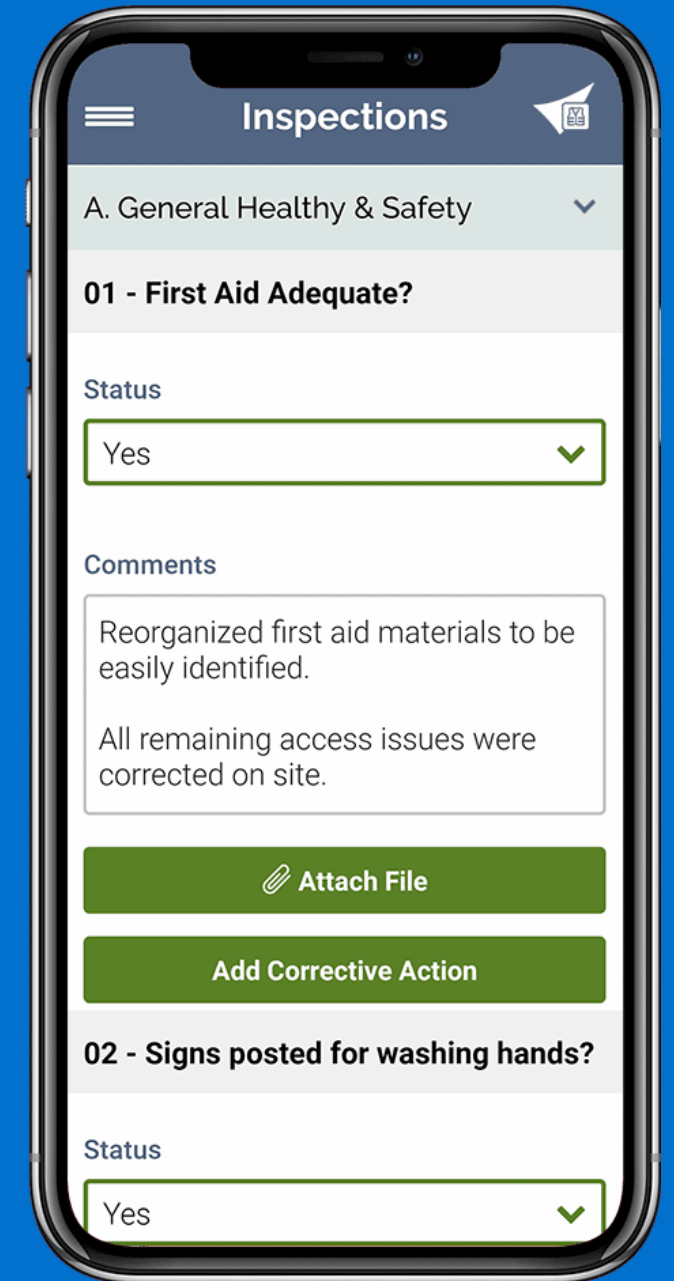
Use Case 1: Provide Standard Health & Safety Checklists

Summary Review

- ChatGPT does a decent job of providing basic checklists in adherence to OSHA standards.
- Require carefully written prompts.
- Lack extensive detail but can provide regulatory references
- Require formatting and appropriate criteria or ranking of checklist items

Tool	Type of AI	Risks
Chat-GPT	ML, NLP, Generative AI	May not provide all areas or detail

*Use of Chat-GPT 3.5 in Fall 2023



Chat GPT Prompt:

Prepare a general health safety checklist following OSHA guidelines

Chat GPT Response Sample

Please note that OSHA regulations can vary by industry, so it's important to consult the specific regulations relevant to your industry. Here's a general health and safety checklist that you can use as a starting point:

****1. Hazard Communication:****

- Are hazardous chemicals properly labeled?
- Is a Material Safety Data Sheet (MSDS) available for each hazardous substance?
- Are employees trained on how to handle hazardous chemicals?

****2. Personal Protective Equipment (PPE):****

- Are appropriate PPE (e.g., gloves, goggles, helmets) provided and used when necessary?
- Is PPE in good condition, and is there a process for replacing damaged PPE?

Vector Human Reviewed Analysis

- Categories are streamlined and consolidated from OSHA Small Business handbook.
- Use of MSDS instead of SDS
- Does not provide criteria or ranking for checklist
- Does not provide or reference actual OSHA CFRs
- Checklist while basic does not have anything that does not comply with OSHA and /or recommended safety practices

Time to Generate: 5 seconds

First Round of Human Review: 15 minutes

*Use of Chat-GPT 3.5 in Fall 2023

Chat GPT Prompt:

1: Prepare facility walk through checklist following OSHA general industry guidelines

2: Prepare a facility walk through checklist that includes the corresponding OSHA general industry regulations

1: NO CFR Reference Sample

Emergency Exits and Evacuation

- Are emergency exits clearly marked and unblocked?
- Are exit routes adequately lit and maintained?
- Are exit doors easy to open from the inside without special knowledge or tools?
- Is there a designated assembly area for employees in case of evacuation?

2: With CFR Reference

Emergency Exits and Evacuation

- Are emergency exits clearly marked and unblocked?
- Are exit routes adequately lit and maintained?

OSHA Regulation Reference

- 29 CFR 1910.36 - Design & Construction Requirements for Exit Routes
- 29 CFR 1910.37 - Maintenance, Safeguards, & Operational Features for Exit Routes

Vector Human Reviewed Analysis

- Checklist items and detail are reduced when CFR reference is requested.
- Does not provide criteria or ranking for checklist
- Checklists do not have anything that do not comply with OSHA and /or recommended safety practices

Time to Generate: 5 seconds

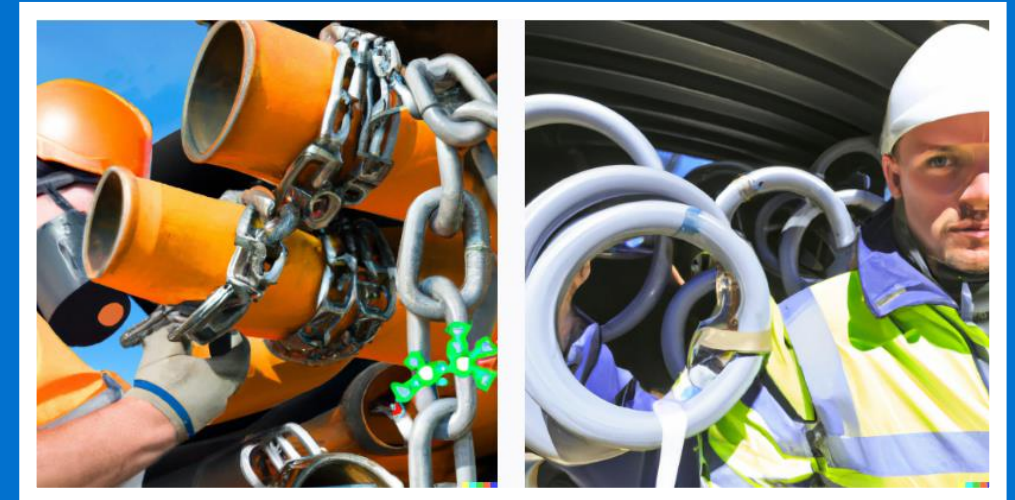
First Round of Human Review: 15 minutes

Use Case 2: Develop Award Winning Safety Training Video Case Study

Summary Review:

- ChatGPT does not add much color or nuance in developing a script for emotionally resonate safety case study
- Dall-E images are not ready for use in depicting complex safety procedures in the United States without extensive human review and editing.

Tool	Type of AI
Dall-E	Computer Generated Image
Chat-GPT	ML, NLP, Generative AI



Images generated from Dall-E

DALL-E Prompt:

Award winning digital image of a human properly securing pipes safely on a transport truck in the US

Images generated from Dall-E:



Vector Human Reviewed Analysis:

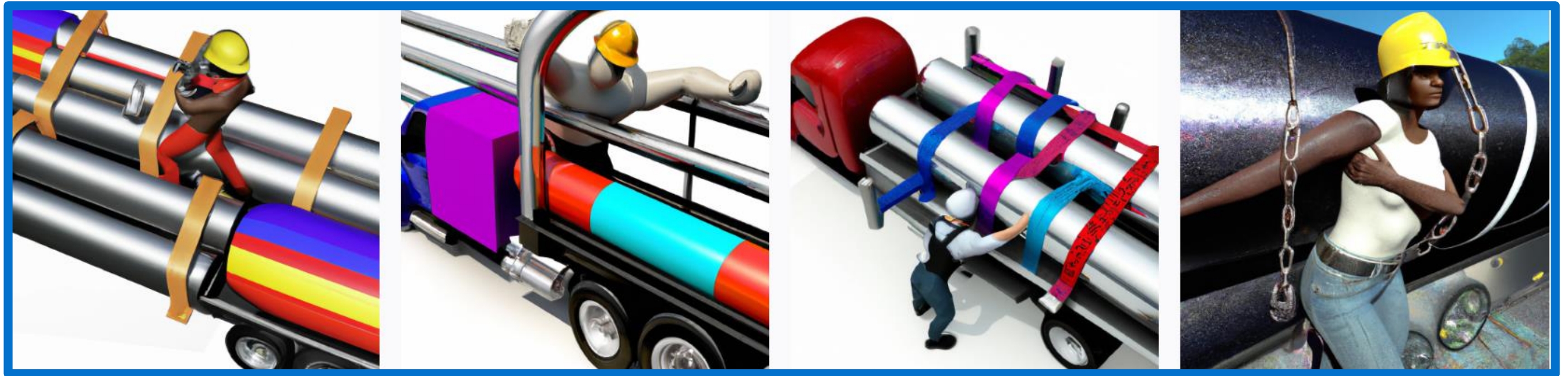
- Unclear that the humans are practicing US best practices; potential safety violations without use of proper PPE
- Securement devices have no safety or load markings; use a language other than English

Time to Generate: 5 minutes | **First Round of Human Review:** 5 minutes

DALL-E Prompt:

Award winning 3-D digital image of a human properly securing pipes safely on a transport truck in the US

Images generated from Dall-E:



Vector Human Reviewed Analysis:

- Very strange images that provide limited safety benefit in training content

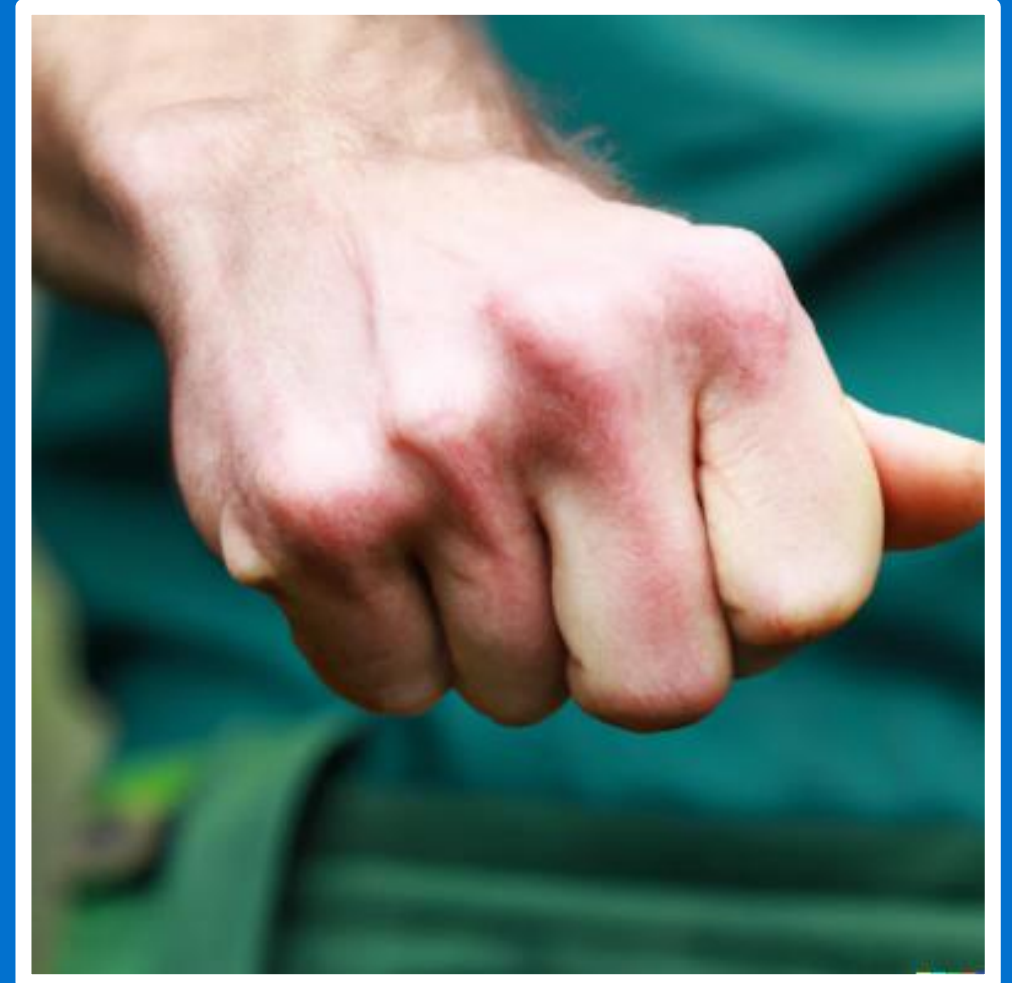
Time to Generate: 1 minute | **First Round of Human Review:** 1 minute

Use Case 3: Post Incident Corrective Actions and Training Recommendations

Summary Review:

- ChatGPT does strong job of providing corrective actions and online courses in case of a “standard” workplace incident and injury.
- Corrective action specifics would need to be tailored to your organization.
- Vector Solutions would need to train the model to provide specific SKU models for online courses and ensure appropriate data protection and security within its Vector EHS product.

Tool	Type of AI	Risks
Chat-GPT	ML, NLP, Generative AI	Data protection and policy, intellectual property



Images generated from Dall-E

Chat GPT Prompt:

Please provide the appropriate corrective actions based on this incident description: While cutting pipe the worker cut his left index finger off. Finger was cut from the top to the knuckle.

Chat GPT Response Sample

1. Immediate Medical Attention:

1. Ensure the injured worker receives immediate medical attention. Call 911 or the nearest emergency services if necessary.
2. Apply basic first aid to control bleeding while waiting for professional medical help. Use a clean cloth or bandage to cover the wound without putting too much pressure on it.

2. Secure the Scene:

- Ensure that the area around the incident is safe and secure to prevent further accidents or injuries. This may include turning off equipment, cordoning off the area, or taking other appropriate precautions.

3. Notify Supervisors and Management:

- Notify supervisors, managers, and relevant personnel about the incident as soon as possible. They should be informed of the situation and its severity.

Vector Human Reviewed Analysis

- ChatGPT does strong job of providing corrective actions and online courses in case of a “standard” workplace incident and injury.
- Corrective action specifics would need to be tailored to your organization.

Time to Generate: 5 seconds

First Round of Human Review: 15 minutes

Chat GPT Prompt:

Please provide the appropriate vector solutions online training course recommendations based on this incident description: While cutting pipe the worker cut his left index finger off. Finger was cut from the top to the knuckle. Worker was not wearing safety gloves.

Chat GPT Response Sample

1. ****Hand and Finger Safety Course:****

Course Description: This course covers the importance of hand and finger safety, including the use of safety gloves and other personal protective equipment. It emphasizes safe work practices and how to prevent injuries when working with tools and machinery.

- **Provider:** Vector Solutions offers a variety of safety training courses, including hand and finger safety.

Vector Human Reviewed Analysis

- ChatGPT does a strong job of providing course training recommendations based on the incident description.
- Vector solutions would need to train the model specifically on our class catalog to include specific course title recommendations and provide a secure version and instance for data privacy and protection.

Time to Generate: 5 seconds

First Round of Human Review: 5 minutes

Use Case 4: Video Machine Learning to Identify Unsafe Acts or Conditions

Tool	Type of AI	Risks
Vertex AI for AutoML (Google) Video Intelligence API (Google) Amazon Rekognition	ML Generative AI	Accuracy Privacy concerns

Summary Review:

- Video machine learning is still a work in progress. Requires extensive images to be fed into the model to determine appropriate safety outcomes.

Use Case 4: Video Machine Learning to Identify Unsafe Acts or Conditions

1. Set up Video storage and AI System
2. Provide video tool images of a common unsafe conditions – i.e., tripping hazard
3. Tag the video or image with unsafe condition (i.e., tripping hazard)
4. Video AI will return a confidence score between zero (low) and 1 (high) whether video shows an unsafe condition (tripping hazard)
5. Trigger a notification or action based on high confidence score



Images generated from Dall-E

Use Case 5: Automated Translation Services to Deliver Safety Content

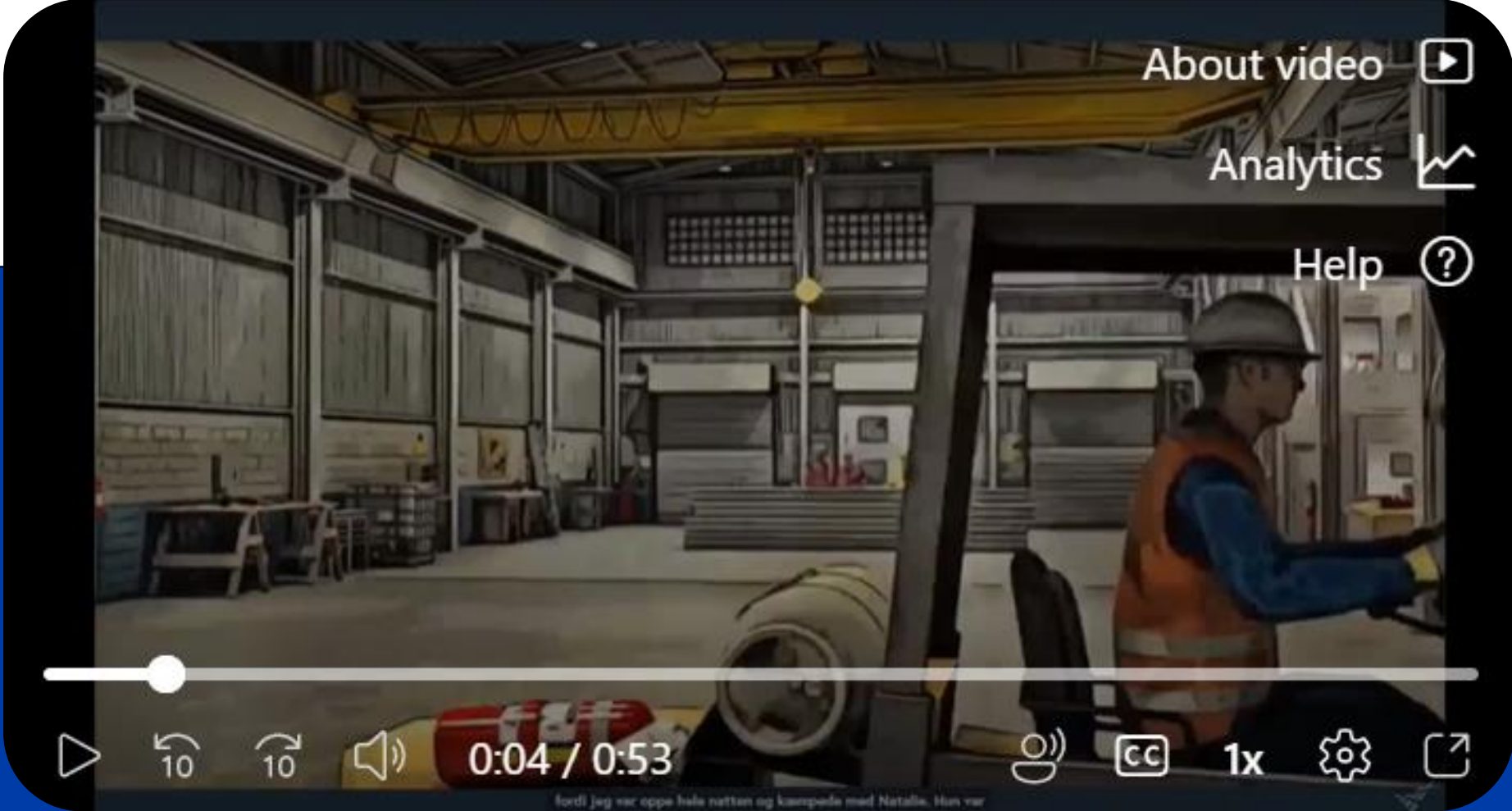
Tool	Type of AI	Risks
<p>Amazon Translate: translates the course and provides live captioning in 44 languages.</p> <p>Amazon Polly: Converts text into life like speech.</p>	<p>Machine Learning, Natural Language Processing</p>	<p>Translation is not always accurate for technical terms.</p> <p>Audio translation in multiple languages may have a different cadence and timing than English.</p>

Summary Review:

- Automated translation services require human review especially for detailed and technical safety terms but offers great potential to translate common material into 44 plus languages.

Vector Solutions had to allocate significant development resources and time to utilize Amazon translation services seamlessly into its course player and Learning Management System.

Use Case 5: Automated translation services to deliver safety content



[202309071355.mp4](#)

Best Practices

Survey Question

Which of the following best describes your organization's approach to addressing AI in the workplace?

- A) We have a well-defined AI policy in place
- B) We are in the process of developing an AI policy
- C) We don't have an AI policy in place, but are considering one
- D) We have not considered implementing an AI policy

Survey Results

Which of the following best describes your use of AI in assisting with your EHS (or other job) responsibilities?

- A) We have a well-defined AI policy in place -6.00%
- B) We are in the process of developing the AI policy -18.50%
- C) We don't have an AI policy in place, but we are considering one -28.50%
- D) We have not considered implementing an AI policy -47%

* 200 Responses from Vector OH&S webinar on 2/20/2024

Best Practices

- Establish an AI policy
- Research the tools and approaches that are supported by your organization
- Train employees are the appropriate uses and uses case of AI
- Budget time and resources for Human Review
- Assess risk /benefits

Questions?

Thank you!

