HUB TECH IA

Deliverable report 16

AI and IAGEN Application Use Case

Construction and installation - Safety - Development of protocols and work guides

Executive Summary – Application of IAGEN in Construction and Installation for Operational Security in Vaca Muerta

This executive summary presents a strategic application of generative artificial intelligence (IAGEN) in the construction and installation sector, focusing on the development of protocols and work guides oriented towards operational safety. This is a significant opportunity for Vaca Muerta, where the adoption of these technologies can radically transform risk management, accident prevention and staff training.

Use case classification

The report classifies this IAGEN application based on the following axes:

1. By main resource: oil and gas.
2. By activity: automation and standardization of protocols.
3. By technology: generative AI models, natural language processing (NLP), computer vision.
4. By strategic impact: risk management and industrial safety.

1. Opportunities for using AI and IAGEN in the sector

Concrete opportunities focus on intelligent automation of
security documents, operating protocols and training programs. The
IAGEN allows you to customize guides for critical tasks, generate virtual scenarios of
drill with tools such as DALL-E or Midjourney, and monitor behaviors
risk assessment using artificial vision applied to drones or cameras. It also facilitates the
design of interactive and adaptive training programs for different profiles and
functions.

2. Expected benefits

The implementation of these technologies generates significant benefits such as:

- Substantial improvement in operational safety through proactive prevention.
- Time optimization thanks to document automation.
- Reduction of physical and mental effort of staff by redistributing load
  of work.
- Reduction in costs associated with in-person training
  traditional.
- Greater precision in the implementation of protocols and regulatory compliance
  updated.

3. Application of AI

The application is structured in a flow that integrates identification of needs, selection of the most
appropriate IAGEN model (such as GPT-4 Turbo, Claude 3 or Gemini), training with regulations and
technical documents, automatic generation of
content, regulatory validation, virtual simulation and real-time feedback.
This architecture allows safety materials to be adapted to real-life conditions.
of operation in Vaca Muerta.

4. Proposed AI Agent

The report proposes the creation of an intelligent agent specialized in security
operational for the oil sector, designed from models such as GPT-4 Turbo,

Claude 3 and Gemini. This agent is trained with international regulations (such as OSHA and ISO 45001), internal protocols, and historical accident cases in Vaca Muerta. Its core function is to automatically generate customized protocols for each task (e.g., working at heights, handling chemicals) and validate them against frameworks.
regulatory through automatic review mechanisms.

Additionally, the agent creates visual simulations using tools such as DALL-E and Midjourney, integrating them with virtual reality environments for training immersive. It can be constantly updated with feedback from staff and real-time data, allowing guides and training to be adjusted to the changing operating conditions. This improves staff training, reduces human errors and strengthens the preventive culture in the field.

5. Conclusion

The adoption of IAGEN in construction and installation tasks represents a qualitative leap in safety management at Vaca Muerta. This transformation allows
move from a reactive to a preventive approach, integrating data, simulation and automation in an intelligent security ecosystem. In the long term, this solution not only improves operational safety and efficiency, but also drives a culture organizational based on prevention and technological innovation.