Step-by-step instructions for safe piercing

Safety guides in Vaca Muerta

Executive Summary – IAGEN Application for Safety Guides in the Drilling in Vaca Muerta

This executive summary presents a strategic application of artificial intelligence generative (IAGEN) in the energy sector, oriented towards automated generation of safety guides for drilling in the Vaca Muerta formation. This is a concrete opportunity to strengthen operational safety and efficiency in one of the world's largest reserves of unconventional hydrocarbons.

Use case classification

The report classifies this IAGEN application based on four axes:

1. By main resource: oil and gas (water and energy as resources) secondary).
2. By activity: automation and standardization of operating protocols.
3. By technology: generative AI models (such as GPT-4), natural language processing (NLP), data integration platforms and systems machine vision.
4. By strategic impact: risk management and industrial safety through artificial intelligence.

1. Opportunities for using AI and IAGEN in the sector

Specific opportunities in this case include: automated generation of customized drilling safety protocols, predictive analytics

risks, real-time monitoring of operating conditions, recommendations
snapshots to drillers, and conversational assistants trained to
answer technical questions in the field.

2. Expected benefits

The implementation of IAGEN in the generation of security guides allows:

- Improve safety through early warnings and condition detection
  anomalous.
- Optimize drilling processes, reducing time and errors. • Standardize
  protocols tailored to each well type and operational phase.
- Strengthen regulatory compliance and facilitate audits.
- Promote continuous learning from operational feedback.

3. Application of AI

The proposed solution is based on a workflow that begins with the loading of
technical, regulatory and field data, followed by analysis using NLP,
Automatic generation of detailed operating guides, expert validation, digital
implementation in the field (via tablets, sensors, SCADA), and continuous monitoring
with feedback for subsequent updates. All of this is supported by
in generative models and advanced semantic processing.

4. Proposed AI Agent

The report proposes the development of an intelligent agent designed to elaborate
operational safety guidelines for drilling environments in Vaca Muerta. This
agent collects technical information on wells, regulations (such as OSHA, ISO, IRAM),
incident reports, and input from field personnel. Using processing
of natural language, identifies failure patterns, regulatory gaps and conditions of
risk, automatically generating guides adapted to each operational phase (drilling,
fracturing, production), with visual alerts and detailed steps.

In addition, the agent incorporates expert validation, real-time feedback
from the field, and integrates with mobile devices, sensors and SCADA platforms.
Its main function is to transform fragmented data into clear protocols,

dynamic and auditable, improving security, reducing human errors and standardizing operations across the entire field.

5. Conclusion

The incorporation of IAGEN for the creation of security guides represents a qualitative leap in risk management in Vaca Muerta. This innovation not only strengthens the safety of operations, but also positions the industry national at the forefront of technology. Through responsible adoption and supervised, IAGEN can contribute decisively to a more efficient, safe and sustainable exploitation of the country's hydrocarbon resources.