HUB TECH IA

AI and IAGEN Application Use Case

Adjusting Drilling Conditions in the Oil, Gas and Petroleum Industry Water in Vaca Muerta, Neuquén, Argentina

Executive Summary – IAGEN Application for Condition Adjustment
Drilling in the Oil, Gas, and Water Industry in Vaca Muerta

This executive summary presents a strategic application of generative artificial intelligence (IAGEN) in the energy sector, specifically in the dynamic adjustment of the drilling conditions in the Vaca Muerta formation. This is a concrete opportunity to improve the efficiency, safety and competitiveness of operations in one of the most important unconventional deposits in the world.

Use case classification

The report classifies this IAGEN application according to four main axes:

1. By main resource: oil (main), gas (secondary) and water (tertiary).
2. By activity: optimization of production processes.
3. By technology: generative AI models (GANs, VAEs), machine learning (deep neural networks, GAN-LSTM) and data integration platforms
   and Big Data.
4. By strategic impact: optimization of production and infrastructure.

1. Opportunities for using AI and IAGEN in the sector

The IAGEN application allows for automatic, predictive and real-time adjustments. real-time monitoring of critical parameters such as drilling speed, pressure, torque, and flow fluids. In addition, it enables early simulation of operating scenarios, early identification of faults, and improved decision-making in the face of challenging conditions. adverse geological conditions, typical of the complex environment of Vaca Muerta.

2. Expected benefits

The incorporation of IAGEN generates benefits such as:

- Reduction of operational risks and technical failures.
- Improvement in well quality and productivity.
- Optimization of times and reduction of operating costs.
- Increased operational safety through early detection of
   dangers.
- Overall efficiency by reducing non-productive times.

3. Application of AI

The system integrates surface and downhole sensors to capture real-time data. real. AI models then process this information to generate predictions about well behavior and automatically adjust operating parameters. This continuous cycle of capture, analysis and feedback enables drilling adaptive, precise and proactive.

4. Proposed AI Agent

The report proposes an intelligent agent based on IAGEN, composed of four modules: one for data capture, another for predictive analysis, a generator of optimal recommendations and a continuous learning system. This agent acts as a digital co-pilot for drilling, automating critical decision-making to maximize efficiency, mitigate risks and reduce dependence on adjustments

manuals.

5. Conclusion

IAGEN's application for adjusting drilling conditions in Vaca Muerta represents a paradigm shift towards intelligent, predictive and operational management data-driven. Its implementation not only strengthens the sector's competitiveness Argentine energy sector, but also promotes safer, more efficient and sustainable use of unconventional resources.