AI and IAGEN Application Use Case

Optimization of Maintenance Cycles in Vaca Muerta

Executive Summary – Application of IAGEN in the hydrocarbon production sector: an opportunity for Vaca Muerta

This executive summary presents an innovative application of Artificial Intelligence Generativa (IAGEN) in the hydrocarbon production sector, focused on the optimization of maintenance cycles, which represents a great opportunity for Vaca Muerta.

The report classifies this use case based on the activity as part of optimization of production processes, with a specific focus on predictive maintenance and prescriptive. The technology used includes IAGEN models and algorithms machine learning. The main resource addressed is oil, and the impact Strategic focus on infrastructure optimization and increased efficiency operational.

1. Opportunities for using AI and IAGEN in the sector.

The application of AI and IAGEN in the maintenance of critical equipment allows anticipation faults, generate dynamic maintenance plans and perform advanced simulations to optimize strategies. Capabilities such as generation are also highlighted automated personalized plans and continuous analysis of historical and current data real-time. These tools enable the transition from reactive maintenance to one that is condition-based and highly predictive.

2. Benefits.

The expected benefits of this implementation include:

- Reduction of operating costs.
- Increased availability of equipment.
- Increased production
- Greater efficiency in resource allocation.
- Optimization of spare parts use.
- Improved coordination of maintenance tasks.
- A safer and more controlled operating environment.

3. Application of AI.

AI is applied by using models that process sensor data (vibration, pressure, temperature, etc.) and maintenance records. These algorithms allow identify anomalous patterns and anticipate failures before they occur. In addition, they can suggest specific maintenance actions and optimize planning accordingly of the real status of each team, improving real-time decision-making.

4. Proposed Artificial Intelligence Agent and its main function.

The report proposes an IAGEN agent that operates in five stages: collection of data, predictive analytics, generating predictions, creating action plans optimized maintenance, and real-time monitoring. Its main function is anticipate maintenance needs and generate automated responses adapted to the current state of the equipment. Their benefit lies in reducing failures unexpected, improve efficiency and ensure operational continuity.

5. Conclusion.

The implementation of IAGEN for maintenance in Vaca Muerta represents a strategic innovation with the capacity to transform the operational management of the site. If cultural resistance is overcome, the quality of the data is guaranteed and properly integrate existing systems, AI can position itself as a

fundamental ally to strengthen the competitiveness, profitability and sustainability of the Argentine energy production.