HUB TECH IA

Deliverable report 47

AI and IAGEN Application Use Case

Hydraulic Fracturing Design and Propagation Modeling Fractures to Optimize Inputs

Classification of deliverable report 47: "Hydraulic Fracturing Design and Modeling" Fracture Propagation to Optimize Inputs in Vaca Muerta":

Classification 1: By Main Resource

- Selected option: Oil, Gas, Water + energy (comprehensive approach).
- Justification:

The report is oriented to the optimized design of hydraulic fracturing in shale oil and shale gas deposits, explicitly mentioning both resources as an extraction target. In addition, the use of water, chemical additives and energy, which justifies a comprehensive approach on the three resources.

Classification 2: By Activity within Vaca Muerta

- Selected option: Optimization of Production Processes
- Justification:

The use of IAGEN is focused on improving the design and execution of the hydraulic fracturing operations, increase production, reduce inputs, optimize operational efficiency and minimize risks. These actions correspond directly to the category of process optimization

productive.

Classification 3: Type of AI Technology Used

- Main selected option:
  1ÿÿGenerative AI Models,
  2ÿÿMachine Learning Algorithms, 6ÿÿAI
  Platforms for Data Integration and Big Data, 5ÿÿAI
  Systems Based on Intelligent Agents,
  4ÿÿComplementary Computer Vision Systems).
- Justification:
  The report includes the use of artificial neural networks, genetic algorithms, machine learning, scenario simulation, real-time monitoring, intelligent agents and distributed sensors. It also describes agentic flows for operational decision-making and continuous optimization.

Classification 4: By Strategic Impact on the Industry

- Selected option: AI for Production and Quality Optimization Infrastructure
- Justification:
  The report emphasizes benefits such as: increased production, reduction of water consumption, reduced emissions, lower operational risk, and improved in the efficiency of inputs. These improvements directly aim to optimize productive infrastructure, increasing its performance and sustainability.