HUB TECH IA

AI and IAGEN Application Use Case

**Predictive Asset Maintenance with AI for the optimization
and prediction of equipment failures by analyzing operational data in
real time**

**Classification of deliverable report 41: "Predictive Asset Maintenance with AI"
for Optimization and Failure Prediction in Vaca Muerta":**

Classification 1: By Main Resource

• Selected option: Oil and Gas (main), Water + energy
   (secondary).
• Justification:

   The report focuses on predictive maintenance applied to equipment
   used in the production and transportation of oil and gas. While mentioning
   tangential form processes also applicable to renewable energies or use
   efficient use of resources such as water, the focus is purely hydrocarbon,
   aimed at optimizing critical infrastructure in Vaca Muerta.

Classification 2: By Activity within Vaca Muerta

• Selected option: Optimization of Production Processes
• Justification:

   The main objective is to anticipate failures, avoid unscheduled stops, increase
   asset availability, and reduce operating costs, which impacts
   directly on productive efficiency. It addresses the maintenance of

pumps, compressors, pipes, structures and critical components of the productive operations.

Classification 3: Type of AI Technology Used

• Main selected option:

1ÿÿGenerative AI Models,

2ÿÿMachine Learning Algorithms,

4ÿÿComputer Vision and Image Analysis Systems,

5ÿÿAI Systems Based on Intelligent Agents, 6ÿÿAI

Platforms for Data Integration and Big Data.

• Justification:

The report mentions the use of artificial vision applied to drones and inspection automated visual, generative models for failure prediction and simulation, Machine learning for time series and signal analysis, and implementation of intelligent agents for monitoring, analysis and execution of actions maintenance. Integration with SCADA systems and sensors is also detailed. IoT and complex analytics platforms.

Classification 4: By Strategic Impact on the Industry

• Selected option: AI for Production and Quality Optimization Infrastructure

• Justification:

Predictive maintenance with AI seeks to maximize operational uptime, reduce the risk of catastrophic failures, and optimize the use of critical infrastructure. They report metrics such as a 35% reduction in downtime. planned, 20% in maintenance costs, and greater energy efficiency. This It has a direct impact on the productive infrastructure and its reliability. operational.