Use Case of AI and IAGEN Application
Optimization of Drilling Conditions Related to Water and Oil Activities in Vaca Muerta, Neuquén

Deliverable Report Classification 7: Optimization of Drilling Conditions Related to Water and Oil Activities in Vaca Muerta

🔹 **Classification 1: By Main Resource**

- **Selected Option:** 🛢️ Oil (main), 💧 Water + energy (secondary)
- **Justification:**
  The report primarily addresses advanced optimization in drilling activities related to hydrocarbons, specifically oil. It also considers the efficient management of water used during drilling operations. Water is presented as a secondary resource essential to the operation, while oil is clearly the primary resource of focus in the report.

🔹 **Classification 2: By Activity within Vaca Muerta**

- **Selected Option:** Optimization of Production Processes
- **Justification:**
  The main objective is to optimize drilling conditions through the application of IAGEN. The aim is to significantly improve operational efficiency by reducing time and operational costs, and improving safety through real-time advanced optimization of drilling parameters, predictive maintenance, and well planning.

🔹 **Classification 3: Type of AI Technology Used**

- **Main Selected Option:** 1️⃣ Generative AI Models and 2️⃣ Machine Learning Algorithms
- **Justification:**
  The report specifically emphasizes the use of Generative Artificial Intelligence (IAGEN) to generate advanced predictive models, new content based on historical data, and automated solutions to optimize drilling conditions in real time. It also explicitly mentions machine learning techniques, including deep learning and reinforcement learning, to optimize operational parameters and predictive equipment maintenance.

🔹 **Classification 4: By Strategic Industry Impact**

- **Selected Option:** AI for Optimization of Production and Infrastructure
- **Justification:**
  The report mainly highlights the strategic impact of IAGEN implementation on significantly reducing drilling operational costs, improving rate of penetration (ROP), reducing non-productive time, increasing overall well productivity, and substantially reducing operational risks. This direct impact on critical infrastructure and drilling operations clearly aligns with the selected strategic category.