



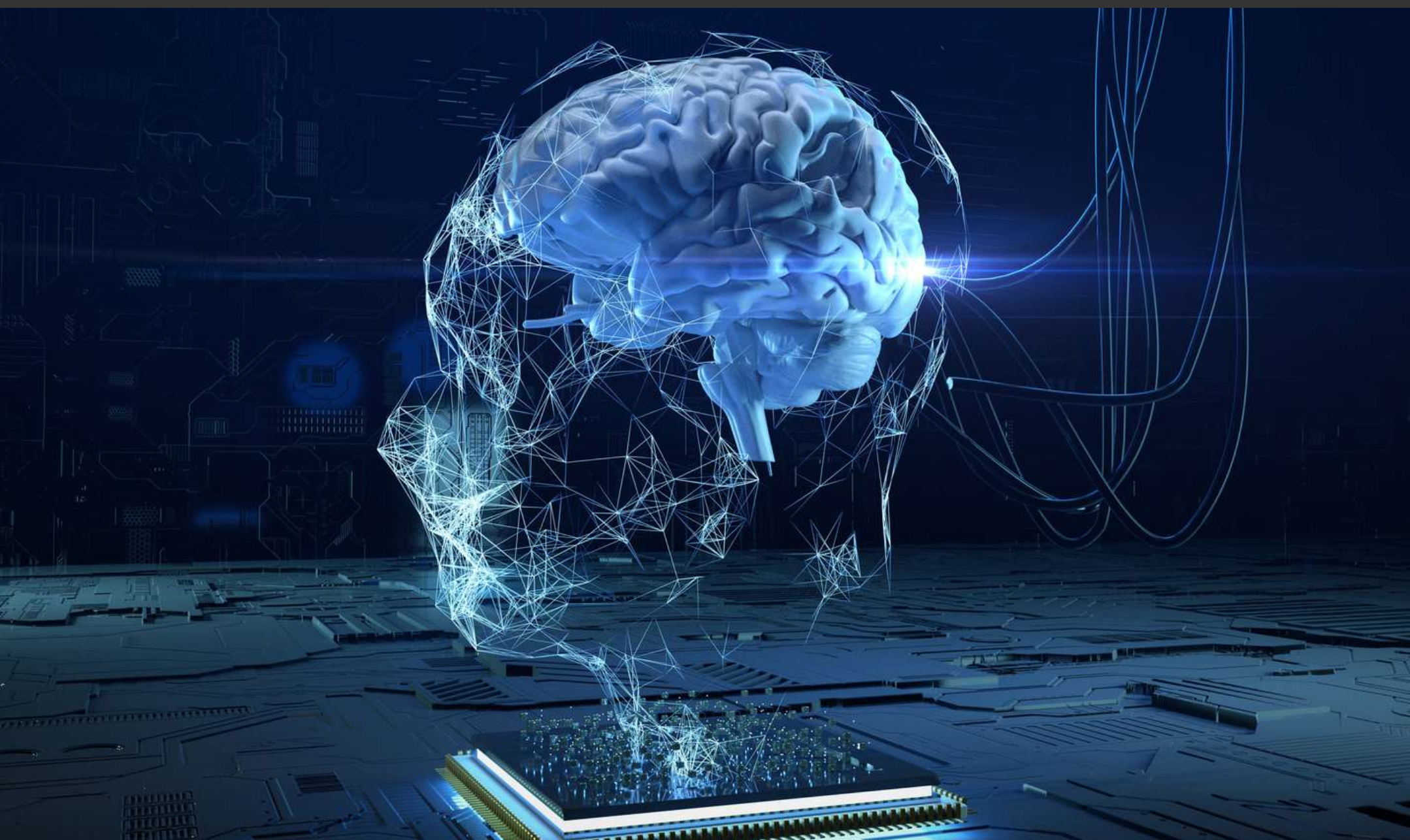
Innovarpel 2025

TECHNICAL DAYS

**DIGITAL TRANSFORMATION
& INDUSTRIAL CYBERSECURITY**
IN THE OIL&GAS INDUSTRY

arpel **60**
YEARS

JUNE, 24 & 25
Rio de Janeiro, Brazil



INDUSTRIAL AI

**How to enhance asset reliability and
operational performance through ML.**

DOWNSTREAM YPF

June 2025
INNOVARPEL 2025

YPF 4X4

STRATEGIC PILLARS

01

**FOCUS ON
OUR MOST
PROFITABLE
BUSINESS**

VACA MUERTA

SHORT TERM

02

**ACTIVE
PORTFOLIO
MANAGEMENT**

**SHORT AND
MEDIUM TERM**

03

**MAXIMIZE
UPSTREAM AND
DOWNSTREAM
EFFICIENCY**

**SHORT AND
MEDIUM TERM**

04

**ARGENTINA
LNG PROJECT**

**MEDIUM AND
LONG TERM**



REFINERIES

3

PETROCHEMICALS

2

CRUDE PROCESSING CAPACITY

320 Kbbbl/d

OIL AND PRODUCT PIPELINES

2.900 Km

TERMINALS

16

GAS STATIONS

1.600

DOWNSTREAM PORTFOLIO



A LUJÁN DE CUYO
CAPACITY:
114 Kbbbl/d

B LA PLATA
CAPACITY:
189 Kbbbl/d

C PLAZA HUINCUL
CAPACITY:
25 Kbbbl/d

1 ENSENADA
CAPACITY:
1.3MM tons/year

2 PROFERTIL ⁽⁴⁾
CAPACITY:
2.1MM tons/year

3 PLAZA HUINCUL
CAPACITY:
0.4MM tons/year

REFINERY
PETROCHEMICAL
COMPLEX
TERMINALS: 17
OIL PIPELINE:
1,165 Km

PRODUCTS PIPELINE:
1,785 Km
PORTS: 3
AIRPLANE REFUELING
FACILITY: 50

OUR GOAL AS A BUSINESS

Evolve into a more competitive and efficient organization, with safer and more sustainable operations, leveraged on digital technology.



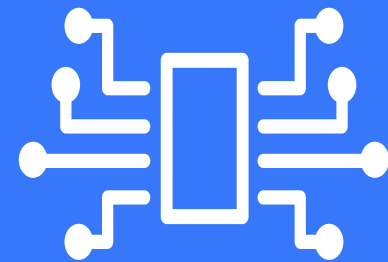


PATH BUILT: THE SEARCH OF VALUE

Stages of Digitalization to enable value generation in Downstream



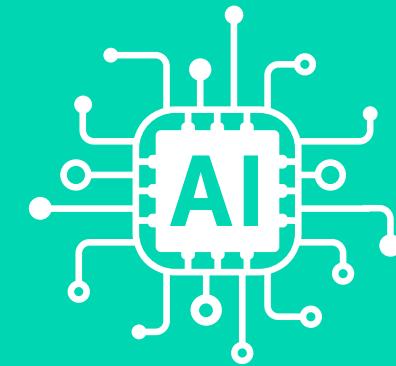
CONNECTIVITY



INSTRUMENTATION



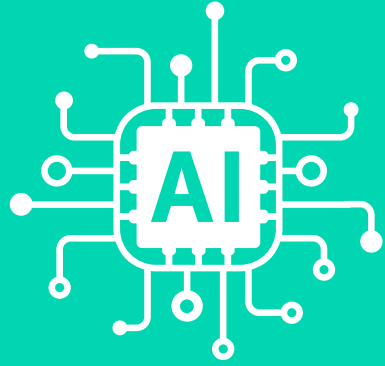
DATA



ARTIFICIAL
INTELLIGENCE



VALUE



Our Goal

Accelerate business strategy through enhanced adoption of Industrial IA

Key Challenges



Contribute to the safety of processes and people.



Maximize productivity.



Strengthen K-H for decision-making.

ECOSYSTEM INDUSTRIAL AI



Early detection of
anomalies through the
efficient and assertive
use of Industrial AI.

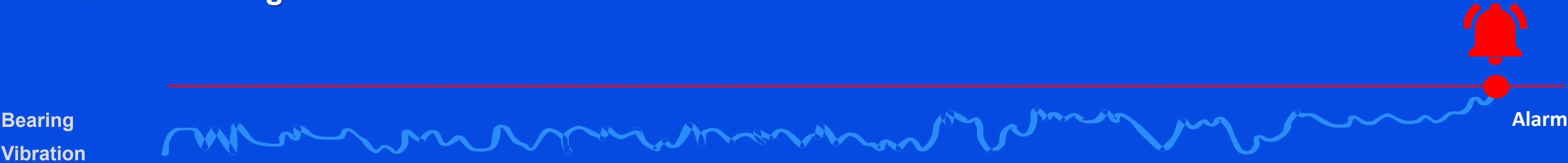




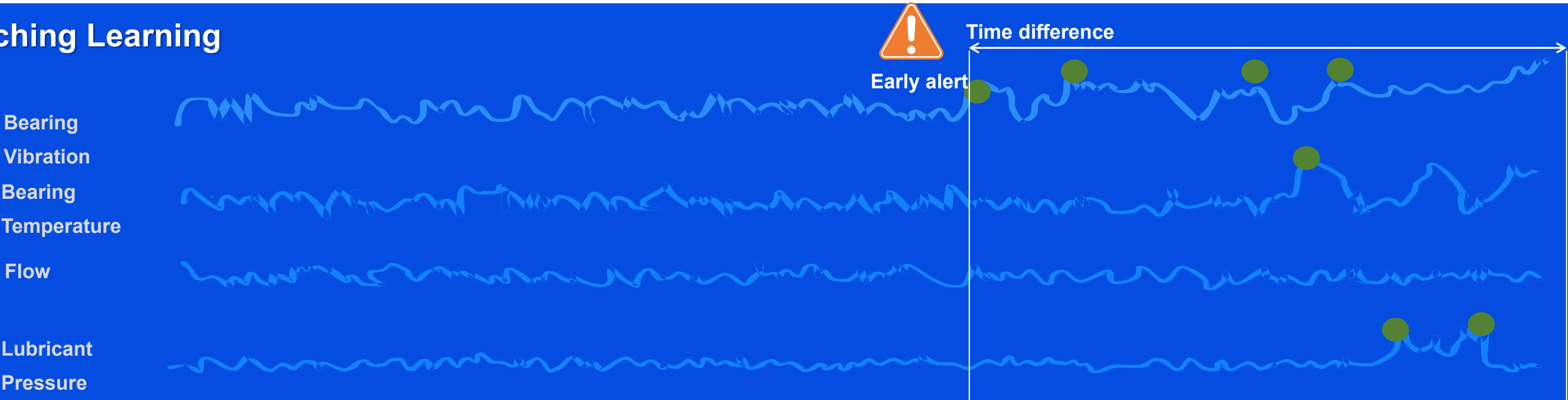
SUCCESS CASES
Anomaly
detection

IA - MACHINE LEARNING

Traditional methodologies



Maching Learning



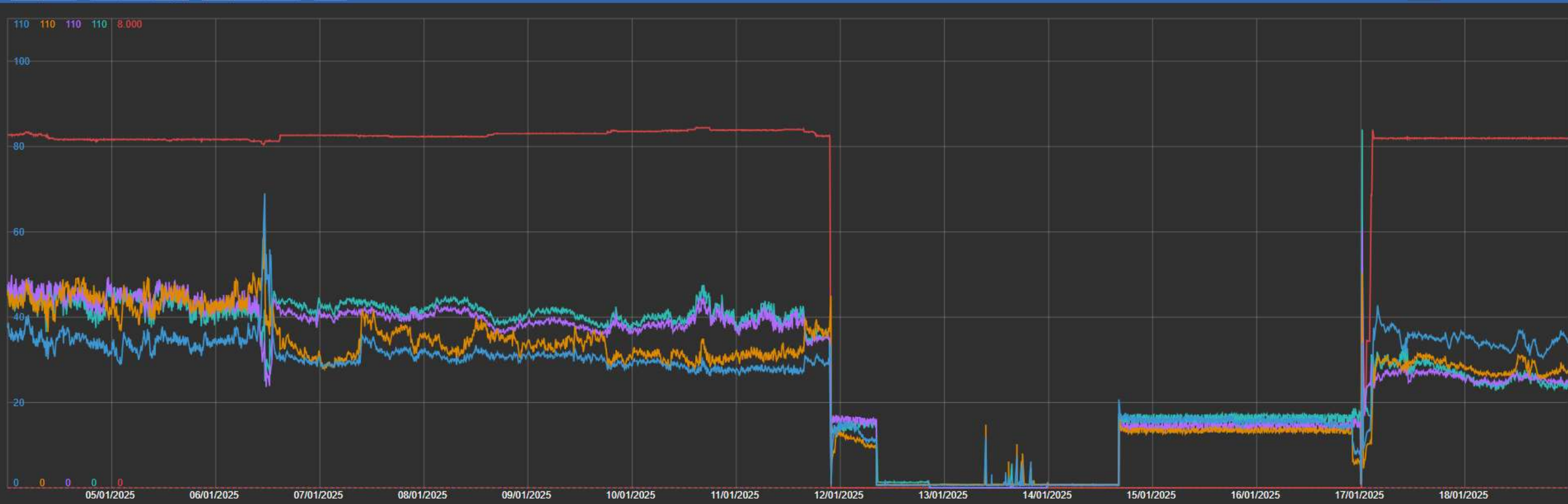
Increase asset reliability.

Minimize deviations from operational processes.



FCC GAS COMPRESSOR

Early anomaly detection through combined behavior of vibration sensors.



Name	Description	Value	Units	Average	Minimum	Maximum	Bottom	Top	
C1-VI3091_A	VIBRACION TURBINA EMPUJE .(DV1H) JC-451TR	34.17...	mic.pp	24,03229	0,53101	69,03868	0	110	
C1-VI3091_B	VIBRACION TURBINA EMPUJE .(DV1V) JC-451TR	26.82...	mic.pp	25,42226	0,67750	60,99794	0	110	
C1-VI3092_A	VIBRACION TURBINA APOYO HORIZONTAL .(DV2H) JC-	24.66...	mic.pp	27,60435	0	60,56077	0	110	
C1-VI3092_B	VIBRACION TURBINA APOYO VERTICAL .(DV2V) JC-451	23.51...	mic.pp	28,41188	0	84,01007	0	110	
C1-SI552	RPM MITSUI (DE BENTLY NEVADA)	5.962...	rpm	3.936,6...	0	6.147,4...	0	8000	

 Damage spread prevented.

 Low-demand period intervention

 No impact on the refinery's monthly plan.

 Reduction of lost profit.



EMISSIONS MANAGEMENT

Early detection of flare events & identification of contributors.



Recovery compressor

Unidentified contributors



50% flow Identified



CILC

EMISSIONS MANAGEMENT

LARGE-SCALE FLARE PROJECT

190

Sources of
contribution

58

Virtual flow
meters

10

Coke Drums

5

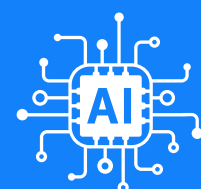
Gas storage
spheres

35

Accumulators,
towers and
rotating
equipment

140

PSV's

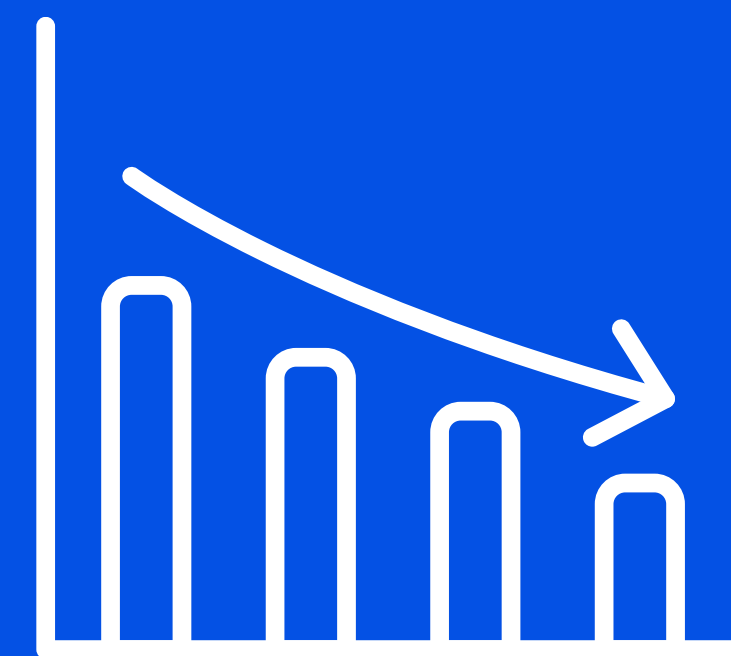


23

ML Agents

175

rules



60%

Reduction flare flow
2023-2024

UPDATE JUNE 2025

90 

Monitored Assets
ROTANTES - PROCESS

+500

Live AI Agents

4,000

Sensors & Variables

5 MM

Live Daily Dta



Reduction of emergency stops



Optimization of intervention times



Reduced maintenance costs



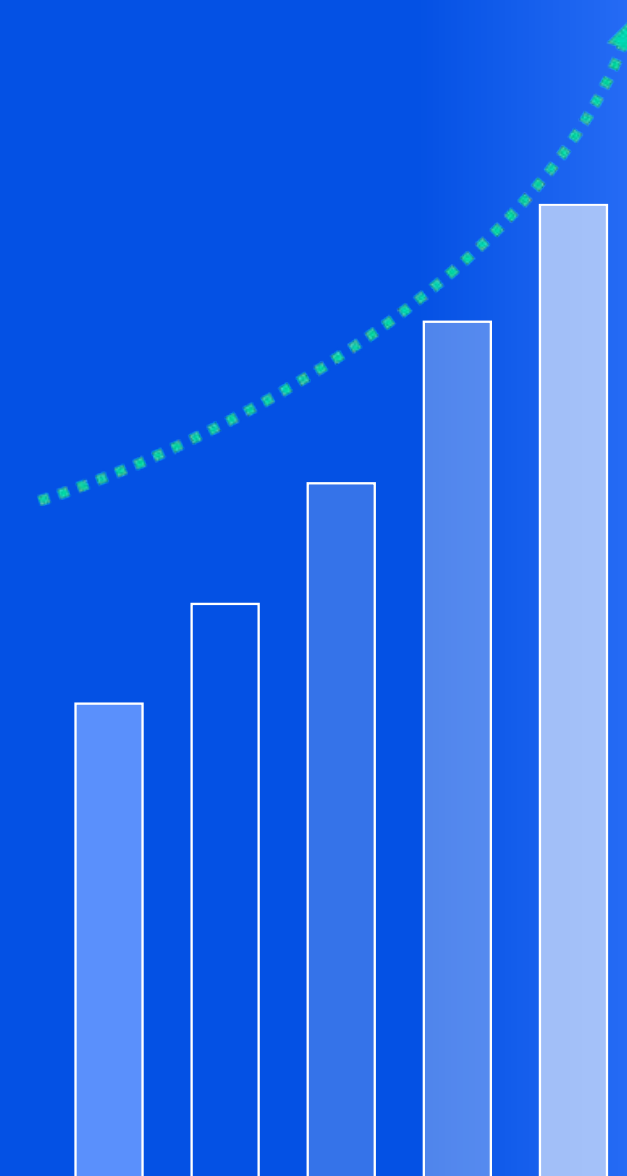
Improved emissions management



Improved cross-sector relations



VALUE





KEY CHALLENGES

Penetration of digitalization



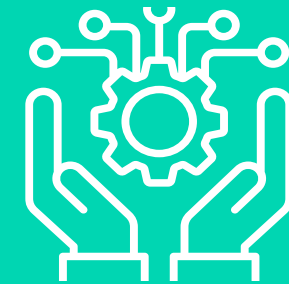
**Data
management**



**Variety of
professional
profiles**



**Cultural
Resistance**



Adoption



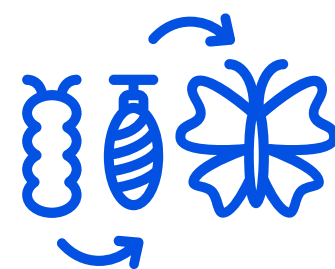
**Scaling and
acceleration**



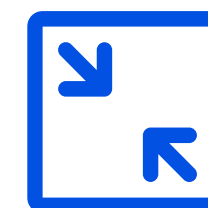
KEYS TO SUCCESS



ACCELERATE



EVOLVE



TECHNOLOGY -
CULTURE

ENHANCE PEOPLE'S
KNOWLEDGE WITH AI,
EMPOWERING THEM TO
GO BEYOND THEIR
LIMITS.

MUCHAS GRACIAS

MARÍA NOEL FORAME

Noel.forame@ypf.com