AVEVAWORLD

ACCELERATE INDUSTRIAL INTELLIGENCE

AVEVA WORLD MILAN, MAY 2026

Power Community Group Panel: Connecting the Lifecycle

Harnessing Technology and Industrial Data from Design to Optimization

Maged Amr, Elsewedy Electric Power Systems Projects

Guillermo De Simone, Central Puerto

Eduardo Coronel, ITAIPU Binacional

Connecting the Lifecycle: Harnessing Technology and Industrial Data from Design to Optimization

Your Panelists

Fiona Straton

Global Industry Marketing – Critical Infrastructure

AVEVA

With over 20 years of industry experience, Fiona is an advocate for digital transformation and how technology delivers a better, more sustainable quality of life for all.

Maged Amr

Senior Director Ops. Engineer

Elsewedy Electric

Maged is a senior EPC leader specializing in digital transformation, leading teams that integrate AVEVA ERM, Oracle EBS, Primavera P6, and in-house solutions to improve project delivery and efficiency.

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Guillermo De Simone

Business Applications, Data & IT/OT Manager

Central Puerto

Guillermo is an IT executive with 20+ years' experience delivering large-scale digital transformation across energy, agribusiness, and consumer sectors.

Eduardo Coronel

M.Sc. – Maintenance Engineer

ITAIPU Binacional

An Electronic Engineer with a Master's in Electrical Engineering and PhD candidate in Computer Science, Eduardo specializes in AI for industrial maintenance, cybersecurity, and systems integration at Itaipu Binacional.

Elsewedy Electric

Maged Amr

EPC 4.0

BUILDING A DIGITAL FUTURE

ELSEWEDY ELECTRIC | PSP

WHAT WE WILL COVER

1. WHO WE ARE
2. SUPPLY CHAIN – GLOBAL REACH
3. INDUSTRIAL REVOLUTIONS
4. TRANSFORMATION FRAMEWORK
5. CHALLENGES – STATUS QUO IS BROKEN
6. CORE TECHNOLOGIES OF EPC 4.0
7. PROJECT LIFECYCLE
8. INTEGRATED BUSINESS SOLUTION FRAMEWORK FOR EE|PSP

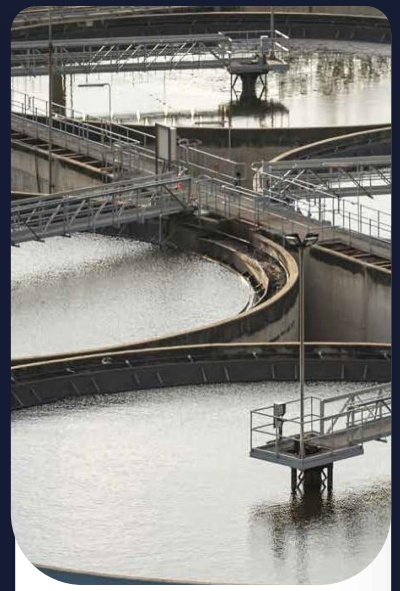
WHO WE ARE

Power Generation

- Thermal Power Projects
- Co-generation Power Projects (CHP)
- Hydropower Projects
- Renewable Energy Projects (Wind)

Power Transmission

- EHV Substations



Water and Wastewater Treatment

- Sea Water Desalination (SWRO/BWRO)
- Water and Waste Water Treatment Plant
- Pumping Stations and Distribution

Mobility

- Signaling and Electrification
- Monorail

Oil & Gas

- Petrochemicals
- Contracting Services

Construction & Energy Services

- Installation
- Commissioning
- Construction
- Operations & Maintenance

SUPPLY CHAIN – GLOBAL REACH

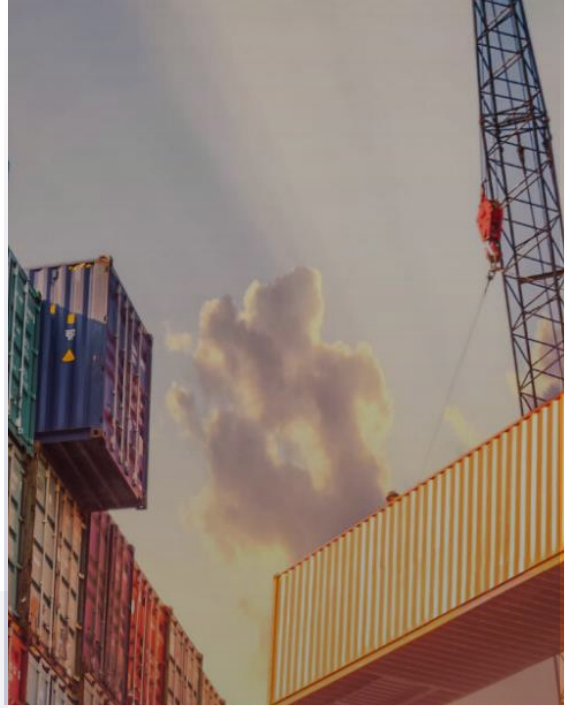
Leveraging our expertise in dealing with complex, fast-track projects, our supply chain division has immensely enhanced its services and expanded globally to procure the best quality products and services, respecting detailed technical requirements and strict timelines.

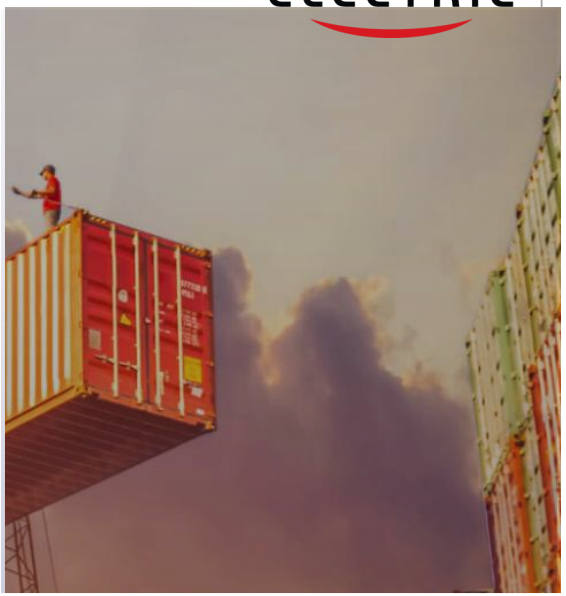
GLOBAL REACH
2000+ approved and qualified vendors in **44** Countries, **4** continents, adopting **11** Incoterms

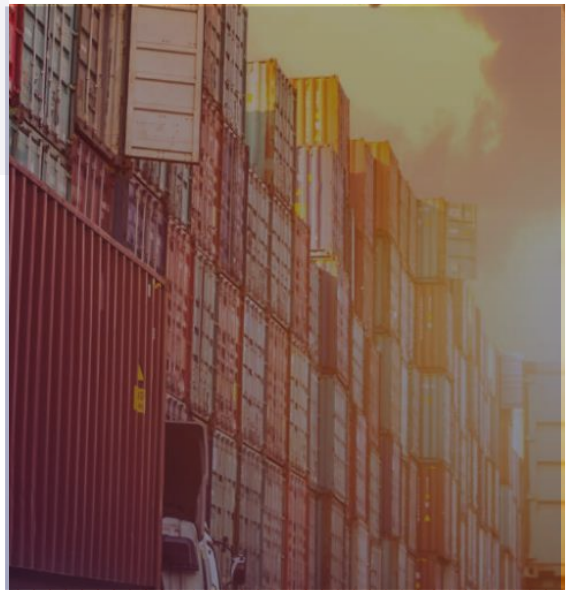
>1000 Manufacturers

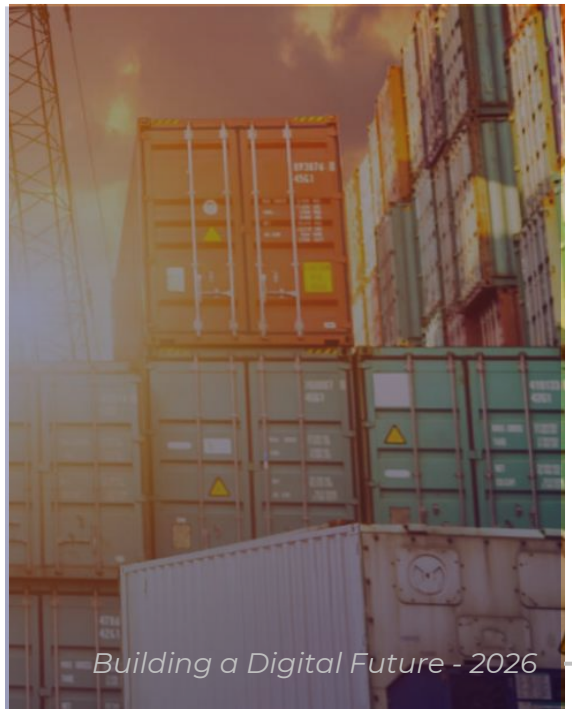
>450 Subcontractors

>2300 Supplier

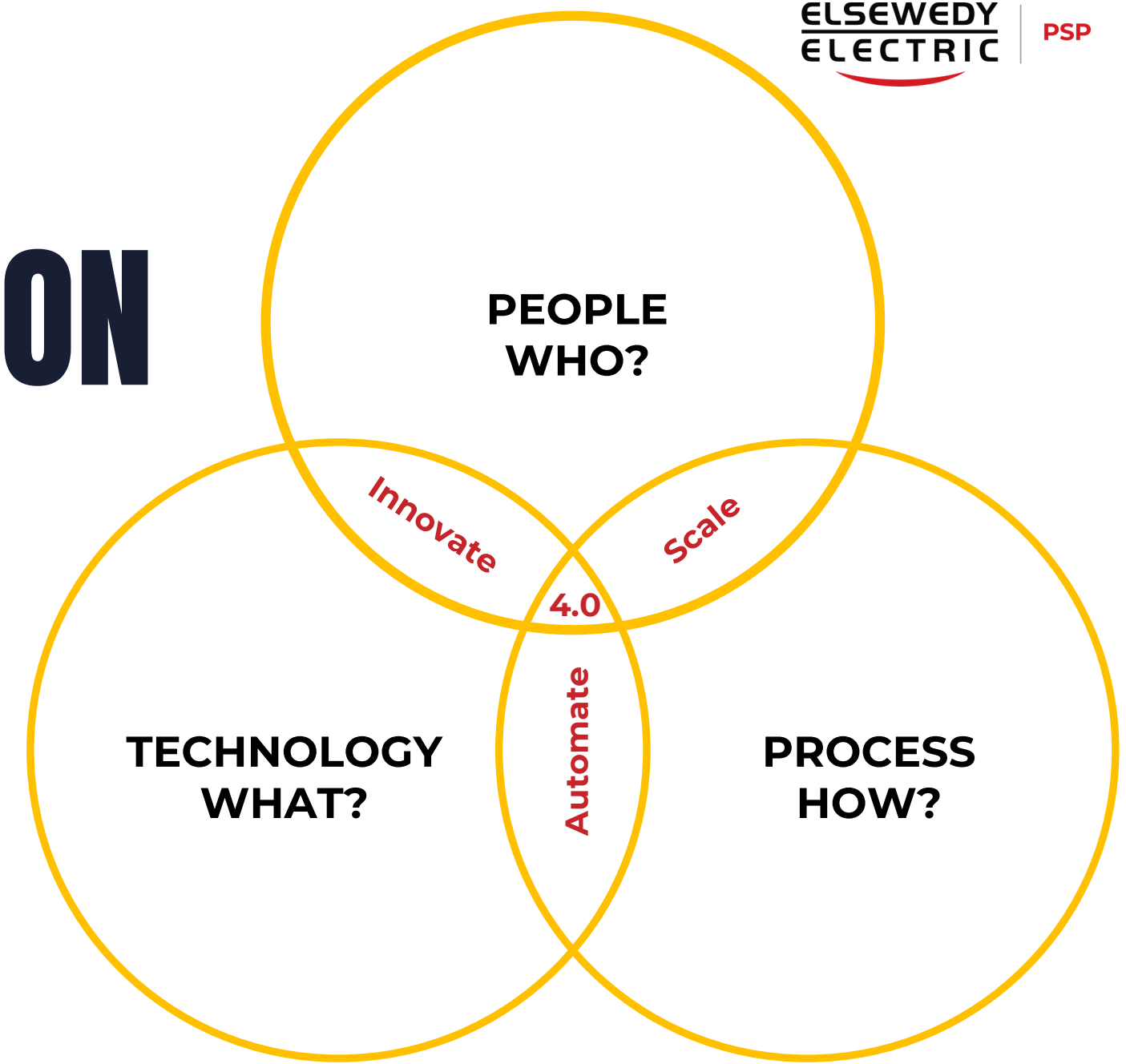








THE TRANSFORMATION FRAMEWORK



THE CHALLENGE:

The Status Quo is Broken

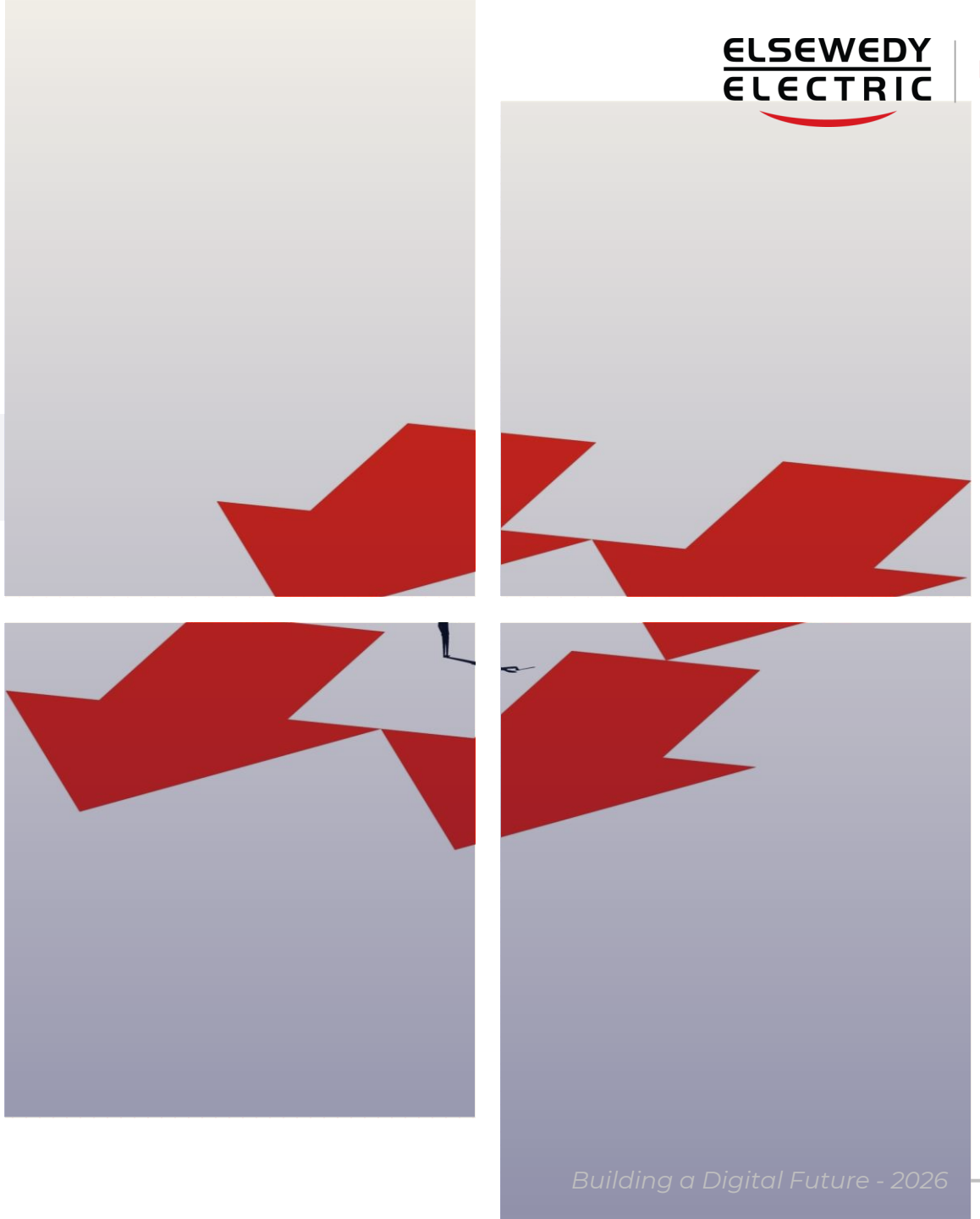
Why We Can't Afford Business as Usual

1. **Cost & Schedule:**
   >80% of megaprojects face significant overruns

2. **Productivity:**
   Construction productivity has stagnated for decades.

3. **Silos:**
   Engineering, Procurement, and Construction operate in disconnected bubbles.

4. **Rework:**
   Up to 30% of all work on a project is rework due to poor data handover.



ELSEWEDY ELECTRIC | PSP

PROJECT LIFECYCLE

Digital Transformation & Change Control Impact

30-40%
Schedule Reduction

+50%
Change Cost Savings

3×
Faster Issue Resolution

THE IMPACT OF DIGITAL TRANSFORMATION

ELSEWEDY ELECTRIC | PSP

Quantified benefits of EPC 4.0 change control across the project lifecycle

TRADITIONAL EPC

- Project Duration: 5 – 6 years
- Change Cost: 20–40% budget overrun
- RFI Resolution: 2–6 weeks average
- Drawing Revisions: 15–30 revision cycles
- Data Handover: Paper / PDF bundles
- Project Visibility: Reactive — monthly reports
- Team Collaboration: Siloed teams & systems

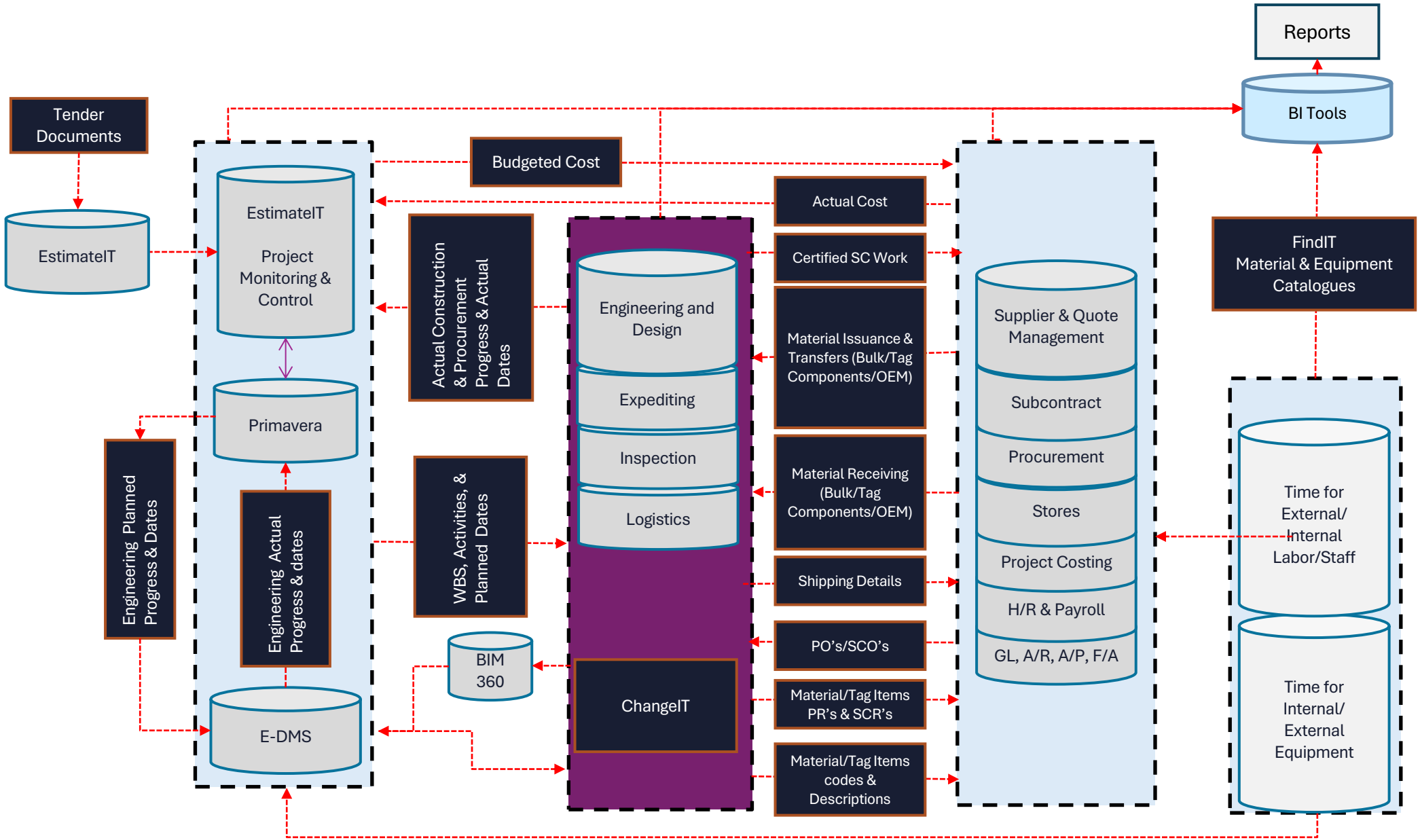
DIGITAL EPC 4.0

- Project Duration: 3 – 4 years (↓ ~35%)
- Change Cost: Reduced by 30–50%
- RFI Resolution: Hours to 2–3 days
- Drawing Revisions: 5–10 cycles (BIM clash detection)
- Data Handover: Structured digital model
- Project Visibility: Real-time dashboards & KPIs
- Team Collaboration: Integrated digital platform

KEY ENABLERS OF DIGITAL CHANGE CONTROL

1. BIM / 3D Modeling
2. Common Data Environment
3. Digital Tools
4. Smart MTO & Procurement
5. Real-Time Dashboards
6. e-Handover Packages

INTEGRATED BUSINESS SOLUTION FRAMEWORK FOR EE|PSP



WORKPACKS, AN INTEGRATED PLATFORM

ELSEWEDY ELECTRIC | PSP

Revit, Navisworks, Tekla, AVEVA (E3D, Diagram, Electrical, Instrumentation), Autodesk… etc.,
3D Models, 3D Smart Models, 2D dwgs, Model Elements, Model Attributes… etc.,

AVEVA ERM
TMRs, TMRs' status, TMRs', Revision(s), expediting dates, logistics dates, material master, EMC, MTO

Templates;
BOQs, MTS, MDL

In-house Manpower Application
Manpower Resources

In-house DMS(.Net)
Master Document List, Documents Status, IFC, NCR(s), Permits… etc.,

Oracle EBS ERP
PO(s), PO header and line item information, material receiving, material issuance, PO line delivery, contractual date, PO header incoterm(s), PO origin, On-hand balance, vendors master data

P6 & Microsoft Project
(WBS, activities, work packages, activity codes, resources, progress… etc.,)

SCAN THE QR CODES

TO VIEW OUR

CORPORATE PRESENTATION

CORPORATE MAGAZINE

CORPORATE WEBSITE

COMPANY PRESENTATION

WWW.ELSEWEDYELECTRIC.COM

THANK YOU

POWER AND UTILITIES, EPC | MIDDLE EAST AND EUROPE

Elsewedy Electric delivers EPC 4.0 with unified project data

Challenge

- Engineering, procurement, and construction operated in disconnected silos
- Design changes and materials data were inconsistently tracked, increasing rework risk and delivery uncertainty
- Manual processes reduced planning accuracy and decision confidence
- Limited integration constrained enterprise wide visibility

Solution

- Implemented AVEVA™ E3D Design, AVEVA™ Diagrams, AVEVA™ Instrumentation & Control, AVEVA™ Engineering Resource Management, and WorkPacks™ to support an EPC 4.0 delivery model grounded in Advanced Work Packaging (AWP).

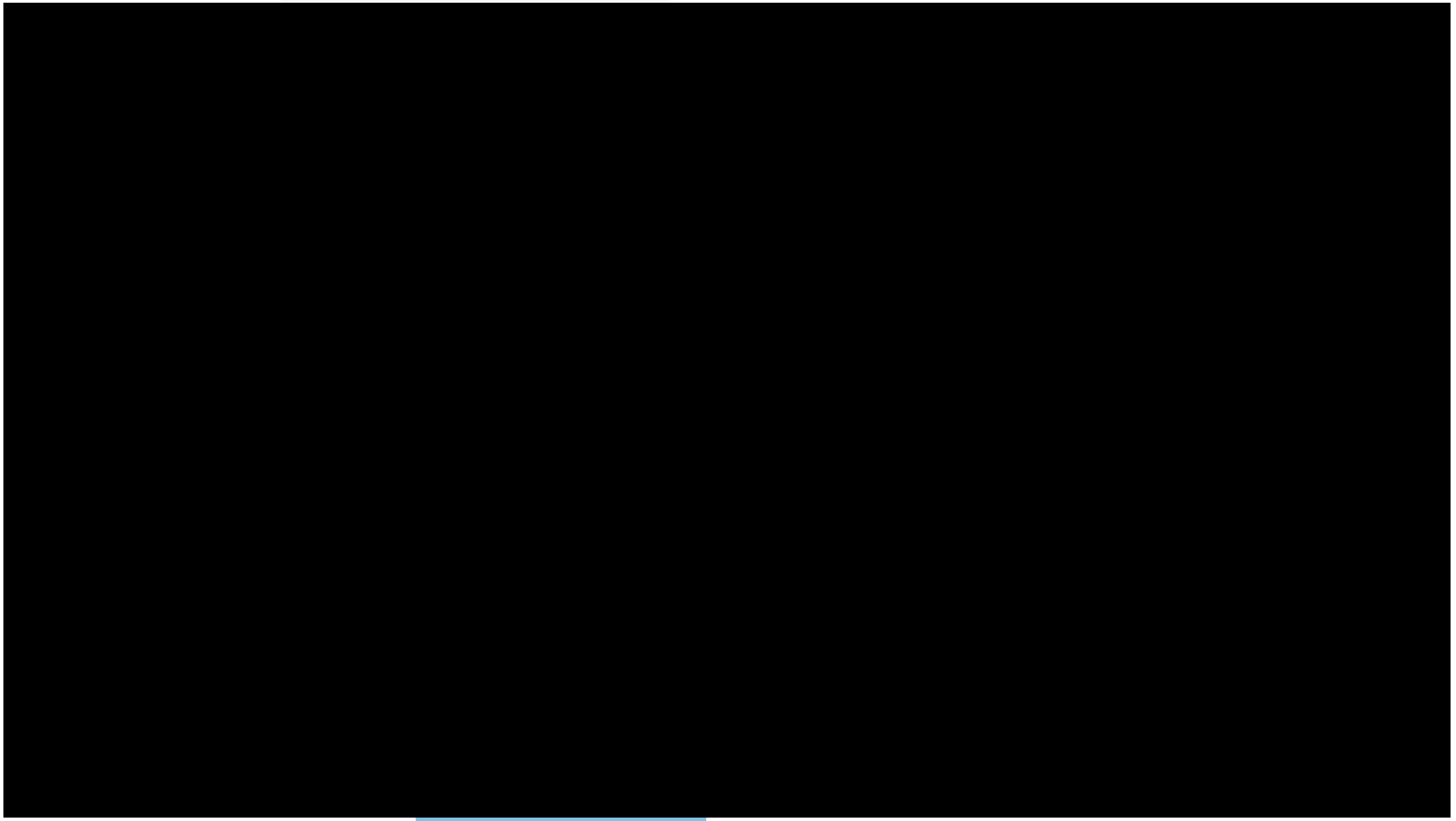
Results

- **Improved material take-off accuracy to over 95%, increasing confidence in procurement and construction planning**
- **Enabled earlier and more reliable construction planning by shifting preparation upstream of site material delivery**
- **Reduced rework risk by improving traceability of design changes across engineering, procurement, and construction**
- **Established a shared source of project data, aligning EPC teams around consistent, up-to-date information**

Central Puerto

Guillermo De Simone

Central Puerto Institutional Video



Driving operational excellence in power generation with AVEVA PI System

Central Puerto

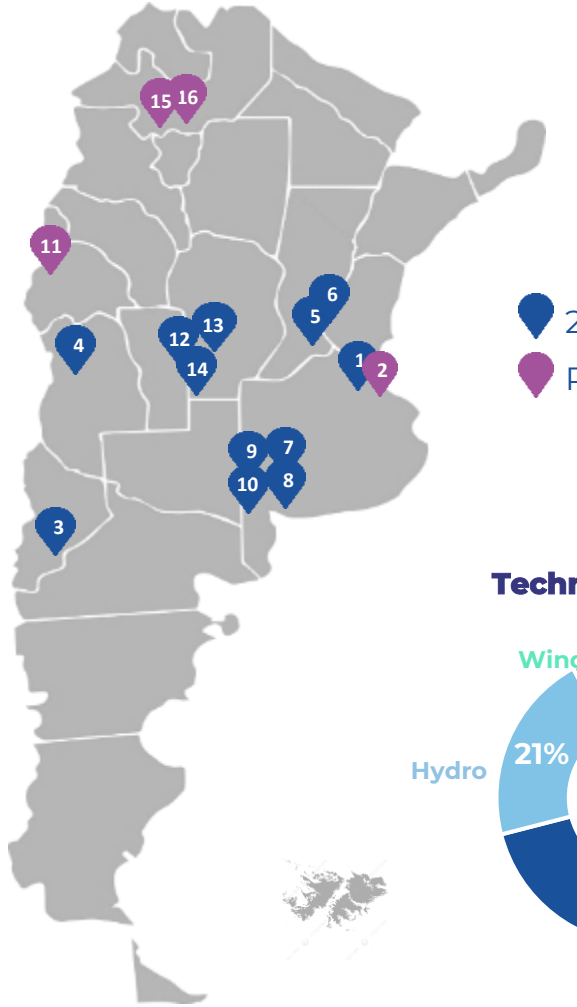
AVEVA WORLD
MILAN 2026

May 19-21, 2026 | Milan, Italy

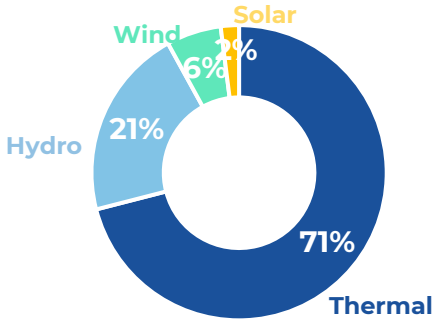
Initial Context in 2023 - Pre Corporate PI System

- Rapid growth required digital transformation to improve efficiency
- Stand alone operational systems in each plant with limited access
- Lack of real-time visibility and centralized historical operational data
- Foundational capabilities were not in place to enable advanced and predictive analytics

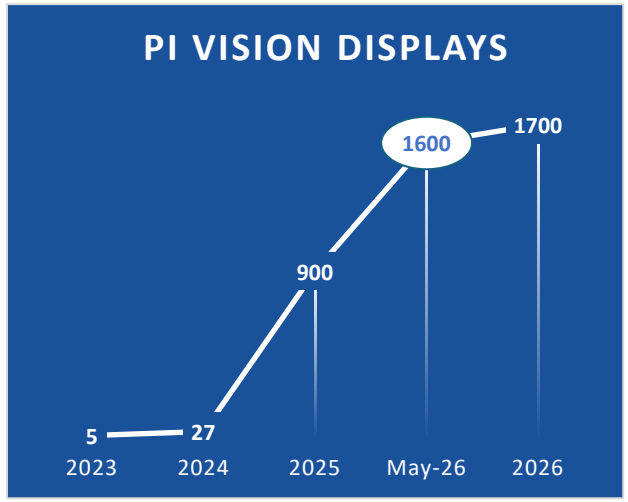
Current Central Puerto's Facilities

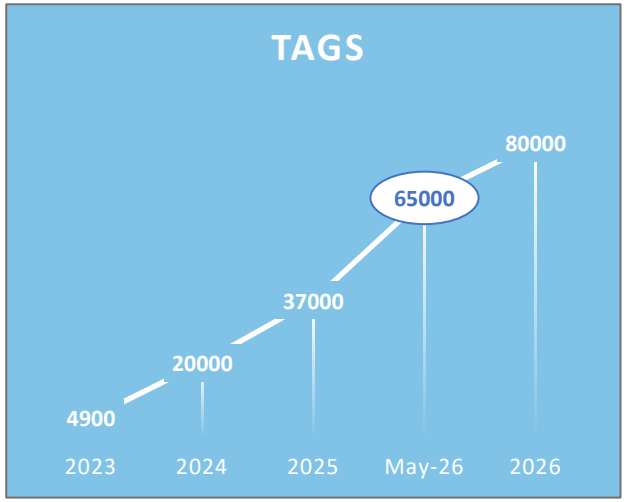


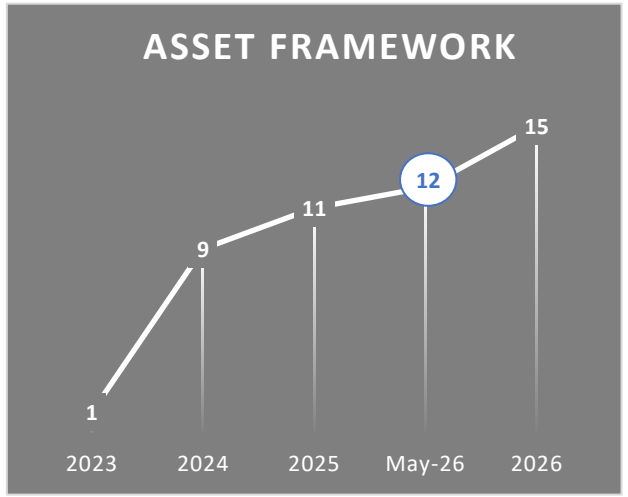
Technology portfolio

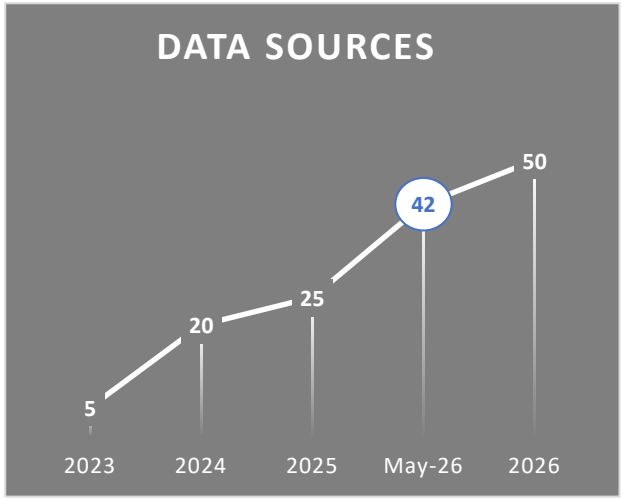


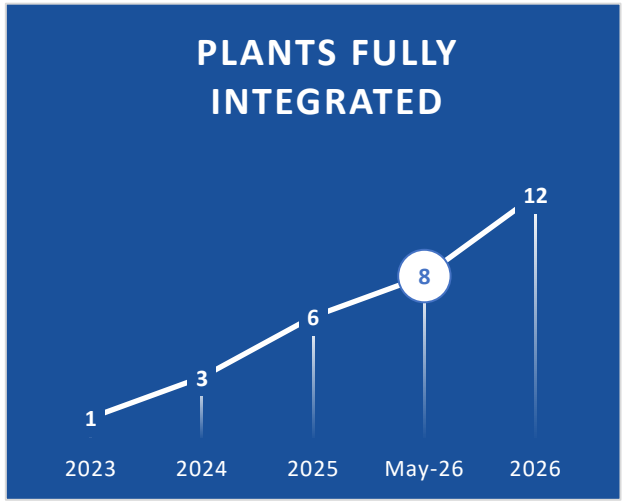
Evolution of PI System in Central Puerto

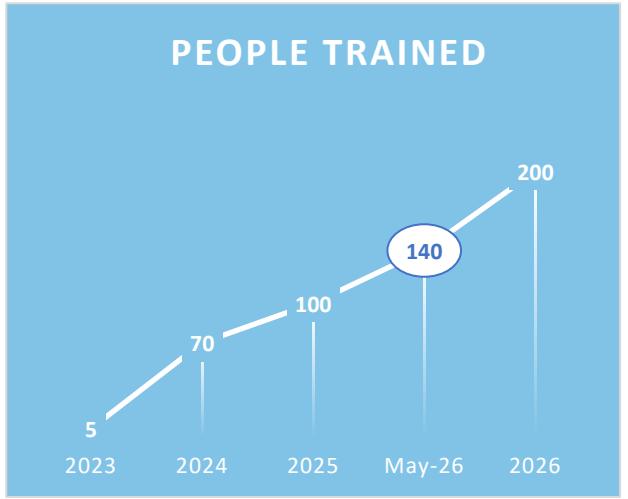








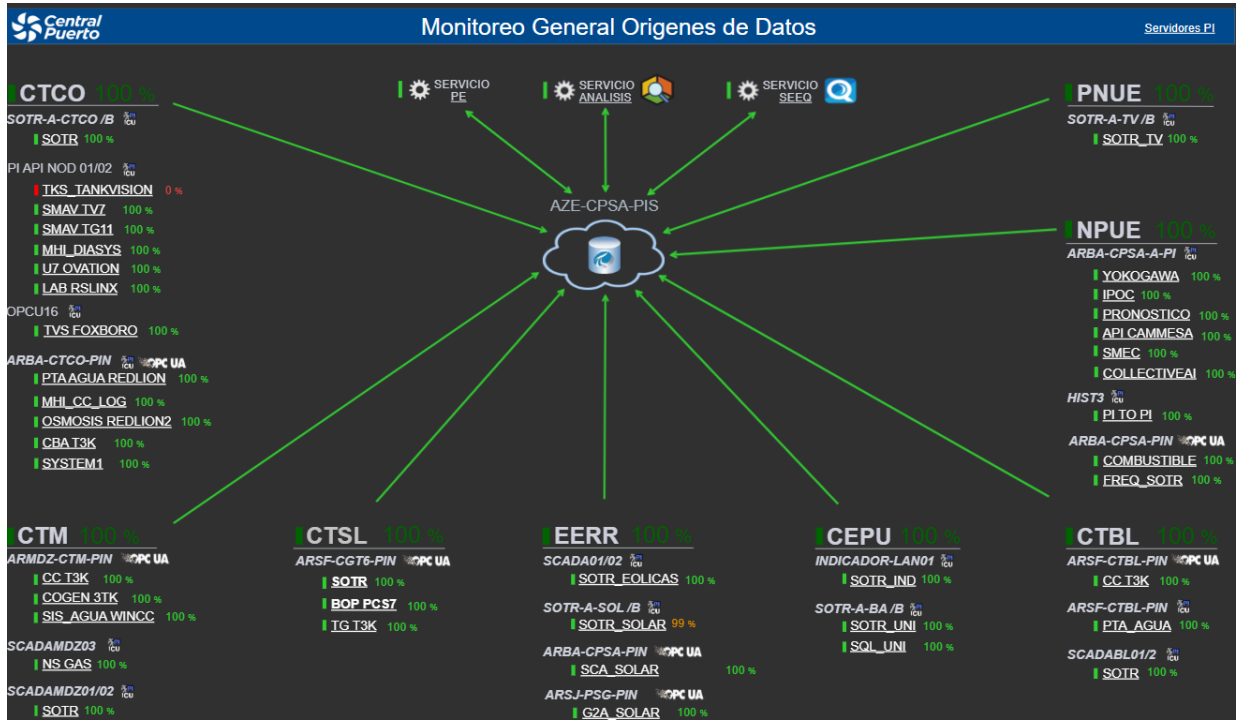




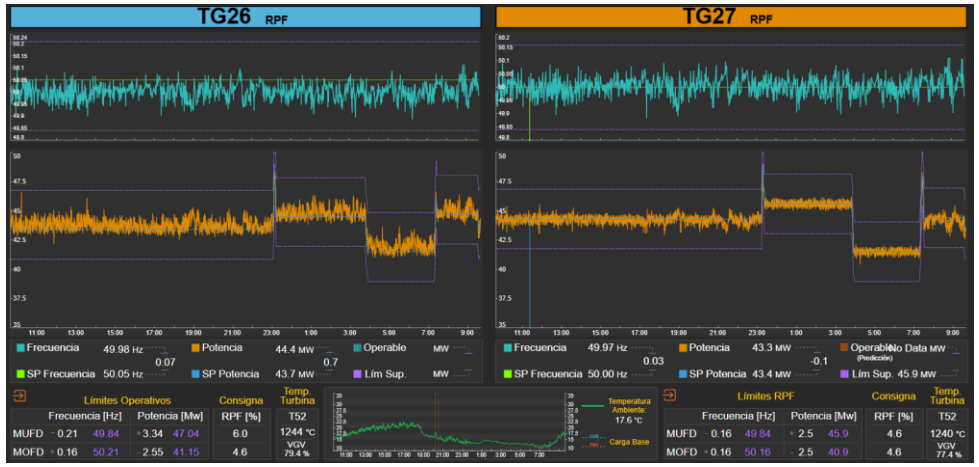
Challenges During PI System Implementation

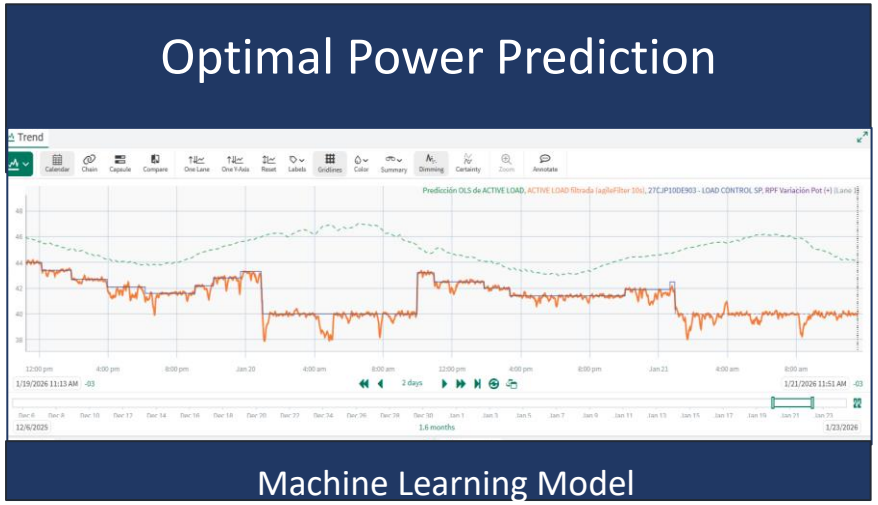
- Integration of multiple data sources from diverse vendors and technologies
- Standardizing tag naming and Asset Framework structure for a unified name space
- Migration of legacy PI Systems to consolidate data and PI Vision displays into the corporate PI environment

Data Sources Monitor



Most Relevant Use Case - Power Set Point Prediction





Objective

- Maximize gas turbine performance during primary frequency regulation by predicting achievable power under current ambient operating conditions.
- Notify operators when the power setpoint must be modified in the control system.

Benefits

- Performance improvement of two gas turbines while operating under primary frequency regulation, achieving a **1.6%** increase in generation equivalent to **USD 28K per month**.

POWER AND UTILITIES | ARGENTINA

Central Puerto centralizes operational data to accelerate decisions and improve efficiency with PI System

Challenge

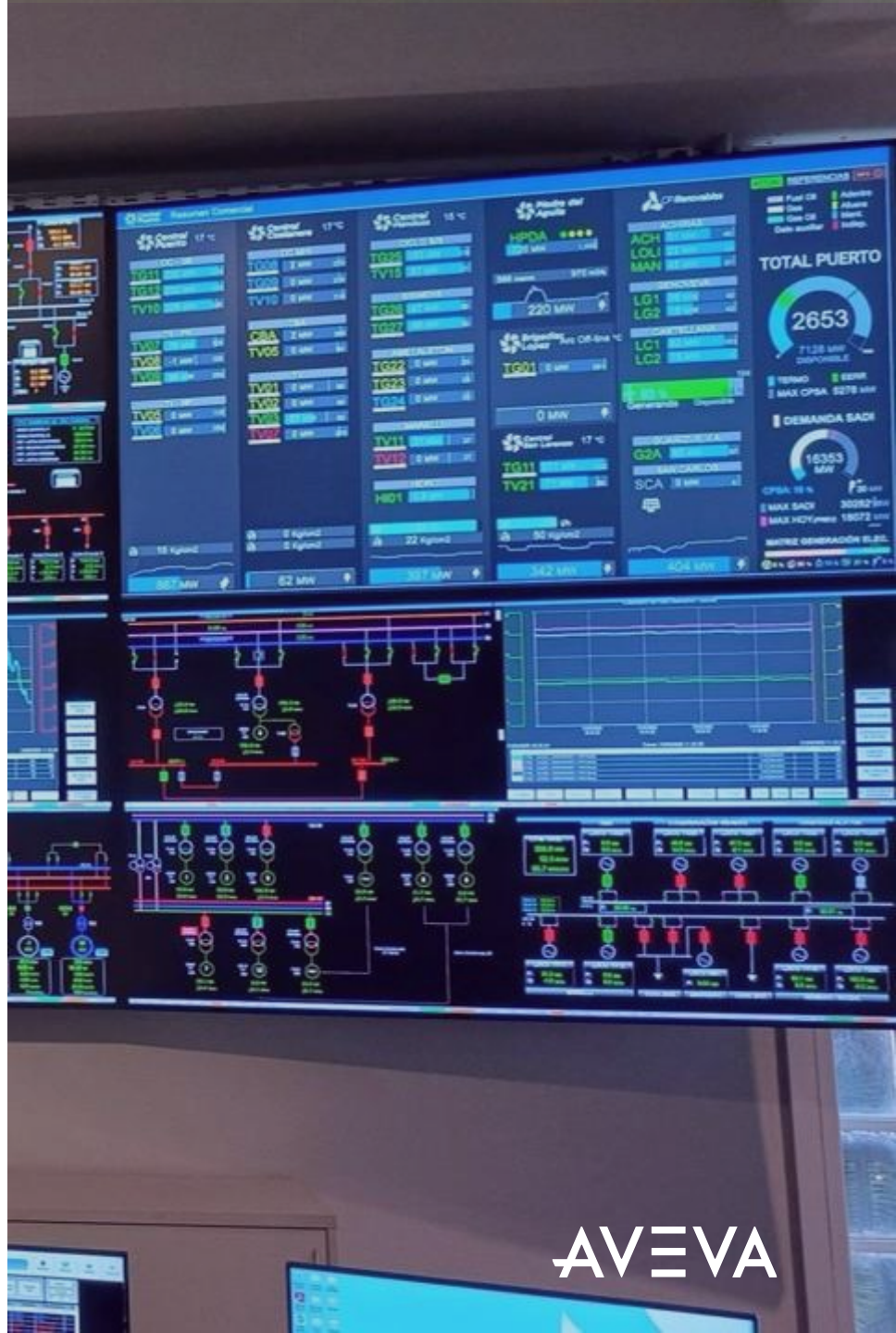
- Build a centralized operational data repository to enable company-wide data sharing and empower data-driven decision
- Unleash operational data to drive advanced analytics and predictive maintenance through machine learning
- Break down operational data silos and deliver real-time information across all levels of the organization

Solution

- Deployed AVEVA™ PI System™ to centralize and enhance data collection, accessibility, and analytics, enabling predictive insights powered by machine learning

Results

- **Proven improvement in accessibility to operational data and agility in decision-making, delivering more accurate results and reducing key user hours by 30%**
- **Leveraged large-scale operational data to enable machine learning models for process behavior prediction, achieving a 1.6% increase in turbines energy generation in a specific operation condition.**
- **Established the PI System as the central backbone for operational data, integrating enterprise applications and dashboards while eliminating manual workloads and increasing trust in the data.**



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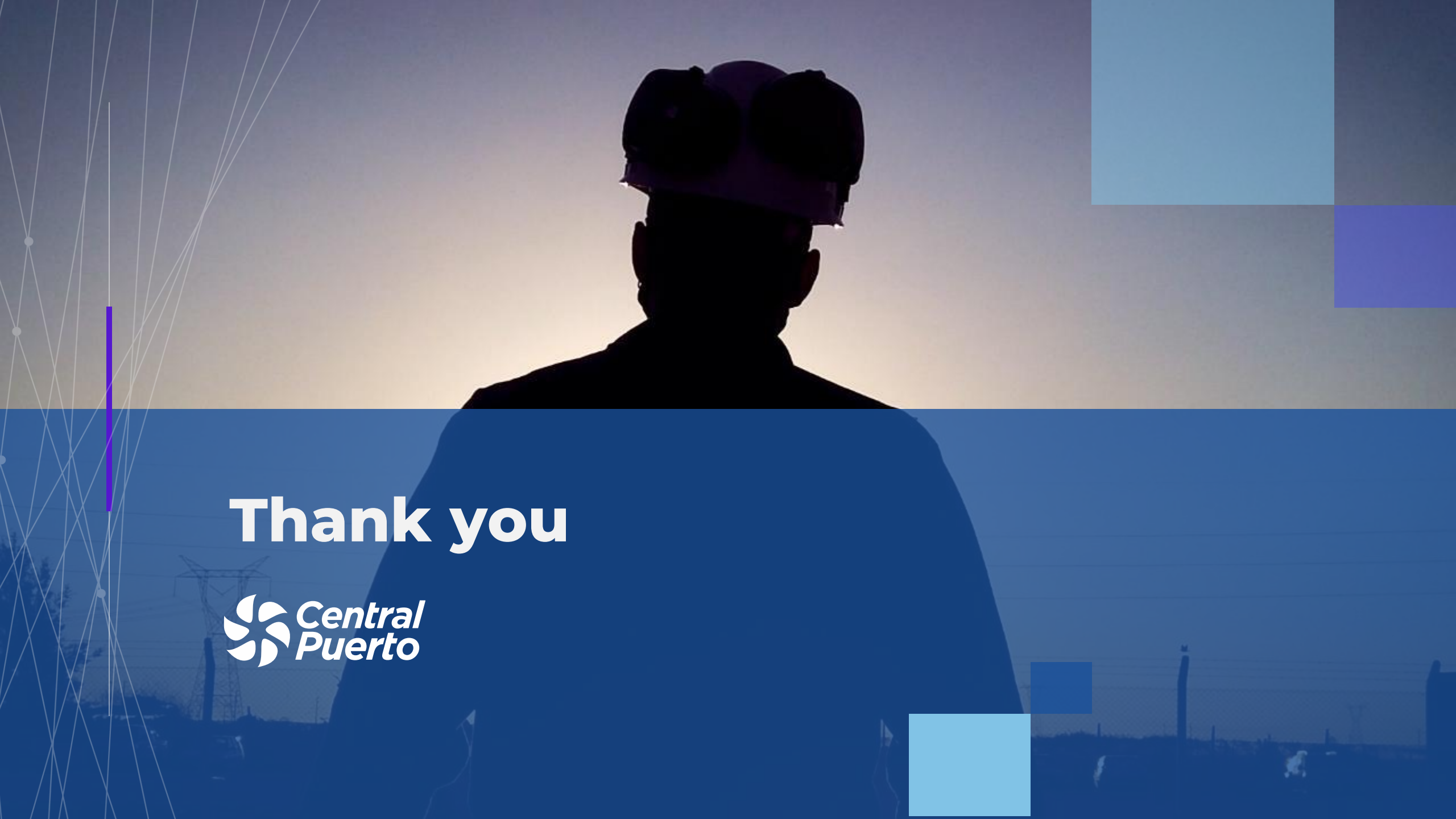
Central Puerto


Thank you
Central Puerto

ITAIPU Binacional

Eduardo Coronel

Towards continuous health monitoring of generation and transmission equipment using data fusion and advanced analysis at the ITAIPU Binacional Power Plant

Dirección Técnica - DT
Superintendencia de Mantenimiento – SM.DT
Departamento de Ingeniería de Mantenimiento – SMI.DT

AN ANALYSIS STUDY ON DATA-DRIVEN DECISION-MAKING SUPPORT

M.Sc. Eng. Eduardo Coronel

ITAIPU
BINACIONAL

ABOUT THE COMPANY

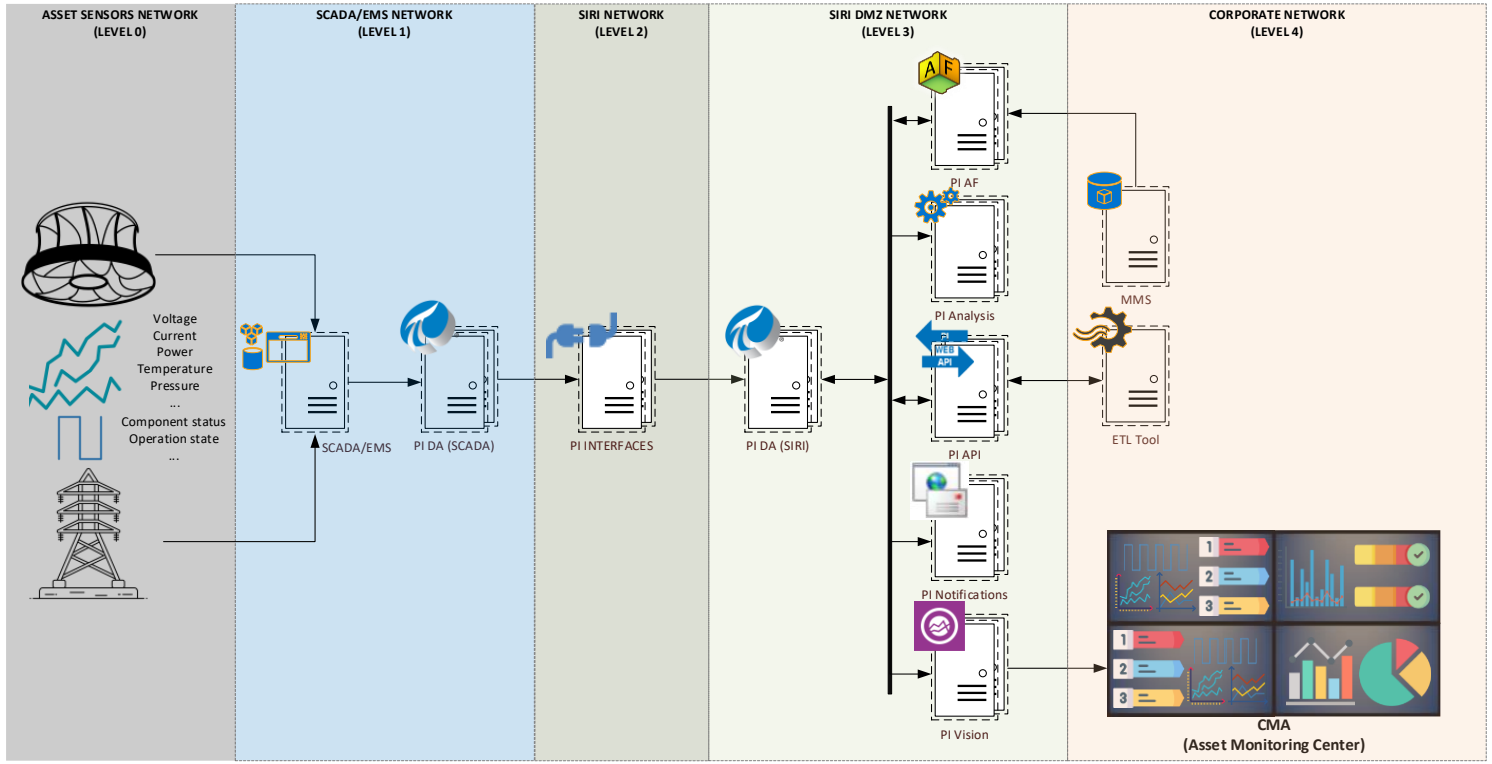
- **Binational:** Paraguay and Brazil (*50% each*).
- **Number of Generating Units:** 20.
- **Total installed capacity:** 14 GW.
- **Total production:** ~75.0 GWh year, *+3 TWh (since 1984)*.
- **Last 5 years availability of Generation Units:** > 97 %.

CHALLENGE & SOLUTIONS

- **Challenge**
  - Leverage advanced analysis techniques to support condition-based and predictive maintenance models for generation and transmission systems;
  - Pave foundations for a data-centric decision-making process for continuous asset health index estimation and its use by the maintenance team through a Monitoring Asset Center (CMA).
- **Solution**
  - As a Proof of Concept (PoC), data from a generation unit and from one-and-a-half circuit breaker scheme associated with two transformers of the Right Bank Substation (14 disconnectors and 6 circuit breakers) was structured at the AVEVA PI System. Then machine learning models was trained for classification of asset's status in "normal" and "abnormal", from which a health index estimation is derived.

SOLUTION

- **Implementation details of ML models**



ML algorithms:

- ✓ Long short-term memory (LSTM);
- ✓ Random forest (RF).

1. data collection, pre-processing and fusion
2. actual forced downtime calculation
3. selection of machine learning algorithm
4. Model's performance evaluation
5. new data classification
6. asset's health index estimation
7. interpretation of predictions
8. methodology deployment assessment

SOLUTION (cont.)

Disconnector dataset

2015-2024

Circuit breaker dataset

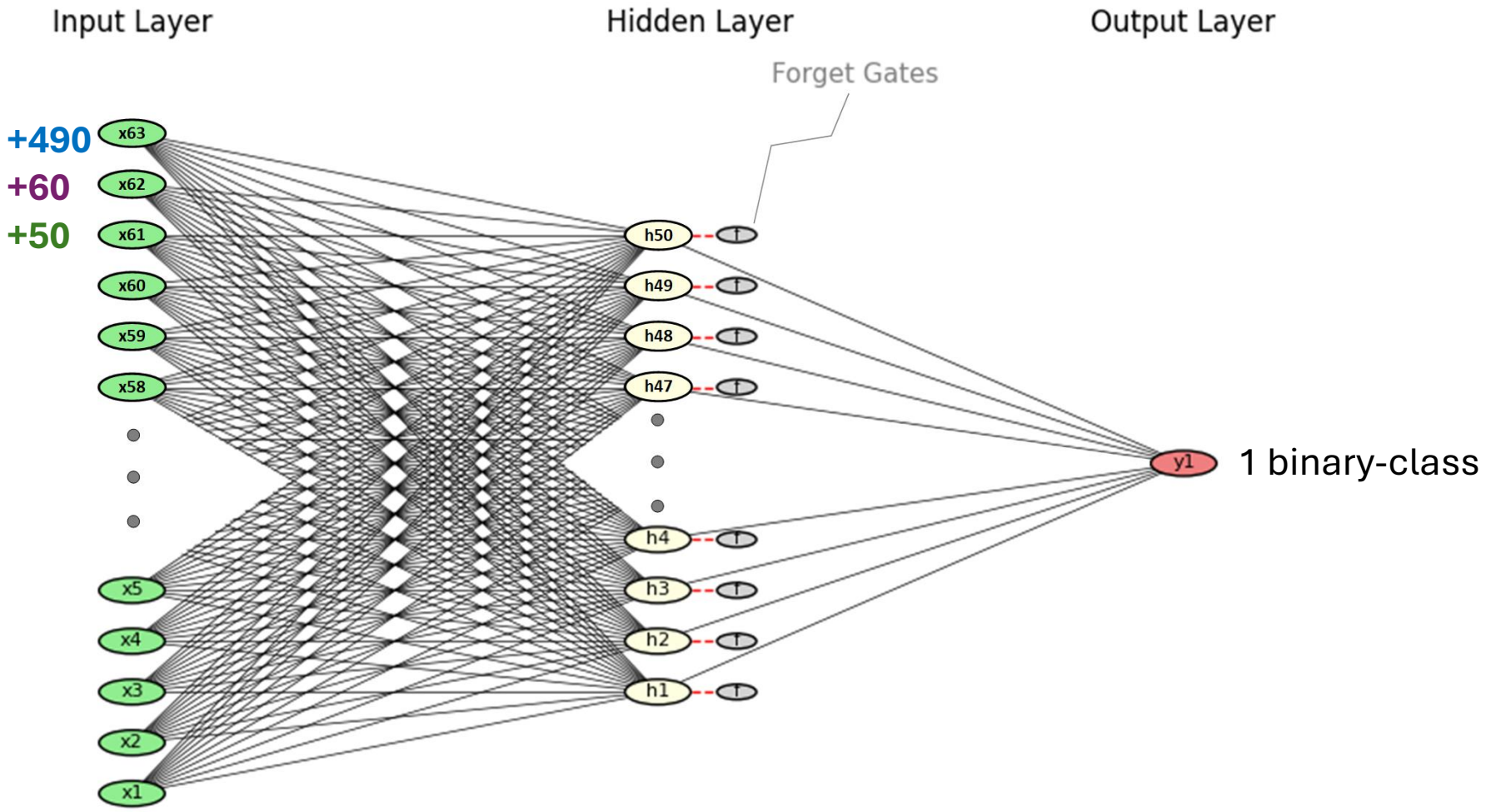
2015-2024

Generation unit dataset

2017-2025

Parameters:

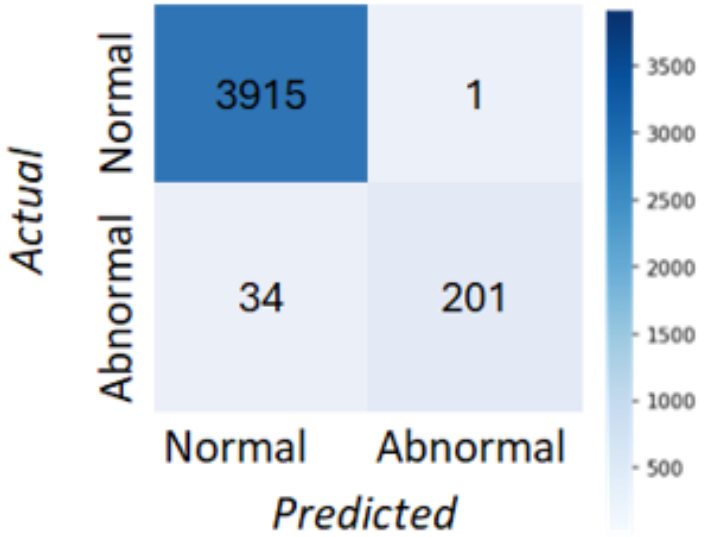
- ✓*component states*
- ✓*Voltage*
- ✓*Current*
- ✓*active power*
- ✓*reactive power*
- ✓*power factor*
- ✓*bus frequency*
- ✓*transformer winding and oil temperature*
- ✓*components temperatures*



RESULTS

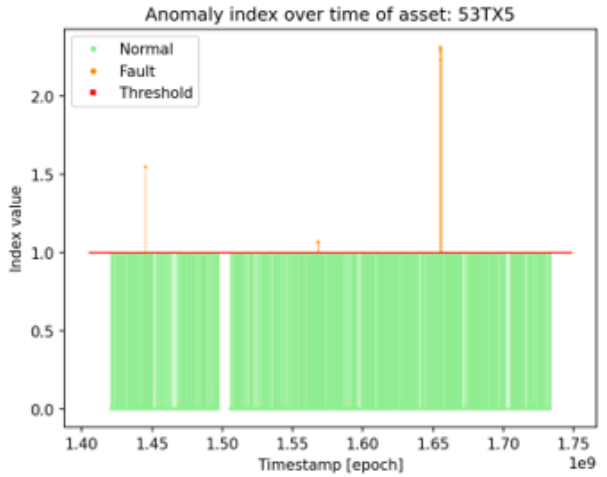
- **Performance analysis**

F1-score = 96%



Confusion matrix of the LSTM model of circuit breaker dataset

- **Health index estimation**

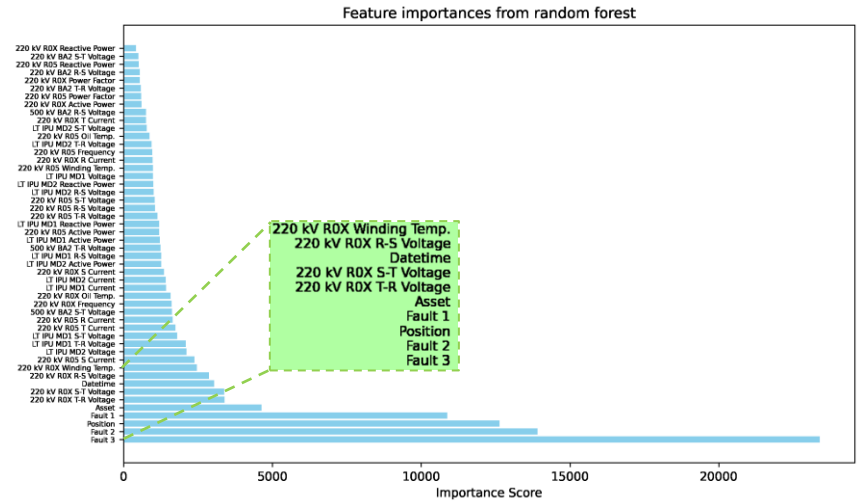


Example of health index estimation of the RF model of disconnector dataset

0,021	0,022	0,023	0,023
03T0X	43TX5	83T05	04T0X

Example of health index estimation with a new data sequence of circuit breakers

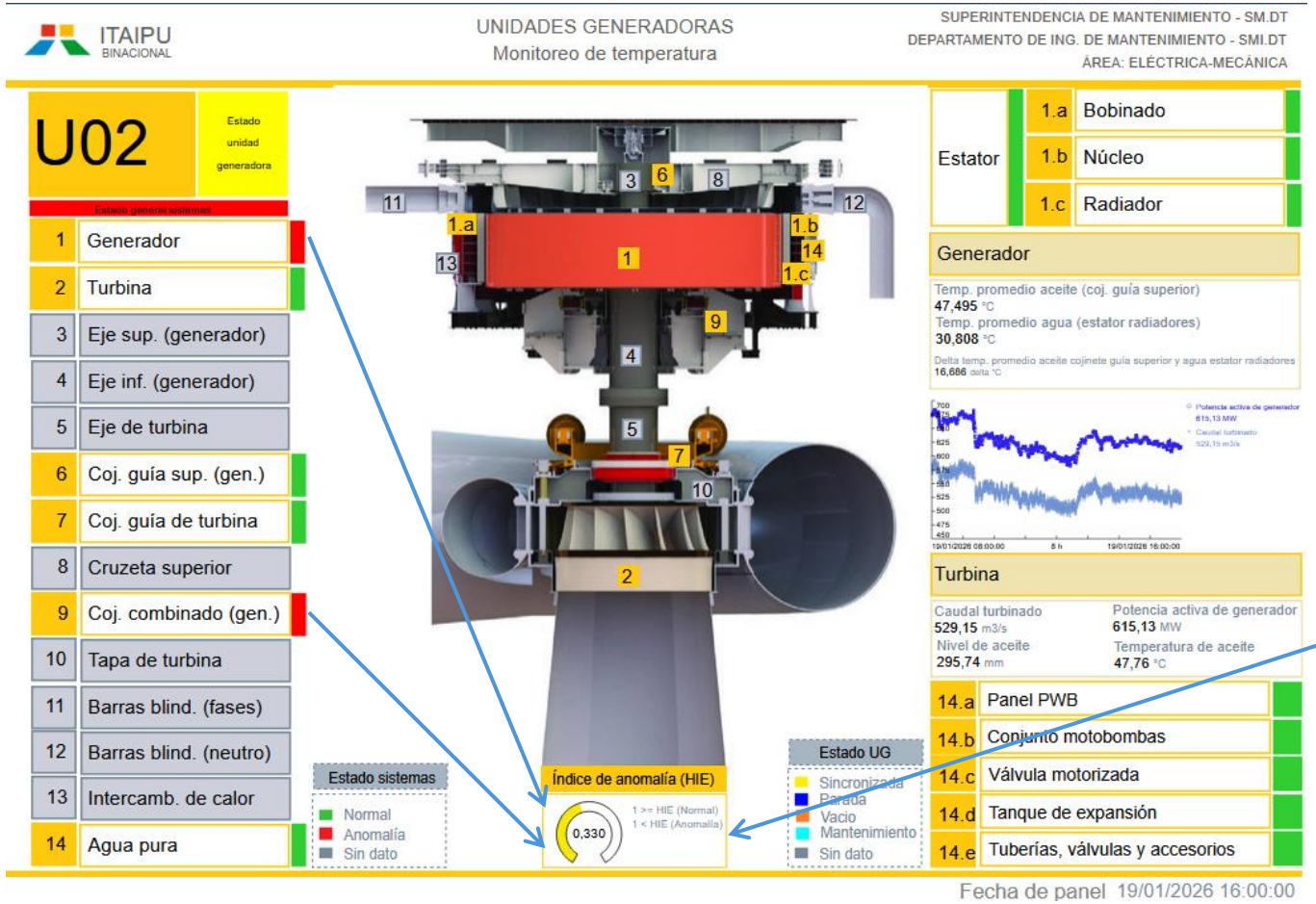
- **Explanation of ML predictions**



Global feature importance of RF model of disconnector dataset

RESULTS

- **Benefits**



✓ Foundations of condition-based maintenance on a Generation Unit;
✓ Proposition of upgrading preventive maintenance on switching equipment's.

severity	event_start_time	unit	type	parameter_name	asset_name
Warning	02/16/26 08:00:00	U02	Falha eletromecânica	Correlação entre temperatura do enrolamento e nível do tanque	Tanque de expansão
Warning	02/10/26 08:41:30	U02	Anomalía mecánica	Estado de variación de temperatura	Gerador-Cojinete combinado-Segmento guía
Warning	02/10/26 08:00:00	U02	Falha eletromecânica	Correlação entre temperatura do enrolamento e nível do tanque	Tanque de expansão
Warning	02/10/26 03:54:30	U02	Anomalía mecánica	Estado de variación de temperatura	Gerador-Cojinete combinado-Segmento guía
Warning	02/10/26 03:54:14	U02	Problema en sensor del conjunto	Erro Telemetria	Estator-Bobinado-Agua pura
Warning	02/10/26 03:54:14	U02	Problema en sensor del conjunto	Erro Telemetria	Estator-Radiadores-Aire frío
Warning	02/10/26 03:54:13	U02	Problema en sensor del conjunto	Erro Telemetria	Estator-Radiadores-Aire caliente
Warning	02/10/26 03:54:13	U02	Problema en sensor del conjunto	Erro Telemetria	Gerador-Cojinete combinado-Segmento guía
Warning	02/03/26 04:00:00	U02	Falha eletromecânica	Correlação entre temperatura do enrolamento e nível do tanque	Tanque de expansão
Warning	01/30/26 08:00:00	U02	Falha eletromecânica	Correlação entre temperatura do enrolamento e nível do tanque	Tanque de expansão
Warning	01/28/26 08:00:00	U02	Falha eletromecânica	Correlação entre temperatura do enrolamento e nível do tanque	Tanque de expansão
Warning	01/21/26 04:00:00	U02	Falha eletromecânica	Correlação entre temperatura do enrolamento e nível do tanque	Tanque de expansão
Warning	01/20/26 02:45:30	U02	Anomalía mecánica	Estado de variación de temperatura	Gerador-Cojinete combinado-Segmento guía
Warning	01/20/26 01:40:30	U02	Anomalía mecánica	Estado de variación de temperatura	Gerador-Cojinete combinado-Segmento guía
Warning	01/19/26 09:20:30	U02	Anomalía mecánica	Estado de variación de temperatura	Gerador-Cojinete combinado-Segmento guía
Warning	01/18/26 05:35:30	U02	Anomalía mecánica	Estado de variación de temperatura	Gerador-Cojinete combinado-Segmento guía
Warning	01/18/26 02:20:30	U02	Anomalía mecánica	Estado de variación de temperatura	Gerador-Cojinete combinado-Segmento guía
Warning	01/17/26 08:00:00	U02	Falha eletromecânica	Correlação entre temperatura do enrolamento e nível	Tanque de expansão

CONCLUSIONS

- For the considered assets, a health index estimation was possible to implement leveraging machine learning models;
- The implemented explanation techniques enabled the identification of features most influential in model´s predictions. The analysis also shows that the LSTM network and the RF model capture complementary, rather than redundant, representations;
- Based on the preliminary results, a transition from corrective to condition-based and predictive maintenance is possible with a data-driven approach;
- The benefit of leveraging machine learning models is the possibility of early identification of abnormal behavior in both switching equipment and generation units;
- To replicate the methodology to all generation and transmission equipment's, it is necessary a robust-advanced analysis tool with redundancy, scalability, flexibility and integration capability, which will be at the core of an Asset Monitoring Center (CMA).

FUTURE WORK

- Address a prospection regarding advanced data analysis solutions aiming the identification of the best and more suitable tool for the interests of ITAIPU Binacional;
- Implementation of the advanced data analysis solution as the technological backbone of the Asset Monitoring Center (CMA);
- Transition to condition-based and prediction maintenance models in equipment's related to generation and transmission;
- Integration with more advanced AI tools for accelerated insights for decision-making.

POWER AND UTILITIES | PARAGUAY

ITAIPU Binacional advances predictive asset health monitoring

Challenge

- Operational data was distributed across isolated monitoring systems, limiting visibility
- Difficulty interpreting changing asset states and alarms
- Needed to shift from preventive to predictive maintenance with trusted analytics
- Effective decision-making depended on establishing trust in model outputs and explainable predictions.

Solution

- ITAIPU Binacional implemented AVEVA™ PI System™, including AVEVA™ PI Data Archive, AVEVA™ PI Asset Framework, AVEVA™ PI Analysis, and AVEVA™ PI Vision™, as the core data platform for advanced analytics and asset monitoring.

Results

- **Established a foundation for condition-based maintenance across generation assets**
- **Centralized data from previously isolated monitoring systems**
- **Enabled early identification of abnormal equipment behavior using asset health indices**
- **Improved maintenance decision support through explainable, multi-model predictions**
- **Created a scalable analytics methodology for future rollout across assets**

Connecting the Lifecycle: Harnessing Technology and Industrial Data from Design to Optimization

Your Panelists

Fiona Straton

Global Industry Marketing – Critical Infrastructure

AVEVA

With over 20 years of industry experience, Fiona is an advocate for digital transformation and how technology delivers a better, more sustainable quality of life for all.

Maged Amr

Senior Director Ops. Engineer

Elsewedy Electric

Maged is a senior EPC leader specializing in digital transformation, leading teams that integrate AVEVA ERM, Oracle EBS, Primavera P6, and in-house solutions to improve project delivery and efficiency.

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Guillermo De Simone

Business Applications, Data & IT/OT Manager

Central Puerto

Guillermo is an IT executive with 20+ years' experience delivering large-scale digital transformation across energy, agribusiness, and consumer sectors.

Eduardo Coronel

M.Sc. – Maintenance Engineer

ITAIPU Binacional

An Electronic Engineer with a Master's in Electrical Engineering and PhD candidate in Computer Science, Eduardo specializes in AI for industrial maintenance, cybersecurity, and systems integration at Itaipu Binacional.

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AVEVA is a world leader in industrial software, providing engineering and operational solutions across multiple industries, including oil and gas, chemical, pharmaceutical, power and utilities, marine, renewables, and food and beverage. Our agnostic and open architecture helps organizations design, build, operate, maintain and optimize the complete lifecycle of complex industrial assets, from production plants and offshore platforms to manufactured consumer goods.

Over 20,000 enterprises in over 100 countries rely on AVEVA to help them deliver life's essentials: safe and reliable energy, food, medicines, infrastructure and more. By connecting people with trusted information and AI-enriched insights, AVEVA enables teams to engineer efficiently and optimize operations, driving growth and sustainability.

Named as one of the world's most innovative companies, AVEVA supports customers with open solutions and the expertise of more than 6,400 employees, 5,000 partners and 5,700 certified developers. The company is headquartered in Cambridge, UK.

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