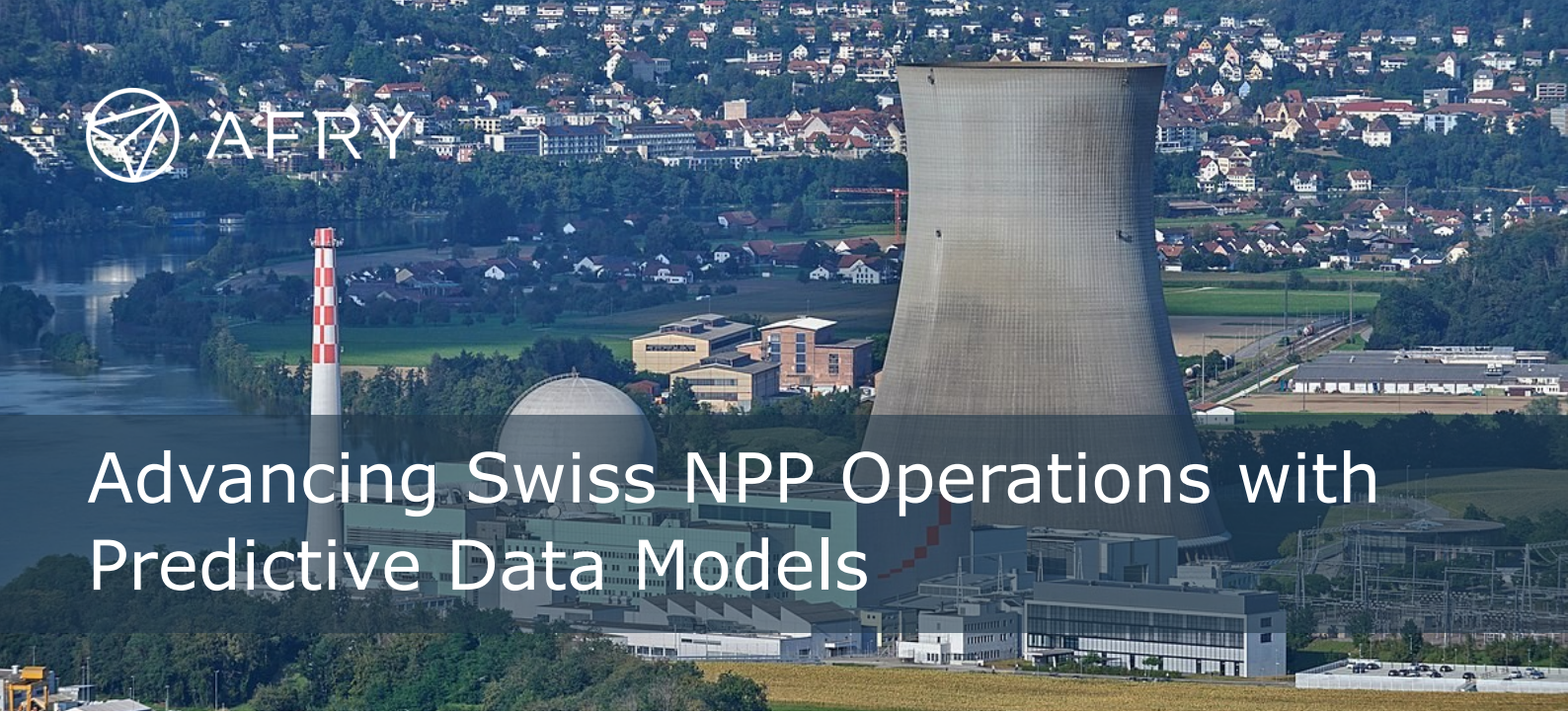


Advancing Swiss NPP Operations with Predictive Data Models

Harnessing modular data design and causality analysis to detect neutronics signal faults.

INDUSTRIAL DATA ANALYTICS

This is the process of collecting, analyzing and using plant data to harness the hidden value. Tools like e-DAP are capable of modelling a physical phenomenon on the basis of data collected over time. The insight gained helps improve operational efficiency, optimize process, and plan maintenance ahead of time.

SITUATION & CHALLENGE

— AXPO lacked a framework for detecting anomalies in neutronics signals during plant start-up and its impact on steam production and instabilities.

— 'Deterministic' causality analysis struggled to predict faulty signals linked to flow instabilities and potential dry-out in the reactor vessel.

SERVICE & APPROACH

— Legacy data was collected, ingested into the platform, and engineered (feature selection, windowing, PCA, etc.).

— A unique, sophisticated anomaly detection module, employing an autoencoder networks, was developed within e-DAP.

— Data from 5 cycles and 1 cycle-startup was used to highlight changes in system causality and cross-correlation over time.

— An online framework was created, offering visual analytics of real data and live inference of the digital twin using sensor data.

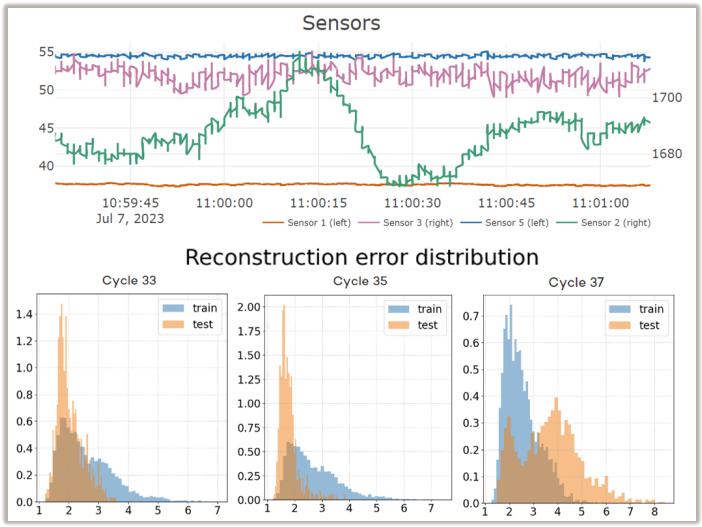
E-DAP: the *end-to-end* data platform

A cloud-hosted infrastructure for the treatment of plant data: from IoT sensing, through engineering, dashboarding, ML/AI, digital twinning, to insight

IMPACT & ADDED VALUE

— An online business intelligence tool was acquired, offering daily operational insights and monitoring asset health using defined KPIs.

— There's capability to deduce potential asset failure scenarios using real-time data (when IoT is connected to e-DAP Edge) for the digital twin's input.



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