

# Advancing Power Grid Decision-Making: Enabling Collaborative Intelligence for Congestion Management Across Operational Timeframes

## PROBLEM

The energy transition is tightening operating margins for managing congestion in the Power Grid Control Room. Current tools to help with aid the operator are only one-directional: the operator is not involved

## GOAL

Enable collaborative congestion remediation and move towards a unified AI-powered control room interface.

## APPROACH

- 1 Observations in the control room
- 2 Framing how collaboration modes change across operational timeframes
- 3 Defining core collaborative interaction patterns based on timeframes
- 4 Derive design implications analysis using scenario based design
- 5 Enable collaboration through design interventions

## Key findings

- Integrating AI into critical decision support requires human and AI teaming.
- Collaboration needs shared situational awareness built in a shared environment.
- The environment should enable mutual initiative and co-iteration, combining strengths to optimise outcomes.
- Interactive tools enable proactive congestion remediation, which increases situational awareness for the intraday and day ahead timeframes
- Proactive planning for intraday and day ahead timeframes enables the creation of robust plans in uncertainty, increasing situational awareness in the forecast horizon

