

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

