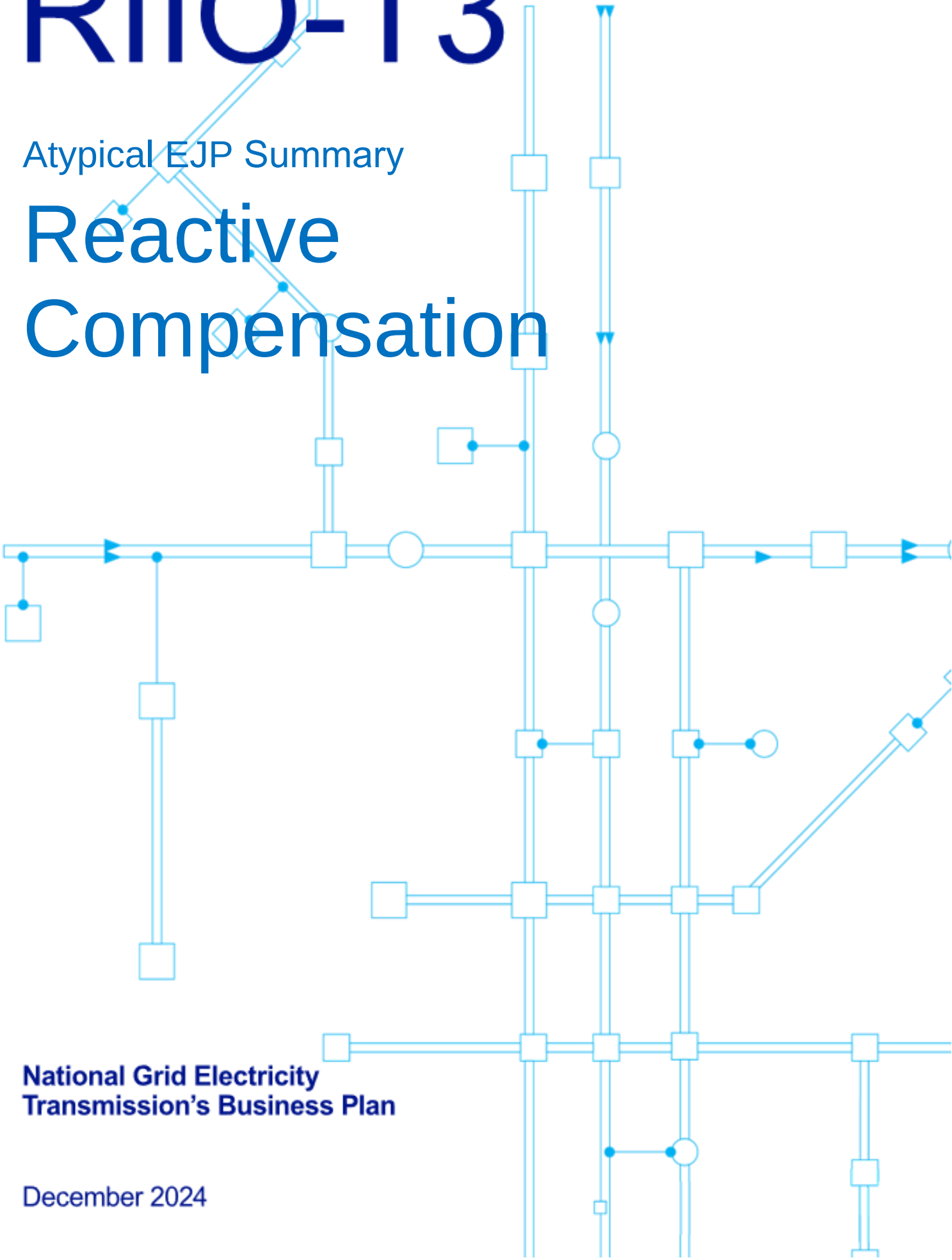
nationalgrid

RIIO-T3

Atypical EJP Summary

Reactive Compensation



National Grid Electricity Transmission's Business Plan

December 2024

Reactive Compensation

Executive Summary

Background

Reactive power, integral to alternating current (AC) networks, is managed through network elements that store energy in magnetic (inductive) or electric (capacitive) fields. These elements either absorb or generate reactive power, influencing system voltage. Significant alterations to the electricity network, driven by decarbonisation goals, impact reactive power utilisation and consequently the system voltage profile. Increased offshore wind connections and reduced conventional generation necessitate new reactive compensation solutions. Additionally, the variability in demand and generation, especially from weather-dependent sources, requires adaptable power flow management.

Investment Drivers

The primary driver for this investment is load-related, aimed at providing new network reactive capability to meet future requirements. This is justified through:

- Network Options Assessment (NOA): Focused on winter peak load scenarios, identifying areas at risk of low voltage conditions.
- Annual Voltage Compliance Assessments (VCA): Assessing high voltage conditions during summer minimum load.

Options

Various asset-based interventions have been considered that take a holistic approach while considering the potential impacts of industry code modifications and reactive service procurement events by the NESO.

Preferred Solution

The preferred solution meets NGET's licence obligation to adhere to the SQSS requirements and maintain a compliant voltage profile, ensuring network reliability and resilience.

Timeline

The proposed delivery programme spans from 2026 to 2029 and includes the installation of various reactive compensation devices on our network. The delivery schedule accounts for key industry changes and evolving system requirements along with our commitment to deliver a safe and resilient network.