

Constellation

Creating the UK's First Smart Substation!

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Constellation Partners





About UK Power Networks

We distribute electricity across our **Eastern, South-Eastern and London** network of cables and overhead lines. We deliver the electricity to homes & businesses safely and reliably



8.3m

Homes and Businesses– 29% of GB's population

13 GW

Peak demand – 28% of GB's electrical demand

9.5 GW

Distributed generation on our network



Constellation Overview

The aim is set:

Release capacity for more low carbon generation

Increase resilience of operation

Enable scalable deployment of smart functionality

We will achieve this by:

Enhancing our substations by making them digital, interoperable, future-proof and enabling secure communication between them

FUNDING
NIC
ROUTE

South
SPN
East

PROJECT
£17.8m
BUDGET

GB'50
£1.1b
BENEFITS

T OF CO2
1.9m
REDUCED



Constellation Solutions

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SIEMENS



Constellation Solutions

Digital Substation

Following successful de-risking, Constellation will be trialed in seven UK Power Networks sites, 2 Grids and 5 Distributed Energy Resources



Local Active Network Management (ANM)

Optimise network operation and DER output when communication links to Central ANM are unavailable



Wide Area Protection

Dynamic management of Loss of Mains (LoM) protection settings leveraging local intelligence obtained through site-to-site communication



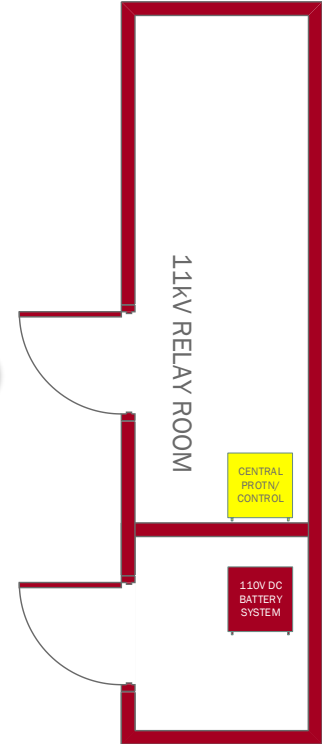
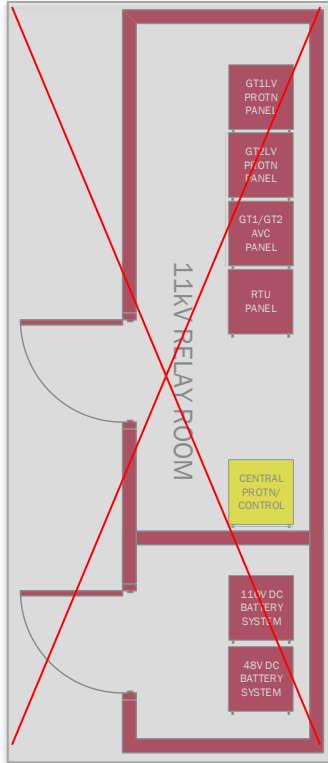
Adaptive Protection

Increase network capacity through the application of adaptive protection that appropriately respond to dynamic changes in the network

SIEMENS



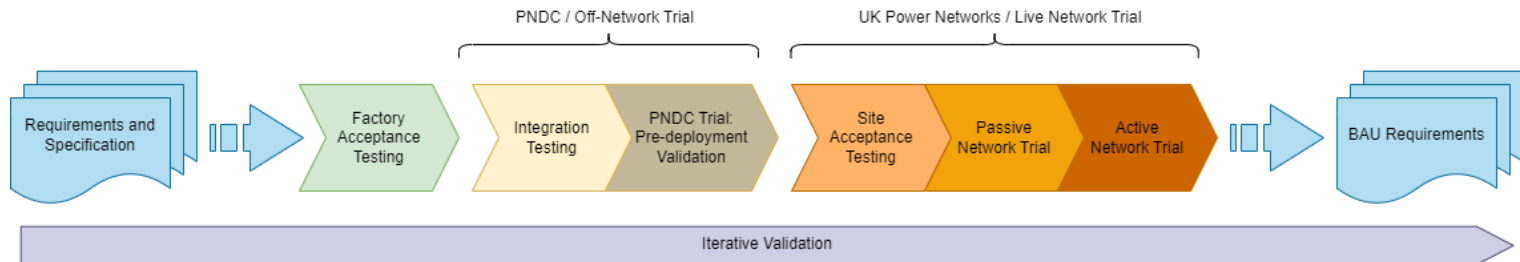
The Future Substation





Off-Network Trial at the PNDC

- ❖ Successful Factory Acceptance Testing for all solutions
- ❖ Successful Lab Integration Testing of all solutions
- ❖ Concluded PNDC testing in the first trial area and second area nearing completion; tests include:
 - Agile iterative testing with project partners
 - Communication testing and 5G validation
 - Virtualisation and cyber security evaluation
 - Evaluation against base case for each of the solutions





Test Scenario – Local Active Network Management



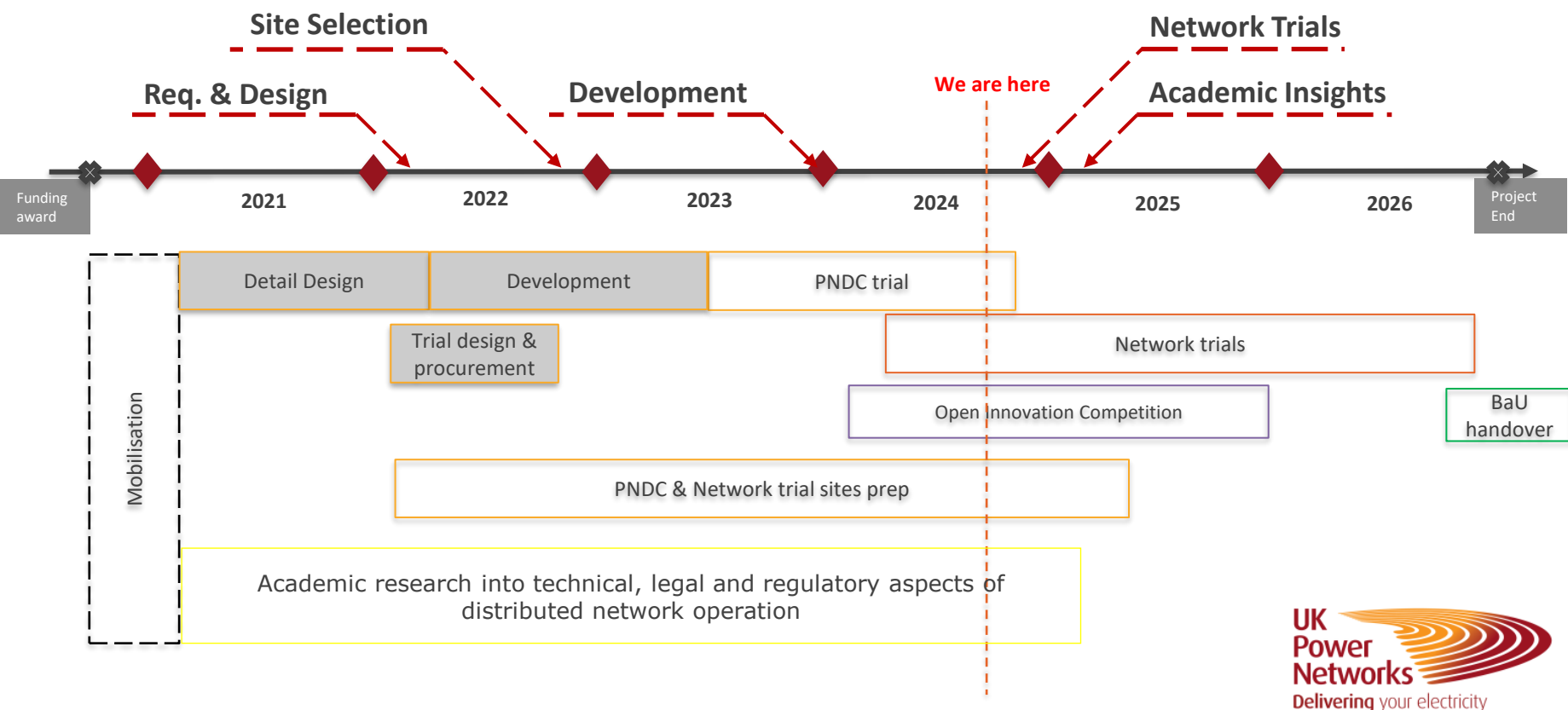


Test Scenario – Wide Area Protection





Constellation Timeline





Thank you



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Constellation



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Me



Photograph by Greg Rakozy

**UK
Power
Networks**
Delivering your electricity

