Flexible Distributed Generation
FDG-C Walpole East (EPN)       December 2016
Principles of Flexible Distributed Generation

• A Flexible DG connection is a technical and commercial agreement where a generator is allowed to connect an amount of capacity above the unconstrained connection limits. When a network operation threshold is breached, UK Power Networks manages the generator output to ensure network voltages and currents are kept within operational limits. This is operated by an Active Network Management (ANM) solution;

• FDG-C will be open on the basis of Last-In, First-Out (LIFO) principle where each generator is assigned a position within a global priority stack. When new generators apply for a connection in the area, they are given a position at the bottom of the priority stack and which will be curtailed first during a constraint event.
FDG-C Flexible Distributed Generation Zone

- The **FDG-C Walpole East** zone is defined by the extent of the electrical network within the following geographical area:
FDG-C  Flexible Distributed Generation Zone

- UK Power Networks Grid Substations supplied from Walpole Grid Supply Point (GSP) include:
  - Hempton Grid (132/33kV)
  - Swaffham Grid (132/33V)
  - Kings Lynn Grid (132/33kV)
  - Kings Lynn South Grid (132/33kV)
  - Kings Lynn Power Station (132kV)
- 20+ Primary Substations (33/11kV);
- The boundary of FDG-C area is defined by the 11kV network;

Diagram from May 2016 Long Term Development Statement
FDG-C  Installed Generation Capacity

• A total of **689MW** of unconstrained generation (over 1MW) is included in UK Power Networks assessment, of which 27MW is awaiting connection. In addition a further **145MW** of constrained generation as part of the initial FDG-C process has already been accepted and is awaiting connection.

• A 400MW Gas Generation at Kings Lynn Power Station represent 48% of the total installed capacity with Solar PV at 24% and Onshore Wind 10%.
FDG-C Existing Global Network Constraints

- This is a highly utilised network in respect and new connections would require more substantial customer contribution;

- UK Power Networks continue to work with National Grid in managing potential network constraints at the interface with the transmission system and in improving the Statement of Works process;

- The following *Global network constraints* have been identified in the Walpole East FDG-C area that will be managed by the ANM scheme:
  - Walpole 132kV constraints:
    - 132kV Circuit thermal limits between Walpole GSP and King’s Lynn Power Station;
    - 132kV Circuit thermal limits between King’s Lynn South and Swaffham-Hempton Tee;
    - 132kV Circuit thermal limits between Walpole Grid and Peterborough Power Station.
FDG-C  Existing Global Network Constraints

• **Global network constraints** (Continuation):
  • Hempton Grid 33kV constraints:
    • Transformer Reverse Powerflow at Hempton Grid 132/33kV;
    • 33kV Circuit thermal limits on Hempton-Coxford and Hempton-Burnham Thorpe.
  • Swaffham Grid 33kV constraints:
    • Transformer Reverse Powerflow at Swaffham Grid 132/33kV;
    • 33kV Circuit thermal limits on Downham Market-Northwold-Wissington.
  • Kings Lynn Grid 33kV constraints:
    • 132/33kV Grid Transformer tap changer reverse power capability.
    • 33kV Circuit thermal limits on Snettisham – Hunstanton – Burnham Thorpe.
  • King’s Lynn South 33kV constraints:
    • 33kV Circuit thermal limits on King’s Lynn South – Downham Market.
    • 33kV Circuit thermal limits on Downham Market - Outwell.
  • Local network constraints may be identified in the Walpole East FDG area as part of the technical assessment which will be managed by the ANM scheme.
Useful Contacts and Links

• UK Power Networks will invite customers to apply for a feasibility study for a FDG connection. More information will follow.

• Useful Links:
  - UK Power Networks DG webpages
  - UK Power Networks Flexible Distributed Generation
  - UK Power Networks Online DG Mapping Tool
  - UK Power Networks Innovation Page - FPP
  - ENA Active Network Management Good Practice Guide

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