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Emergency Disconnection of Embedded Generation

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High Level Objective

As the capacity of embedded generation increases we need to ensure that we have the tools to manage the networks in emergency situations as well as normal operating conditions.

Wider Access to BM
Overview of Current Mods

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- Access routes to the BM and TERRE for Distribution connected participants are being developed through BSC modification P344 and corresponding Grid Code modification GC0097.
- These modifications are due to be submitted to the Authority for decision June 2018.
- Proposed implementation Q4 2019.
- If approved, will provide a mechanism for call off and compensation of Distribution connected generation through the BM.

Wider Access to BM
Overview of Current Mods

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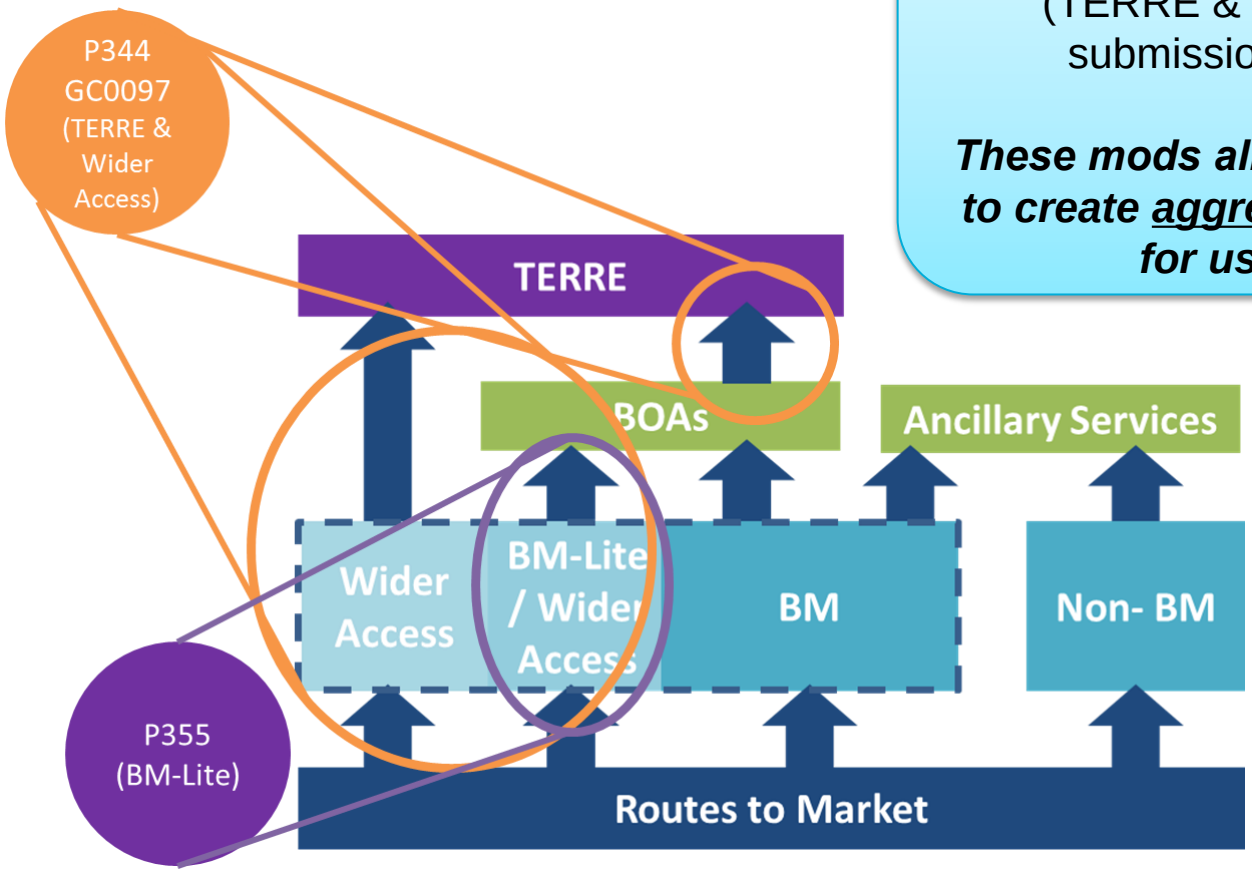
P355 (BM-Lite) on hold as wider access is being delivered through P344 & GC0097 (TERRE & Wider Access) – due for submission to Ofgem June 2018

These mods allows "Virtual Lead Parties" to create <u>aggregated</u> "Secondary BMUs" for use in TERRE & BM



Wider Access to BM
Potential issues for consideration

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- P344 and GC0097 provide a mechanism through which aggregated BMUs will be able to be called for Balancing Services, including the BM.
- This gives a potential call off and compensation route for distributed participants without having to use Emergency Instructions.
- However, still uncertainties around how aggregation will work with this in terms of systems. It may be that a whole aggregated BMU (which could be across a whole GSP group) would need to be called as a single unit rather than by sub-unit.
- Also, participation will be optional rather than mandatory so not all distributed participants captured.

Emergency Instructions: Background Material

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- The Grid Code:
  BC2.9, OC6

- Balancing Principles Statement: Part B Section 5 – available online at
  https://www.nationalgrid.com/sites/default/files/documents/Balancing%20Principles%20Statement%20v15%20Effective%20from%201%20April%202017.pdf

- CUSC:
  5.2 and the associated definition

Emergency Instructions: Utilisation

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When
Events
Demand Control
System and Localised Negative Reserve Active Power Margin
Black Start
Max Gen
Frequency Sensitivity
Communication Failure

Sequence of Disconnection
Most effective units
Price (Bid-Offer)
Contribution to losses
Reserve/ response capability
Reactive capability
Dynamic parameters

If a commercial option is available within the timescales required we would take commercial actions first

Emergency Instructions: Post Event

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- Restoration:

Reverse order of disconnection

- Compensation:

Generation:	In line with Access Rights and BM Participation
Demand:	No compensation offered

- Reporting:

Immediate:	Balancing Mechanism Reporting Service
Annual:	Balancing Principles Statement Report – Audited by an independent consultant

Emergency Instructions: Plant covered

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Plant	Covered or not
Transmission Connected	
Generation	✓
Demand	✓
Grid Supply Point	✓
Distribution Connected	
Demand	✓
Large Power Station	✓
“An item of Plant or Apparatus”	✓
Medium/Small Power Station	Depends how we interpret “An item of Plant or Apparatus”

Emergency Instruction for EG Why Change

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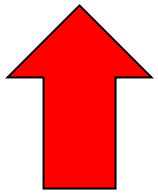
- Issue:

Ability to issue emergency instructions to DNOs to disconnect embedded small and medium power stations is subject to interpretation

- Risk:

Inability to manage emergency situations that are caused or exacerbated by an embedded small or medium power station



- Interim Solution:

Through the SoW process, impose emergency disconnection requirements, via the DNO, on new embedded generation (generally listed in Appendix G of the BCA)

- Enduring Solution:

Modify the Grid Code, Distribution Code, CUSC, and BSC – if required – to provide clarity

?

Emergency Disconnection of EG What Needs to Change

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- Clear and transparent requirements – potentially a new OC or a change to OC6
- Set of equitable rules to reduce the risk on any specific Generator
- Generic process
- Relevant data submissions
- Any relevant changes to the legal and commercial frameworks

Emergency Disconnection of EG What Needs to Be Agreed

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■ Should we have the capability?	■ If not, need to justify why embedded generation receives preferential treatment to everyone else.
■ Affected plant:	■ All embedded generation? ■ Above certain MW capacity? ■ After certain date? ■ Reopener for revision
■ Process	■ We have a process agreed with some DNOs. This can be rolled out unless there are any concerns.
■ Week 24 Submissions	■ Can we tailor this on emergency demand disconnection?

Emergency Disconnection of EG Risks to EG

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- Minimal risk – only 13 Emergency Instructions in the last 4 years.
- Impact is less sever than the consequence of the emergency situation materialises.
- Rules will be developed to ensure equitable impact on all parties.
- Opportunity for embedded generation to join the BM.

Emergency Disconnection of EG Legal and Commercial Issues

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- Embedded Medium and Small Power Stations are generally not CUSC or BSC Parties
- CUSC

  Section 5.2 covers emergency disconnection for embedded Large Power Stations (Users). Could this be extended to cover all embedded power stations?

  Any other impact?
- Distribution Code

  What rights do DNOs have?

  Could these be extended
- BSC

  Any views on this?
- BCAs

  Changes to any BCAs as a part of this Grid Code modification should be minimal– if at all required.

Next Steps

- Agree the impact on the Grid Code;
- Identify potential consequential changes to other codes, policies, and industry frameworks;
- Agree timescales for submission of these proposals;
- Develop a proposal for a Grid Code modification and submit it to the GCRP;
- Propose any consequential modifications in accordance with the governance of the affected code/policy/framework.