



# Unexpected Generation Failure Management

Update - July 2021

**nationalgrid**ESO

# Agenda

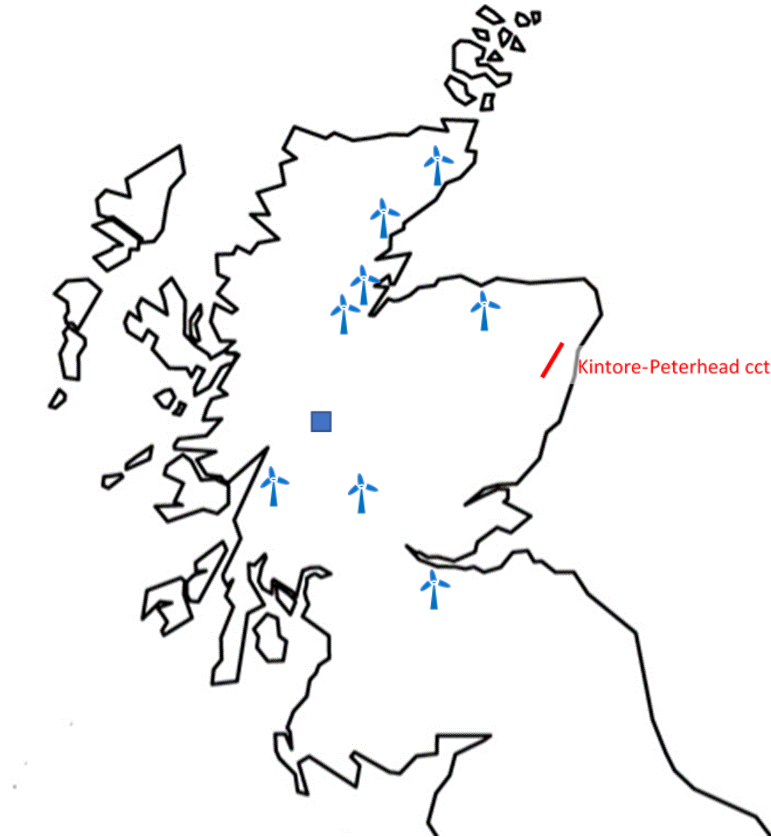
No	Item	To Cover Points Raised...
1	The Context	
2	General Admin	<ul style="list-style-type: none"><li>• FRT letter is on the website,</li><li>• Contacts for the letters</li></ul>
3	FRT Requirements - Background	<ul style="list-style-type: none"><li>• Applicability of FRT</li></ul>
4	Managing System Risk	<ul style="list-style-type: none"><li>• Engagement with users</li><li>• Adjusting BM parameters</li><li>• Applicable codes</li></ul>
5	User's Responsibility	<ul style="list-style-type: none"><li>• User resource issues</li></ul>
6	ESO's Responsibility	<ul style="list-style-type: none"><li>• Incident reporting,</li><li>• Future code mods</li></ul>

# Context

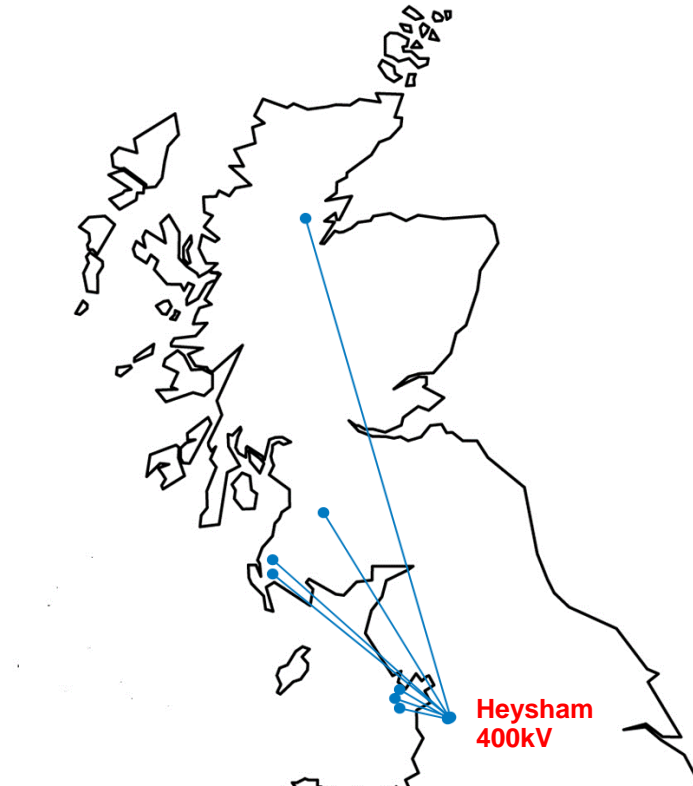
- There were 8 transmission faults between 10th February and 18th April where generation was unexpectedly lost coincident with the fault.
- These faults were 'normal' system events with no direct widespread impact.
- However, in some cases the generation losses were significant, close to RoCoF trigger levels and over 1000MW in one case.
- The number of incidents in two months and level of risk it posed to the system triggered the need for discussion with industry and the regulator.

# Context – Wide Areas Impacted

## Peterhead – Kintore Fault



## Heysham Busbar Fault



# Causes of Losses and Lesson Learned

## Basic Problems

### a) Protection Systems not working/set correctly

- Under/overvoltage limits
- Transformer protection
- Earth Fault protection
- RoCoF/Vector shift

### b) FRT functionality out of service but units generating

- No synchronous generator loss was pole slipping

## More Complex

- Power Electronics
- Service Level Agreements

# Lesson Learned - ESO

- ESO to investigate circuit fault events more
- Pro-active check on whether wind farm outputs dropped
- Not just when significant frequency event
- Review reporting to GCRP

# General Admin

- There were couple of points realised regarding the communication and delivery of the letter
- ESO published the letter on their website.
- ESO circulated widely to a list of contacts within the affected User community.
- ESO are taking steps to verify and confirm the recipients are correct for future communications of a similar nature.



# FRT Requirements - Background

- The first FRT requirements were introduced in the Grid Code in 2004.
- The basic requirement were applied retrospectively.
- Users were allowed to apply for derogation at that time if they could not meet the requirement (either partially or fully).
- The difference between the CC and ECC (as introduced to implement RfG in 2018) section requirements from a FRT perspective is minimal.
- Users demonstrate FRT at the time of connection as detailed in CP and ECP sections.



# Managing System Risk

- The obligations in OC5.4.2 set out a procedure to be followed in the event of persistent failure of a BM unit.
- As prudent system and plant operators we cannot afford to expose the system to risks where these have been identified as this would be against our licence obligations.
- Users are asked to restrict their output until a FRT issue is ruled out (either MEL to zero or to a safe level). This is to mitigate system risk and **not** to penalise the User. The ESO will work with Users to understand these issues.

# User's Responsibility

- Users should be able to quickly explain sudden unexpected loss of output when requested by ESO.
- The request to respond to a SIR within 2Hrs is not about finding the root cause or fully explaining the events. It could be as simple as to say that the detailed causes are being investigated and to set out a timeline to give a fuller explanation. It may also include asking the ESO further questions.
- The ESO understands it is not possible for all Users to have the resources to fully investigate events immediately all the time. However, we expect users to have internal business and operational procedures in place to manage unexpected events and to cooperate with the ESO in reasonable timescales.

# ESO's Responsibility

- The panel questioned the number of events discussed and publicly reported doesn't add up.
  - This is due to the number of generators tripping within specific events.
  - ESO take note of industry feedback on publishing all transmission fault events in the system to help users monitoring their plant behaviours
  - It may be necessary to review reporting threshold.
- OC5.4.2 does not have clear timelines to manage unexpected generation losses. This could be modified with the agreement of industry to better manage system risks.
- The ESO would like to engage with Users to understand their concerns and to formulate a better process.

Thank You

Questions?