GC0155

Clarification of Fault Ride Through Technical Requirements

Meeting 2

07 June 2022

Online Meeting via Teams

nationalgridESO

Agenda

Topics to be discussed	Lead
Welcome & Introductions	Chair
Review of Timeline / Meeting objective	All
Review of Actions Log	Chair
Recap of Modification Requirements	Terry Baldwin
Updates on Draft Legal Text amendments *Actions 1, 5, 6	Alastair Frew
Presentation of Strawman for High Voltage Ride Through Requirement • Workgroup feedback/Questions	Fraser Norris All
Draft Workgroup Consultation Questions	All
Review and agree Terms of Reference	All
AOB & Next Steps • ESO Presentation • Workgroup Consultation Draft Report and Proforma	Chair Tony Johnson

Members / Alternates & Observers

Role	Name	Representing
Chair	Banke John-Okwesa	**Code Administrator (ESO)**
Technical Secretary	Ruth Roberts	**Code Administrator (ESO)**
Proposer	Terry Baldwin	**ESO**
Workgroup Member	Alan Mason	**Oceanwinds**
Workgroup Member	Alan Creighton	**Northern Powergrid**
Workgroup Member	Alastair Frew	**Drax Power Station**
Workgroup Member	Andrew Larkins	**Sygensys**
Workgroup Member	Andrew Vaudin	**EDF**
Workgroup Observer	David Griffiths	**RWE Generation UK, RWE Renewables**
Workgroup Member	Damian Jackman	**SSE Generation**
Observer	Fiona Williams	**NGESO**
Workgroup Member	Forooz Ghassemi	**NGET**
Workgroup Member	Frank Martin	**Siemens**
Workgroup Member	Garth Graham	**SSE**
Workgroup Member	Isaac Gutierrez	**Scottish Power**
Observer	Mike Kay	**Electricity North West**
Workgroup Member	Nicola Barberis Negra	**Orsted**
Workgroup Member	Priyanka Mohapatra	**Scottish Power**
Workgroup Member	Ryan Tumilty	**SSE**
Workgroup Member	Sean Gauton	**Uniper Energy**
Workgroup Member	Tim Ellingham	**RWE Generation UK, RWE Renewables**
Workgroup Member (Alternate)	Julie Richmond	**Scottish Power**
Workgroup Member (Alternate)	Martin Aten	**Uniper**
Workgroup Member (Alternate)	Sridhar Sahukari	**Orsted**
Workgroup Member (Alternate)	Tobias Siepker	**Siemens**
Authority Representative	Shilen Shah	**Ofgem**

Timeline

Banke John-Okwesa – ESO Code Administrator

Timeline for GC0155 (OLD)

Milestone	Date	Milestone	Date
Proposal Presented to Panel	16 December 2021	Panel undertake DFMR recommendation vote	28 July 2022
Workgroup 1 - Understand / discuss proposal and solution, note the scope and identify any possible alternative solutions, agree timeline and review terms of reference, agree next steps.	10 February 2022	Final Modification Report issued to Panel to check votes recorded correctly (5 working days)	01 August 2022 – 08 August 2022
Workgroup 2 - Review solution(s) and legal text, agree alternatives, finalise Workgroup consultation (including agreeing Workgroup Consultation questions)	10 March 2022	Final Modification Report issued to Ofgem	09 August 2022
Workgroup Consultation (15 Working Days)	21 March 2022 – 11 April 2022	Ofgem decision	TBC
Workgroup 3 – Assess Workgroup Consultation Responses, review legal text, carry out Alternative Vote (if applicable)	26 April 2022	Implementation Date	10 working days after Ofgem decision
Workgroup 4 - Finalise solution(s) and legal text, agree that Terms of Reference have been met, Review Workgroup Report and hold Workgroup Vote	10 May 2022		
Workgroup Report issued to Panel (5 working days)	18 May 2022		
Panel sign off that Workgroup Report has met its Terms of Reference	26 May 2022		
Code Administrator Consultation	01 June 2022 – 30 June 2022		
Draft Final Modification Report (DFMR) issued to Panel	20 July 2022		

Revised Timeline for GC0155 approved 31 March 2022

Milestone	Date	Milestone	Date
Proposal Presented to Panel	16 December 2021	Draft Final Modification Report (DFMR) issued to Panel	16 November2022
Workgroup 1 – Understand / discuss proposal and solution, note the scope and identify any possible alternative solutions, agree timeline and review terms of reference, agree next steps.	10 February 2022	Panel undertake DFMR recommendation vote	24 November 2022
Workgroup 2 – Refresher of modification requirement, Review of solution(s) and legal text, consider any alternatives, draft Workgroup consultation	07 June 2022	Final Modification Report issued to Panel to check votes recorded correctly (5 working days)	28 November 2022 – 02 December 2022
Workgroup 3 – Finalise Workgroup Consultation proforma and report	05 July 2022	Final Modification Report issued to Ofgem	06 December2022
Workgroup Consultation (15 Working Days)	18 July 2022 – 8 August 2022	Ofgem decision	TBC
Workgroup 4 – Assess Workgroup Consultation Responses, review legal text, carry out Alternative Vote (if applicable)	23 August 2022	Implementation Date	10 working days after Ofgem decision
Workgroup 5 – Finalise solution(s) and legal text, agree that Terms of Reference have been met, Review Workgroup Report and hold Workgroup Vote	07 September 2021		
Workgroup Report issued to Panel (5 working days)	21 September 2022		
Panel sign off that Workgroup Report has met its Terms of Reference	29 September 2022		
Code Administrator Consultation	03 October 2021 – 03 November 2022		

Review of Actions Log

Banke John-Okwesa – ESO Code Administrator

Actions Log

Action Number	Workgroup raised	Owner	Action	Comment	Due by	Status
1	WG1	AF	To remove figure 7 on slide 29 of the presentation pack and replace with applicable wording		WG2	Open
2	WG1	TB	Find out how ESO define Overvoltage compliance following a fault		WG2	Open
3	WG1	TB	Consider DJ suggestion of removal of undervoltage from proposal		WG2	Open
4	WG1	TB	Consider PM suggestion of reviewing of different standards at different points of the network		WG2	Open
5	WG1	AF	To check the previous text changes in the CC and ECC within legal text point - CC.6.3.15.1 b) (iii) for active and reactive power		WG2	Open
6	WG1	AF	To check the reasons why current overvoltage requirements within CC and ECC changed		WG2	Open
7	WG1	DJ	To provide a strawman example to the WG		WG2	Open
8	WG1	BJO	Review and amend ToR, small tweaks in wording for WG to review at next meeting		WG2	Open

Action 2

Find out how ESO define Overvoltage compliance following a fault

The current expectation is that systems will be designed in accordance with TGN288 although we don't believe this expectation is explicit within the Grid Code.

Action 3

Consider DJ suggestion of removal of undervoltage from proposal

No issues with this- not yet in legal text.

Action 4

Consider PM suggestion of reviewing of different standards at different points of the network

We acknowledge that there is an issue with decreasing short circuit levels and that whilst it does impact on being able to achieve the clarifications identified within GC0155 it is a much bigger piece of work than the scope of GC0155 allows for and is already being discussed elsewhere.

The system operability framework has published a paper to discuss the current and future requirements for SCL data and is seeking feedback from stakeholders on this topic including whether a minimum short circuit level needs to be defined.

Question from previous workgroup -Multiple Fault Ride Through

This has been highlighted as a concern due to an incident in other parts of the world. Following a review it was determined that the weather pattern required to replicate that scenario in the UK would be very unlikely.

As multiple fault ride through currently has a low needs case, we are not looking to progress it at this moment in time.

ENTSO-E High Voltage ride through requirements

It was mentioned that ENTSO-E are looking at entering High voltage ride-through requirements into the RfG. This would be looking at creating thresholds for duration and level

We are no longer members of ENTSOE and have no visibility of the draft document which we believe will be coming in the next 12-18 months. When it is published we will be able to review the document and see which elements we wish to add to our own codes however at this moment in time it is not possible.

Recap of Modification Requirements

Terry Baldwin – NGESO

nationalgridESO

Background

This modification proposal is based on an alternative proposal (WAGCM2) to **GC0151** *'Grid Code Compliance with Fault Ride Through Requirements'* by Drax Power Ltd. It seeks to clarify the technical requirements for fault ride through capability set out in the Grid Code to improve consistency, accuracy and understanding and to help prevent non-compliance with the Grid Code.

Clarification of Fault Ride Through Requirements

Issue-

The way CC.6.3.15(a)(i) is written deals both with plant capability and actions to be taken during a fault, however, it does not clearly distinguish between either leading to confusion.

Proposed solution-

It is suggested that the current CC.6.3.15(a)(i) is split into two sections, one dealing with the required capability CC.6.3.15(a)(i)(a) and a second section CC.6.3.15(a)(i)(b) dealing with actions to be taken during a fault.

Plant Capabilities

Proposed solution-

The new section CC.6.3.15(a)(i)(a) will only deal with plant capabilities by clarifying that the plant has to be capable of riding through the worst fault that the network could impose which is a 3-phase short circuit at the connection point which lasts for up to 140ms.

Proposed Legal text

The words “be design to” will be added to section CC.6.3.15(a)(i)(a) as can be seen in the legal text in appendix 1.

Operating Requirements During a Fault

Issue-

The new section CC.6.3.15(a)(i)(b) will specify the actions to be taken if a fault occurs by requiring that plants ride through faults in the transmission system which can be cleared by the transmission system circuit breaker as shown in figure 2 below and by adding the following text as the introduction to the section

Proposed Legal text

(b) Each **Generating Unit**, **DC Converter**, or **Power Park Module** and any constituent **Power Park Unit** thereof and **OTSDUW Plant and Apparatus** shall remain transiently stable and connected to the **System** without tripping of any **Generating Unit**, **DC Converter** or **Power Park Module** and / or any constituent **Power Park Unit**, **OTSDUW Plant and Apparatus**, and for **Plant and Apparatus** installed on or after 1 December 2017, reactive compensation equipment, for any balanced and unbalanced fault where subjected to a voltage dip at either the **Onshore Grid Entry Point** or **Interface Point** as applicable where the voltage remains either on or within the envelope shown in figure CC.6.3.15(a)(i)(a) except where:

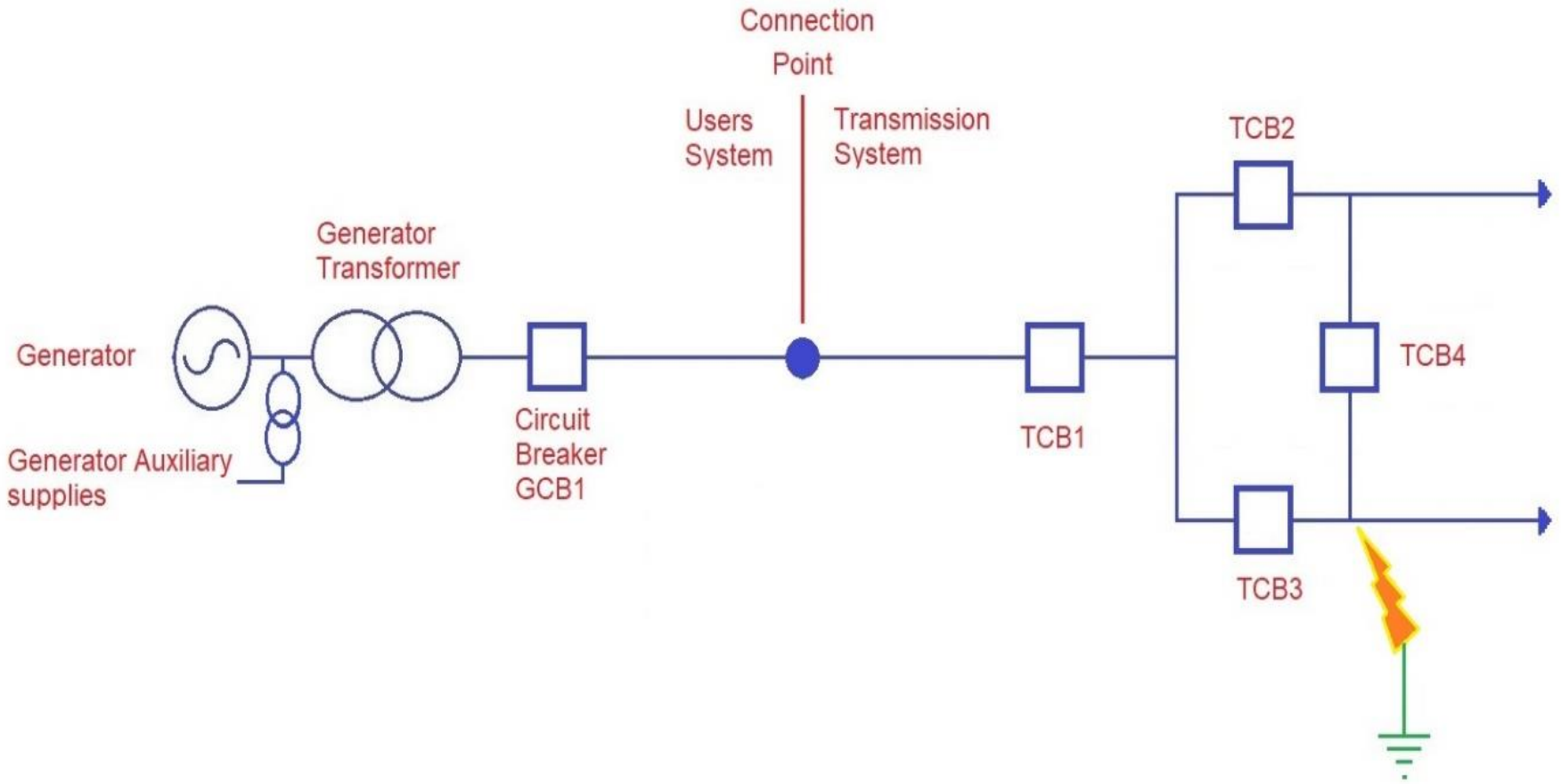

Figure 2 showing a fault which can be cleared by transmission system breakers TCB3 & 4

Operating Requirements During a Fault

Issue-

Whilst the introduction deals with plants riding through faults as it is currently drafted in the Grid Code, it is not clear what is supposed to happen where the plant's circuit breaker has to open to clear the fault.

There are concerns that the current text could be interpreted that the plant shall remain connected feeding the fault for 140ms which could lead to dangerous situations. It is clear this is not the intent, and that plant should trip during these circumstances.

It is proposed that the following subclauses are added to clarify each situation where tripping is permitted.

Subclause 1

If the fault is on the Generator's equipment then the Generator shall be required to trip to clear the fault from the transmission system as detailed in the proposed new section CC.6.3.15(a)(ii)(b)(i) (note that this is already permitted in the ECCs), as follows:-

Power Park Module and any constituent **Power Park Unit** thereof and **OTSDUW Plant and Apparatus** shall trip to clear the fault from the **Transmission System.** The protection schemes and settings should not jeopardise **Fault Ride Through** performance as specified in CC.6.3.15.1

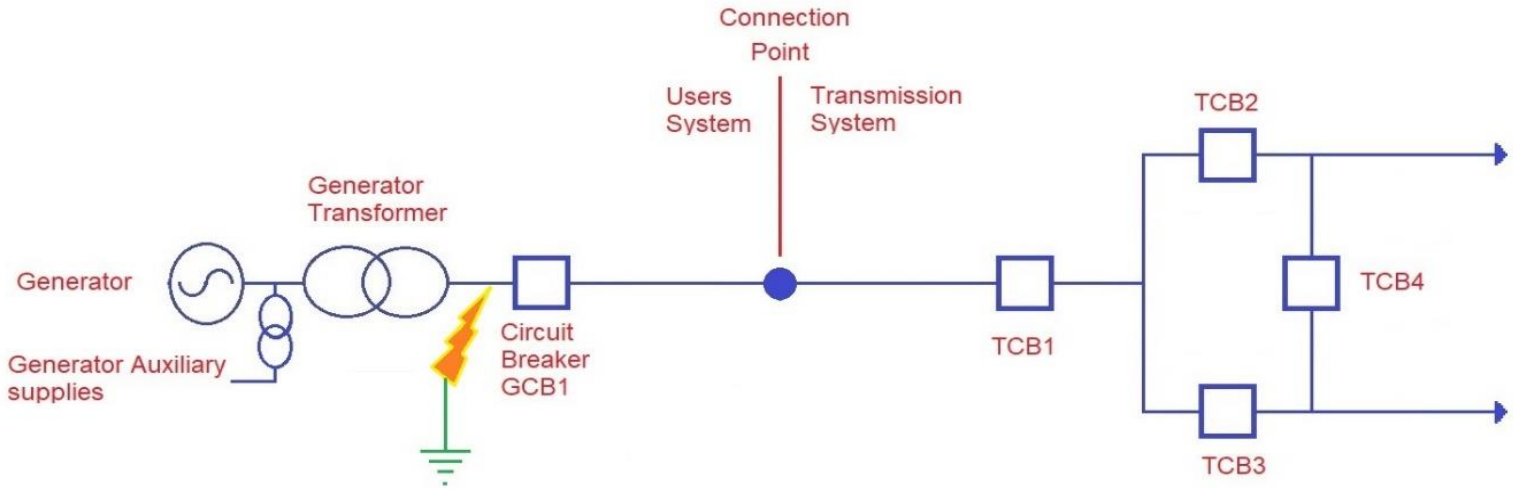

Figure 3 showing a fault which can only be cleared by generator breakers GCB1

Subclause 2

If the location of the fault on the network that means that the fault can only be cleared by operation of both Transmission and the Generator circuit breaker as shown in figure 4, again the Generator will be permitted to trip to clear the fault as detailed in the proposed new section CC.6.3.15(a)(i)(b)(ii) and ECC.6.3.15.8(vi)(i), as follows:-

the location of the fault means it cannot be fully cleared without tripping the of **Generating Unit**, **DC Converter**, or **Power Park Module** and any constituent **Power Park Unit** thereof and the **OTSDUW Plant** shall trip as required.

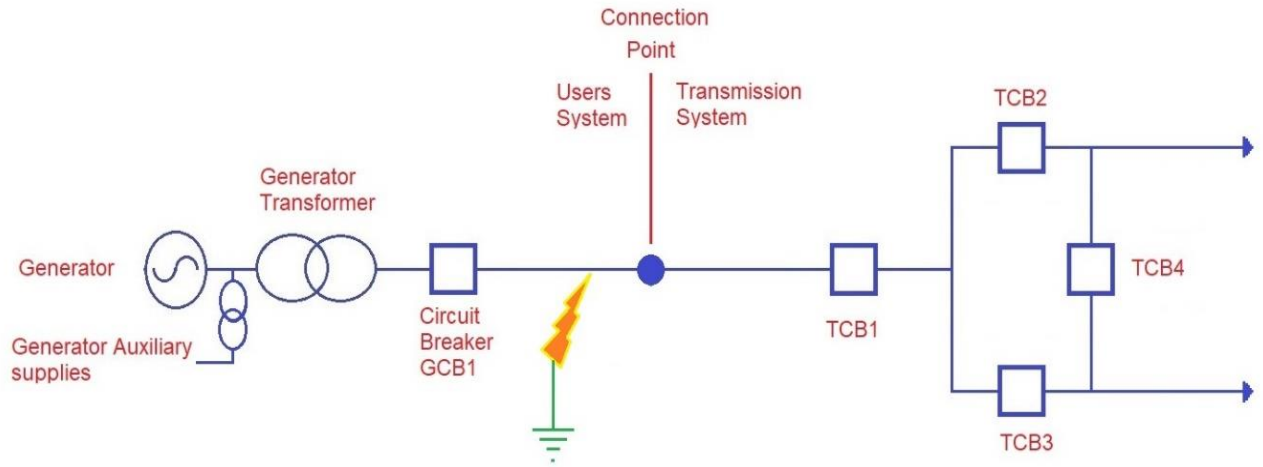

Figure 4 showing a fault which can only be cleared by generator breaker GCB1 & transmission circuit breaker TCB1

Subclause 3

if the location of the fault on the network means that the Generator will become islanded by the operation of the transmission circuit breakers as shown in figure 5 then it shall be permitted to trip as detailed in the proposed new sections CC.6.3.15(a)(ii)(b)(iii) and ECC.6.3.15.8(vi)(ii), as follows:-

clearance of the fault results in the **Generating Unit**, **DC Converter**, or **Power Park Module** or **OTSDUW Plant** becoming islanded and disconnected from the **Total System** and not supplying **Customers** (where CC.6.3.7(c)(i) applies), then the **Generating Unit**, **DC Converter**, or **OTSDUW Plants** shall be permitted to trip as required**.**

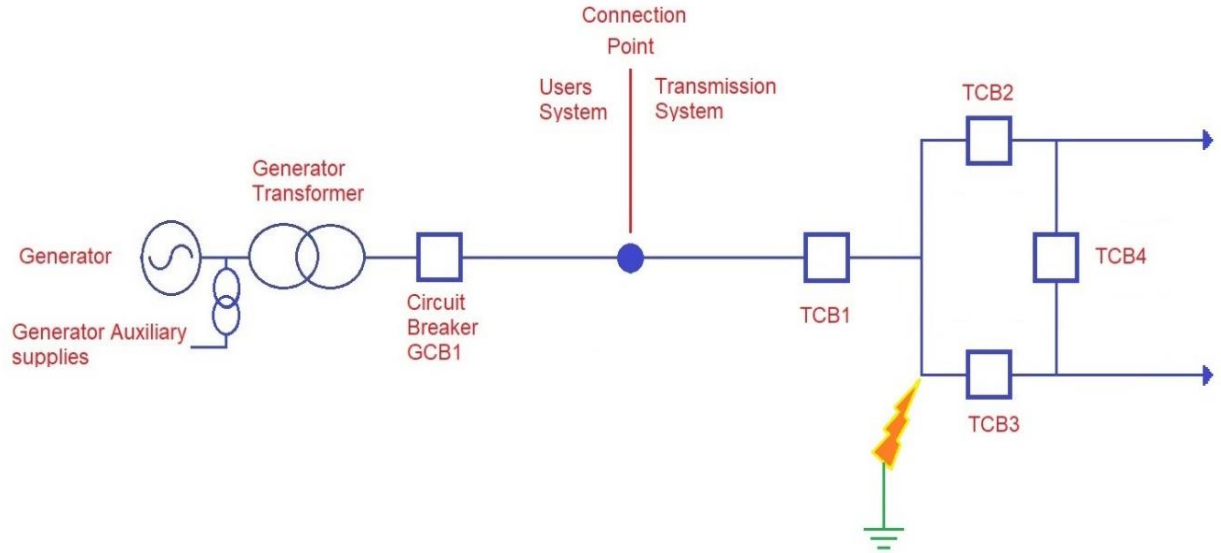

Figure 5 showing a fault which can be cleared by transmission breakers TCB1,2&3, however this results in the Generator being islanded from the main transmission system and needs to come off

Subclause 3

Also, if there are inter-trip arrangements with the TO or ESO in relation to protection schemes to prevent cascade overloading, etc then plants shall be required to trip as per these arrangements as detailed in the proposed new section CC.6.3.15(a)(i)(b)(iv & v) and ECC.6.3.15.8(iii & iv),as follows:-

the **Generating Unit**, **DC Converter**, or **Power Park Module** and any constituent **Power Park Unit** thereof and **OTSDUW Plant** is part of combined protection scheme with the **Transmission Operator**, then the **Generating Unit**, **DC Converter**, or **Power Park Module** and any constituent **Power Park Unit** thereof and **OTSDUW Plants** shall be permitted to trip as required**.**

the **Generating Unit**, **DC Converter**, or **Power Park Module** and any constituent **Power Park Unit** thereof and **OTSDUW Plant** is part of and intertrip scheme which is switched into service and triggered, then the **Generating Unit**, **DC Converter**, or **Power Park Module** and any constituent **Power Park Unit** thereof and **OTSDUW Plants** shall be permitted to trip as required**.**

Fault Current Injection

Issue-

The area of the current legal text which technically creates the biggest problem in relation to compliance are in sections CC.6.3.15 (a)(ii) and ECC.6.3.15.9.2.1(a)(i) which currently state “for which the voltage at the Grid Entry Point (or Interface Point in the case of OTSDUW Plant and Apparatus) is outside the limits specified in CC.6.1.4, each Generating Unit or Power Park Module or OTSDUW Plant and Apparatus shall generate maximum reactive current". If this requirement is drawn out on the figure 6 below where the current and voltage must always either be within the green shaded area or on the red line.

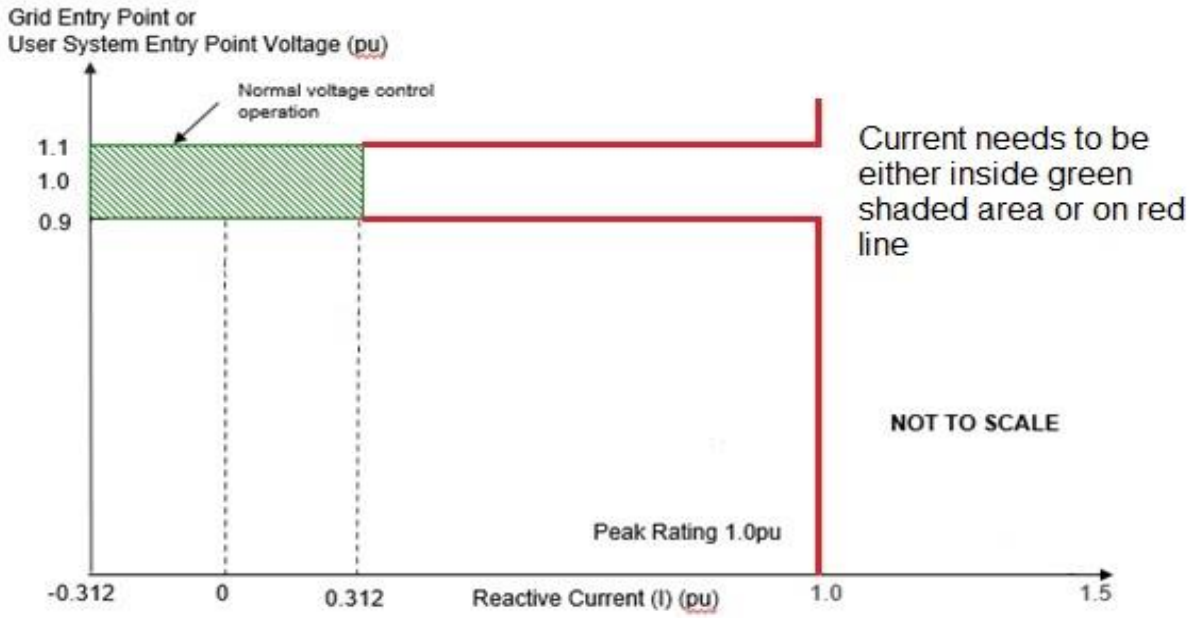

Figure 6 showing an interpretation of the existing legal text requiring the current to either be in the green box or on the red line

Fault Current Injection

Proposed Legal text

(iv) During the period of the fault as detailed in CC.6.3.15.1 (a) (i) for which the voltage at the **Grid Entry Point** (or **Interface Point** in the case of **OTSDUW Plant and Apparatus**) is outside the limits specified in CC.6.1.4, each **Generating Unit** or **Power Park Module** or **OTSDUW Plant and Apparatus** shall inject a reactive current above the heavy black line shown in Figure CC.6.3.15(b) without exceeding the transient rating limit of the **Generating Unit**, **OTSDUW Plant and Apparatus** or **Power Park Module** and / or any constituent **Power Park Unit** or reactive compensation equipment.

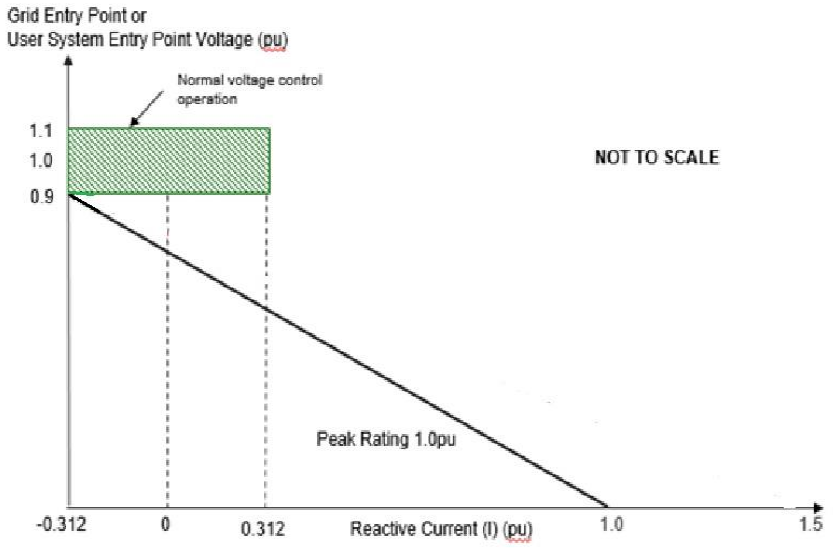

Figure 7 showing the proposed reactive current injection requirements, requiring the current to always remain above the black line

Active Power Requirements- (solution required)

Issue-

Minimum active Power requirements after the fault has cleared because within CC.6.3.15.1 a) ii) it states:

(or within 0.5 seconds of restoration of the voltage at the **User System Entry Point** to 90% of nominal or greater if **Embedded**), Active Power output or in the case of OTSDUW Plant and Apparatus, Active Power transfer capability, shall be restored to at least 90% of the level available immediately before the fault. Once the Active Power output, or in the case of OTSDUW Plant and Apparatus, Active Power transfer capability, has been restored to the required level, Active Power oscillations shall be acceptable provided that:

- the total Active Energy delivered during the period of the oscillations is at least that which would have been delivered if the Active Power was constant

- the oscillations are adequately damped

Whilst this works in principle at higher loads, it does create an issue at lower loads if you consider a real event for a unit operating as a synchronous condenser in figure 8.

Active Power Requirements

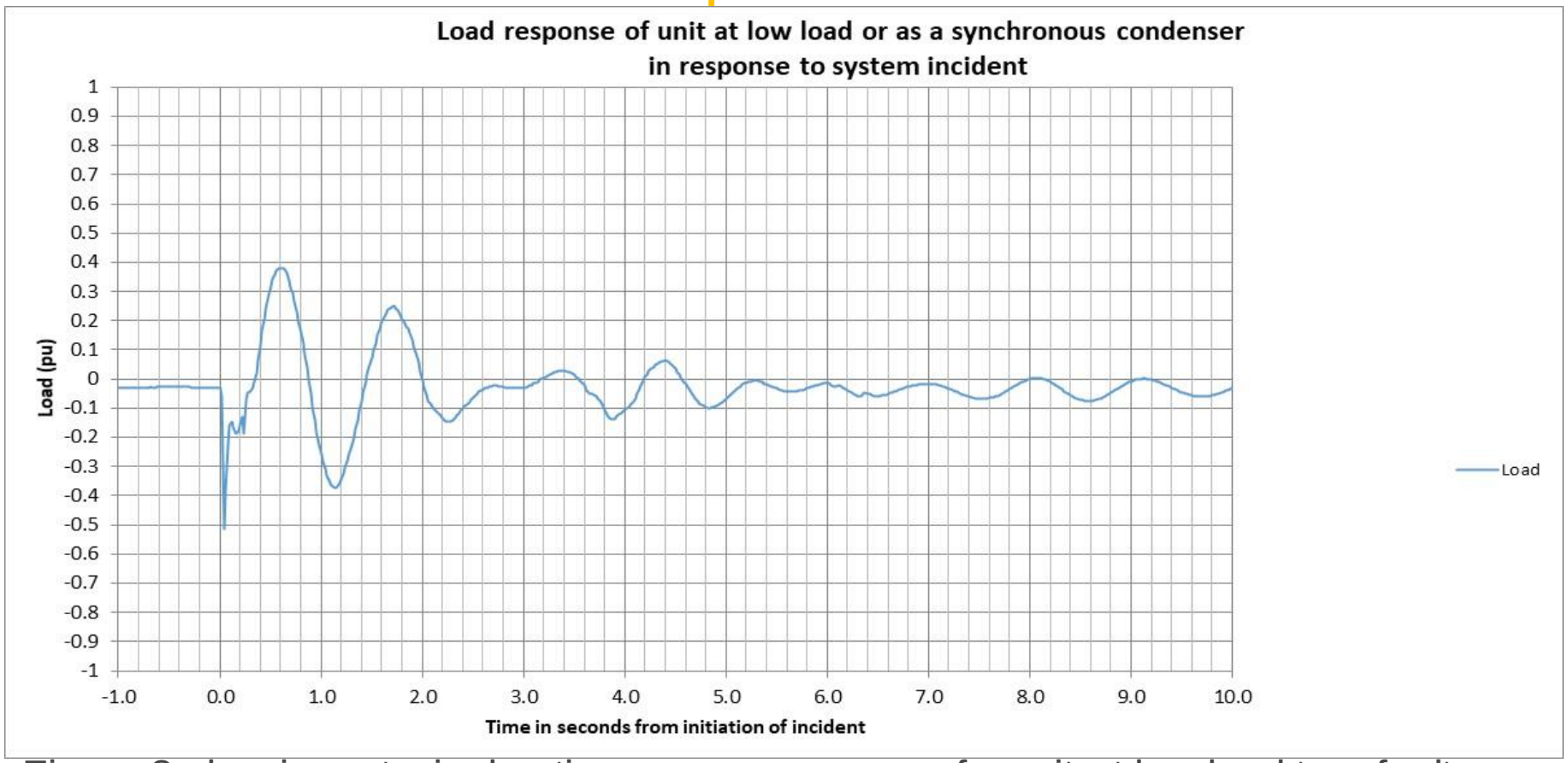

Figure 8 showing a typical active power response of a unit at low load to a fault

If you look at the initial load which is 0.02 pu then 90% of this small number you get a very small number, it is also difficult to see how a sensible compliance assessment can be carried out at these levels and it is hence suggested that under these circumstances the tolerance should be changed.

Voltage Protection Settings

Issue-

The Grid Code defines in detail the FRT requirements for voltage dips, it is silent on the requirement for Users or Network Operators to remain connected for transient over-voltages, particularly those that are expected to occur after the clearance of a fault.

Therefore it is possible, for example, that currently a Generator or Interconnector may successfully ride through a voltage dip, but trip when the fault is cleared as the resulting over-voltage transient is sufficiently high or sustained that it could trigger over-voltage protection that would ordinarily be expected to be fitted by the User (or Network Operator) to protect their equipment.

It is also possible a User site or Network Operator asset could ride through a low voltage fault but incorrectly configured protection settings result in the User site or Network Operator asset(s) tripping or de-loading.

Voltage Protection Settings

Proposed solution-

To provide further clarity to Users and Network Operators, it is proposed that wording along the following lines would be added to Section CC.6.3.15.3 and ECC.6.3.15.10 ('Other Fault Ride Through Requirements'):

- Users and Network Operators shall ensure voltage sensitive relays installed to protect the User's plant and / or apparatus or Network Operator's asset are configured such that they will not prevent correct operation of the Fault-Ride-Through capability of the User's equipment (or Network Operator's assets) against the relevant Voltage-Time curves. For example,
    - o Over-voltage protection shall be configured to be insensitive to transient overvoltages of at least 1.20pu for at least 0.5 seconds.
    - o Under-voltage protection shall be configured to be insensitive for transient undervoltages of below 0.8pu for at least 3 seconds

Draft Legal Text Amendments

**actions 1, 5, 6

Alastair Frew – Drax

nationalgridESO

Action 1 Look at removing graph and changing text

Graph removed and now proposing this text for sections CC.6.3.15a(iii)

(iii) During the period of the fault as detailed in CC.6.3.15.1 (a) (i)(a) for which the voltage at the **Grid Entry Point** (or **Interface Point** in the case of **OTSDUW Plant and Apparatus**) is zero volts ~~outside the limits specified in CC.6.1.4~~, each **Generating Unit** or **Power Park Module** or **OTSDUW Plant and Apparatus** shall generate maximum reactive current without exceeding the transient rating limit of the **Generating Unit**, **OTSDUW Plant and Apparatus** or **Power Park Module** and / or any constituent **Power Park Unit** or reactive compensation equipment.

In the original H04 modification the text "is outside the limits specified in CC.6.1.4" did not exist and appears to have been added to clarify, however the fault described in CC.6.3.15.1 is a hard 140ms 0volt fault so there are no other voltages so this text is not helpful. As the actual fault described is a hard 0 volt fault then maximum fault current would be correct, so it is proposed to change to text to "zero volts" as this describes the actual situation.

Action 5 Look at removing graph and changing text

Graph removed and now proposing this text for sections CC.6.3.15.1 1b(ii), CC.6.3.15.1 2b(ii), CC.6.3.15.2 a(ii), CC.6.3.15.2 1b(ii), CC.6.3.15.2 2b(ii), & ECC.6.3.15.9.2.1a(ii)

(ii) provide **Active Power** output at the **Grid Entry Point**, during **Supergrid Voltage** dips on the **Onshore Transmission System** as described in Figure 5a, at least in proportion to the retained balanced voltage at the **Onshore Grid Entry Point** (for **Onshore Synchronous Generating Units)** or **Interface Point** (for **Offshore Synchronous Generating Units)** (or the retained balanced voltage at the **User System Entry Point** if **Embedded**) and shall correspondingly generate proportionate ~~maximum~~ reactive current (where the voltage at the **Grid Entry Point** is outside the limits specified in CC.6.1.4) without exceeding the transient rating limits of the **Synchronous Generating Unit** and

This text is the original H04 modification, however the active power and reactive current are interrelated so there is a conflict with the use of "in proportion" for active power and "maximum" for reactive. So it is proposed to change to text to remove the "maximum" and change it to be "correspondingly proportionate" .

Action 6 To check current over voltage requirements

Current code requirements on overvoltage are:-

There are over voltage requirements in CC.6.2.1.1 (b) and ECC that the phase to earth voltage can go to 150% in Scotland and 140% in England and Wales for duration of fault, based on back-up protection times 300ms Scotland and 800ms England & Wales detailed on next side.

There also a tripping requirement in Scotland in CC.6.3.15.3 (4) and ECC if the voltage stays above 120% for more than 1 second

How durations work is not entirely clear the old Scottish Grid Code of 300ms was clearer see 3 slides on yellow highlighted, but not sure about clarity of the 800ms in England & Wales the current code.

Action 6 To check current over voltage requirements

Current code requirements on overvoltage are:-

Existing code

CC.6.2.1.1 (b) The National Electricity Transmission System (and any OTSDUW Plant and Apparatus) at nominal System voltages of 132kV and above is/shall be designed to be earthed with an Earth Fault Factor of, in England and Wales or Offshore, below 1.4 and in Scotland, below 1.5. Under fault conditions the rated Frequency component of voltage could fall transiently to zero on one or more phases or, in England and Wales, rise to 140% phase-to-earth voltage, or in Scotland, rise to 150% phase-to-earth voltage. The voltage rise would last only for the time that the fault conditions exist. The fault conditions referred to here are those existing when the type of fault is single or two phase-to-earth.

CC.6.2.2.2.2 (b) para 4… On a Generating Unit (other than a Power Park Unit), DC Converter or Power Park Module or OTSDUW Plant and Apparatus connected to the National Electricity Transmission System and on Generating Units (other than a Power Park Unit), DC Converters or Power Park Modules or OTSDUW Plant and Apparatus connected to the National Electricity Transmission System at 400 kV or 275 kV or 132 kV, in respect of which the Completion Date is before the 20 January 2016, the Back-Up Protection or Independent Back-Up Protection shall operate to give a fault clearance time of no longer than 800ms in England and Wales or 300ms in Scotland at the minimum infeed for normal operation for faults on the HV Connections.

Action 6 To check current over voltage requirements

Current code requirements on overvoltage are:-

Existing code

CC.6.3.15.3 To avoid unwanted island operation, Non-Synchronous Generating Units in Scotland (and those directly connected to a Scottish Offshore Transmission System), Power Park Modules in Scotland (and those directly connected to a Scottish Offshore Transmission System), or OTSDUW Plant and Apparatus with an Interface Point in Scotland shall be tripped for the following conditions:

…

4) Voltage as measured at the Onshore Connection Point or Onshore User System Entry Point or Offshore Grid Entry Point or Interface Point in the case of OTSDUW Plant and Apparatus is above 120% (115% for 275kV) for more than 1 second.

Action 6 To check current over voltage requirements

Old Scottish Grid Code

4.1.3 Voltage Variations

(a) The voltage at any point on the Company's network will normally remain within the following nominal values unless abnormal conditions prevail. Following major System faults, the maximum overvoltage values given may occur but the duration will not exceed 15 minutes unless exceptional circumstances prevail.

Nominal Voltage (kV)	Normal Range	15 Minutes Overvoltage
400	±5 %	+10%
275	±10 %	+15%
132	±10 %	+20%

(b) Under fault and circuit switching conditions the rated frequency component of voltage could fall transiently (possibly extending to the back-up Protection times in 4.2.2(b)) to zero on one or more phases or rise to 150% of nominal phase-to-earth voltage.

(c) Under Planned Outage conditions the maximum negative phase sequence component of the phase voltage on the Transmission System should remain below 2% unless exceptional circumstances prevail.

4.2.2 Protection Fault Clearance Times

(a) Users shall comply with the following requirements for fault clearance times (from fault inception to circuit breaker arc extinction) by main Protection not exceeding:

(i) 400 kV network - 80 milliseconds

(ii) 275 kV network - 100 milliseconds

(iii) 132 kV network - 140 milliseconds

The probability that these times will be exceeded for any given fault must be less than 2%.

(b) Back-Up Protection shall be provided with a target maximum fault clearance time of 300ms to cover for the failure of the main Protection.

(c) In case of the failure to trip of a User's circuit-breaker provided to interrupt fault current interchange with the Transmission System, circuit-breaker fail Protection shall be provided to trip all necessary electrically adjacent circuit-breakers within 300ms.

(d) The design reliability for Protection shall be equal to or greater than 99%

Strawman

Fraser Norris – SSE

nationalgridESO

Terms of Reference

Banke John-Okwesa – ESO Code Administrator

nationalgridESO

GC0155 – Terms of Reference

Workgroup Term of Reference	Location in Workgroup Report
a) Implementation and costs;	
b) Review draft legal text should it have been provided. If legal text is not submitted within the Grid Code Modification Proposal the Workgroup should be instructed to assist in the developing of the legal text; and	
c) Consider whether any further Industry experts or stakeholders should be invited to participate within the Workgroup to ensure that all potentially affected stakeholders have the opportunity to be represented in the Workgroup. Demonstrate what has been done to cover this clearly in the report	
d) Consider Electricity Balancing Guideline (EBGL) implications	
e) Minor changes and clarifications to the existing Grid Code Fault Ride Through (FRT) requirements specifically but not limited to consideration of the following areas: i. Clarify instances where User plant is required to trip in order to clear transmission system faults ii. Amending requirements for generating maximum reactive current during faults where these may be unachievable for some generators iii. Amending post-fault active power requirements to consider whether generators at low load may have greater levels of oscillation than permitted iv. To consider clarifying and or defining requirements for over-voltage ~~during~~ following a fault	
f) ~~Consider~~ Identify and address any cross code impacts on other codes especially Distribution Code (e.g. G99 requirements)	

AOB

Tony Johnson – NGESO

nationalgridESO

Next Steps

Banke John-Okwesa – ESO Code Administrator

- Review and finalise Legal Text
- Finalise Workgroup Consultation report and proforma