

## **EUROPEAN COMPLIANCE PROCESSES**

(ECP)

### **CONTENTS**

.....

ECP.4.2.3 the provisions contained in ECP.8 detail the process to be followed for the confirmation of continued compliance under the Compliance Repeat Plan.

ECP.4.2.34 The provisions contained in ECP.8-9 detail the process to be followed when:

- (a) a **Generator's** or **HVDC System Owner's**, or **Network Operator's** or **Non-Embedded Customer's Plant** and/or **Apparatus** (including the **OTSUA**) is unable to comply with any provisions of the **Grid Code** and **Bilateral Agreement**; or,
- (b) following any notification by a **Generator** or a **HVDC System Owner** or a **Network Operator** or a **Non-Embedded Customer** under the **PC** of any change to its **Plant** and **Apparatus** (including any **OTSUA**); or,
- (c) a **Modification** to a **Generator's** or a **HVDC System Owner's** or a **Network Operator's** or a **Non-Embedded Customer's Plant** and/or **Apparatus**.

Updates to cross referencing in ECP.6.3.6.1, ECP.6.4.6.1 and ECP.7.2.2(d) required

.....

ECP.7.4 If the requirements of ECP.7.2 and ECP.7.3 have been successfully met, **The Company** will notify the **Generator** or **HVDC System Owner** that compliance with the relevant **Grid Code** provisions has been demonstrated for the **Power Generating Module(s)**, **OTSUA** if applicable or **HVDC Equipment** as applicable through the issue of a **Final Operational Notification**. In respect of a **Embedded Power Station** or **Embedded HVDC Equipment** other than a **Embedded Medium Power Stations** not subject to a **Bilateral Agreement** and **Embedded HVDC Equipment** not subject to a **Bilateral Agreement**, **The Company** will notify the **Network Operator** that a **Final Operational Notification** has been issued. The **Final Operational Notification** will be subject to a Compliance Repeat Plan (CP.9) no later than 5 years from the date of issue.

Updates to cross referencing in ECP.7.5 and ECP.7.11 required

.....

ECP.8 Compliance Repeat Plan

**Commented [H(M1)]:** Added ne ECP.8 to require users to confirm continued compliance with the Grid Code and BCA

ECP.8.1 No later than 4 calendar years and 6 months after the issue of a **Final Operational Notification**, **The Company** will notify the **Generator** or **DC Converter Station** owner that confirmation of continued compliance with the requirements of the **Grid Code** and/or the **Bilateral Agreement**.

**Commented [H(M2)]:** Following WG discussion Altered to 4years 6 months to increase time window to 6 months.

ECP.8.2 No later than 5 calendar years after the issue of a **Final Operational Notification**, the **Generator** or **DC Converter Station** owner shall confirm that the **Plant** and/or **Apparatus** (including **OTSUA** if applicable) is fully compliant with the requirements of the Grid Code and/or the **Bilateral Agreement**. The confirmation of compliance will include:

- (a) a **Compliance Statement** and a **User Self Certification of Compliance** signed by the **EU Code User** and a statement of any requirements that the **Generator** or **HVDC System Owner** has identified that have not been met together with a copy of the derogation in respect of the same from **The Authority**.
- (b) complete set of relevant **Planning Code** data (both **Standard Planning Data** and **Detailed Planning Data**), with validated actual values and updated estimates for the future including **Forecast Data** items such as **Demand**. Simulation Studies and results from Site Tests detailed in Appendix ECP.A.3 – ECP.A.8 inclusive are not required as part of the Compliance Repeat Plan.

For the avoidance of doubt the **Generator** or **DC Converter Station** owner is responsible for ensuring that **Plant** and/or **Apparatus** (including **OTSUA** if applicable) remains compliant with the relevant clauses of the Grid Code and/or the **Bilateral Agreement** and/or connection site conditions notified by **The Company**.

**Commented [H(M3)]:** Following WG discussion. Added to clearly restrict scope to data not simulations/tests

ECP.8.3 If the requirements of ECP.8.2 have been completed to **The Company's** satisfaction, **The Company** will notify the **Generator** or **HVDC System Owner** that compliance with the relevant Grid Code provisions has been demonstrated for the **Power Generating Module(s)**, including **DC Connected Power Park Module(s)** and **OTSUA**, if applicable or **HVDC Equipment** as applicable through the issue of a **Final Operational Notification** subject to Compliance Repeat Plan (ECP.8) no later than 5 years from the date of issue. In respect of an **Embedded Power Station** or **Embedded DC Converter Station** other than **Embedded Medium Power Stations** not subject to a **Bilateral Agreement** and **Embedded HVDC Systems** not subject to a **Bilateral Agreement**, **The Company** will notify the **Network Operator** that a **Final Operational Notification** has been issued.

**Commented [H(M4)]:** Following WG discussion .Added to clarify Users obligations

ECP.8.4 If a **Final Operational Notification** cannot be issued because the requirements of ECP.8.2 have not been successfully met prior to 5 years from the date of issue of the **Final Operational Notification**, then **The Company** will issue the **Generator** or **HVDC System Owner** (where licensed in respect of its activities) a **Limited Operational Notification** with respect to the **Unresolved Issues**. The provisions of ECP.9 shall then apply.

Updates to numbering CP.8 to CP.9, CP.9 to CP10 and CP10 to CP.11 and updates to cross referencing in CP.9-CP.11 required

### APPENDIX 3

#### SIMULATION STUDIES

ECP.A.3.1 SCOPE

ECP.A.3.1.1 This Appendix sets out the simulation studies required to be submitted to **The Company** to demonstrate compliance with the Connection Conditions unless otherwise agreed with **The Company**. This Appendix should be read in conjunction with ECP.6 with regard to the submission of the reports to **The Company**. Where there is any inconsistency in the technical requirements in respect of which compliance is being demonstrated by simulation in this Appendix and ECC.6.3 and the **Bilateral Agreement**, the provisions of the **Bilateral Agreement** and ECC.6.3 prevail. The studies specified in this Appendix will normally be sufficient to demonstrate compliance. However **The Company** may agree an alternative set of studies proposed by the **Generator** or **HVDC System Owner** provided **The Company** deem the alternative set of studies sufficient to demonstrate compliance with the **Grid Code** and the **Bilateral Agreement**.

ECP.A.3.1.2 The **Generator** or **HVDC System Owner** shall submit simulation studies in the form of a report to demonstrate compliance. In all cases the simulation studies must utilise models applicable to the **Synchronous Power Generating Module, HVDC Equipment or Power Park Module** with proposed or actual parameter settings. Reports should be submitted in English with all diagrams and graphs plotted clearly with legible axes and scaling provided to ensure any variations in plotted values is clear. In all cases the simulation studies must be presented over a sufficient time period to demonstrate compliance with all applicable requirements. All simulation study reports should be checked and approved by an independent engineer or independent test body prior to submission to The Company. The independent engineer or independent test body is signing the report to approve the study methodologies used are appropriate and the results are an accurate simulation of the behavior of the Plant and Apparatus. In the context of ECP.A.3.1.2 for a particular connection, the independent engineer is only employed by the Generator or HVDC System Owner to check and approve the simulation study reports for that connection and is not employed for other work on that connection.

Commented [H(M5)]: Review of simulation studies by an independent engineer.

ECP.A.3.1.3 In the case of an **Offshore Power Station** where **OTSDUW Arrangements** apply simulation studies by the **Generator** should include the action of any relevant **OTSUA** where applicable to demonstrate compliance with the **Grid Code** and the **Bilateral Agreement** at the **Interface Point**.

.....  
ECP.A.3.5 Fault Ride Through and Fast Fault Current Injection

ECP.A.3.5.1 This section applies to **Type B, Type C and Type D Power Generating Modules** and **HVDC Equipment** to demonstrate the modules fault ride through and **Fast Fault Current** injection capability.

The **Generator** or **HVDC System Owner** shall supply time series simulation study results to demonstrate the capability of **Synchronous Power Generating Module, HVDC Equipment, and Power Park Modules** and **OTSUA** to meet ECC.6.3.15 and ECC.6.3.16 by submission of a report containing:

- (i) a time series simulation study of a 140ms three phase short circuit fault with a retained voltage as detailed in table A.3.5.1 below applied at the

**Grid Entry Point or (User System Entry Point if Embedded) of the Power Generating Module or HVDC Equipment or OTSUA.**

- (i) a time series simulation study of 140ms unbalanced short circuit faults with a retained voltage as detailed in table 1 on the faulted phase(s) applied at the **Grid Entry Point or (User System Entry Point if Embedded) of the Power Generating Module or HVDC Equipment or OTSUA**. The unbalanced faults to be simulated are:

1. a phase to phase fault
2. a two phase to earth fault
3. a single phase to earth fault.

<b>Power Generating Module</b>	<b>Retained Voltage</b>
<b>Synchronous Power Generating Module</b>	
Type B	30%
Type C or Type D with Grid connection point voltage <110kV	10%
Type D with connection point voltage >110kV	0%
<b>Power Park Module</b>	
Type B or Type C or Type D with connection point voltage < 110kV	10%
Type D with connection point voltage >110kV	0%
<b>HVDC Equipment</b>	10%

Table A.3.5.1

For a **Power Generating Module or HVDC Equipment or OTSUA** the simulation study should be completed with the **Power Generating Module or HVDC Equipment or OTSUA** operating at full **Active Power** and maximum leading **Reactive Power** and the fault level at the **Supergrid HV connection point** at minimum or as otherwise agreed with **The Company** as detailed in ECC.6.3.15.8.

- (iii) time series simulation studies of balanced **Supergrid** voltage dips applied on the nearest point of the **National Electricity Transmission System** operating at **Supergrid** voltage to the **Synchronous Power Generating Module or OTSUA**. The simulation studies should include:

1. 50% retained voltage lasting 0.45 seconds
2. 70% retained voltage lasting 0.81 seconds
3. 80% retained voltage lasting 1.00 seconds
4. 85% retained voltage lasting 180 seconds.

For a **Synchronous Power Generating Module or OTSUA**, the simulation study should be completed with the **Synchronous Power Generating Module or OTSUA** operating at full **Active Power** and zero **Reactive Power** output and the fault level at the **Supergrid HV connection point** at minimum or as otherwise agreed with **The Company**. Where the **Synchronous Power Generating Module** is **Embedded** the minimum **Network Operator's System** impedance to the **Supergrid HV connection point** shall be used which may be calculated from the maximum fault level at the **User System Entry Point**.

- (iii) time series simulation studies of balanced **Supergrid** voltage dips applied on the nearest point of the **National Electricity Transmission System** operating at **Supergrid** voltage to the **HVDC Equipment or Power Park Module**. The simulation studies should include:

1. 30% retained voltage lasting 0.384 seconds
2. 50% retained voltage lasting 0.71 seconds
3. 80% retained voltage lasting 2.5 seconds
4. 85% retained voltage lasting 180 seconds.

For **HVDC Equipment** or **Power Park Modules** the simulation study should be completed with the **HVDC Equipment** or **Power Park Module** operating at full **Active Power** and zero **Reactive Power** output and the fault level at the **Supergrid** HV connection point at minimum or as otherwise agreed with **The Company**. Where the **HVDC Equipment** or **Power Park Module** is **Embedded** the minimum **Network Operator's System** impedance to the **Supergrid** HV connection point shall be used which may be calculated from the maximum fault level at the **User System Entry Point**.

For **HVDC Equipment** the simulations should include the duration of each voltage dip 1 to 4 above for which the **HVDC Equipment** will remain connected.

ECP.A.3.5.2 In the case of **Power Park Modules** comprised of **Power Park Units** in respect of which the **User's** reference to a **Manufacturer's Data & Performance Report** has been accepted by **The Company** for Fault Ride Through, ECP.A.3.5.1 will not apply provided:

- (i) the **Generator** or **HVDC System Owner** demonstrates by load flow simulation study result that the faults and voltage dips at either side of the **Power Park Unit** transformer corresponding to the required faults and voltage dips in ECP.A.3.5.1 applied at the nearest point of the **National Electricity Transmission System** operating at **Supergrid** voltage are less than those included in the **Manufacturer's Data & Performance Report**,
- or;
- (ii) the same or greater percentage faults and voltage dips in ECP.A.3.5.1 have been applied at either side of the **Power Park Unit** transformer in the **Manufacturer's Data & Performance Report**.

**ECP.A.3.5.3** In the case of a **Power Park Module** the studies detailed in ECP.A.3.5.1 should be repeated to demonstrate compliance during foreseeable running arrangements resulting from outages of major **Plant and Apparatus** (for example outage of the main export cable in the case of **OTSDUW** or module step up transformer where alternative export connections are possible). For these conditions, the **Power Park Module Active Power** output may be reduced to levels appropriate to the planned operating regime proposed by the **Generator**. The **Generator** shall consult **The Company** on alternative running arrangements and agree with the **The Company** the running arrangements that will be studied prior to the **Generator** undertaking the studies. For the avoidance of doubt, compliance of a **Power Park Module** with **Fault Ride Through** requirements remains the responsibility of the **Generator** under all operating conditions.

**Commented [H(M6):** Additional simulation requirements for large or complex connections to improve robustness of process.

**Commented [H(M7):** Following WG discussion. Added to agree scope of studies prior to studies being carried out

ECP.A.3.5.4 In the case of a **Power Park Module** with a **Registered Capacity** greater or equal to 100MW, the studies detailed in ECP.A.3.5.1 should be repeated with 50% of the **Power Park Units Synchronised** to the **Total System**. In the case of a **Power Station** containing multiple **Power Park Modules** or multiple **Offshore Power Park Modules** connected to an **Offshore Transmission System** or **OTSDUW** the study should include all **Power Park Modules** with 50% of the **Power Park Units Synchronised** to the **Total System**.

ECP.A.3.5.5 In the case of **HVDC Equipment** the studies detailed in ECP.A.3.5.1 should be repeated to demonstrate compliance during foreseeable running arrangements resulting from outages of major **Plant and Apparatus** (for example outage of an HVDC cable or convertor. For these conditions, the **HVDC Equipment Active Power** transfer may be reduced to levels appropriate to the planned operating regime. **The Generator or HVDC Owner** shall consult **The Company** on alternative running arrangements and agree with the **The Company** the running arrangements that will be studied prior to the **Generator** or **HVDC Owner** undertaking the studies. For the avoidance of doubt, compliance of **HVDC Equipment** with **Fault Ride Through** requirements remains the responsibility of the **Generator** or **HVDC Owner** under all operating conditions.

**Commented [HM8]:** Following WG discussion. Added complex HVDC Systems

**Commented [HM9]:** Following WG discussion. Added to agree scope of studies prior to studies being carried out