RMS Model Specification Data Centre

Version 1.0

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Contents

Revision	Date	Description
Draft 1.0	August 2025	Draft TSAT model specification circulated to Data Centre owners
V1.0	June 2026	First release of RMS model specification for Data Centres

Note: This document supersedes sections 3.2.1 and 3.2.2 of "EirGrid Simulation Studies and Modelling Requirements for Compliance Demonstration, v1.0", March 2021.

1. Introduction

1.1. Scope & Purpose

This document has been published by the TSO to provide clarity on the **balanced root mean-square positive phase-sequence (RMS) modelling requirements for Data Centres** in Ireland, as specified in the Grid Code (PC.A8) [1.], in compliance with European legislation EU 2016/1388 reflected in the Network Code on Demand Connection (Article 21) [2.]. The contents of this document are also in alignment with the recommended amendments to the existing Network Codes submitted by ACER to the European Commission in December 2023 (DCC 2.0) [3.], expected to be approved in 2026.

As the Ireland and Northern Ireland power system transitions towards a net zero carbon operation; the number of Inverter-Based Resources (IBR) is expected to increase, with the amount of synchronous generation in the grid to decline, which will significantly change the dynamic characteristics of the All-Island power system. In addition, the number and size of Data Centre connections in Ireland is growing rapidly. This type of Inverter-Based Load (IBL) behaves differently from conventional loads and is large enough (in aggregate) to influence the dynamic stability of the All-Island power system. The aggregate effects of IBRs and IBLs are introducing new operational and reliability challenges that require accurate simulation models for impact analysis and risk mitigation.

The TSO bases the safe and secure design and operation of the Power System on the models provided by the Users. Therefore, the TSO requires all Data Centre Users connected to, or applying for a connection to, the Transmission System to provide an RMS model of their facility in accordance with the instructions included in this document, as specified in the Grid Code (PC.A8[1]).

The objective of this document is to provide clear and consistent guidance with regards to the level of detail, model type, model accuracy, performance, usability and interoperability requirements for RMS models of Data Centres in Ireland. Provision of RMS models compatible with these instructions will enable the TSO to effectively setup and integrate the individual Data Centre model into a larger RMS network model and conduct electromechanical dynamic simulation studies related to security and stability of the All-Island power system. The Data Centre owner is responsible for ensuring that the RMS model submitted to the TSO is developed and configured to meet the specifications described in this document and is accompanied by documentation demonstrating that it represents the overall Data Centre behaviour, seen at the Point of Connection (PoC), as accurately as possible. Submission of an RMS model is a requirement for compliance with Grid Code clause PC.A8.

This document describes:

- Intended use of the model.
- Components that must be included in the model.
- Model fidelity.
- Acceptable software platform.
- Performance and usability features of the model.
- Model package and submission timelines.
- Maintenance of the model.

This document does not address how model validation or benchmarking should be done. Guidelines for model validation will be described in a separate document following the conclusion of an industry Working Group.

[1] Note: The Grid Code defines obligations on all Users to submit dynamic models to the TSO (PC.A8). These obligations were introduced in 2016 with MPID 239 on a non-retrospective basis. This means that PC.A8 applies to all Users that were connected (or will connect) to the power system after 1st June 2016, or to previous connections that undergo major refurbishment.

1.2. Abbreviations

AC	Alternative Current
BESS	Battery Energy Storage System
BoP	Balance of Plant
C&P	Control and Protection
DC	Direct Current
FRT	Fault Ride Through
GC	Grid Code
IBL	Inverter-Based Load
IBR	Inverter Based Resource
IP	Intellectual Property
MIC	Maximum Import Capacity
MSS	Minimum System Strength
PED	Pre-Energisation Data
PoC (*)	Point of Connection
RMS	Root Mean Square
RoCoF	Rate of Change of Frequency
SCR	Short Circuit Ratio
SLD	Single Line Diagram
SMIB	Single Machine Infinite Bus
TSO	Transmission System Operator (EirGrid)
UPS	Uninterruptible Power Supply
VFD	Variable Frequency Drive
X/R	Reactance over Resistance ratio

(*) Note: A Data Centre demand facility may have one or more physical connection points to the main power system located in the same HV substation. The use of the PoC term in this document refers to the common HV busbar where the multiple connection points are physically connected to.

2. Intended use

This section provides clarity on the type of studies that the TSO will conduct with the RMS model submitted by the Data Centre owner. The RMS model shall be valid and accurate for these types of studies. Any simplifications or limitations in the RMS model shall be discussed with the TSO and documented in the model user guide (section 0).

2.1. Context

DATA_INT_1

Simulation models play an important role in enabling the TSO to maintain a safe, reliable and resilient transmission system. Accordingly, it is important that simulation models submitted by Data Centre Owners comply with the requirements set out by the TSO to ensure that the models both accurately represent the facility in question, whilst also fulfilling the requirements of the TSO's internal simulation tools for system-wide dynamic studies.

This specification aims to support Data Centre owners in ensuring that submitted RMS dynamic models comply with the modelling requirements for Users, as defined in the Grid Code (PC.A8).

2.2. Studies

DATA_INT_2

The RMS model shall be used for dynamic studies within various timeframes over the entire lifetime of the Data Centre, including:

- pre-connection studies,
- transmission network planning,
- real-time operational studies,
- system incident investigations.

DATA_INT_3

The RMS model shall be suitable for wide-area and local dynamic performance studies including, but not limited to, the following list:

- Power system stability studies (e.g. transient, voltage and frequency stability).
- Balanced AC fault performance studies, including ride through and post-disturbance recovery trajectory analysis.
- Sensitivity to voltage magnitude or phase-angle jumps.
- Low frequency oscillation / interaction studies (within the bandwidth of the phasor domain simulation method – up to 10 Hz)

2.3. Model Capabilities

DATA_INT_4

The RMS model shall be capable of simulating the steady-state and dynamic behaviour of the Data Centre facility, as seen at the PoC, under normal operating conditions, small disturbances (e.g. voltage step change) and large disturbances in the external grid (e.g. during and after balanced 3-phase system faults, voltage disturbances and frequency disturbances) under a range of credible system strength conditions.

DATA_INT_5

The RMS model shall be capable of smooth integration, without requiring any special settings to be implemented, in the larger network model and run in online mode (24 x 7) without detrimental impact on performance of the overall system model.

DATA_INT_6

The RMS model shall accurately reproduce the Data Centre voltage and frequency ride-through behaviour and active power recovery ramp, as seen from the PoC, including tolerance to successive disturbances.

DATA_INT_7

The RMS model shall be capable of simulating control interactions or any other oscillatory behaviour in the range of 0.1 Hz to 10 Hz.

DATA_INT_8

The RMS model shall represent the voltage dependency of the Data Centre, seen at the PoC, in the range from 0 to 1.4 pu.

DATA_INT_9

The RMS model shall represent the frequency dependency of the Data Centre, seen at the PoC, in the range from 47 to 52 Hz.

DATA_INT_10

The Data Centre load composition shall be parametrised in the RMS model (e.g. 80% IT load, 15% cooling load, 5 % auxiliary load). The model user shall have the capability to change the portion of each type of load in the model.

DATA_INT_11

The RMS model shall capture the steady state and dynamic characteristics of the Data Centre full operating range of active and reactive power.

3. Model Components

This section provides an overview of the expected Data Centre components that need to be included in the RMS model.

3.1. Electrical Components of the Data Centre Facility

DATA_COM_1

The RMS model shall include accurate representation of all the relevant **electrical components and balance of plant equipment** (up to the PoC) which can affect the dynamic behaviour of the Data Centre into the power system, as seen at the PoC. These components shall be represented in an aggregated manner as described in section 4.3. A non-exhaustive list of electrical components is given hereafter:

- Uninterruptible Power Supply (UPS), Battery Storage System (BESS), supercapacitors, E-STATCOM, flywheels, back-up/onsite generators[2] and others (where applicable).
- IT loads (e.g. compute, storage and communication load), including relevant load profiles for the type of studies described in section 2.2.
- Mechanical cooling loads (e.g. VFD and direct connected motors driving computer room air conditioning units, compressors and fans).
- Other relevant auxiliary loads.
- Additional reactive power/power factor control devices (e.g. STATCOM, capacitor banks, shunt reactor, harmonic filters).
- Power transformers (e.g. Grid Connected Transformer and relevant internal transformer units between the PoC and the UPS's), including tap changers.
- AC internal distribution system.

3.2. Control and Protection of the Data Centre Facility

DATA_COM_2

The RMS model shall include all relevant **Control and Protection (C&P)** functionality which can affect the dynamic behaviour observed at the PoC in the event of external network faults or frequency deviations.

A non-exhaustive list of C&P functions expected to be included in the model is shown below (when applicable):

- UPS C&P responsible for voltage and frequency ride through behaviour, including temporary load decoupling from main grid supply, voltage and frequency transfer thresholds and timing, disturbance counters, staged reconnection and/or delayed recovery.
- UPS bypass control and other relevant UPS protection functions (if relevant for the type of studies described in section 2.2).
- Connection of back-up generation (if intended to operate in parallel with the power system).
- Transformer tap changer control.
- Control of additional active power and/or reactive power control devices (e.g. BESS, back-up generator, STATCOM, capacitor banks, shunt reactor), when applicable.

[2] On-site generation and storage is only expected to be included in the RMS model if intended to operate in parallel with the power system.

DATA_COM_3

The RMS model shall include representation of all the relevant **protection relays**[3] at site level and rack-level that can impact the Data Centre facility dynamic performance seen at the PoC (e.g. trip all or parts of the demand facility), including thresholds settings and delays. A typical list of functions includes, when applicable:

- Over/under voltage protection.
- Over current protection.
- Over/Under Frequency protection.
- Rate of Change of Frequency (RoCoF) protection.
- Harmonic protection.
- Negative phase sequence (voltage unbalance) protection.
- Other protection that can affect the active or reactive power drawn at the PoC under any operating condition, including tripping of cooling systems and other auxiliary loads.

[3] Generic representation of protection relays is acceptable, provided that settings are site-specific.

4. Model Fidelity

Model fidelity refers to how accurately a model represents the real-world behaviour and dynamic response of the facility. This section provides clarity on the expected model characteristics affecting its fidelity.

4.1. Accuracy

DATA_FID_1

The RMS model shall be accurate and numerically stable for all operating conditions described in the Grid Code and for any studies listed in section 2.2, including the full range of SCR and X/R values at the connection point provided by the TSO as pre-energisation data (PED).

4.2. Site Specific

DATA_FID_2

The RMS model shall be **specific to the equipment and the site.** Generic models are only acceptable if they can be parametrised to reproduce the expected dynamic behaviour of the Data Centre with reasonable accuracy.

DATA_FID_3

The RMS model must be accurately parameterized to represent **site-specific** controls, settings, and protections. Generic or manufacturer- default parameters are not acceptable. It is recommended that the simulation models are developed and adjusted in coordination with the equipment vendors to ensure that the RMS models accurately reflect the on-site characteristics.

DATA_FID_4

Transformers tap changer controls shall be represented and parametrized with the same voltage setpoints and delays as in the physical equipment on site.

4.3. Aggregation

DATA_FID_5

The RMS model of the Data Centre must include an aggregated representation of all components of the same “type” and dynamic behaviour (i.e. identical or similar model, type, FRT capability, settings and performance), which must be represented as one single equivalent component. A high-level illustration of the expected level of aggregation is shown in Figure 1 for a generic case where all components of the plant are of the same “type”. The same principle applies for cases with multiple component “types”.

The necessary steps to achieve adequate aggregation depend on the layout of the Data Centre. Therefore, the Data Centre owner must include a detailed description of the aggregation method and assumptions in the model user guide (section 0). In addition, the aggregated model must fulfil the following requirements:

- For Data Centre facilities with several types of components, aggregation of each unit type shall be performed separately (e.g. centralised vs distributed UPSs, FRT capable vs FRT non-capable, etc).
- The response of the aggregated model seen at the PoC shall be equivalent to that of the non-aggregated model (i.e. with all individual components explicitly represented) for the intended use of the RMS model described in section 2. Demonstration of accuracy (against a non-aggregated model) shall be provided in the model user guide (section 0).
- The aggregated model shall preserve aggregate P/Q load, dominant time constants, and material switching/protection actions.
- Internal distribution system (i.e. LV & MV cables and transformers) shall be aggregated.

- Main grid connected transformers and HV reactive compensation devices (e.g. switched shunts, harmonic filters, etc) shall not be aggregated.
- The aggregated model shall be scalable.
- Aggregated models should provide access to the component's terminal bus quantities (voltage, current, active power and reactive power) for each aggregated equivalent component.

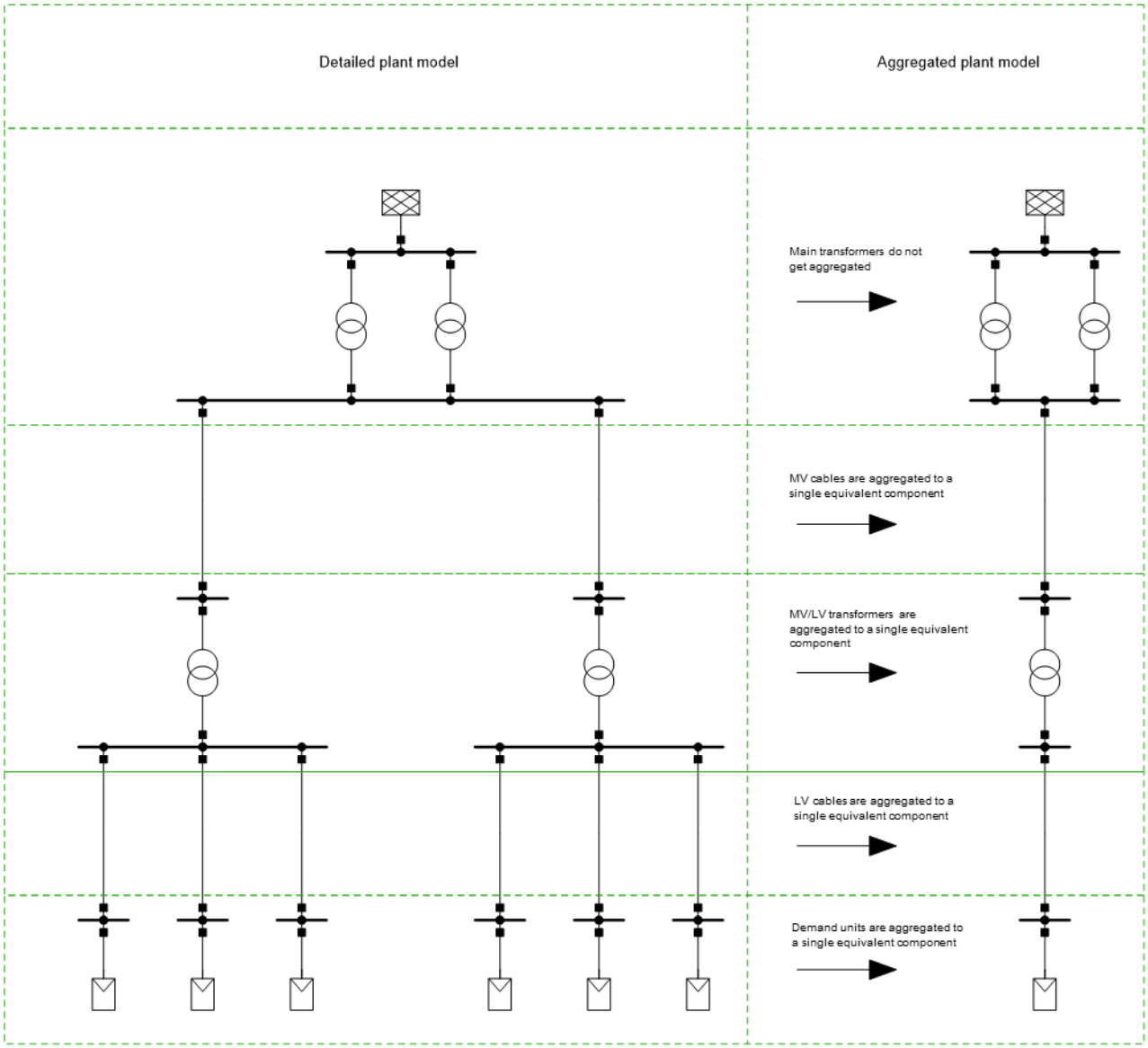

Figure 1: Example of aggregation

5. Software Platform

This section describes the software platform and version compatibility required by the TSO for the RMS models, as defined in the Grid Code (PC.A8.8).

5.1. Simulation Software

DATA_SOF_1

The TSO will accept RMS models compatible with the following software package and version:

- TSAT v19.

Any changes to the above software package or version will be advised to the Data Centre owner.

DATA_SOF_2

The TSAT model shall be provided in “equipment name” format for bus identification (as opposed to “bus number”). An associated PSAT (power flow) model shall also be provided.

6. Performance and Usability

This section provides clarity on aspects related to performance and usability of the models to ensure smooth and efficient integration into a larger RMS network model and allow users configure the model, run simulations and analyse results.

6.1. Performance

DATA_USA_1

The RMS model shall run with any integration time-step in the range of 1 to 10 ms (in steps of 1 ms) without negative impact on accuracy.

The model shall not be restricted to running at one single defined time step and shall allow the user to have the flexibility to change the simulation time step within the above range.

Any accuracy limitations at larger time steps shall be clearly flagged to the TSO in the model documentation.

DATA_USA_2

The RMS model shall initialise to a stable operating point and provide a numerically stable simulation for a minimum of 60 seconds following any simulated system incidents/faults for any valid operating point of the Data Centre.

DATA_USA_3

Any unstable operation of the dynamic behaviour of the Data Centre model shall not result in crashing of the simulation, and any mechanism (protection etc.) that ceases the unstable operation shall reflect the actual behaviour of the Data Centre facility.

6.2. Encryption

DATA_USA_4

The RMS model shall not contain any encrypted or compiled parts.

6.3. Inputs, Configuration & Tuning

DATA_USA_5

The aggregated model (section 4.3) should allow parametrisation of the load composition (e.g. % of IT load, % of cooling load, % of auxiliary load).

DATA_USA_6

Relevant control and protection parameters, time delays, thresholds and hardware settings shall be accessible to the user. The user shall be capable of enabling and disabling relevant control and protection functions in the model before and during simulation (e.g. parameters determining FRT activation / load transfer / load recovery).

DATA_USA_7

The model shall be able to accept external reference variables. This functionality shall be supported during initialization and during dynamic simulation, enabling seamless set-point changes at runtime without compromising numerical stability or control accuracy. Where applicable, all models shall allow adjustment — both prior to and during a simulation run — of, at a minimum, the following parameters:

- P (MW) and Q (MVAr) value from each type of load component: IT, cooling and auxiliaries.
- Reference values/setpoints for voltage control modes (e.g. transformer voltage control).

DATA_USA_ 8

The model shall be submitted with all control modes and parameter settings defined to reflect the actual configuration of the Data Centre facility on site.

DATA_USA_ 9

Any user-settable option shall reflect real hardware capabilities and must only expose control configurations that are valid at the actual site being modelled.

6.4. Outputs & Diagnostics

DATA_USA_10

The RMS model shall provide at the PoC and relevant internal nodes (e.g. UPS terminals), at a minimum, the following measurements:

- V(t), I(t): positive sequence RMS AC voltage (in pu) and current (in pu)
- P, Q: Active power (in MW) and reactive power (in MVAr)
- freq: Frequency (in Hz)
- RoCoF: Rate-of-change-of-frequency (in Hz/sec)

DATA_USA_11

The RMS model shall provide access to the relevant signals needed to analyse the behaviour of the Data Centre facility, while preserving confidential IP. In general, the following output signals shall be available:

- Positions of UPS by-pass switches (if relevant/applicable).
- UPS mode of operation (e.g. normal, by-pass, other).
- Input and output signals of relevant C&P functions, including FRT.
- Transformers tap position.
- Diagnostic signals (e.g., flags to show UPS entering into FRT mode or triggering of protection functions) and should clearly identify why a control or protection function triggers during simulations.

DATA_USA_12

Appropriate and clear warnings should be generated whenever the operating point violates defined thresholds or enters invalid operating condition.

7. Model Package

This section provides clarity on the scope of the model package (i.e. model files and associated documentation) and the timeliness for submission.

7.1. Contents

DATA_PAC_1

The **preliminary model package** submission shall include:

- Model files (section 7.2)
- Model user guide (section 0)
- Additional technical documentation related to the Data Centre facility (section 7.4)
- Model sample case (section 7.5)
- Model checklist (section 7.6)

DATA_PAC_2

The **final model package submission** (post energisation) shall include:

- As-built model files (section 7.2)
- As-built model user guide (section 0)
- As-built technical documentation related to the Data Centre facility (section 7.4)
- As-built model sample case (section 7.5)
- Model checklist (section 7.6)
- Model validation report (guidelines for model validation will be provided in a separate document)

DATA_PAC_3

All files submitted in the model package shall be identified with a name that includes a unique version identifier. When the model package is resubmitted for whatever reason (e.g. following an update), all corresponding files shall be renamed with a new unique identifier.

DATA_PAC_4

When a new model version is submitted, the model package shall contain all items listed in DATA_PAC_2, with updated documentation reflecting the changes made to the model structure and/or parameters.

7.2. Model Files

DATA_PAC_5

The RMS model submission must include all files required to run a simulation, including a loadflow case (in PSAT) and the dynamic file (in TSAT).

7.3. Model User Guide

The model must be accompanied with a site-specific model user guide, as defined in the Grid Code (PC.A8.3) including clear descriptions of the implemented components and functions (e.g. control, protection, etc) and enough information to allow EirGrid properly integrate the Data Centre model into the full system model, understand all control models and parameters, initialise the model and troubleshoot simulation issues. The documentation must highlight any approximations and limitations of the model. The model user guide shall include:

DATA_PAC_6

Name, location (i.e. connection point) and MIC of the Data Centre facility.

DATA_PAC_7

The name and version of the model.

DATA_PAC_8

Version history of the model - including versioned filenames and a brief change log.

DATA_PAC_9

Software version.

DATA_PAC_10

List and description of all the files included in the package.

DATA_PAC_11

Declaration by the Data Centre owner confirming site-specific representation, including credible loading and cycling profiles expected at the PoC.

DATA_PAC_12

Detailed description of the overall Data Centre RMS model structure (including single line representation), functionality, connectivity and representation of individual components, including assumptions and limitations.

DATA_PAC_13

Description of any possible limitations of the model for the required simulation time step range defined in section 6.1 and intended use described in section 2.

DATA_PAC_14

Model applicability boundaries, including minimum system strength (SCR) below which the model is no longer stable and, minimum/maximum X/R ratio outside which the model is no longer stable.

DATA_INT_15

Description of load composition in terms of type (e.g., UPS, IT load, cooling load, etc). Explain the % composition of each type of load type and its variability.

DATA_PAC_16

Description of model aggregation method (section 4.3), including assumptions and limitations. This includes listing the characteristics of all loads and which of these have been combined into single aggregated instances. The documentation shall demonstrate the equivalence between a "non-aggregated"[4] and the "aggregated" model responses over a representative range of operating conditions and disturbances[5].

DATA_PAC_17

Description of FRT functionality implementation in the model, including how to parametrise the model and description of all signals, delays and flags available for the user to understand its behaviour.

DATA_PAC_18

Description of voltage control implementation in all transformers, including instructions on how to change voltage setpoints and to enable/disable the functionality.

[4] Submission of the "non-aggregated" model to the TSO is not required.

[5] Representative operating points and disturbances for demonstrating adequacy of "model aggregation" representation shall be discussed with the TSO.

DATA_PAC_19

Description of all other protection and control functions implemented in the model (e.g. protection relays) that can be triggered by external disturbances, including trip signals, delays and activation flags available for the user to understand its behaviour.

DATA_PAC_20

Clear mapping of implemented vs. missing Data Centre facility functions and/or control modes (including transition logic, if applicable). Any missing logic, protection or control mode that can materially affect the PoC behaviour must be flagged and justified to the TSO.

DATA_PAC_21

Mapping between model parameters and real equipment settings on site, highlighting any differences (with explanations).

DATA_PAC_22

Tabular list of model parameters and control modes accessible to the user (including description of each parameter), highlighting parameters affecting FRT and recovery behaviour. Include site-specific setting and valid range of values for each model parameter. If parameters are defined in “per unit”, the relevant Base value should be included.

DATA_PACK_23

List and description of input and output signals available to the user. The description should include signal name, unit, measurement point, base value, and variable type.

DATA_PAC_24

Guidance on integrating the provided model into a wider network model so as to be used as part of wider system studies.

DATA_PAC_25

Instructions for model setup and initialization.

DATA_PAC_26

Instructions for scaling the rating of the aggregated components.

DATA_PAC_27

Instructions on how to change the load composition (i.e. % of IT load, % of cooling load, % of auxiliary load) and the load profile.

DATA_PAC_28

Instructions to change control modes and parameter settings.

DATA_PAC_29

Guidance on the interpretation of error messages and troubleshooting.

DATA_PAC_30

Description of model sample case (section 7.5).

7.4. Additional Technical Documentation

Supporting technical documentation shall be provided in appendices to the **RMS Model User Guide** (or as a separate document), including:

DATA_PAC_31

Single-line diagram (SLD) showing the Data Centre architecture and main electrical components up to the PoC.

DATA_PAC_32

Comprehensive description of the FRT design of the Data Centre facility, including temporary load decoupling from main grid supply, voltage and frequency transfer thresholds and timing, disturbance counters, staged reconnection and/or delayed recovery for various voltage and frequency variations at the PoC.

DATA_PAC_33

UPS technical documentation, including manufacturer, model and ratings, for all UPS types.

DATA_PAC_34

IT load technical documentation, including load profiles, cyclic behaviour and ramping rates.

DATA_PAC_35

Cooling load technical documentation, including expected load variation with the ambient temperature.

DATA_PAC_36

Description of all relevant C&P functions and protection relays at facility and device level, including transfer function block diagrams.

DATA_PAC_37

P,Q,U operational capabilities of the Data Centre facility.

DATA_PAC_38

Lengths and electrical characteristics of HV and internal distribution circuits.

DATA_PAC_39

Transformers datasheets including standard nameplate data (e.g. MVA, % impedance, transformation ratios, etc).

DATA_PAC_40

Description of transformer voltage control (manual or automatic), including voltage setpoints and deadbands.

DATA_PAC_41

Harmonic filter data sheet (if applicable).

DATA_PAC_42

Technical documentation of other relevant components, when applicable (e.g. BESS, STATCOM, on-site generators, etc).

7.5. Model Sample Case

DATA_PAC_43

The delivery of the RMS model shall be accompanied by a **sample case** such that the model can be tested before being integrated into the wide area model of the All-Island network, as specified in the Grid Code (PC.A8.8). The sample case shall include a PSAT (v19) power flow case and the TSAT (v19) dynamic model.

The sample case and associated documentation (section 0) shall illustrate how to use the model with clear guidelines and simulation results.

- The sample case model shall be configured according to the site-specific real equipment configuration and parameters up to the PoC, including relevant voltage regulation in all transformers.
- The sample case shall use a Single Machine Infinite Bus (SMIB) representation of the power system, as seen at the PoC using the Minimum System Strength (MSS) data provided by the TSO.

- Time step used for the sample case simulation shall be clearly indicated in the documentation.

DATA_PAC_44

The sample case shall be configured to simulate the following disturbance:

- a 100 milliseconds three-phase fault at PoC of the Data Centre facility,

7.6. Model Checklist

DATA_PAC_45

A complete checklist (see Appendix A) shall be submitted to the TSO confirming compliance with the modelling specifications described in this document.

7.7. Submission Timelines

DATA_PAC_46

Preliminary model package (see section 7.1):

- **12 months** before first energization of the Data Centre facility[6].

DATA_PAC_47

Final model package (see section 7.1):

- **1 month** after energization of the Data Centre facility[6].

DATA_PAC_48

In accordance with Grid Code clause PC.A8.6, the TSO will conduct regular studies and ongoing validation against data recorded during system incidents in order to ensure that the RMS model submitted by the Data Centre owner is representative of the facility through its operational lifetime. If the measured data indicates that the RMS model is not valid in one or more respects, the Data Centre owner shall provide an updated RMS model package whose behaviour corresponds to the observed on-site behaviour according to the timeline below:

- 90 business days after the date of request by TSO.

[6] Alternative timelines shall be discussed with the TSO in cases where the Data Centre facility is energised in phases. These timelines must allow for TSO's review of the submitted model (and model resubmission when necessary) and TSO's impact assessments of the proposed Data Centre connection on the transmission system.

8. Maintenance of Model

This section provides clarity on the requirement for the Data Centre owner to provide maintenance and updates of the RMS model to ensure it remains accurate over the lifetime of the Data Centre facility, as defined in the Grid Code (PC.A8.7).

8.1. General

DATA_MAI_1

Data Centre owners should facilitate model support for the duration of the Data Centre operational lifetime, as per Grid Code clause PC.A8.7. Should this requirement not be achievable either in practical or commercial terms, then further discussions with the TSO are required to seek alternative means of continued model maintenance and support.

8.2. Technical Support

DATA_MAI_2

Technical support from the model supplier shall be made available to help the TSO in setup and running simulation analysis and solve any relevant issues in case of non-compliance with any item of this RMS model specification.

8.3. Model Maintenance

DATA_MAI_3

All Models provided to the TSO must be maintained and updated to accurately reflect the operational performance of the User's plant over its lifetime (Grid Code PC.A8.7). In the event of any changes to the Data Centre facility which may materially affect the accuracy or capability of the submitted RMS model to reproduce the dynamic behaviour of the Data Centre facility under the conditions described in this document, the Data Centre owner shall submit a new model package with updated model and associated documentation. The timelines for submission shall be agreed with the TSO (typically, no later than 30 business days after modifications have been implemented on site).

In case of Data Centre capacity expansion with similar dynamic performance characteristics, the original aggregated model may be scaled to capture the new Data Centre capacity. In this case, a full model resubmission is not required and a notification to the TSO of the new Data Centre capacity will suffice.

DATA_MAI_4

Any update of the model submitted shall comply with the most up-to-date RMS model specification published by the TSO.

DATA_MAI_5

The TSO may from time-to-time request that the models be updated to be compatible with changes in the TSO’s computing environment, namely software version and/or compiler version. The Data Centre owner shall ensure that such updated models are provided without undue delay or in any event, within **90 Business Days** of the date of the request, as defined in the Grid Code (PC.A8.8).

9. References

[1.] EirGrid Grid Code v16 (October 2025).

[2.] Commission Regulation (EU) 2016/1388 of 17 August 2016 establishing a Network Code on Demand Connection.

[3.] ACER proposes amendments to the electricity grid connection network codes | www.acer.europa.eu

[4.] Fingrid modelling instruction for PSS/E models – Data Centres (13/03/2026)

[5.] AEMO Power System Model Guidelines, v 3.0 (25th September 2025)

[6.] ESIG Large Loads Task Force "Large Load Modelling for Dynamic Studies": Current Practices and Recommendations (March 2026).

10. Appendix

10.1. Appendix A: Model Checklist

This appendix is a RMS model checklist which must be completed by the Data Centre owner and submitted alongside the RMS model.

Data Centre model identification	
Model submission Date	
Data Centre project name	
Data Centre Maximum Import Capacity (MIC)	
Data Centre connection point / HV substation name	
Primary contact information for model related questions	
List of model files submitted	
List of documents submitted	

Data Centre model specification checklist		
2. Intended use		**Model Complies? (Y, N, N/A, comments)**
2.1	DATA_INT_1	
2.2	DATA_INT_2	
2.2	DATA_INT_3	
2.3	DATA_INT_4	
2.3	DATA_INT_5	
2.3	DATA_INT_6	
2.3	DATA_INT_7	
2.3	DATA_INT_8	
2.3	DATA_INT_9	
2.3	DATA_INT_10	
2.3	DATA_INT_11	

3. Model Components		Model Complies? (Y, N, N/A, comments)
3.1	DATA_COM_1	
3.2	DATA_COM_2	
3.2	DATA_COM_3	
4. Model Fidelity		**Model Complies? (Y, N, N/A, comments)**
4.1	DATA_FID_1	
4.2	DATA_FID_2	
4.2	DATA_FID_3	
4.2	DATA_FID_4	
4.3	DATA_FID_5	
5. Software Platform		**Model Complies? (Y, N, N/A, comments)**
5.1	DATA_SOF_1	
5.1	DATA_SOF_2	
6. Performance and Usability		**Model Complies? (Y, N, N/A, comments)**
6.1	DATA_USA_1	
6.1	DATA_USA_2	
6.1	DATA_USA_3	
6.2	DATA_USA_4	
6.3	DATA_USA_5	
6.3	DATA_USA_6	
6.3	DATA_USA_7	
6.3	DATA_USA_8	
6.3	DATA_USA_9	
6.4	DATA_USA_10	
6.4	DATA_USA_11	
6.4	DATA_USA_12	
7. Model Package		**Model Complies? (Y, N, N/A, comments)**
7.1	DATA_PAC_1	
7.1	DATA_PAC_2	
7.1	DATA_PAC_3	
7.1	DATA_PAC_4	
7.2	DATA_PAC_5	
7.3	DATA_PAC_6	
7.3	DATA_PAC_7	

7.3	DATA_PAC_8	
7.3	DATA_PAC_9	
7.3	DATA_PAC_10	
7.3	DATA_PAC_11	
7.3	DATA_PAC_12	
7.3	DATA_PAC_13	
7.3	DATA_PAC_14	
7.3	DATA_PAC_15	
7.3	DATA_PAC_16	
7.3	DATA_PAC_17	
7.3	DATA_PAC_18	
7.3	DATA_PAC_19	
7.3	DATA_PAC_20	
7.3	DATA_PAC_21	
7.3	DATA_PAC_22	
7.3	DATA_PAC_23	
7.3	DATA_PAC_24	
7.3	DATA_PAC_25	
7.3	DATA_PAC_26	
7.3	DATA_PAC_27	
7.3	DATA_PAC_28	
7.3	DATA_PAC_29	
7.3	DATA_PAC_30	
7.4	DATA_PAC_31	
7.4	DATA_PAC_32	
7.4	DATA_PAC_33	
7.4	DATA_PAC_34	
7.4	DATA_PAC_35	
7.4	DATA_PAC_36	
7.4	DATA_PAC_37	
7.4	DATA_PAC_38	
7.4	DATA_PAC_39	
7.4	DATA_PAC_40	
7.4	DATA_PAC_41	
7.4	DATA_PAC_42	
7.5	DATA_PAC_43	

7.5	DATA_PAC_44	
7.6	DATA_PAC_45	
7.7	DATA_PAC_46	
7.7	DATA_PAC_47	
7.7	DATA_PAC_48	
8. Maintenance of Model		**Model Complies? (Y, N, N/A, comments)**
8.1	DATA_MAI_1	
8.2	DATA_MAI_2	
8.3	DATA_MAI_3	
8.3	DATA_MAI_4	
8.3	DATA_MAI_5	