Statement of Works Data Template

This Statement of Works (SoW) Data Template is to be completed by Distribution Network Operators (DNOs) in order to provide National Grid the required data for SoW applications.

There are two types of SoW applications; an initial SoW baseline assessment and a SoW update. The baseline assessment is for the first SoW application of the GSP(s) within the new SoW process and the SoW update is for when the materiality trigger has been breached and a network re-assessment is required.

The baseline assessment has more extensive data requirements as it is the first time the detailed network data is being provided. In the SoW updates a reduced set of data can be supplied as data is only required where there have been changes from the baseline assessment. A summary of the data requirements is outlined in the table below

SoW Application Data Requirements

Data Schedule	SoW Baseline Assement	SoW Update
Embedded Power Station Data	Full submission of all data	Only changes to Embedded Power Stations
Fault Infeed Data	Full submission of all data	Only the contracted Embedded Power Station fault infeed.
Demand Data	Full submission of all data	Updated annually or post season
Network Data	Full submission of all data	Only when required for new connections
Medium Power Station Data	Full submission of all data	Only required for new connections

Please note that the Statement of Works process being reviewed within the ENA however it is envisaged that this dataset will remain unchanged following this review.

Grid Code Link to Data Requirements

NG requires the information within this data template to determine the impact on the NETS. For example, a 33 kV PV farm will impact the PQ characteristics at the BSP. NG does not model below the BSP level therefore this information needs to be provided by the DNO. Voltage studies are dependent on reactive power flows, thus without this information an accurate voltage study cannot be undertaken. This requirement is further clarified within Planning Code Appendix A2 (of the Grid Code) – Standard Planning data, User's System Data (see below). In essence, the information request above is already codified.

PC.A.2.1.2   Each **User** must reflect the system effect at the **Connection Site(s)** of any third party **Embedded** within its **User System** whether existing or proposed.

PC.A.2.1.3   Although not itemised here, each **User** with an existing or proposed **Embedded Small Power Station**, **Embedded Medium Power Station** or **Embedded DC Converter Station** with a **Registered Capacity** of less than 100MW or an **Embedded** installation of direct current converters which does not form a **DC Converter Station** in its **User System** may, at **NGET's** reasonable discretion, be required to provide additional details relating to the **User's System** between the **Connection Site** and the existing or proposed **Embedded Small Power Station**, **Embedded Medium Power Station** or **Embedded DC Converter Station** or **Embedded** installation of direct current converters which does not form a **DC Converter Station**.

PC.A.2.1.4   At **NGET**'s reasonable request, additional data on the **User's System** (or **OTSUA**) will need to be supplied. Some of the possible reasons for such a request, and the data required, are given in PC.A.6.2, PC.A.6.4, PC.A.6.5 and PC.A.6.6.

PCA.6 provides a list of possible triggers for requiring information as per PC.A.2.1.4. Where existing data provision is insufficient for the purpose of producing meaningful system studies, NGET may reasonably request such data

																Additional Requirements for Storage			3 Phase Short Circuit Infeed of Small			Zero sequence Impedance at BSP where	
GSP - Grid Supply Point	Commercial Position - Connected/ Accepted	Generator Name	Embedded Small Power Station Reference Number	Connection Date	Generator unit Reference	Technology Type	CHP (Y/N)	Registered Capacity	BSP - Bulk Supply Point	Geographic Location for PV & Wind	Control mode	Control mode voltage target and reactive range or target pf (as appropriate)	Loss of mains protection type	Loss of mains protection settings	Comments - Including Power Station connection point if above the BSP level	Total Energy Storage Capacity (MWh)	Exporting Power Rating (Generating) MW	Importing Power Rating (Storage) MW	Sub-Transient I'' (kA RMS)	Transient (120ms) I' (kA RMS)	X/R (G74 Method 'C')	Ro - % on 100MVA base	Xo - % on 100MVA base
			PC.A.3.1.4 (a)		PC.A.3.1.4 (a)	PC.A.3.1.4 (a)	PC.A.3.1.4 (a)	PC.A.3.1.4 (a)	PC.A.3.1.4 (a)	PC.A.3.1.4 (a)	PC.A.3.1.4 (a)	PC.A.3.1.4 (a)	PC.A.3.1.4 (a)	PC.A.3.1.4 (a)									

GUIDANCE:

* Data that is not essential at the application stage is greyed out
* This table should be updated for all Statement of Works applications with all Embedded Power Stations of a size greater or equal to 1MW at each GSP being studied.
* The Power Station Reference can either be in the form of a code (with a combination of numbers and/or letters) or a name. The name and reference number must be the same as in the Appendix G within the BCA.
* Any Small Power Station that connects above the level of the lowest voltage modelled node (BSP) will be discretely modelled and will require:
  - the three phase short circuit contribution (orange columns above)
  - its location marked on the week 24 single line diagram (see Network Data tab)
  - network data for the network between its connection point and the network provided in the Week 24 SLD (see Network Data tab)

Bulk Supply Point Fault Infeed

Grid Code Reference: PC.A.2.5.4 / PCA 2.5.6

Node Data				Existing Network BSP Fault Infeed				Post Contracted DER BSP Fault Infeed				Difference in BSP Fault Infeed				Zero sequence Impedance at BSP where there is a zero	
				Short Circuit				Short Circuit				Short Circuit					
GSP	National Grid Node (BSP) Name	Operating Voltage (kV)		Sub-transient I" (kA RMS)	Tr I' (kA RMS)	X/R (G74 Method 'C')		Sub-transient I" (kA RMS)	Tr I' (kA RMS)	X/R (G74 Method 'C')		Sub-transient I" (kA RMS)	Tr I' (kA RMS)	X/R (G74 Method 'C')		Ro - % on 100MVA base	Xo - % on 100 MV
												0.000	#	0.000			
												0.000	#	0.000			
												0.000	#	0.000			
												0.000	#	0.000			
												0.000	#	0.000			

GUIDANCE:

 * The data requirements above are explained in more detail in the Statement of Works Data Guidance Note and in sections PC.A.2.5.4 & PCA 2.5.6 of The Grid Code

 * The maximum three phase fault infeed shall be provided for every BSP node within each GSP in the SOW application

 * BSP Node Names should align with those within Week 24 submission (and associated SLDs)

 * Where there is a new Node or any network reinforcement on the DNO network this must be clearly identified and relevant parameters provided to NGET (see the 'Network Data' tab)

 * Zero sequence impedance data shall only be provided where there is a zero sequence path (see guidance note)

Bulk Supply Point Gross Demand

Grid Code Reference: PC.A.4.3.4

GSP	National Grid Node (BSP) Name	Operating Voltage (kV)		GSP Peak Demand (Gross) Power BSP Demand (+ve = demand, or inductive				Summer Minimum AM Demand (Gross) Power BSP Demand (+ve = demand, or inductive				Summer Minimum PM Demand (Gross) Power BSP Demand (+ve = demand, or inductive				Maintenance Period Peak Demand (Gross) Power BSP Demand (+ve = demand, or inductive		
	Node Data			MW	Mvar	MVA		MW	Mvar	MVA		MW	Mvar	MVA		MW	Mvar	MVA

GUIDANCE

* The data requirements above are explained in more detail in the Statement of Works Data Guidance Note
* Data to be provided for each node (BSP) within a GSP, even in cases where there is no change to flows. This is valuable for confirmation of P,Q because it is recognised that data provided within Week 24 submission is for the purpose of Demand Compliance and not necessarily for understanding the worst case high volts or peak reverse flows
* Node Names should align with those within Week 24 submission (and associated SLDs)
* Where there is a new Node or any network reinforcement on the DNO network this must be clearly identified and relevant parameters provided to NGET (see the 'Network Data' tab)
* Demand should be based on the most recently metered demand of the relavent period on year and should be updated annually (e.g. following the maintenance period, the 'Maintenance Period Peak Demand' can be updated)
* If there are significant increases of micro-generation/storage within a year (equal or greater than Materiality Trigger size for the GSP) this should be discussed with NGET prior to SoW updates

* Where there are planned future demand connections or significant load change in the next 7 years which will have a material impact on the demand as seen at the GSP this should be detailed in the comments below.

DNO Comments:
1
2
3
4

Additional Network Data   REQUIRED IN SOW UPDATE FOR NEW MEDIUM POWER STATIONS OR DISCRETELY MODELLED SMALL POWER STATIONS

* Network data will be required upto the voltage below the GSP/subtransmission level voltage.
* For example for a GSP connected at a subtransmission voltage of 132kV the next voltage down may be 33kV. All node and branch data will be required up until this voltage.
* The demand and generation data (on the other tabs in this workbook) should be supplied for the nodes at lowest voltage level modelled
* The format of the node and branch data should be the same as the shedule 5 data which forms part of the week 24 data submsisions, please update the relavent week24 shedules when providing this data
* The data requirements below are explained in more detail in the Statement of Works Data Guidance Note

Data Item	Grid Code Section	DRC Shedule	Description
Single Line Diagrams	PC.A. 2.2.1, 2.2.2, 2.2.3	Schedule 5 (Page 1 of 9)	Single Line Diagrams of User's system layout
Schedule 5 spreadsheet	PC.A. 2.3		Lumped system susceptance
Node data	PC.A. 2.5.1, 2.5.4, 2.5.6	Schedule 13	Fault infeeds
	PC.A. 4.3.4		Node demands
Schedule 5 spreadsheet	PC.A. 2.2.4	Schedule 5 (Page 3 of 9)	Circuit parameters
Branch data	PC.A. 2.2.5	Schedule 5 (Page 4 of 9)	Transformer parameters

Embedded Medium Power Station Data　　REQUIRED IN SOW UPDATE FOR NEW MEDIUM POWER STATIONS

* Further data is required for Embedded Medium or Large Power Stations. The data requirements are highlited in the table below.
* Embedded Medium Power Stations are only required to supply DRC data if they are subtransmission connected (the first voltage level below the transmission voltage)
* They are required to complete Data Registration Codes 1,2,5 & 14 if synchronous and 1,2,5 & 13 is they are power electronics based generation
* The links below will take you to the relavent data tab in this spreasheet

Embedded Medium Power Station (Synchronous) DRC
Embedded Medium Power Station (Power Electronic) DRC
Embedded Medium Power Station Network Data
Guidance notes on the submission of Grid Code data for Power Stations

Classification of Power Stations
The classification of power stations is dependent upon their location with respect to
transmission system ownership as tabulated below.

Class	NGET /MW	SPTL /MW	SHETL /MW
Large	≥ 100	≥ 30	≥10
Medium	50 ≤ Pg ≤ 100		
Small	< 50	< 30	< 10

Embedded Medium Power Station Data (Synchronous)

Power Station Generating Unit Data

Data Item	Grid Code Reference	Unit	Value
Power Station Name			
List of units within Power Station	(PC.A.3.2.2 (g))		
Generating Unit Data			
Connection Point to User System (DNO Network) as on User (DNO) Wk 24 SLD	(PC.A.3.4.1)		
Generating Unit Type	(PC.A.3.2.2 (h))		
Rated MVA	(PC.A.3.3.1)	MVA	
Rated MW	(PC.A.3.3.1)	MW	
Rated terminal voltage	(PC.A.5.3.2.(a) & PC.A.5.4.2 (b))	kV	
Intertia Constant	(PC.A.5.3.2(a))	MW secs	
Impedances			
Direct axis synchronus reactance (Unsaturated)	(PC.A.5.3.2(a))	Z% (100MVA)	
Direct axis transient reactance	(PC.A.3.3.1(a)& PC.A.5.3.2(a)	Z% (100MVA)	
Direct axis sub-transiet reactance	(PC.A.5.3.2(a))	Z% (100MVA)	
Time Constants			
Direct axis sub-transient time constant	(PC.A.5.3.2(a))	s	
Excitation			
Excitation System - Rotating or Static Exciter	(PC.A.5.3.2c)		

Power Station Network Parameters

Data Item	Grid Code Reference	Unit	Value
Generating Unit Step-up Transformer			
Rated MVA	(PC.A.3.3.1 & PC.A.5.3.2)	MVA	
Votlage Ratio	(PC.A.5.3.2)		
Positive Sequence Reactance	(PC.A.5.3.2)	Z% (100MVA)	
Positive sequence resistance	(PC.A.5.3.2)	Z% (100MVA)	
Zero phase sequence reactance	(PC.A.5.3.2)	Z% (100MVA)	
Max tap			
Min tap			
Nominal tap			
Tap change step size	(PC.A.5.3.2)	%	

Please complete the Embedded Medium Power Station Network Data Shedule: -

[Embedded Medium Power Station Network Data](#)

Embedded Medium Power Station Data (Non-Synchronous)

Data Item	Grid Code Reference	Unit	Value
Power Station Name			
List of Power Park Modules/Generating Units within Power Station	(PC.A.3.2.2 (g))		
Power Park Module/Generating Unit Data			
Connection Point to DNO Network as on Wk 24 SLD	(PC.A.3.4.1)		
Generating Unit Type	(PC.A.3.2.2 (h))		
Rated MVA	(PC.A.3.3.1)	MVA	
Rated MW	(PC.A.3.3.1)	MW	
Short Circuit Infeed to User System (DNO Network) Connection Point			
Symmetrical three phase short-circuit current infeed - Sub-Transient	(PC.A.3.3.1 & PC.A.5.3.2)	KA	
Symmetrical three phase short-circuit current infeed - Transient	(PC.A.5.3.2)	KA	
Positive sequence X/R ratio at instance of fault			
Pre-Fault voltage magnitude at which the maximum fault currents were calculated p.u.		p.u.	
Zero sequence source impedances as seen from the Point of Connection or node on the Single Line Diagram (as appropriate) consistent with the maximum infeed above: - Resistance % on 100 MVA	(PC.A.5.3.2)	R% (100MVA)	
Zero sequence source impedances as seen from the Point of Connection or node on the Single Line Diagram (as appropriate) consistent with the maximum infeed above: - Reactance % on 100 MVA		X% (100MVA)	
Negative sequence impedances of User's System as seen from the Point of Connection or node on the Single Line Diagram (as appropriate). - Resistance % on 100 MVA	(PC.A.5.3.2)	R% (100MVA)	
Negative sequence impedances of User's System as seen from the Point of Connection or node on the Single Line Diagram (as appropriate). - Reactance % on 100 MVA	(PC.A.5.3.2)	X% (100MVA)	

Please complete the Embedded Medium Power Station Network Data Shedule: -

Embedded Medium Power Station Network Data