Constraint Managed Zones
General Technical Requirements

September 2020

Within the Future Networks department of SSEN, the Flexible Solutions Team's key responsibilities include the specification, design, delivery and ongoing management of flexible solutions (in accordance with the regulated flexible connections process). Flexibility on the SSEN network is achieved through initiatives such as Constrained Managed Zones (CMZs), the use of Active Network Management (ANM) systems and an ability to apply innovation within 'Business As Usual' scenarios, such as our market leading Flexible Connections suite.

A Constraint Managed Zone is an area of our existing electrical network that is or could potentially experience one of the following scenarios;

- Forecast to exceed its firm capacity, where network requirements related to peak electrical demand are met using demand reducing or demand shifting techniques. CMZ techniques do not seek to increase capacity on the network, but will reduce or time-shift demand to avoid capacity constraints.
- Will experience planned maintenance works, where DER flexibility services could be employed to maintain network operation or reduce the risk of outage,
- Could experience outages due to a combination of maintenance works and/or circuit faults, where DER flexibility services could be employed to avoid or minimise outages,
- In the event of outages, DER flexibility services could be employed to aid in the restoration of normal supply by reducing loading or providing additional power injection, or;
- In the event of prolonged outage, DER flexibility services could be employed to restore and maintain supply as significant or long duration repairs are undertaken to the distribution network.

SSEN do not dictate how CMZ services should be provided and anticipate solutions ranging from Embedded Generation, Energy Storage and Demand-Side Management/ Response. SSEN are continually developing our systems, service requirements and interfaces and as such reserve the right to amend detail within this document on an as needs basis. Additionally, requirements may change for specific services and will be detailed within any procurement exercise, as such the information contained in this document is provided as a guide only.

1   Despatch System/Process

The despatch system used by SSEN to issue control signals to instruct the contracted third party to provide SSEN with the agreed service is currently based on telephone or email based contact. This system will develop in time as new management systems are adopted, once complete it is expected that automatic signalling from a central DMS to the 3rd party CMZ management system will be employed. The CMZ services will not be deployed unless SSEN has issued a control email, call or signal to initiate it. Additional SSEN systems are currently utilised to collect, store and report on data provided by network monitoring and CMZ service providers.

Monitor Status/Availability

The status of the services which SSEN communicate with shall be monitored in order to enable SSEN to efficiently manage the services available to them.

Provide usage data

Data is required to be gathered by SSEN to pass onwards to the SSEN Settlements team. This data is used by SSEN to validate the 'Utilisation' payment to the service provider. In the case of DSM/DSR and ADR the counterfactual base demand profile for measurement of volume of service must be provided.

Report

Management reporting shall measure the availability and utilisation of each CMZ service type which will help to maintain accurate billing/settlement and inform future business decisions.

Select Service from a pre-defined list

The Despatch system/process will hold a list of CMZ services and their status, which it can then select from when it requires.

Start Service

The Despatch system shall select and instruct which CMZ service provision is initiated. The communication of this will be to either a third party aggregator who shall organise and communicate with the multiple DERs under one

service offering or SSEN shall communicate directly with the DER Management system.

Stop Service

The Despatch system shall select and instruct which CMZ service provision is stopped. The communication of this will be to either a third party aggregator who shall organise and communicate with the multiple DERs under one service offering or SSEN shall communicate directly with the DER Management system.

Adjust Service

The Despatch system shall select and instruct which CMZ service provision is adjusted. The communication of this will be to either a third party aggregator who shall organise and communicate with the multiple DERs under one service offering or SSEN shall communicate directly with the DER Management system.

2 Aggregator of Service Providers

Service providers may wish to group together to offer a block or bundle of services in a location where we have a need. SSEN shall contact the aggregator when their contracted service is required to be initiated. This contact may be made over the telephone by a Control Engineer who has a need to instruct the aggregator to deliver a service now.

Instruct DER

The Aggregator shall issue an instruction to the DER to request they provide the agreed service provision on the back of a telephone call from SSEN control room.

Provide Status Data

The Aggregator shall provide to SSEN the status of the group DER service provision.

Select a Group of Services

The Aggregator shall respond to deliver the requested group service when prompted to do so by the Despatch System/Process. DER shall respond to a request to Start, Stop or Update a service.

3 DER Management System/Process

SSEN shall contact the DER Management system/Process to instruct when a service is required to be initiated. This contact may be made over the telephone by a Control Engineer who has a need to instruct the DER management system provider to deliver a service now.

Post Service offers

The service provider can look at the visibility platform and post offers to the needs that suit their provision.

Instruct DER

The service provider shall issue an instruction to the DER to request they provide the agreed service provision on the back of a telephone call from SSEN control room.

Provide Status Data

The service provider shall provide to SSEN the status of the DER service provision.

Provide Agreed Service

The service provider shall respond to deliver the requested service when prompted to do so by the Despatch system. DER shall respond to a request to Start, Stop or Update a service.

4   DER

Each Distributed Energy Resource (DER) shall be capable of responding to controls originating directly or indirectly from SSEN Despatch System.

DER

The range of DERs services will be reviewed by SSEN under the tender process in order to deliver the required step change on our network where we have a requirement to manage our network constraints.

DER will be able to deliver the following capability:

- Reduce / Increase Demand
- Reduce / Increase Generation
- Reduce / Increase Power or Reactive Power to alter Voltage
- Store Energy for export during pre-defined network events

14 Energy Efficiency Devices/Approaches

Energy Efficiency (EE) devices or engagement approaches are considered 'background' solutions and as such are not directly controllable, requiring no interfaces or technical requirements from SSEN's perspective. However, to be considered as part of a CMZ solution, most likely or exclusively within the Social Constraint Managed Zones (SCMZ) initiative, the installation of devices and total energy reduction must be closely monitored, reported and any significant alteration to the EE 'population' must be escalated to SSEN as soon as it is identified, for example if 200 homes have LED lighting installed and subsequently 100 homes then remove these devices.

5   APPENDIX A

The system requirements relating to the proposed *(Add Zone and Service type details)* are included in the following tables. It is likely the requirements specified below will be refined (in collaboration with the successful CMZ service provider) and dependant on the specific service requirements.

Reference	Description of Requirement
Functional Requirements	
CMZ_FR_1.1	The service window and power injection / energy requirements for the CMZ service to SSEN in summary are: (*example details below, to be updated with scheme specific detail for each implementation)* <table><tr><td>Contract Start Year</td><td>TBC</td></tr><tr><td>Contract End Year</td><td>TBC</td></tr><tr><td>Service Windows</td><td>TBC</td></tr><tr><td>CMZ Power Injection</td><td>TBC</td></tr><tr><td>CMZ Energy Requirement</td><td>TBC</td></tr><tr><td>Preferred Location</td><td>TBC</td></tr></table>
CMZ_FR_1.2	The CMZ service provider system/process shall deliver the specified level of power for the duration stipulated (or until the energy delivery requirement has been met), in accordance with the CMZ service requirement for SSEN (specified in CMZ_FR_1.1 above).
CMZ_FR_1.3	The CMZ service could be called upon a single or multiple times within the defined service window up to a maximum of the agreed MW/MWh stipulated within the CMZ agreement for SSEN. In the event the service is called upon outside of the defined service windows or in excess of the agreed MW/MWh then the provider is not obligated to respond.
CMZ_FR_1.4	A Despatch system/process shall be employed by SSEN which shall issue instructions via telephone or email to instruct the contracted CMZ service provider to provide SSEN with the agreed service.

CMZ_FR_1.5	The Despatch system/process employed by SSEN shall select and instruct which service provision is initiated.
CMZ_FR_1.6	The SSEN Despatch system/process shall select and instruct which CMZ service is **initiated**. (The instruction will be to either a third party aggregator who shall organise and communicate with the multiple DERs under one service offering, or directly with the DER Management system).
CMZ_FR_1.7	The CMZ service provider systems/process shall send a notification to the SSEN Despatch system/process on receipt of a service initiation instruction via telephone or email.
CMZ_FR_1.8	The SSEN Despatch system/process shall select and instruct which CMZ service is **stopped**. (The instruction will be to either a third party aggregator who shall organise and communicate with the multiple DERs under one service offering, or directly with the DER Management system).
CMZ_FR_1.9	The CMZ service provider systems shall send a notification to the SSEN Despatch system/process on receipt of a service stop instruction.
CMZ_FR_1.10	The SSEN Despatch system/process shall select and instruct which CMZ service is **adjusted**. (The instruction will be to either a third party aggregator who shall organise and communicate with the multiple DERs under one service offering, or directly with the DER Management system/process).
CMZ_FR_1.11	The CMZ service provider system/process shall send a notification via telephone or email to the SSEN Despatch system/process on receipt of a service adjust instruction.
CMZ_FR_1.12	The CMZ service aggregator shall issue an instruction to the DER to instruct provision of the agreed service (which could be on receipt of telephone call from SSEN control room).
CMZ_FR_1.13	The CMZ service provider systems shall continuously monitor the availability of the CMZ service during the Service Window.
CMZ_FR_1.14	The CMZ service provider system/process shall report the availability status of the CMZ on an annual basis and provide availability status within 24hours of a planned event.
CMZ_FR_1.15	The CMZ service provider system/process shall record within 30min interval or better the CMZ service data in MWh during the Service Window for reporting and settlement, including a) The amount of CMZ residual capacity available during the Service Window b) The amount of energy, as supplied (or consumed), in MWh units during the Service Window c) The amount of energy stored (if applicable) in MWh units

CMZ_FR_1.16	In addition to CMZ_FR_1.15, the CMZ service provider systems/process shall log and retain the status and other data provided.
CMZ_FR_1.17	For the perpetuity of the connection, the import and/or export of energy to a storage system (if applicable) may be constrained to 0kW if there is an N-1 condition and the load is above/below a defined threshold.
CMZ_FR_1.18	On receipt of CMZ Instruction(s), the supplier CMZ system/process shall respond and implement the required control action in less than 2 hours (including the response confirming successful execution). For CMZ Prepare services, response confirming availability must be received within 24 hours.
CMZ_FR_1.19	The CMZ service provider system/process shall provide a suitable system logging function, for audit purposes and root cause analysis of technical issues.
CMZ_FR_1.20	The CMZ service provider system/process log files must be retained for a minimum period of 12 months.
CMZ_FR_1.21	The CMZ service provider system/process data shall be backed up, including system configuration data and historic log data.
CMZ_FR_1.22	The CMZ Supplier shall submit all recorded data to SSEN monthly, for payment verification purposes (along with any workings/justification).
CMZ_FR_1.23	SSEN may perform both pre-notified and no-notification test CMZ events to ensure that the CMZ Supplier has the required load reduction/power injection and storage capacity during Service Windows
CMZ_FR_1.24	The CMZ service provider system/process shall be able of supporting and responding to periodic / routine system testing.

Non-Functional Requirements	
CMZ_NFR_1.1	Availability: The CMZ service provider system/process shall meet a system uptime target of 99.9% during the defined service window.
CMZ_NFR_1.2	Availability: In the event that the CMZ service provider system becoming inoperable, the supplier must be capable of re-establishing a fully functional system within 3 days.
CMZ_NFR_1.3	Security: Appropriate security controls shall be provisioned to restrict physical access to CMZ service provider system(s) to authorised personnel only
CMZ_NFR_1.4	Security: The CMZ service provider system must not hold personal details that enable individuals to be identified. Only data that is required to operate the system will be held and data must not be used outside the system for any other purpose. Reference our SSE Data Protection policy including GDPR.
CMZ_NFR_1.5	Test: verification testing will be undertaken by the CMZ Service Provider to verify the following: • The DER has the ability to Receive the instruction (E-mail/Phone call verification) • On receipt of an instruction the appropriate processes are in place to act upon the instruction • DSR – The service provider provides evidence demand reduction has occurred and this is verified by SSEN using PowerOn/Pi Data/Metering Data. • Storage – The service provider provides evidence energy has been stored.

	· Generation – The service provider provides evidence generation export has occurred and this is verified by SSEN using PowerOn/Pi Data/Metering Data. · The reverse of the above tests will be carried out when the instruction is to stop the service.

Disclaimers

Additional Requirements will be added, or requirements removed, once SSEN has completed development of it's Despatch System.

Additional Requirements may be added for different services, or requirements removed as services develop, as such these requirements are meant as indications only of those issued within specific CMZ service procurement phases.