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SECMP0067 'Service Request Traffic Management'

Annex A

Service Request Traffic Management Mechanism Document version 1.0

Purpose of this Document

This document has been prepared in accordance with SEC Appendix AB 'Service Request Processing Document' Section 15.4 where the Service Request Management Mechanism implemented by the DCC has its allocation formula, mechanism parameters and Service User capacity allocation formula clearly defined.

Service Request Management Mechanism Parameter Values

The following table summarises the configuration parameters that will be required in support of this change. Note that while these are as accurate as possible at this stage, the final list is dependent upon the detailed solution design.

Parameter	Summary	Example Value
DSP Capacity	Declared DSP capacity in Requests/Second	1000
Traffic Management Window	The period used for service request counting and management in seconds	1
System capacity Amber threshold	An amber threshold for system usage, expressed in terms of service requests per second	800
System capacity Red threshold	A red threshold for system usage, expressed in terms of service requests per second	900
System deadband period	The period for which system usage must remain below the red threshold value before	10

Parameter	Summary	Example Value
	the system traffic management event is cleared, expressed in seconds	
User deadband period	The period for which a user must remain below their red threshold value before the traffic management event for that user is cleared, expressed in seconds	10
Service User Amber Threshold	An amber threshold for User usage rate, expressed as a percentage of their allocation	75%
Service User Red Threshold	The red threshold for User usage rate, expressed as a percentage of their allocation	100%
Service User Allocation	An allocation value for each Service User, expressed as a percentage of total system declared capacity	7.84%
List of Priority Service Requests	A list of service request variants that will be regarded as 'priority' and not subject to traffic management measures	-
System Amber threshold incident creation	Enable/Disable the auto creation of DSMS incidents when the system amber threshold is exceeded	Disable
System Red threshold incident creation	Enable/Disable the auto creation of DSMS incidents when the system red threshold is exceeded	Disable
User Amber threshold incident creation	Enable/Disable the auto creation of DSMS incidents when the amber threshold is exceeded for a User	Disable
User Red threshold incident creation	Enable/Disable the auto creation of DSMS incidents when the system red threshold is exceeded for a User	Disable
HTTP Busy Response Code	The HTTP response code to be returned if a Service Request is rejected due to Traffic Management	429
Retry-After Delay	The static delay value returned as part of the HTTP busy response, expressed in seconds	5

Service Request Management Mechanism Service Capacity Allocation Formula

$$\mathrm{R}THR\mathrm{u} = \frac{ASC}{TMe} * \sum euTMu$$

Parameter	Value
THR_u	Total Throughput Allocation for each User.
R	Throughput Allocation value to the next highest integer number once rounded down.
ASC	Available Service Capacity. Calculated by Total System Capacity (TSCw) minus the System Buffer (BSCw).
TMe	Total number of Weighted Meters by User Role (e).
$\sum euTMu$	The sum of meters over all User Roles (e) for that User (u). This is calculated by (αe x NSMeu x PPMu) with αe being the Charging Group Weighting Factor, NSMeu being for each User (u) and their User Role (e), the number of Enrolled Smart Meters for which Users act in that Role and PPMu is a Pre-Payment Multiplier to give additional weighting to Users that manage Pre-Payment meters.

Service User Capacity Allocation Formula

The Service User Capacity Allocation formula detailed below has been provided by the DCC to explain how it functions and its rationale.

The proposed capacity allocation formula operates at a SEC Party ID level and is built on the weighted proportionality principle, that is, each allocation is scaled using one or more weighting factor. To ensure fairness, capacity will be allocated on a basis that is clear and does not disadvantage any one user. Two considerations are applied here:

- Allocation based on installed devices to which that user has an allocated role, and
- Allocation based on the financial contribution of that user to the DCC system, as measured by the Users' charging group weight factor.

These two factors are combined multiplicatively. Thus, if either of the factors is zero the weight itself becomes zero. Consideration is also given to the expected additional volume of service requests required to manage pre-payment customers relative to non-prepayment customers.

The proposed formula also guarantees a minimum allocation that Other Users receive. This will guarantee that even Other Users are given some allocation. The two factors (meter estate and charging group) incorporate aspects of fairness, in the sense that Users who pay most and those with the most customers and the most meters to serve will receive larger allocations than smaller Service Users. These two principles, minimum allocations and weighted proportionality, form the base for a fair and equitable capacity allocation formula.

The two weighting factors are calculated by the following methodologies below.

The first weighting factor is the number of smart meters that the Service User is responsible for, sourced from the Smart Metering Inventory. A growth factor taken from the previous month's growth for that Service Users is applied to the number of smart meters to calculate monthly meter volumes for the month to which the allocation formula applies (t+1).

The second factor is a Service Users' charging group weight factor, taken from the annual charging statement. As Gas Transporters, RSA's and OU's are omitted from the charging group weighting factors, a proportion of the active charging groups weighting factors are reallocated to them, as shown in Tables 1 to 3 below.

Table 1 – **Key Weighting Factors**

SEC Party Details	SEC Party ID	SEC Role	Group Weighting	Total Meters at time t+1
Service User A	A001	Electricity Supplier – Import	0.490	5,000
Service User A	A002	Gas Supplier	0.370	3,500
Service User B	A003	Electricity Supplier – Export	0.080	1,200
Service User C	A004	DNO	0.060	7,200
Service User D	A005	Gas Transporter	0.000	7,250
Service User E	A006	RSA	0.000	3,000
Service User F	A007	Other User	0.000	10,000

Note: The values provided in the table are for illustrative purposes only.

Table 2 – **Charging Group Weight Adjustment**

Group	Share
Share of Capacity Allocated to Service Users With a Charging Group ID	95%
Share of Capacity Allocated to Service Users Without a Charging Group ID	5%

Note: The values provided in the table are for illustrative purposes only.

Each charging group weighting is multiplied by 95%, with the balance of 5% allocated to those Service Users without a charging group weighting. This weighting will be calculated based on the proportion of actual SRV's originating from those Service Users without a charging group weight. This methodology and the resulting calculation will be agreed and regularly reviewed by the Panel.

Table 3 – **Charging Group Weight Adjusted**

SEC Party Details	SEC Party ID	SEC Role	Charging Group ID	Adjusted Charging Group Weighting
Service User A	A001	Electricity Supplier – Import	g1	0.4655
Service User A	A002	Gas Supplier	g3	0.3515

Service User B	A003	Electricity Supplier – Export	g2	0.0760
Service User C	A004	DNO	g4	0.0570
Service User D	A005	Gas Transporter	g5	0.0400
Service User E	A006	RSA		0.0099
Service User F	A007	Other User		0.0001

Note: The values provided in the table are for illustrative purposes only

The next step is to adjust the Smart Meter Volumes by the Pre-Payment Multiplier to reflect the higher expected traffic volume of Pre-Payment customers. This is done by multiplying the percentage of a Service Users customers that are pre-payment customers by the pre-payment multiplier (which represents the increased volume of service requests from pre-payment customers) by the number of meters that a Service User is responsible for. The output is in the final column in Table 4 below.

Table 4 **– Adjust Smart Meter Volumes by Pre-Payment Multiplier**

SEC Party Details	SEC Party ID	SEC Role	Percentage Pre-Pay Customers	Pre-Pay Multiplier	Adjusted Number of Installed Meters at time t+1
Service User A	A001	Electricity Supplier – Import	16%	1.2	5,960
Service User A	A002	Gas Supplier	16%	1.2	4,172
Service User B	A003	Electricity Supplier – Export	0%	1.2	1,200
Service User C	A004	DNO	0%	1.2	7,200
Service User D	A005	Gas Transporter	0%	1.2	7,250
Service User E	A006	RSA	0%	1.2	3,000
Service User F	A007	Other User	16%	1.2	11,920
Total	-				40,702.0

Note: The values provided in the table are for illustrative purposes only.

The next step is to define the system's capacity and the proportion that will not be allocated (the buffer) to ensure capacity is provided for priority service requests during periods when the solution is active.

Table 5 – **Key Weighting Factors**

Capacity	Available Capacity	Buffer Zone
Transactions Per Second	270	30

Note: The values provided in the table are for illustrative purposes only.

The next step is to calculate the Weighted Number of Smart Meters Associated With a User Role, by multiplying the weighted charging group value for the role (e.g. 0.466) from Table 6, by the adjusted number of meters that Service User is responsible for in that role (e.g. 5,960), from Table 6. For Example, Service User A's weighted smart meter volumes for its role as an Electricity Import Supplier is calculated as below;

Table 6 – **Weighted Number of Smart Meters Associated With a User Role**

SEC Party Details	SEC Party ID	User Role	Charging Group Weighting	Adjusted Number of Installed Meters at time t+1	Weighted Smart Meter Volumes at time t+1
Service User A	A001	Electricity Supplier - Import	0.466	5,960	2,774
Service User A	A002	Gas Supplier	0.352	4,172	1,466
Service User B	A003	Electricity Supplier - Export	0.076	1,200	91
Service User C	A004	DNO	0.057	7,200	410
Service User D	A005	Gas Transporter	0.0400	7,250	290
Service User E	A006	RSA	0.0099	3,000	30
Service User F	A007	Other User	0.0001	11,920	1
Sum					5,063

The final step is then to divide the sum of weighted Smart Meters from Table 7 (*e.g.* **5,063)** by the total available capacity from table 6 (*e.g.* **270**) to calculate the allocated capacity per smart meter. This number is then multiplied by the total number of weighted smart meters for each service user from Table 6. For example, Service User A's allocated capacity would be:

$$\left(\frac{5,063}{270}\right) \times (2,774 + 1,466) = 226\ tps\ or\ 84\%$$

Each Service User is allocated a percentage share of capacity, ensuring that the DSP can transparently reallocate capacity in the event that capacity increases are introduced after a Service Users allocation share has been calculated.

Each Service User will have their transactions per second allocation rounded down with the exception of those service users who have an allocation of below 1 transaction per second, who will see their allocation rounded up. By rounding down, this ensures that allocated capacity cannot exceed available capacity. See Table 7 below for an illustrated example with Service User A's capacity.

Table 7 – **Capacity Allocation**

SEC Party Details	SEC Party ID	Capacity Allocation (Transactions Per Second)	Percentage Allocation for time t+1
Service User A	A001 + A002	226	84.33%
Service User B	A003	4	1.49%
Service User C	A004	21	7.84%
Service User D	A005	15	5.60%
Service User E	A006	1	0.37%
Service User F	A007	1	0.37%
Total		268	100%

Note: The values provided in the table are for illustrative purposes only.

For the purposes of the calculations, the DCC shall determine the number of Enrolled Smart Meters for which a User acts in a User Role based on the DCC's reasonable estimate of the number of Enrolled Smart Meters that there will be at the end of the 15th day of the month in respect of which the calculation applies.

Priority Service Requests

DUIS Reference	Service Request	Service Request Variant	Service Request Name

This table is currently not in use.