

Randomisation Offset Limit
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1. Background

This paper sets out the DNOs views on the Randomised Offset Limit as requested during a discussion between Peter Morgan and ENA's Smart metering Steering Group on 4 March 2014

2. Requirements

When establishing the basic off peak switching times and the associated randomisation there are a few principles that are relevant:

- DNOs need to minimise voltage step change issues associated with simultaneous switching of material load
- DNOs need to maximise network utilisation by staggering switching times to allow load switched on earlier to fall drop off before switching on additional load
- NGET need a predictable load pick up without any material step changes
- Generators need a predictable load pick up without any material step changes
- Customers need to know the times when the off peak load is switched
- Customers need assurance that load switching coincides with tariff/ rate change (this is a requirement in SMETS)
- Suppliers / Elexon need to know the times when the off peak load is switched
- Suppliers/ Elexon need to know the total volume of load switched in each time period for supply volume allocation purposes. There may well be a need to discuss with Elexon how much information they would need on the switching times and the associated Randomised Offset.

and

- Randomisation must not be over a period greater than the interval between the defined switching times
- Hardcoded limits (in SMETS2 or the GBCS) shouldn't create future restriction in the functionality
- DNOs should agree both the basic switching times and the Randomised Offset Limit with Suppliers via DCUSA
- The applied Randomised Offset criteria must be capable of amendment as required to satisfy the future requirements of smart grids. The process for agreeing any changes should be via DCUSA.
- The Randomised Offset Limit applied should follow a generic consistent set of rules across the whole of GB. In Load Managed Areas, different rules may be required and these should be agreed via DCUSA
- Rules need to be applied to all switching regime types i.e. static/ dynamic
- In future there may be a need to apply randomisation to "inferred" switching times, i.e. where load is affected by customer's response to a price signal via a TOU tariff.

3. Options

There are two parameters in smart meters that can be used to achieve the above:

- Setting the basic switching times e.g. o'clock, quarter past and half past
- Setting the randomisation around the basic switching times

Different combinations of these factors could be used to ensure that demand switching is spread uniformly over a 30 minute period – thus replicating the current RTS functionality and the effective functionality arising from manual setting and natural drift on mechanical and electronic timeswitches.

Option	Defined / Agreed switching times	Randomisation period (max)	Randomisation Offset limit (ROL)	Comments
1	xx:00, xx:30	30 mins	1799 sec	Replicates the present arrangements where switching is defined on the hour and half hour. Setting ROL at 1799 provides more randomisation than we probably have at the moment.
2	xx:00, xx:10, xx:20, xx:30	10 mins	600 sec	This would allow the DNO to be more prescriptive and have more control over what load is switched when, but would require more detailed analysis than at present. Could be more realistically required as part of a Smart Grid.
3	xx:00, xx:15, xx:30	15 mins	750 sec	Partway between Option 1 and 2
4	xx:00, xx:05, xx:10, xx:15, xx:20, xx:25, xx:30	5 mins	300 sec	More extreme than Option 1, possibly required for Smart Grid

4. Conclusions

1. Initial DNO requirements are likely to be met via Option 1
2. Future Smart Grid requirements are unlikely to require anything better defined than in Option 2
3. If there is a concern that the ROL might be inadvertently set at zero, a minimum value hard coded into SMETS2 and the GBCS of 600 seconds seems reasonable.

4. Recommendation

The following two recommendations summarise the views of DNOs:

1. Nominal switching times should be set at xx:00 and xx:30 with a Random Offset Limit in the range 600 seconds to 1799 seconds.
2. The initial switching times and Random Offset Limit together with any changes to these arrangements should be agreed via DCUSA.