Issue 93 – Minimum burden requirements Summary

## Summary

1. **Meeting Objectives**

The Chair welcomed attendees and presented the following meeting objectives to Work Group (WG) Members:

* Agree on a solution to this aspect of Issue 93
* Confirm redlining requirements

1. **Background**
   1. Elexon went through the background of this aspect pointing out the International Electrotechnical Commission (IEC) standards for measurement transformers (Voltage Transformer (VT) and Current Transformer (CT)).
   2. Elexon also pointed out the prevailing conditions outside of the overall accuracy limits, listing out four situations where the Metering Systems are operating outside of the limits of error specified in both the Codes of Practice (CoPs) and the IEC standards.
2. **Group discussion**
   1. Elexon kicked off the group discussion exercise by asking the WG some questions to understand the following points:
      1. What the current practices are.
      2. What the future developments will be.
      3. A potential solution to the identified issue.
   2. The first question was asked to confirm if the criteria for an appropriate CT ratio should be specified. If yes, what should it be?
      1. To which, a few WG members commented on. Their comments highlighted the following:

* The need to refine how to determine the ‘circuit capacity’ in the CoPs;
* The need to confirm the rationale behind the CT ratios Distribution System Operators (DSOs) are using; and
* Consider the impact the criteria for an appropriate CT ratio will have on DSOs, in terms of procuring equipment.
  1. The second question asked was to confirm if there should be a minimum burden? If yes, what should the minimum burden be?
  2. WG discussed the impact of the burdens connected to CTs and VTs.
  3. Modern static Meters present much lower burdens to CTs and VTs than electro-mechanical Meters. Some MOAs estimated burdens of 0.63VA or 0.5VA. The WG recommended Elexon contact MOAs to find the typical burden connected to measurement transformers. The WG could also consider recommending, to the CoP4 expert group, a figure for consideration as a suggested ‘headroom’ for measurement transformers owners to leave for the equipment MOAs/Customers might install.
  4. Some MOAs, for the higher CoPs (e.g. CoPs 1 and 2), add burden resistors to bring the connected burden up into the 25 – 100% of rated burden range. Some do not. In particular, burden resistors are not added for CoPs 3, 5 and 10 sites. The WG recommended contacting measurement transformer manufacturers to confirm the impact on accuracy where the connected burden is below 25% or above 100% and whether the level of secondary current flowing in a CT (e.g. below 1% or above 120% of the CT’s rated primary current) also has an impact. One WG member questioned whether other products were available to add burden other than resistors.

For High Voltage (HV) scenarios, the main factor impacting the connected burden is the secondary cable run and not the Meters. The WG discussed that standard practice was to double up cable runs or increase the cross sectional area of cables to make sure the rated burden of the CTs and VTs is not exceeded. A WG member questioned the risk of losing a doubled up core and generally, the WG confirmed that the risk is low as they would all be in the same multicore.

1. **Decisions**
   1. The WG decided to reconvene at a later date to discuss the following areas of this aspect:
      1. Should overall accuracy limits be specified where the prevailing conditions are outside of the limits specified in the relevant CoP; and
      2. Whether the changes should be limited to CoPs 1, 2, 3, 4, 5 and 10
2. **Next Steps**

* Elexon to share a summary note of the discussions held today
* Elexon to update the Issue group on the initial discussions and captured actions
* Elexon to schedule another meeting to discuss findings from the assigned actions and debate on the last two (main) bullets (and sub-bullet) below
  + There should overall accuracy limits specified where the prevailing conditions are outside of the limits specified in the relevant CoP?
    - If yes, what would the recommendation be?
  + That any changes made should be limited to CoPs 1, 2, 3, 4, 5 and 10 as Issue 93 is looking to end-date CoPs 6, 7, 8 and 9.

1. **Actions**

* Elexon to contact measurement transformer manufacturers and confirm the impact on accuracy of measurement transformers if working burdens are below (or above) the 25% to 100% burden rating at which they need to be within the error limits prescribed in the relevant standard, and if the level of secondary current will also have an impact on accuracy below 1% rated current (and above 120%), assuming the connected burden is between 25% to 100% rated burden.
* DM to contact DSOs and confirm their rationale for selecting the CT ratios they use, for LV and HV sites
* Elexon to email Meter Operator Agents (MOAs) and enquire what typical burden values are for test terminal blocks, fuses, links, main (and, where relevant check) Meters and other (non-Settlement) burdens so this could be recommended (to the CoP4 Expert Group) as a suggested ‘headroom’ that measurement transformer owners should consider leaving for the equipment MOAs/Customers might install.
* Elexon to ask manufacturers if there are products available, other than resistors, to add burden.