

Uncertainty in measurement

Study Committee C4 Preferential Subject No1

Question 3: Are the limits applicable for various power quality parameters too stringent from engineering perspectives and wider social impact (e.g. the practicality of measurement of various power quality parameters like harmonics up to the 50th order and considering the impact on connected equipment using available sensors at differing voltage levels and measurement methodologies)?

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Introduction and Problem statement

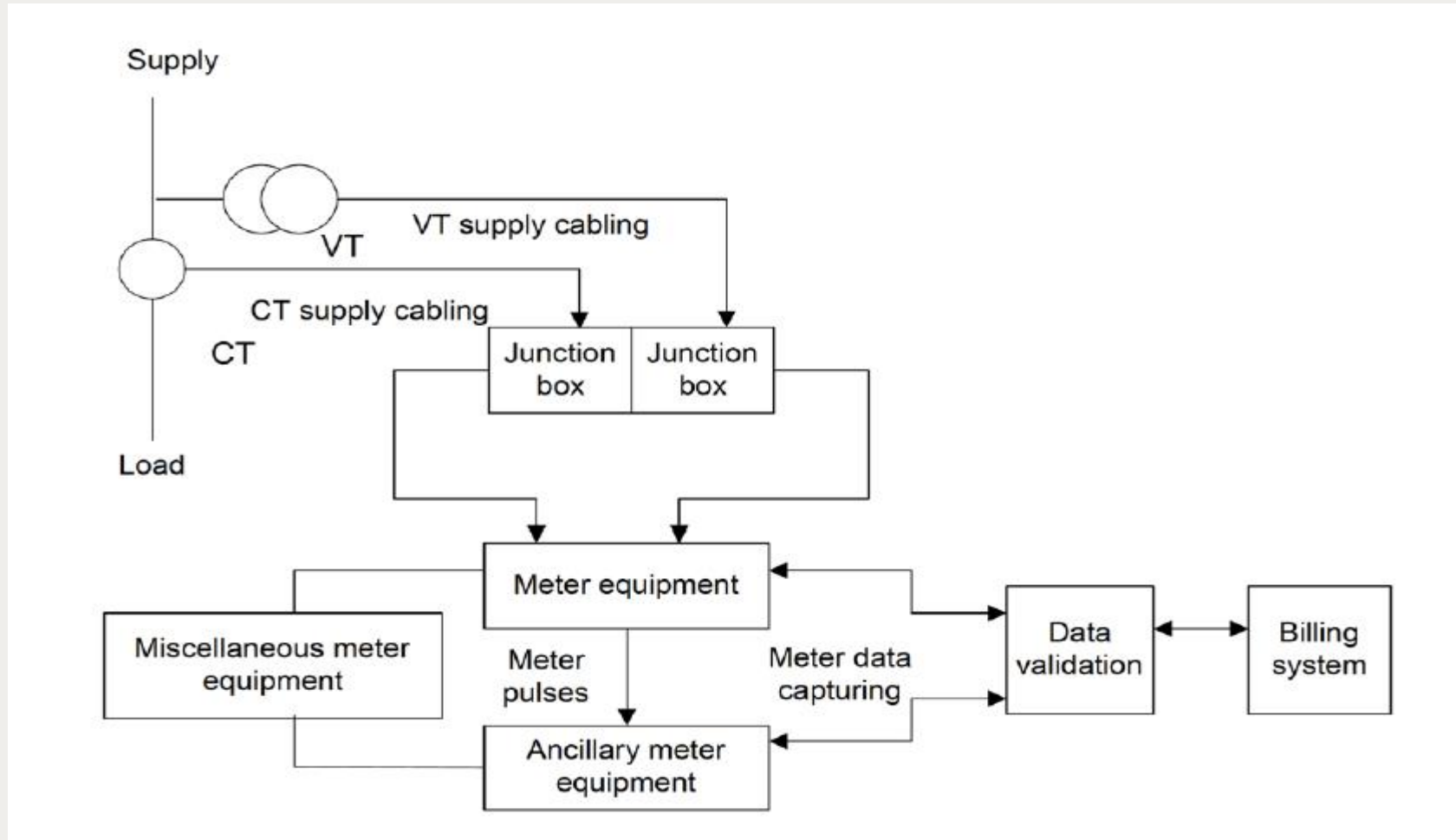
- In South Africa the NRS048:4 specification is used to calculate emission limits for Renewable Power Plants (RPP) and load customers.
 - Principles in NRS048:4 are based on IEC61000-3-6

- In some cases the emission limits (voltage and current) are extremely small and can not be accurately measured or evaluated.
 - Largely due to the network topology and the size of the load.
 - Often disputes arise between the DSO/TSO and the customer

Solution

- Default minimum emission values are specified in NRS048:4 for harmonic distortion
 - 0.1% for voltage emission
 - 0.1% of the rated current of the plant or installation, as the current emission
 - Guided by IEC61400-21-1
- To be more accurate a measurement uncertainty campaign must be done per site
 - Guide for measurement uncertainty (GUM)
 - Calculate the minimum measurable value based on the measurement chain
 - Solve disputes between DSO/TSO and the customer on a scientific bases.

Typical measurement chain for PQ



Thank you



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For power system expertise