



Radiocommunications Agency
Ministry of Economic Affairs

Power Quality ≠ EMC

EMC Knowledge Market
South, TUE

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Radiocommunications Agency

Agentschap Telecom

The Netherlands competent authority on

- EMC Directive
- R&TTE Directive

Groningen : Headquarters and Spectrum Management , 160 fte

Amersfoort : Inspection , 90 fte



Power quality \neq EMC

Power quality is a set of characteristics of the electricity at a given point.

EMC is the ability of equipment to function in its environment without introducing intolerable disturbances to other equipment.

Equipment = apparatus and fixed installations

So, EMC is a set of characteristics for equipment

But here and there they touch and mix





Power quality

Definition 3.20 of IEC 61000-4-30

characteristics of the electricity at a given point on an electrical system, evaluated against a set of reference technical parameters

NOTE These parameters might, in some cases, relate to the compatibility between electricity supplied on a network and the loads connected to that network.



Competences and responsibilities

EMC

Manufacturers of equipment have to make compliant products, installations have to be installed with good engineering practices.

(NL : EMC besluit onder Telecomwet)

Power quality

Utilities have to supply power according to specs

(NL : Elektriciteitswet art 31)



Aspects of power quality

Frequency

Voltage

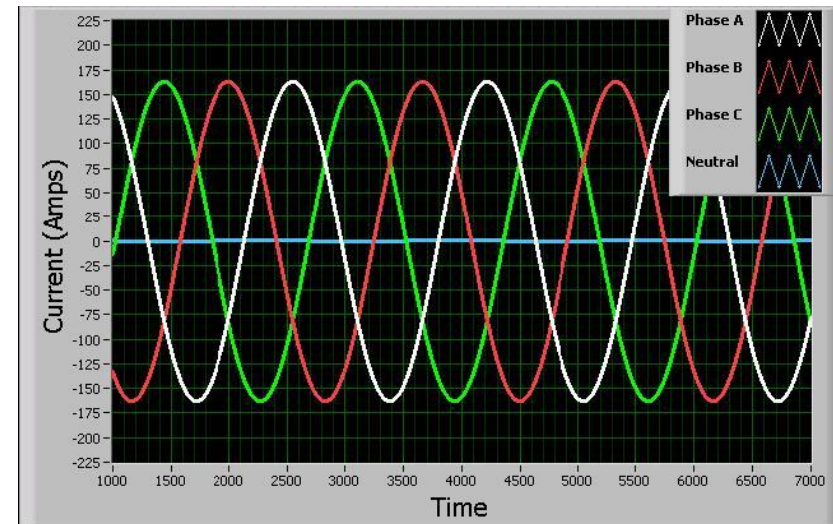
Flicker and rapid variation,
dips and swells

Phase unbalance

Ripple signalling levels

Harmonics up to 25th

RF is no issue





Standards for power quality

IEC (EN) 61000-4-30 , Power quality measurement methods

EN 50160 , Voltage characteristics of electricity supplied by public electricity networks

gives aimed values with tolerances

(EN 50160 is implemented in Netherlands as Netcode)



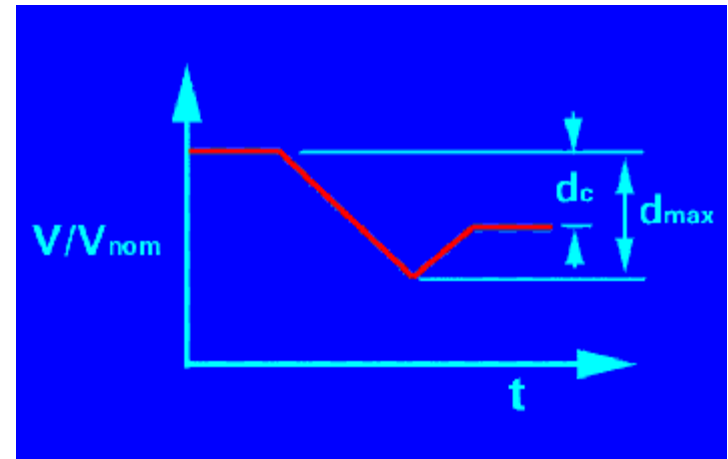
EMC

Characteristics of equipment

Aspects of EMC

Emission

Immunity



To be assessed by phenomena that in themselves seem aspects of power quality



EMC, aspects and sub-aspects

Aspects of EMC

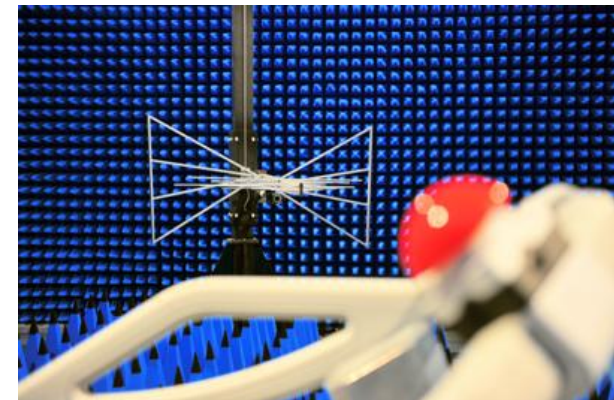
Emission

Immunity

RF emission > 9 or 150 kHz, see the CISPR standards

LF emission , see the IEC SC 77A standards

Immunity , see the IEC SC 77B standards





Power quality \neq EMC

Power quality is on electricity

EMC is on equipment

Do not mix them up !

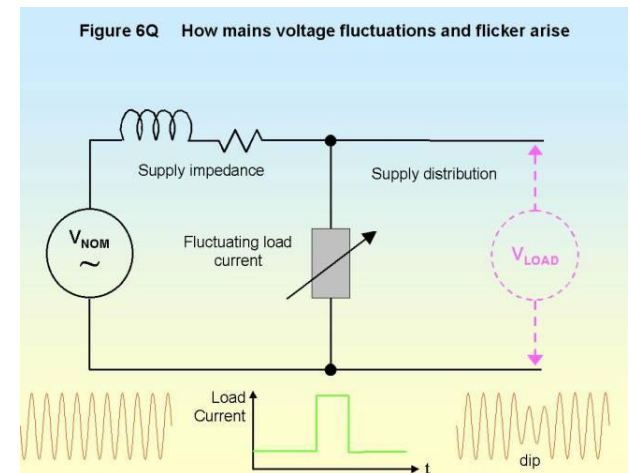


Mains impedance

Defined for EMC purposes, like flicker in IEC 60725

Relevant for power quality as well

Only at mains frequency , like $0,4 + 0,25j \ \Omega$ at 50 Hz





Research question

Investigate how IEC 60725 could be improved to cover (some) harmonics