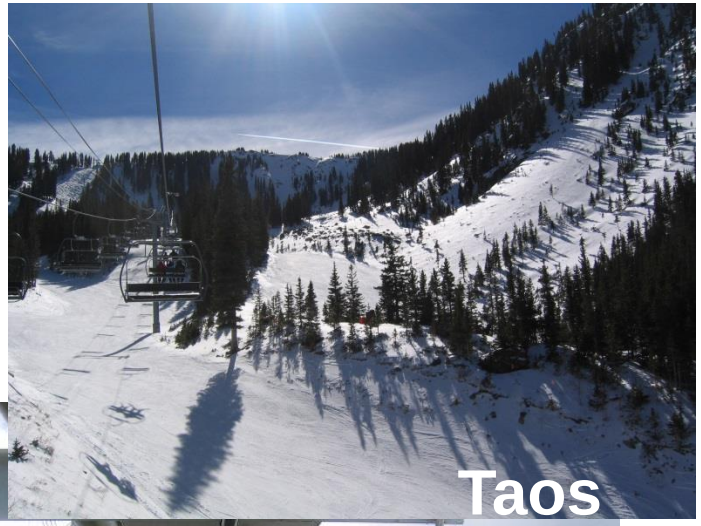
Status of CISPR 32 & CISPR 35

Andy Griffin, December 2014

Why am I here ?

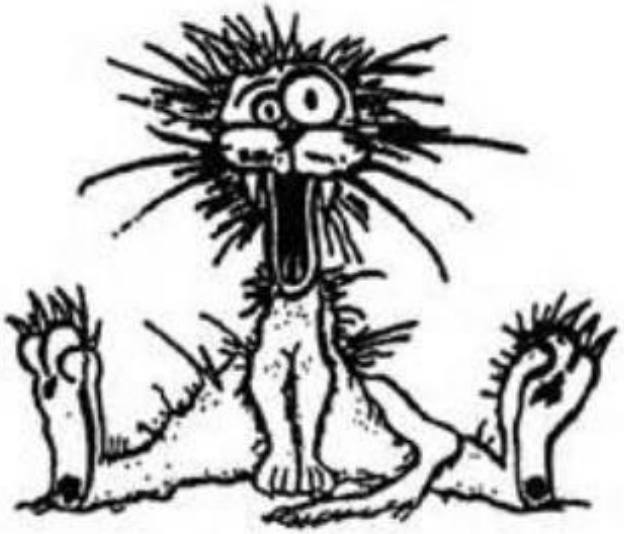
Experience	EMC industry for 25+ years (Cisco for the last 18)
Member of various committees …	Chair H WG1 Co-chair CISPR I WG4 Main editor if CISPR 32 (CISPR I WG2) CISPR I (WG 2 & 4) Co-chair CISPR I/A Task Force ANSI C63 (many sub committees) ETSI ERM EMC, STAN in South Africa CENELEC TC210 / TC209
Writing Standards	I have a passion for editing standards? And it is fun? .. basically get bored during meeting, hence I have to add something stimulating to make them bearable. …. always the good/bad/ugly !

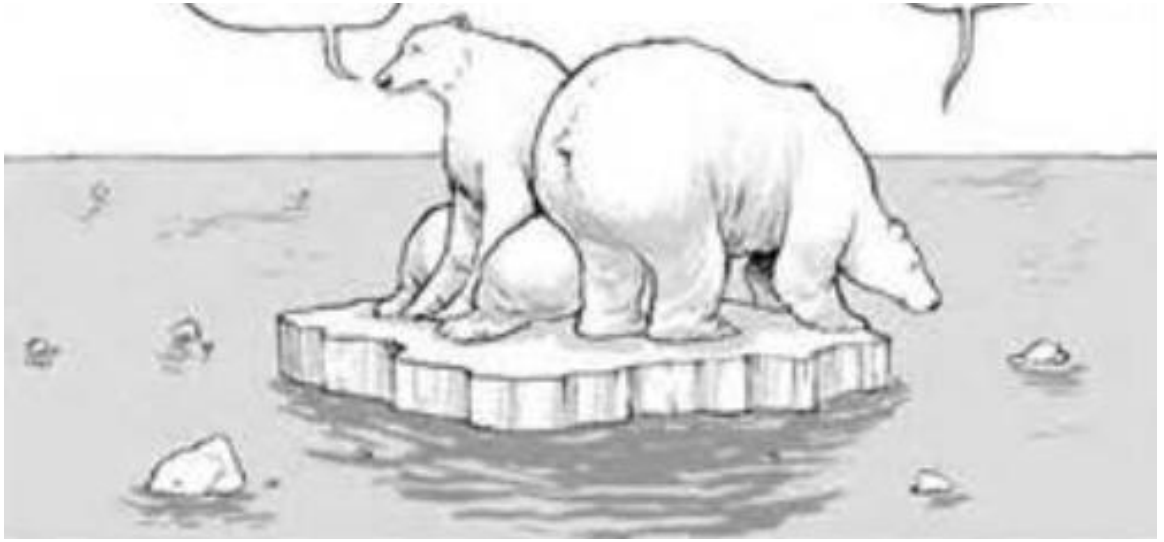
The Good…



The Bad..

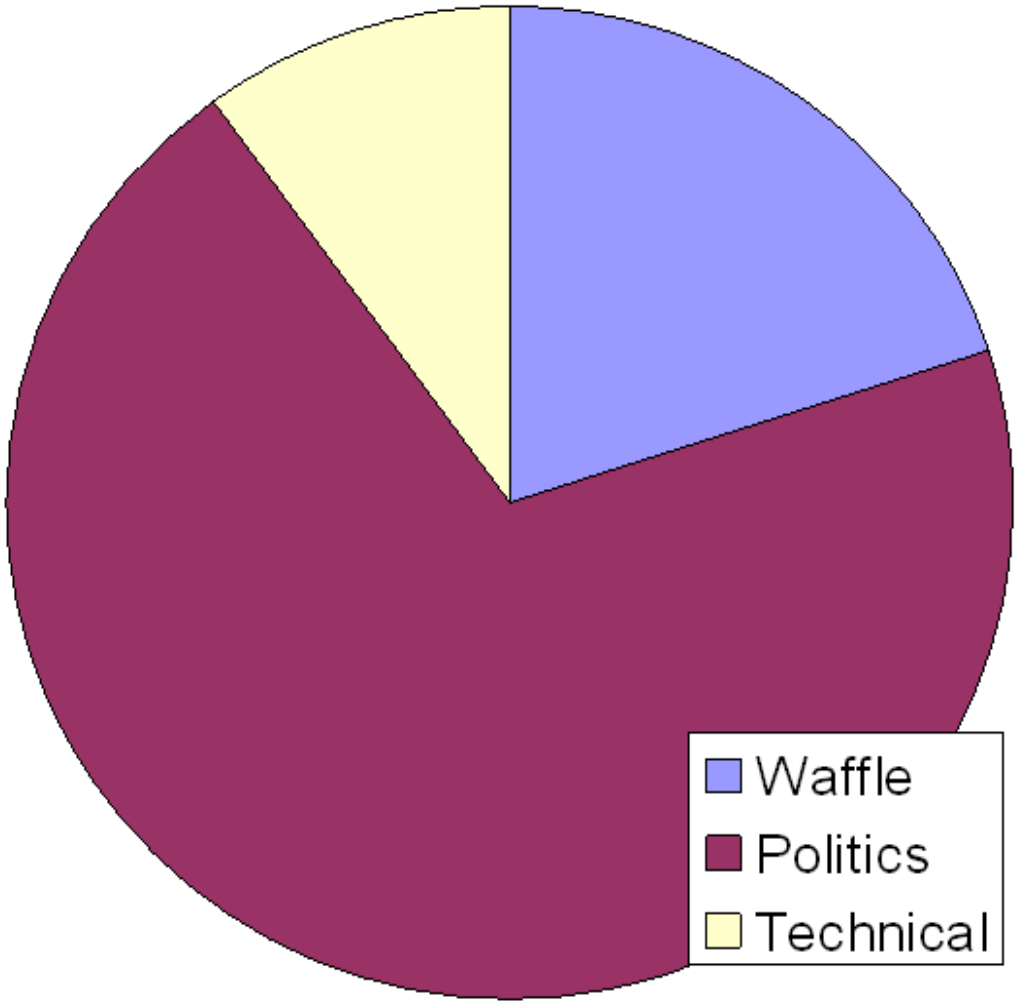
The Ugly..





IEC 1906 Award

Standards development…

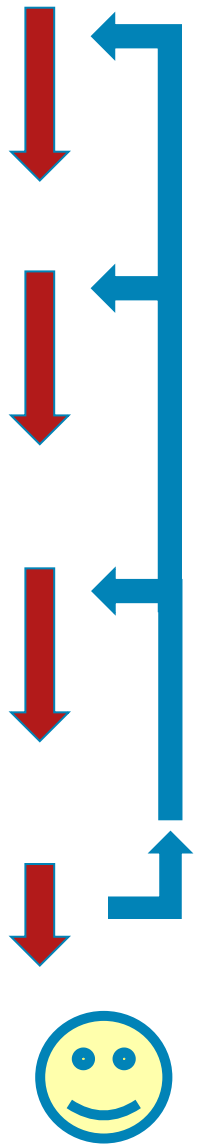


Its just about trying to generate the best standard?

Lets not forget

IEC standards making process

New Work	**NP**	Typically from SC (SC I).. There needs to be enough NC support / nominated experts.
	MCR/RR	Typically from WG, From (NC/WG member) approved by NCs (thru SC)
CD Committee Draft		Basic ideas are established. Iterative process and many different **CD**s can be developed prior to the document going to vote.
CDV Committee Draft for Vote		**CD** needs to be vary stable before it goes out for vote. **CDV**s often pass because of NCs which just vote yes. Hence there is a reluctance to send out **CDV**s.
FDIS		**F**inal **D**raft **I**nternational **S**tandard.
Adoption by country regulation		CISPR standards are usual adopted worldwide with minimal change…



CISPR 32 Process

Timing	Started 2002 / 2003.. Clean **sheet**? FAR was the original proposal ….
Process	2 step process was finally adopted
Controversial Bits **Not in edition 1**	FAR (Full Anechoic Room) RVC (Reverberation chamber) / GTEM Measurement Uncertainty Satellite receiver (DISH) testing
Badly Written	So CISPR 32 is very much CISPR 22 … ….. but CISPR 22 does have a few holes?
Published	2012 (being adopted worldwide)
FDIS 2nd	Expected in the next few months.. MU (failed, not included). RVC/GTM (Informative annex)

CISPR 32 Key Points

CISPR 32	MME Emission Standard
CISPR 22 + CISPR 13	CISPR 22 with a Broadcast Rx tuner port Test…
Class A/B	As CISPR 22 (CISPR 13 was only class B)
3m / 10m	Has 3m/10m limits (10dB offset)… 3m size based upon NSA Volume
CISPR 13	CISPR 32 is a system test, not a component test !!
Network Port	More coverage of network ports
TV /VDU…	Not scrolling H's ! For most displays…..
Other bits	…..

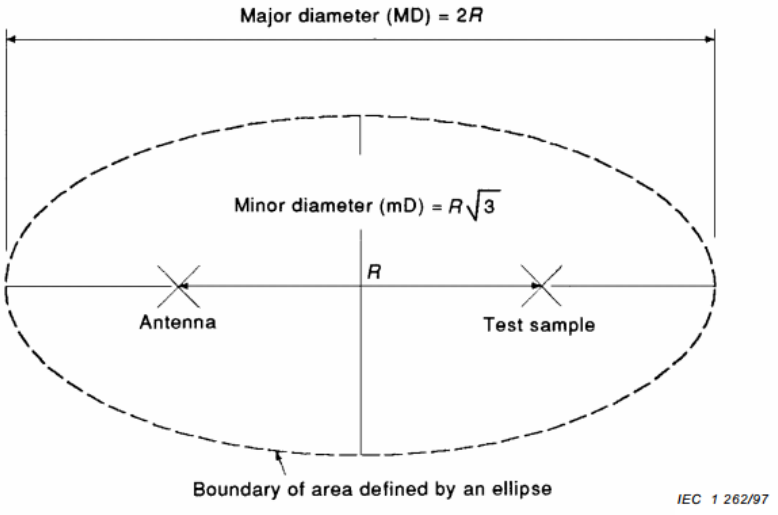
CISPR 32 Different Voltage

Testing at a nominal voltage of 230 V (±10 V) and 110 V (±10 V), using a frequency of 50 Hz or 60 Hz, is normally sufficient for an EUT which is intended to operate over this approximate range of voltage and frequency.

CISPR 32, 10 BaseT

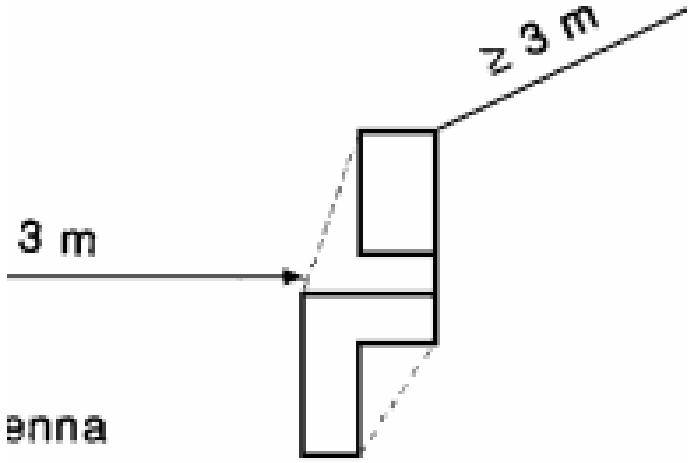
For Ethernet interfaces, measurements are required at the highest data rate supported by the interface except for interfaces supporting a maximum rate of 10Base-T, which shall be measured at a representative data rate only. The data rate shall be recorded in the test report.

CISPR 22 EUT



Volume above earth to be free of reflecting objects.

NOTE Characteristics of test site described further in 10.4. See also Clause 6 for the value of *R*.



6 Limits for radiated disturbance

6.1 Limits below 1 GHz

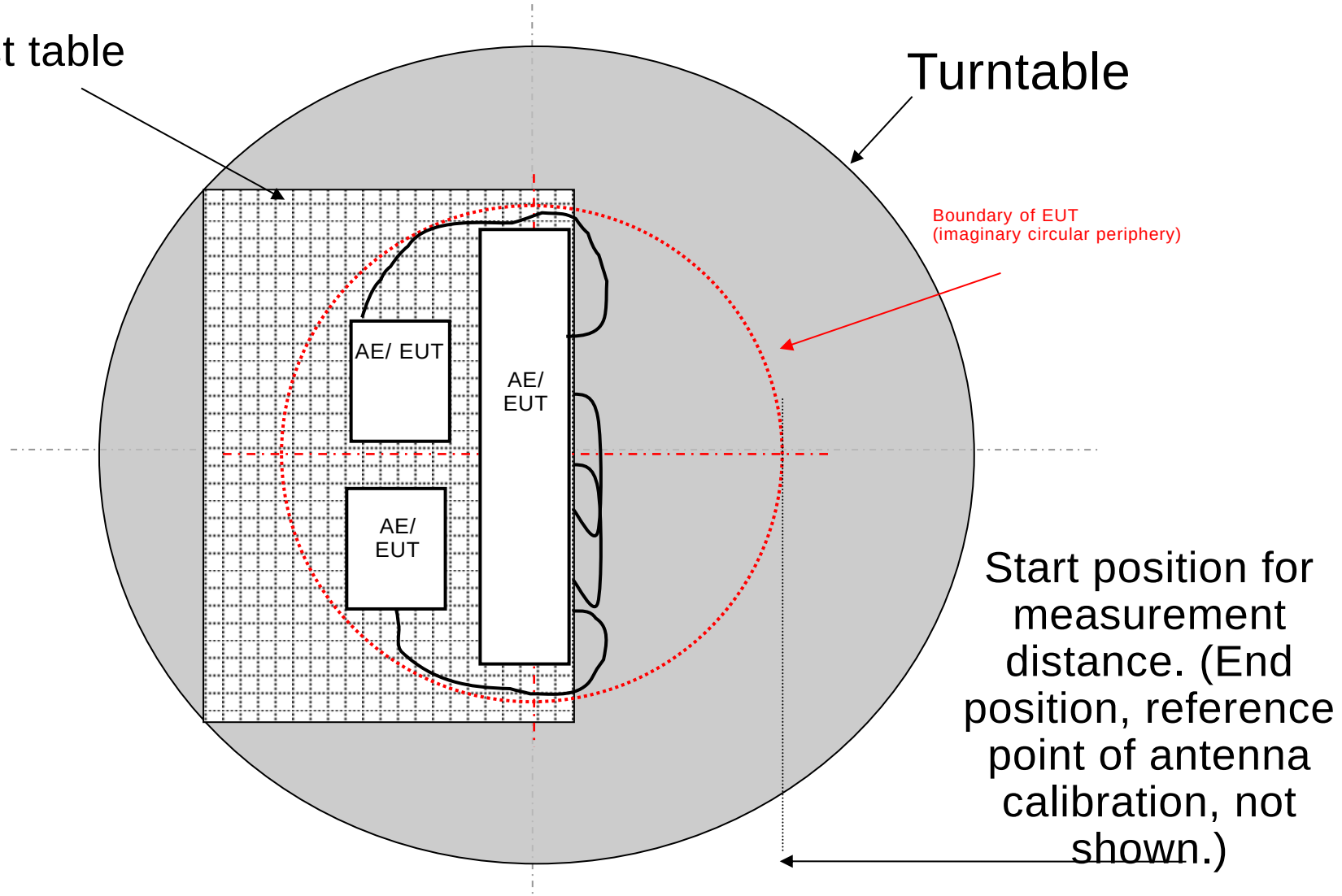
The EUT shall meet the limits of Table 5 or Table 6 when measured at the measuring distance *R* in accordance with the methods described in Clause 10. If the reading on the measuring receiver shows fluctuations close to the limit, the reading shall be observed for at least 15 s at each measurement frequency; the highest reading shall be recorded, with the exception of any brief isolated high reading, which shall be ignored.

Table 5 – Limits for radiated disturbance of class A ITE at a measuring distance of 10 m

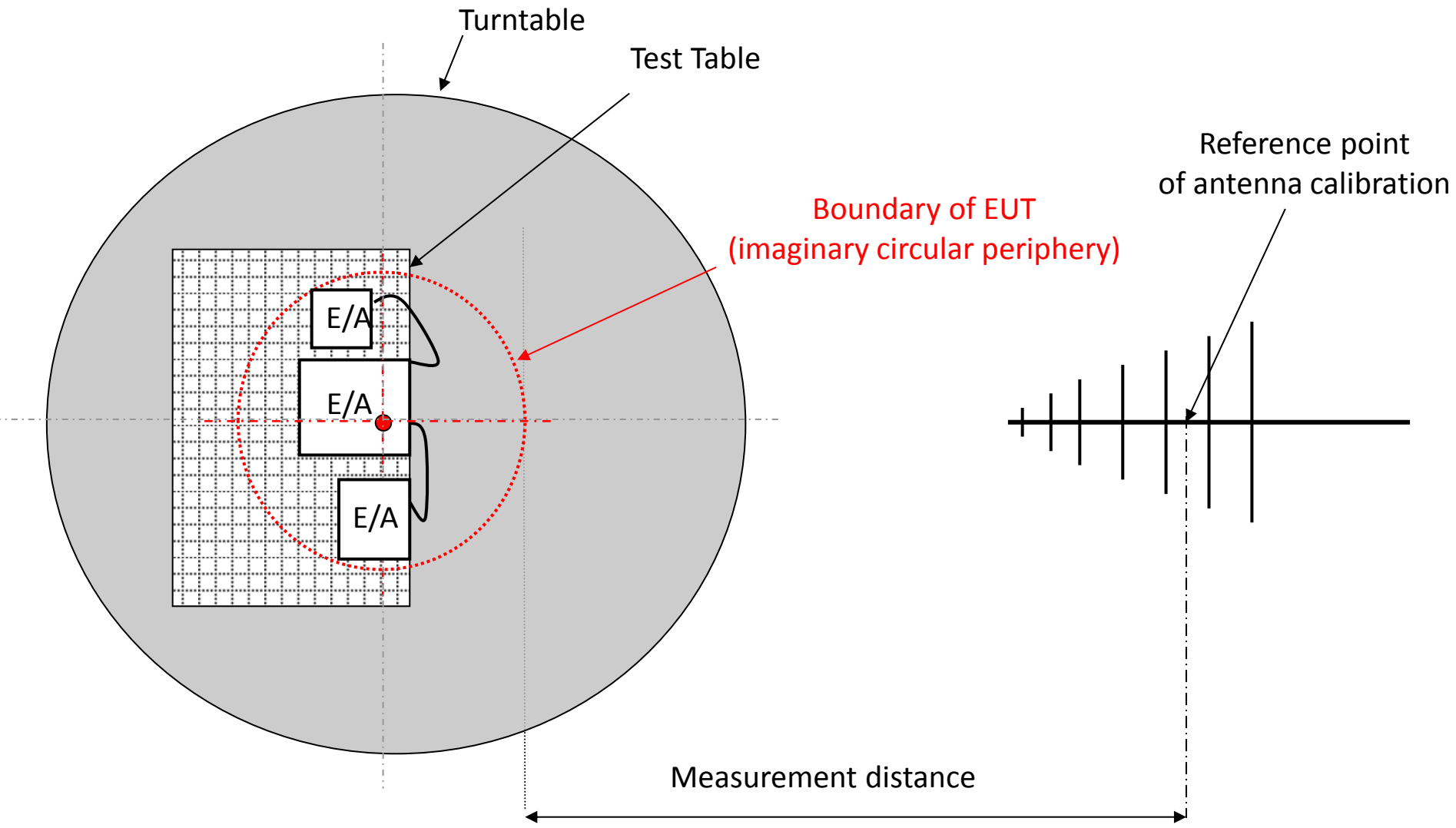
Table A.1 – recommend

R (m)	3	3	
h_1 (m)	1	2	
h_2 (m)	1 to 4	1 to 4	1

CISPR 32 EUT



CISPR 32 EUT

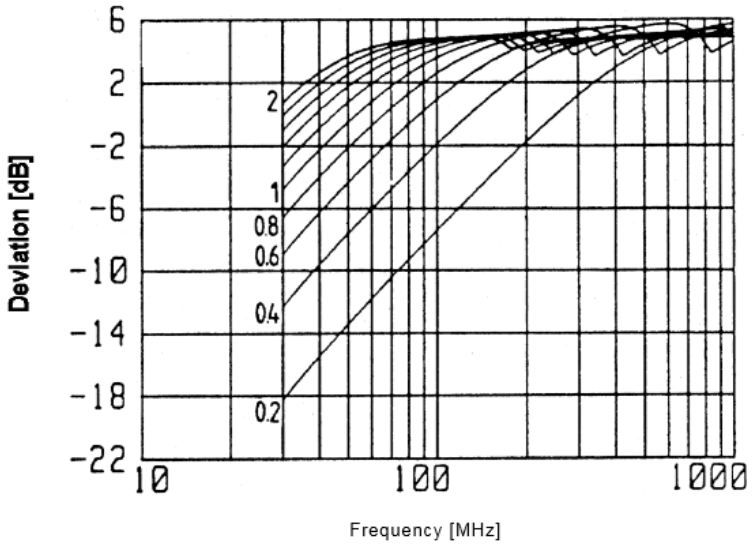


CISPR 32 FAR Limits

Table clause	Frequency range MHz	Measurement			Class B limits dB(uV/m)
		Facility (see Table A.1)	Distance m	Detector type / bandwidth	
A4.1	30 – 230	OATS/SAC	10	Quasi Peak / 120 kHz	30
	230 – 1 000				37
A4.2	30 – 230	OATS/SAC	3		40
	230 – 1 000				47
A4.3	30 – 230	FAR	10	Quasi Peak / 120 kHz	32 – 25
	230 – 1 000				32
A4.4	30 – 230	FAR	3		42 – 35
	230 – 1 000				42
Apply only table clause A4.1 or A4.2 or A4.3 or A4.4 across the entire frequency range.					

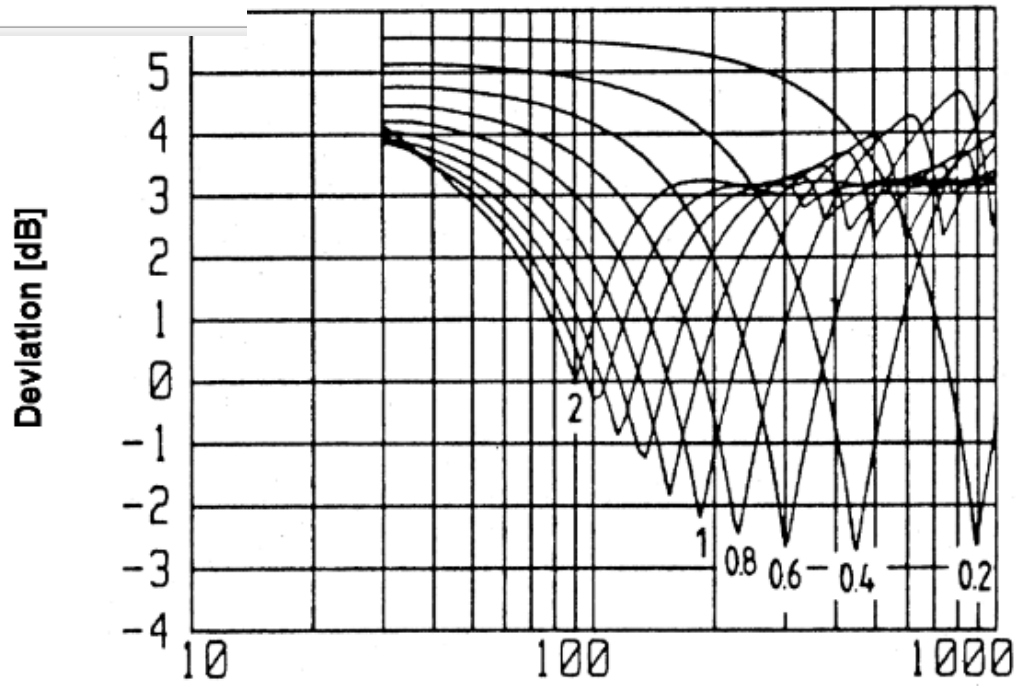
Table top equipment only (Class A, 10dB difference)

CISPR 32 FAR Limits

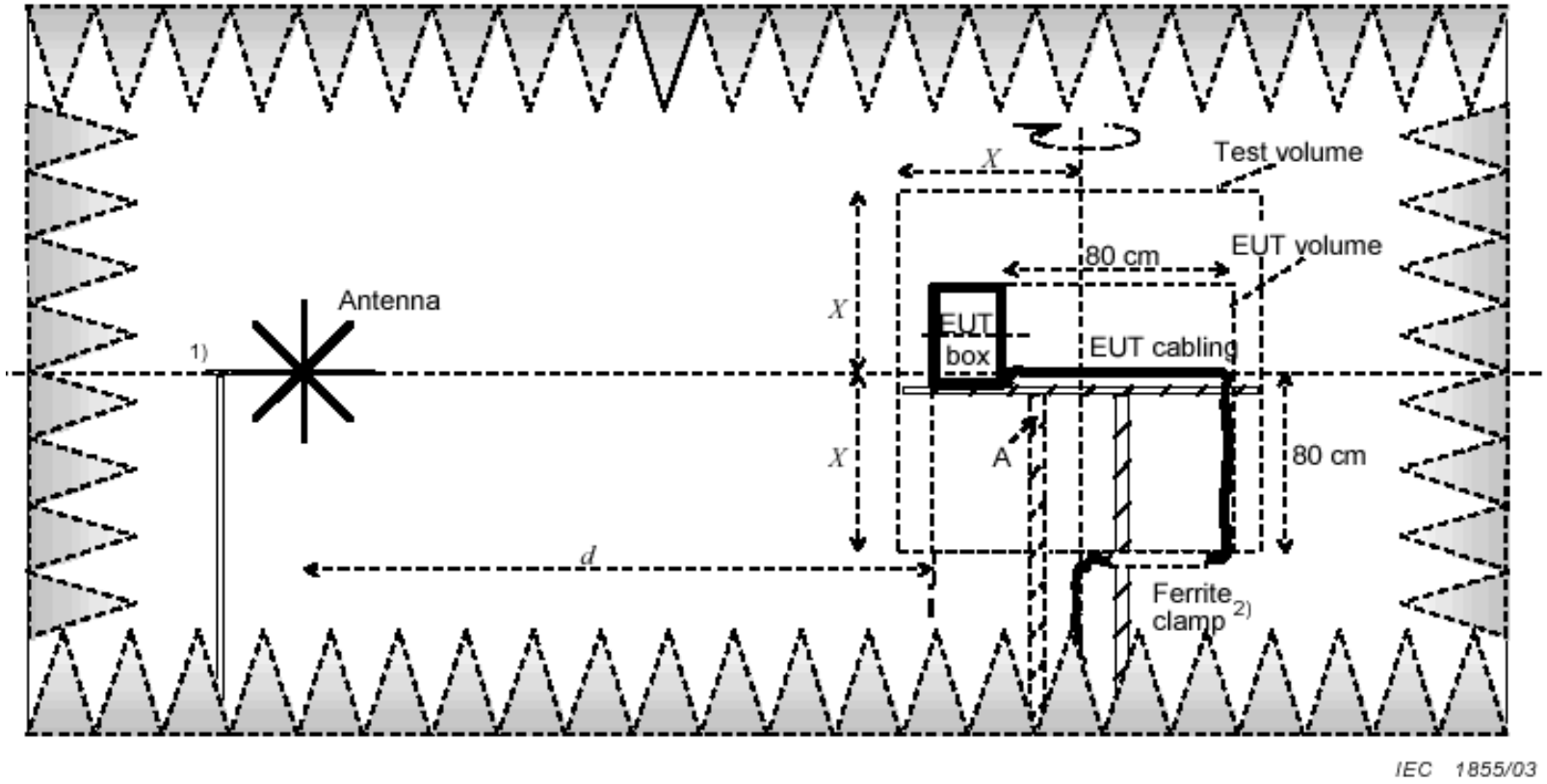


NOTE: the numbers within the graph, is the position of the source above the ground plane on an OATS

Figure A6 – 3 m distance, horizontal polarization, calculated differences for an electrically short straight wire above the ground plane on an OATS compared with a FAR (E_{OATS} - E_{FAR})



CISPR 32 EUT



A = turntable and EUT-support

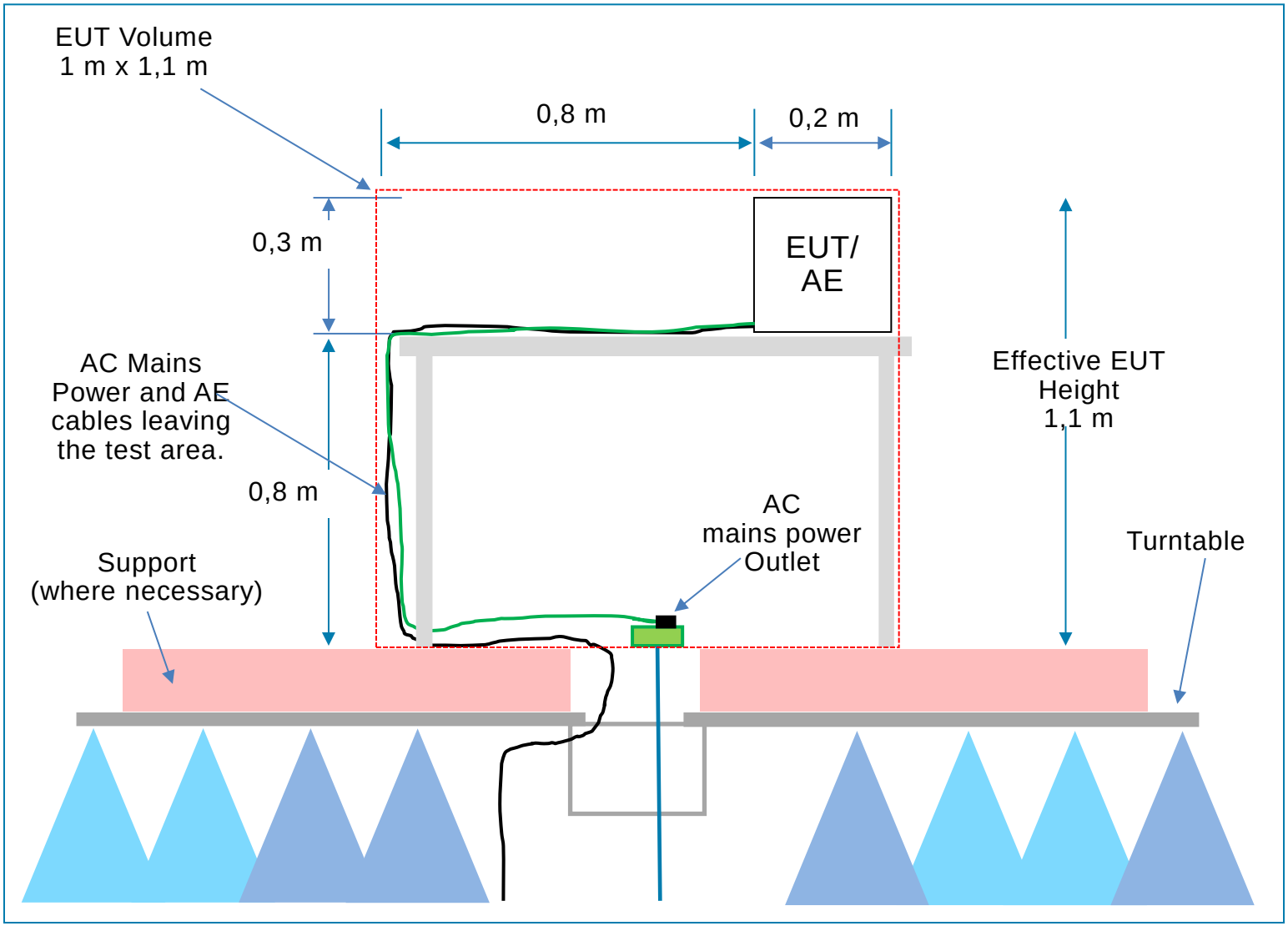
2X = 1,5 m; 2,5 m, 5 m

d = 3 m; 5 m or 10 m (for 3 m, 5 m, or 10 m test distance, respectively)

1) The antenna cable layout shall be the same as in the validation procedure (see Figure 6).

2) Ferrite clamps are to be used in accordance with the applicable product standard. Their possible use (if required) must be documented in the test report.

CISPR 32 EUT



CISPR 35 Key Points

CISPR 35	MME Immunity Standard (few years later start..)
CISPR 24 & CISPR 20	CISPR 24 with **functional** based Annexes… test applied to the port whilst monitoring the function. *Informative annex on how to apply the standard*
Mistake	Failed the FDIS? Should followed CISPR 32 model ! Passed in the EU? Korea have adopted the CDV
Reason	4% Step size (double the voltage) Includes CO equipment 30 V/m for CO equipment (above 1GHz..spot test) Relaxation for Inject RF 3V-1V Above 1GHz Immunity
CDV	4% Step size (double the voltage) 30 V/m for CO equipment (above 1GHz..spot test) Includes CO equipment Relaxation for Inject RF 3V-1V (with info annex) Above 1GHz Immunity

CISPR 35 Key Points

CISPR 35	MME Immunity Standard (few years later start..)
CISPR 24 & CISPR 20	CISPR 24 with functional based Annexes… test applied to the port whilst monitoring the function. *Informative annex on how to apply the standard. Only **primary functions** need to be tested.*
Mistake	Failed the FDIS? Should followed CISPR 32 model ! Passed in the EU? Korea have adopted the CDV
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CISPR 35, Above 1GHz Immunity?

Spot Freq	Spot frequencies only, Radio's are only source. Why do a test, where the EUT will pass.
Levels	3V/m is the requirement
Range	No need to sweep the range of the threat

1.3	Continuous RF electromagnetic field disturbances, spot test	Frequency (±1 %)	800, 900 1 800, 2 600, 3 500, 5 000	MHz
		Field strength (table clause) See [a] and Table I.1	3 (I.1.1) 4 (I.1.2) 6 (I.1.3) 12 (I.1.4) 30 (I.1.5)	V/m

CISPR 35, Above 1GHz Immunity?

Table I.1 – Guidance on the selection of immunity levels to common wireless communication devices

Table clause	Approximate protection distance (m)	Calculated RF field strength in V/m for frequencies and protection distances simulating different radio transmission types, assuming a given ERP						
		LTE/UMTS (0,2 W)	GSM (2 W)	GSM (1 W)	WiMAX/3G (1,26 W)	WiMAX (1,26 W)	WiFi (1 W)	Maximum RF field strength at any frequency
		800 MHz	900 MHz	1,8 GHz	2,6 GHz	3,5 GHz	5 GHz	
I.1.1	3,0	0,6	1,8	1,3	1,5	1,5	1,3	3
I.1.2	1,5	1,2	3,7	2,6	2,9	2,9	2,6	4
I.1.3	1,0	1,7	5,5	3,9	4,4	4,4	3,9	6
I.1.4	0,5	3,3	10,5	10,5	11,8	11,8	10,5	12
I.1.5	0,2	8,3	26,4	26,4	29,6	29,6	26,4	30

The protection distance is not the test distance as defined in IEC 61000-4-3, but the shortest expected operating distance between the EUT and the interfering wireless communication device at which the immunity performance criteria will be satisfied.

CISPR 35, Injected RF relaxation

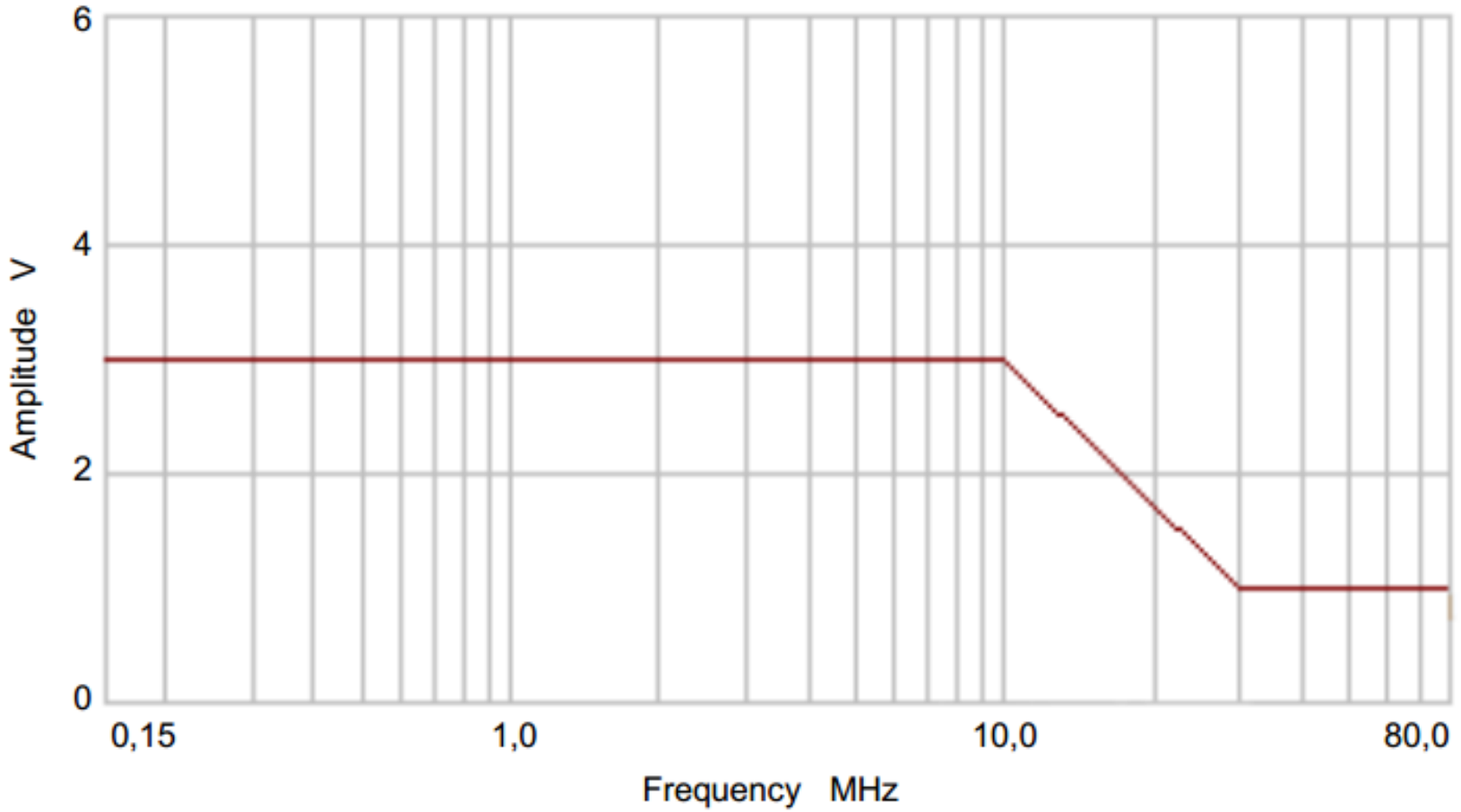

Figure 3 – Graphical representation of the continuous induced RF disturbances levels defined in table clause 2.1

The story continues…..