



European Union initiative towards defence standards

From national to international standards

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History



- **2000**
 - **European Commissioner Liikanen:**
'Towards an European market for defence procurement'
 - **Survey: Key constraint: plethora of national standards**
 - **CEN is the European Institute for standards, and a working group BT/WG125, for defence existed**
 - **A 'workshop' structure appeared to be the best platform: under CEN, no national representatives but stakeholders can participate directly**
 - **Thus 'Workshop 10; Standardization for Defence Procurement'**
 - **Chairman: Jean-Michel Bardot, Vice-President EADS**
 - **Secretariat: Marie-Joëlle Antoine, AFNOR**
 - **Strong support from DG Industry**
- **2002: Business plan**
- **2003: Handbook: collection of all standards used within the EU, >15.000 !**

EU Comm.: CEN WS 10



- **Economical reason for doing this:**
 - **Improve competitiveness European defense industry**
 - No national players anymore!
 - **Testing is expensive**
 - **More efficiency needed**
 - more standards = personnel needs to learn more standards
 - more standards = more paperwork
 - more standards = more test equipment
 - **More and more commercial items are used**
 - tested according to civil standards
- **MoD's: More value for money**
- **Industry: Larger market, lower costs**
- **Political: Improve European strength**

Example: same radar, 6 countries, 5 standards



France: GAM



Germany: VG



Netherlands: MIL



United Kingdom: Def-Stan



Italy: MIL/STANAG



Denmark: STANAG



2004



- **2004**
 - **8 expert groups were created on subjects which were considered as the most important**
 - NBC detectors
 - Energetic materials
 - Fuels and lubricants
 - Batteries
 - Packaging
 - Electrical and mechanical interfaces
 - **Electromagnetic environmental effects (28 members: largest group)**
 - Environmental testing
- **Electromagnetic Environmental Effects: Expert Group 7**
 - **28 members**
 - 9 countries: Finland, France, Germany, Italy, Netherlands, Poland, Sweden, Switzerland, United Kingdom
 - 11 MoDs + 1 NATO
 - 16 (professional) Industry (THALES, Intellect(BAe), MBDA, SAAB, Ericsson, Diehl, Vaisala, Esju, Vectronix AG, Carlo Gavazzi Space, Galileo Avionica)

2004: Selection of relevant standards



- **Relevant EG7 standards in initial handbook: 230 standards**
- **Adding missing standards: 420 standards (SW, PO, etc.)
Still: >1000 EMI standards not in the handbook could be added....**
- **Phenomenae covered (requirement, test, guidelines):**
 - EMI, Radiation hazards (personnel, ordnance, fuel), Lightning, Nuclear and lightning EMP, DC magnetic field, power quality, HIRF
 - Power supply issues: to Expert Group 15
 - Spectrum control, TEMPEST, HPM, UWB, I-EMI

Plethora of (Military) EEE Standards



Best standard????

EUROPEAN DEFENCE STANDARDS REFERENCE SYS



2004: Comparing the standards: constraints & solutions



- **Too many standards, therefore:**
 - Requirements and testing are considered as most important
 - Standards enabling 'free trade' are important
 - Platform level (system), guidelines, management, classified standards (TEMPEST) etc. marked, but not discussed in detail
- **Is it possible to use IEC as reference?**
 - IEC not structured and too limited (now), therefore STANAG as reference, then IEC (a migration to basic IEC standards as the test standard could be possible, on very long term)
- **Maturity STANAGs not sufficient (2004) and progress was slow**
 - Push NATO via participating MoDs
- **STANAGs rarely used for the basic EMC requirements, except for Lightning, ESD, etc; acceptance level was low**
 - Push Industry

2004: Comparing the standards

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Harmonization of U.S. DoD and Civilian E3 Standards Activities of the U.S. Department of Defense

Comparison of Commer

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ENGINEERING PRACTICE STUDY

March 2, 2001

Results Of Detailed Comparisons Of Individual
EMC Requirements And Test Procedures
Delineated In Major National And International
Commercial Standards With Military Standard
MIL-STD-461E



Study Conducted By:
DoD/Industry Electromagnetic
Environmental Effects Standards Committee
(Chaired by DISA/Joint Spectrum Center and
American Standards Committee C63 on EMC)

Stephen Caine
Trint gri.-ctrum Center
s MD, USA

June 1994)

has mandated greater use of performance
'tart' acquisition process. As a result, the
'tary and civilian requirements and to the
area of electromagnetic environmental dards
Committee (DIESC) was established nes to
be addressed and established
and harmonization of existin E³

with a comparison between IL-STD-
n E³ standards.' The comparison is well
etion target date of January, 1998, has been

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mparison.
customers
Shelves rds.

Comparison (Appendix in EG 7 report)



NATO	France	Germany	Poland			United Kingdom	United States	IEC/EN
AECTP 500	GAM EG13	VG 95373	NO-06- A200:1998	NO-06- A500:1998	PN-V- 8410:2002	DEF-STAN 59-41	MIL-STD 461E	Various
NCE01	62C1	LA01	KCE-01	PCE-01	NCE01	DCE01.3	CE101	EN 61000-3-2, but NC
NCE02	62C2	LA02	KCE-02	PCE-02	NCE02	DCE01.3	CE102	EN 55022 etc, NC
NCE03	NE	NE	KCE-03	PCE-03	NE	NE	= CE106	ETSI product standards
NCE04	NE	LA03	NE	NE	NE	= DCE03.3	NE	NE
NCE05	62C3	LA01	NE	NE	NE	= DCE02.3	NE	EN 55022, absorbing clamp, etc., NC
NCS01	63C1	LF01	KCS-01	PCS-01	NCS01	DSC01.3	= CS101	61000-4-11 etc, NC
NCS02	63C2	LF02	KCS-02	PCS-02	NCS02	= DSC03.3	NE	
NCS03	NE	NE	KCS-03	PCS-03	NCS03	NE	= CS103	ETSI product standards
NCS04	NE	NE	KCS-04	PCS-04	NCS04	NE	= CS104	ETSI product standards
NCS05	NE	NE	KCS-05	PCS-05	NE	NE	= CS105	ETSI product standards
NCS06	NE	LF06	KCS-06	PCS-06	NE	NE	= CS109	
NCS07	63C3	LF06	KCS-07	PCS-07	NE	check	= CS114	EN 61000-4-6, differences
NCS08	63C4	LF03, LF04	KCS-08	PCS-08	NE	check	= CS115	
NCS09	NE	NE	NE	NE	NE	check	= CS116	
NCS10	NE	NE	NE	NE	NE	= DSC09.3	NE	
NCS11	NE	NE	NE	NE	NE	= DCS12.3	NE	
NCS12	NE	LF05	NE	NE	NE	= DCS10.3	NE	IEC 61000-4-2
NRE01	62R1	SA01	KRE-01	PKE-01	NRE01	~ DRE02.3	= RE101	IEC-CISPR15, NC
	62R2	SA02	NE	NE	NE			
NRE02	62R3	SA03, SA04, SA05	KRE-02	PRE-02	NRE02	~ DRE01.3	= RE102	EN 61000-6-4 > EN 55011, NC
NRE03	NE	NE	KRE-03	PRE-03	NE	NE	= RE103	NE
NRS01	63R1	SF01	KRS-01	PRS-01	NRS01	DRS01.3	= RS101	EN 61000-6-1 > EN 61000-4-8, 9, 10, NC
	63R2	SF02						
NRS02	63R3	SF03, SF04, SF05	KRS-02	PRS-02	NRS02	DRS02.3	= RS103	EN 61000-6-1 > EN 61000-4-3, EN 61000-4-6, NC
NRS03	national adaption	NE	KRS-03	PRS-03	NE	national adaption	= RS105	IEC 61000-4-25, but not equal
NRS04	NE	NE	NE	NE	NE	= DRS03.3	= 1399 070/2036A	EN 61000-6-1 > EN 61000-4-8, NC

NE: No Equivalent

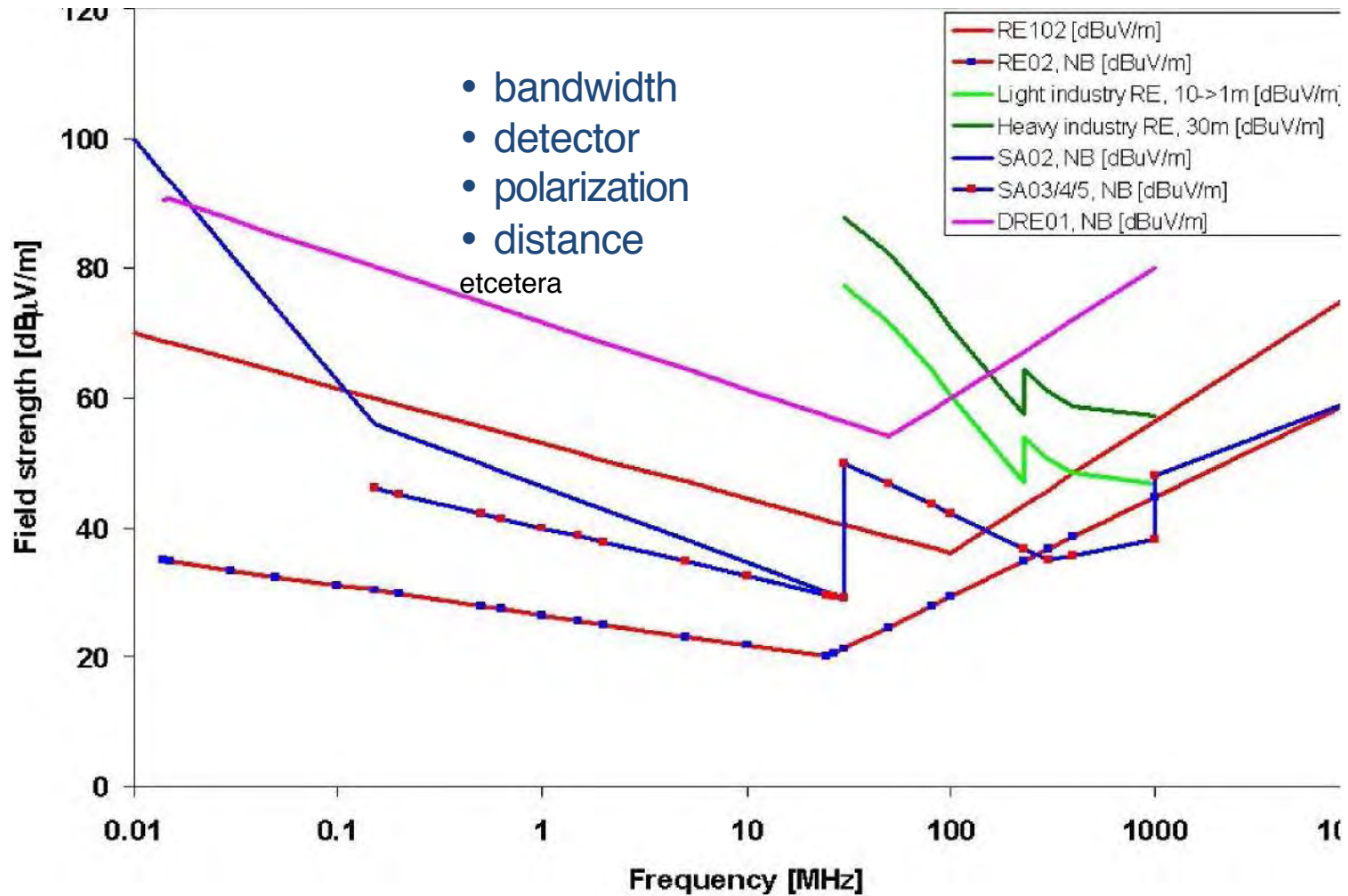
NC: Not Comparable (IEC)

Comparison Appendix in EG 7 r



Comparison of STANAG 4239/ 4235; AOP 24; AECTP 500; EN61000 -4-2 ; and VG 95378/11 Other standards (e.g. IEC, MIL) are not considered, because of their limited use.					
	VG 95378/11 Prove of immunity to disturbance towards EED against ESD	STANAG 4239 Munition Test Procedure, Limits are defined in STANAG 4235	AOP 24 Test Procedure, STANAG 4239 refers to AOP 24	AECTP 500 NSC12 For Munitions testing the test levels and methods in STANAGs 4235 and 4239 shall be applied.	EN 61000-4-2 (IEC) Testing and Measurement technique – ESD Test
Voltage	25 kV	25 kV, 300 kV, see table 2 20, 15, 10, 5; 250, 200, 150, 100, 50, 25		2, 4, 6, 8, 15 kV	2, 4, 6, 8, 15, XkV
Capacitor	500 pF ± 5%	500 pF ± 5%; 1000 pF ± 5%	500 pF ± 5%; 1000 pF ± 5%	150 pF ± 10%	150 pF
Discharge Resistor	5 kΩ ± 5%	500 Ω; 5 kΩ ± 5%, 1 Ω	500 Ω; 5 kΩ ± 5%, 1 Ω	330 Ω ± 10%	330 Ω
Discharge inductance	Defined by pulse shape calibration	< 5 μH; < 20 μH	< 5 μH; < 20 μH		Defined by pulse shape calibration
Measure adapter	2.0 ± 2 %	1.0	1.0	2.0 ± 2 %	2.0
Test	Pin to case and both pins shortened and to case	Air and contact discharge	Air and contact discharge	Air and contact discharge	Air and contact discharge
Polarity	Positive and negative	Positive and negative	Positive and negative	Positive and negative	Positive and negative
Record bridge resistance	Record bridge resistance, before and after test			-	
Number of Samples/ EED	10	See AOP 24	Confidence level defined	See AOP 24	N/A
Number of Test pulses/ Test sequences	5 per Connection	20		20	10
Data Acquisition	75 MHz	100 MHz	100 MHz	1 GHz	1 GHz
Calibration	<u>before, during, after</u>	<u>before and after</u>	<u>before and after</u>	<u>Before</u>	<u>periodic</u>

2004: Comparing the standards



2005: Recommendation



The E3 Expert Group (EG7) concluded

- that no one standard (read: national standard) is better or worse than another in achieving the end goal,
- there are sufficient similarities to STANAG 4370, AECTP to adopt this as the fundamental replacement standard,
- differences between standards are not sufficient to prevent the use of STANAG 4370 AECTPs,
- there is sufficient agreement on NATO-, IEC- and EN produced standards to make worthwhile agreement to use a number of standards as replacement of existing National Standards.

– Approach:

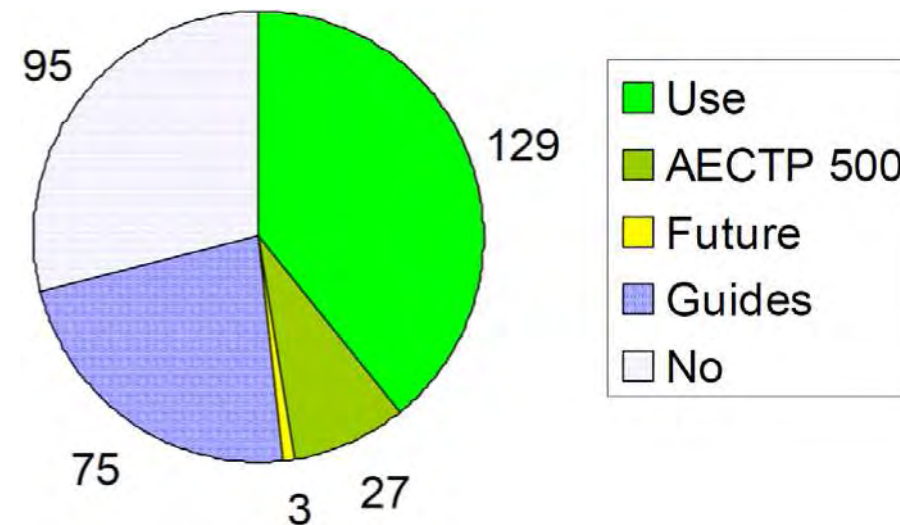
- STANAG (NATO) standards are the reference

– Recommendation and guidance

- **Apply** (EN, IEC, RTCA DO 160, STANAG etc)
- **Guide** (use it as a book on your bookshelf, not in contracts) – **No** (do not use anymore)
- **Future** (if AECTP is complete, this standard can be skipped)

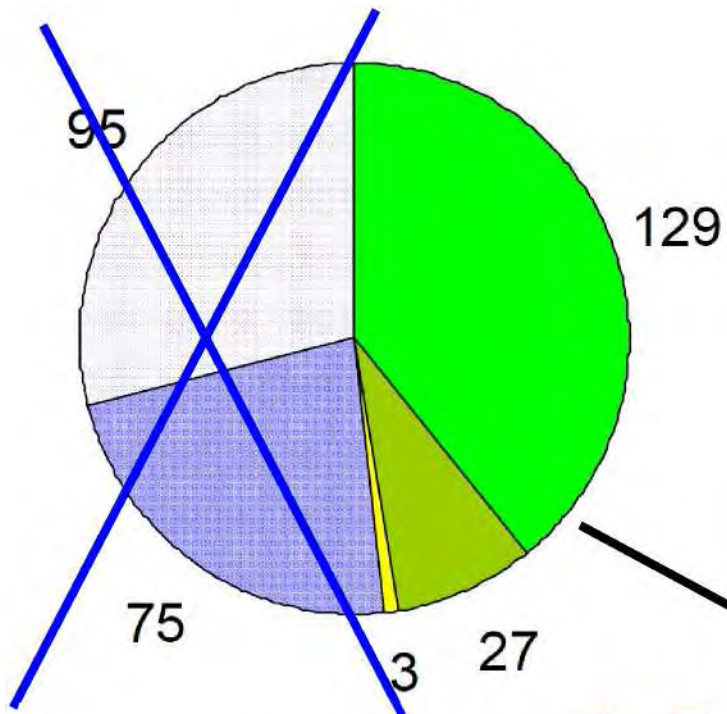
2005 status standards

- 95 E3 standards should not be used anymore
- 75 E3 standard can be used as a guide, but not in contracts anymore
- 27 E3 standards can be replaced by STANAG 4370 AECTP
- 129 E3 standards remained:
 - 49 International civil standards (38 IEC, 8 EN, 3 ISO)
 - 1 aerospace (Eurocae – RTCA)
 - 20 NATO/STANAG, most will be replaced by AECTP250 in the future
 - 59 National defence standards left
 - 33 Germany
 - 14 Poland
 - 7 United Kingdom
 - 3 France
 - 2 United States



2005 status standards

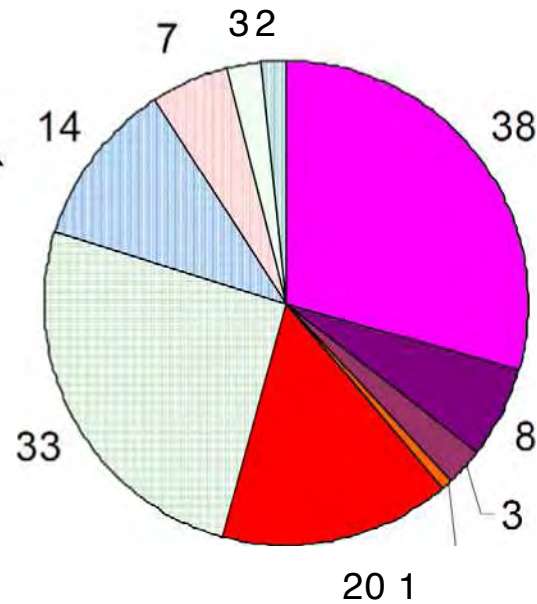
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EI Use
EI AECTP 500
Future
J Guides
No

as civil as possible and
as military as necessary

Phase 1 reduction



- IEC
- EN, ETSI
- ISO III
- RTCA
- NATO
- III GE
- PL
- UK
- FR
- US(MIL)

2005: Recommendations on use of E3 standards



- **Recommendation report:**
 - **Rationale**
 - **Recommendations for users**
 - Use STANAGs for military environments
 - Use IEC, RTCA etc. for other
(but still 70 national standards listed in de European handbook)
 - **Recommendations for standardisation process**
 - **European Defence Agency (or DG Enterprise) should continue activity to create and maintain**
 - Forum, combining industry and MoDs
 - Push towards improvement STANAGs (now! (=2005))
 - Push towards improvement IEC (will reduce costs)
 - Push towards replacement of national standards by STANAG/IEC
 - Take into account new technologies and risks (UWB, spectrum management, intentional EM/ etc.)

Two important EU actions, 1

- **‘Interpretative Communication on the application of Article 296 of the Treaty in the field of defence procurement’, 7 december 2006:**

EMC Directive is also applicable to military equipment

- **CLC/TR 50538 - Guide to EMC Directive conformity of equipment designed for military purposes (2010)**

Two important EU actions, 2

- **‘EU Directive 2009/81/EC
‘On the coordination of procedures for the award of certain works contracts, supply contracts and service contracts by contracting authorities or entities in the fields of defence and security, and amending Directives 2004/17/EC and 2004/18/EC’**
- Preference is given to international standards, above national standards

Standards in the Directive

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3. Without prejudice to either compulsory national technical rules (including those related to product safety) or the technical requirements to be met by the Member State under international standardisation agreements in order to guarantee the interoperability required by those agreements, and provided they are compatible with Community law, technical specifications shall be drawn up:

(a) either by reference to technical specifications defined in Annex III and, in order of preference, to:

- national civil standards transposing European standards,
- European technical approvals,
- common civil technical specifications,

- national civil standards transposing international standards,

- other international civil standards,

other technical reference systems established by the European standardisation bodies, or, where these do not exist, other national civil standards, national technical approvals or national technical specifications relating to the design, calculation and execution of the works and use of the products,

- civil technical specifications stemming from industry and widely recognised by it, or,

- the national 'defence standards' defined in point 3 of Annex III and defence materiel specifications similar to those standards,

UROPEAN DEFENCE

NDARDS Every reference shall be followed by the expression 'or equivalent';

CEN Standard for Selection of Standards (C-A-,,

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EUROPEAN STANDARD EN 16341

NORME EUROPEENNE

EUROPAISCHE NORM March 2012

ICS 95.020

English Version

Selection of standards and standard-like documents for defence products and services - Order of preference

Selection de normes et de documents normatifs destinés Auswahl von Normen und anderen normartigen
aux produits et services de la Défense - Ordre de Documents für wehrtechnische Produkte und
preference Dienstleistungen - Rangfolge

This European Standard was approved by CEN on 11 February 2012.

2009-2010: Phase 3: upgrade

- Several other Expert Groups did not deliver complete reports
- Expert Group 7 (EMC) had many recommendations
‘future upgrades are necessary’

Upgrade in 2010, Phase 3

- **Members Expert Group 7**
 - 9 countries (FR, UK, GE, NL, SW, FI, PO, IT, TU)
 - 35 members, + 1 secretary –
14 MoD’s
 - 21 industry
- **Review of data base in detail**
 - updates of standards (gaps, updates)
 - reduction of number national standards

But: many new or upgraded national standards!! From 329 to 420 And: NATO STANAG 4370 AECTP is mature!

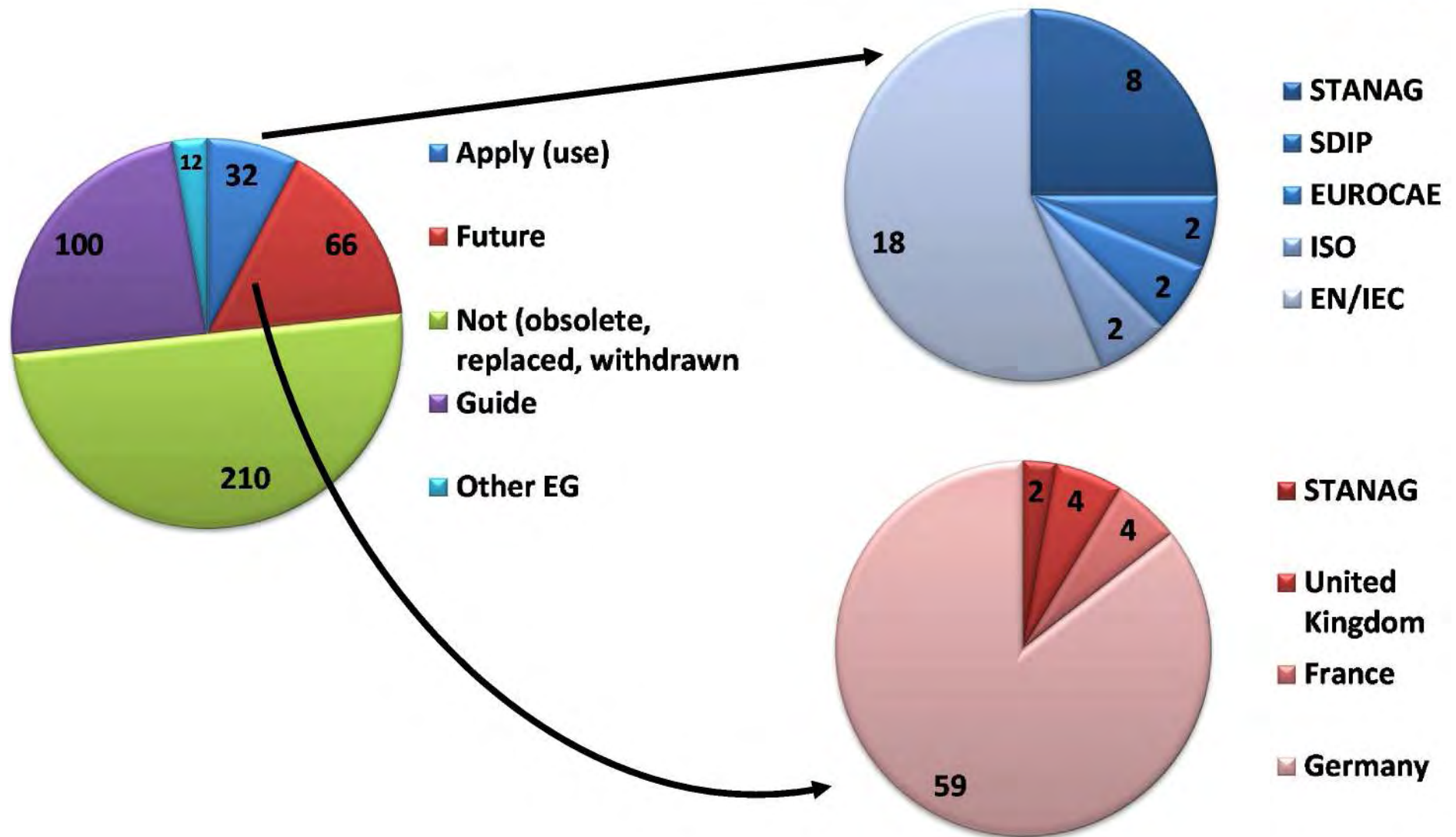
Risks, difficulties

- **Still focus on national standards by some Experts**

- **Solution:**
 - **Improve the STANAG 4370 AECTP**
 - System level testing
 - Better rationale in some standards (as in VG)
 - **Use the category: Future**

- **The category 'Future', although initially not allowed, was accepted, because after upgrade of the AECTP these standards could be also removed from the list of preferred standards**

Phase 3 reduction, 2010



Results CEN WS10, Phase 3, 2012



- **Database delivered, for implementation in the European Defence Standards Reference (EDSTAR) (earlier: European Handbook for Defence Procurement)**
EDSTAR is hosted and maintained by EDA
- **Report delivered, giving guidance**
 1. Introduction
 2. Scope and limitations
 3. Standards for electromagnetic environmental effects
 4. Reduction Process
 5. Recommendations for best practice
 6. Recommendations for standardisation process
 7. Conclusions

Conclusion CEN WS10, Phase 3, 2010



- **Guidance on standards:**
 - **Military Environment: STANAG 4370 AECTP series**

 - **Other environments:**
 - **Aerospace: EUROCAE (~RTCA)**
 - **Space: ESA ECSS-E-ST-20-07C**
 - **Civil: IEC/EN**
 - **Telecommunication: ETSI**
 - **Automotive: ISO/EN**
 - **Etc.**

Environment: intended operational environment!

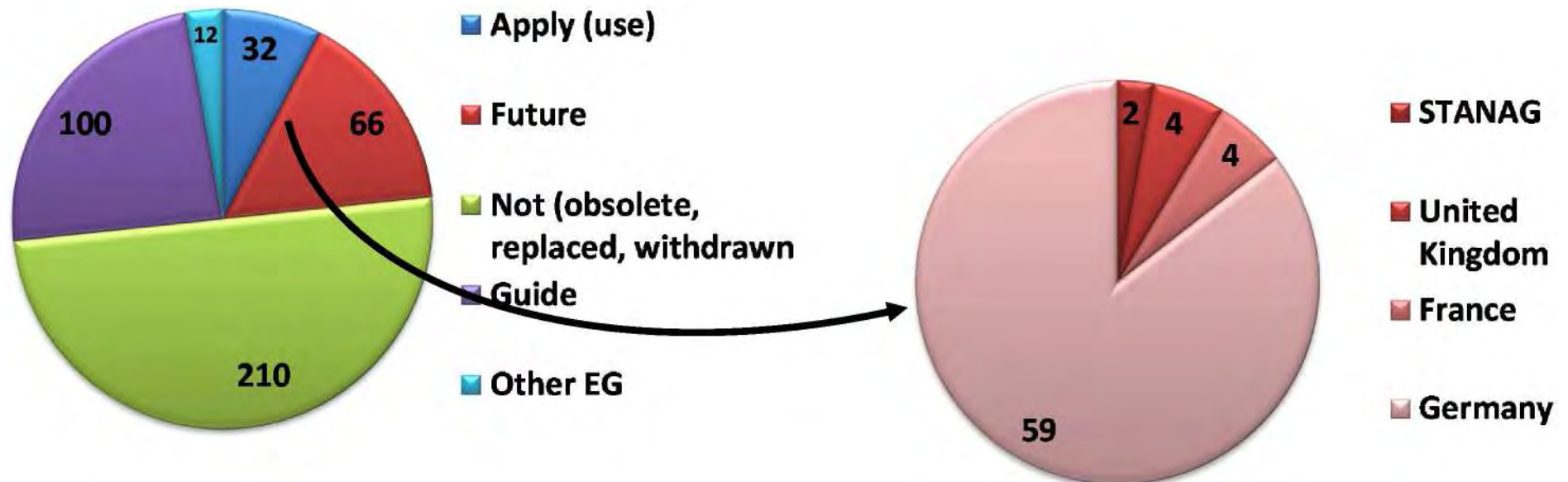
Task, Phase 4, 2015



- **The Joint Maintenance Committee for EDSTAR recommended to start the review process of the Best Practice Standards referenced in EDSTAR database as soon as possible, with a **deadline** (i.e results expected) in **September** 2016 at the latest.**
- **The clear mission is**
 - to produce Change Requests if minor changes are identified and/or
 - reactivation of the entire EG if further developments are needed.
- **The **aim** is either**
 - to reconfirm the references or
 - to reduce the EDSTAR database

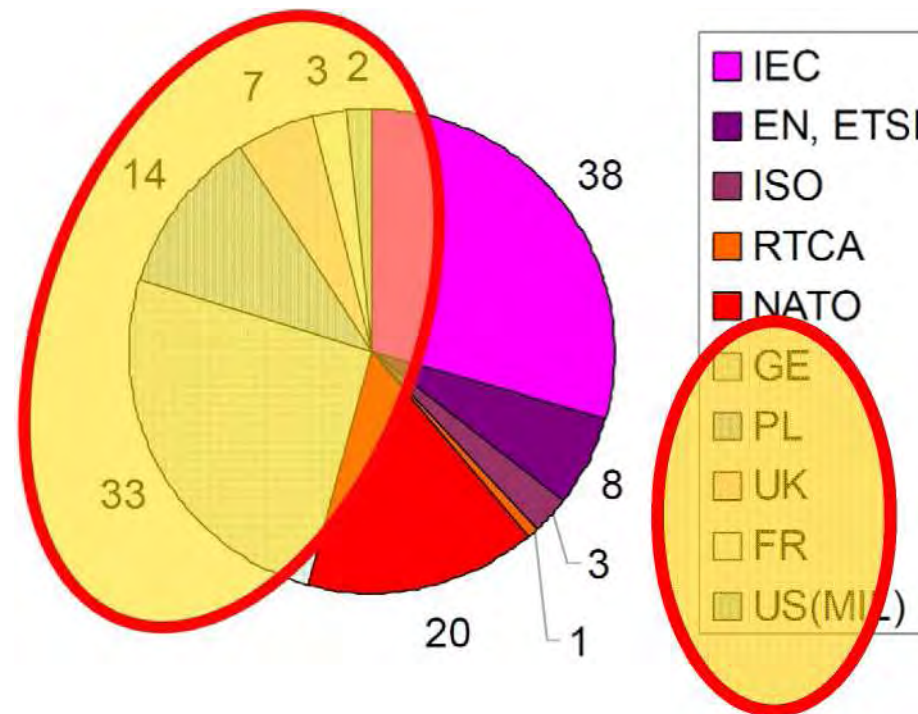
Phase 4: 2015

- Check if current standard in database are up to date
- Check if the AECTP is of sufficient quality so that we can drastically reduce the “F” in the EDSTAR database
- If not, what should be done to update the AECTP



2016

- **Publication of AECTP 500 in January 2016**
- **Now: does this new version cover everything, so we can now change the “Future” parts?**



2016



<https://edstar.eda.europa.eu/home>



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EDSTAR

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[History](#)

Welcome to the European Defence Standards Reference System (EDSTAR) containing references to "Best practice" standards and "standard-like" specifications. The "Best practice" standards are standards which have been selected by consensus by industry and governmental organisations to be the best applicable standards for defence purposes.

Who are the main users / customers that are supposed to use EDSTAR? They mainly belong to the following two categories:

a) For members of Project Teams in national governmental procurement authorities or in multinational Project Teams / procurement agencies etc.

EDSTAR provides support in order to select the most appropriate standards and "standard-like" documents ("Best Practice Standards") when deciding upon technical specifications.

b) For members of Project Teams in defence industries

EDSTAR also provides support in order to assist with the selection of the most appropriate standards and "standard-like" documents ("Best Practice Standards") when drafting specifications for their sub-contractors.

Beside references to the Best Practice Standards, EDSTAR also provides detailed "Best Practice Recommendations" for the application of the recommended standards in a number of Technical Domains.

Users are invited to provide their suggestions for improving EDSTAR's functionality and website as well as suggestions for the inclusion of new Technical Domains. For any suggestion, please use the [Change Request Form](#) which can be downloaded from the Library and send your Change Requests by email to edstar@eda.europa.eu.

Only users from the Ministry of Defence administrations of EDA participating Member States can register at <https://www.eda.afnor.org> to download standard documents referenced in EDSTAR and to get access to a general standard search engine.

