



NATO JOINS FORCES WITH IEEE

First Standard Transfer Ever

**NATO to a Civilian Standards Organization:
Some Lessons Learned**

DMSMS & Standardization Conference

Orlando, FLA

23 October 2009

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OUTLINE



1. Personnel Safety Standards for Electromagnetic Fields
2. Why Use Civil Standards?
3. The Transition From NATO to Civil Standards Process
4. Selection Of Standards Developmental Organization
5. Lessons Learned
6. Way Ahead



WHY DOD and NATO NEED EMF SAFETY STANDARDS?



- Military are the world's largest users
 - 1000s of emitters & anti-electronic devices
 - Many unique to the military
 - Some classified
- Well known bioeffects
 - Thermal effects
 - Electrical effects (Shock, Electro-Stimulation)
- Hazards are the reason for safety standards!



ELECTROMAGNETIC SAFETY ACQUISITION REQUIREMENT




USD (AT&L)

*“shall Integrate EMF protection principles into DoD acquisitions and USD(AT&L) strategic planning. For those systems that have the potential to expose personnel to EMF above the action levels, manage the risk pursuant to DoDI 5000.02 (Reference (g)) **for all phases of the system life cycle.**”*

**DoDI 6055.11 Protecting Personnel from
Electromagnetic Fields, 19 Aug 2009**

Based on Institute of Electrical and Electronics
Engineers standards C95.1 and C95.6

	Department of Defense INSTRUCTION
	NUMBER 6055.11 August 19, 2009 USD(AT&L)
SUBJECT: Protecting Personnel from Electromagnetic Fields	
References: See Enclosure 1	
1. PURPOSE. This Instruction:	
a. Reissues DoD Instruction (DoDI) 6055.11 (Reference (a)) in accordance with the authority in DoD Directive (DoDD) 5134.01 (Reference (b)) and the guidance in DoDD 4715.1E (Reference (c)) to update policy, responsibilities, and procedures for protecting personnel from exposure to electromagnetic fields (EMFs) from 0 to 300 gigahertz (GHz).	
b. Removes laser content, which is covered in DoDI 6055.15 (Reference (d)).	
c. Establishes the DoD Transmitted EMF Radiation Protection (TERP) Working Group to provide technical guidance and recommend policy on EMF safety and health matters within the Department of Defense in accordance with DoDI 6055.1 (Reference (a)).	
d. Establishes the DoD EMF Injury Hotline.	
e. Expands guidance to include exposure to EMFs from 0 to 3 kilohertz (kHz) in accordance with the American National Standards Institute/Institute of Electrical and Electronics Engineers (IEEE) C95.6-2002 (Reference (f)).	
2. APPLICABILITY. This Instruction:	
a. Applies to the OSD, the Military Departments, the Office of the Chairman of the Joint Chiefs of Staff and the Joint Staff, the Combatant Commands, the Office of the Inspector General of the Department of Defense, the Defense Agencies, the DoD Field Activities, and all other organizational entities in the Department of Defense (hereafter referred to collectively as the "DoD Components").	
b. Applies to DoD operations, activities, and installations worldwide, including Government-owned, contractor-operated facilities and non-DoD activities operating on DoD installations.	



NATO RADIO FREQUENCY RADIATION SAFETY STANDARD



Standardization Agreement (STANAG) 2345: *“Evaluation and Control of Personnel Exposure to Radio Frequency Fields – 3kHz to 300 GHz”* 2003

- Designated “**Essential STANAG**”
- USA Custodian 1993-present
- Based on IEEE C95.1
- Last revision 13 Feb 2003
- Triennial review: reaffirm, revise, cancel
- Revision stalled due to proposed EU Worker Safety Directive

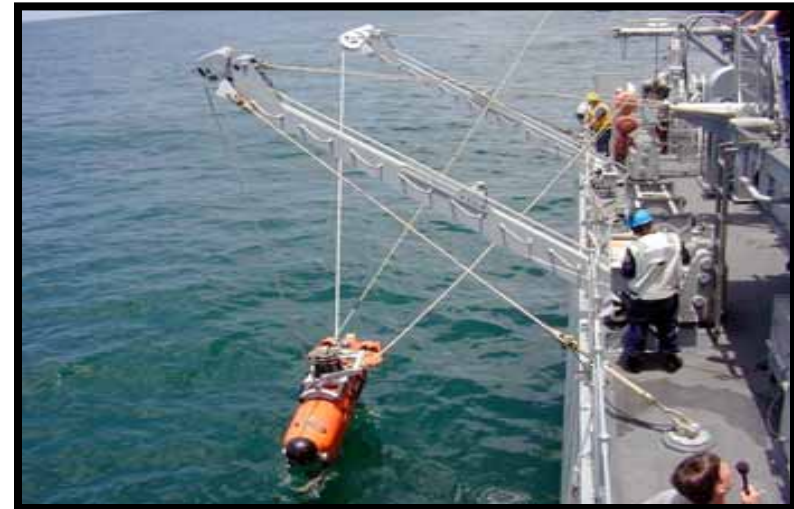




INTEROPERABILITY THREATENED BY PROPOSED EU DIRECTIVE



- Survey of NATO nations showed **operational impact** from new EU Worker Safety Directive action limits on contact currents
- Operations impacted (non-mitigatable)
 - HF communications often lasting 6 – 8 hrs
 - Vertical replenishment operations
 - **Man-Overboard & Search-And-Rescue**
 - Ship to ship supply transfers
 - Fuel transfer
 - Armaments test and transfer
 - **Entire deck of ship “off limits”**

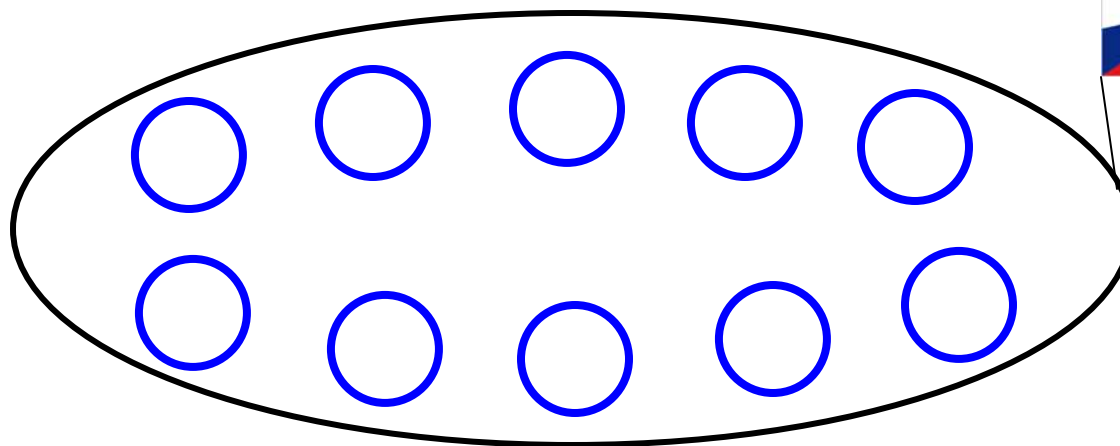




EXCLUSION ZONES AT 100mA



HNLMS Oblong



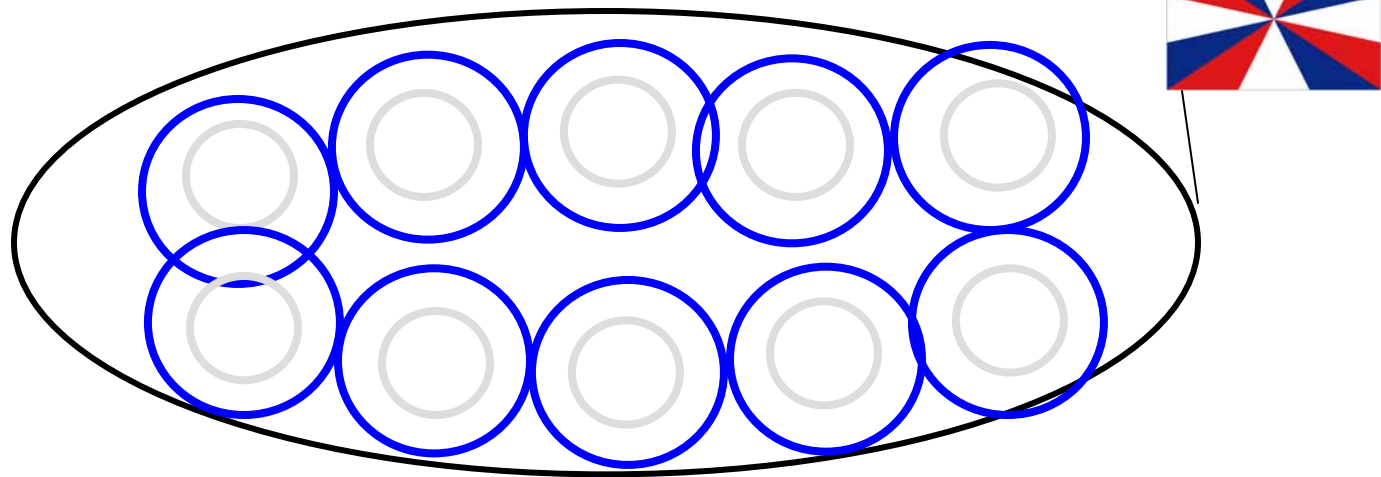
Representation of Measurements on Netherlands frigate



EXCLUSION ZONES AT 40mA



HNLMS Oblong



Representation of Measurements on Netherlands frigate

No space on deck is open to workers! A new risk to safety



SHIFTING RISKS CREATING NEW RISKS



Sorry. EU Directive doesn't permit man overboard operations during HF transmission.

We have to protect our personnel you know.

Can you wait 8 hours?

However in reality.....



NONCOMPLIANCE SLIPPERY SLOPE



**Of course Man Over-Board
Operations are underway !!!**

(even it EU Directive doesn't
permit man overboard
operations during HF
transmission)

**We have to protect our
personnel you know.**

Thank

Ignoring One Safety Standard Will Lead To Ignoring Others



EUROPEAN WORKER STANDARDS



- Most EU nations are already working to the “action levels” in [Directive 2004/40/EC](#)
- USA,CAN and some Non-EU Nations military unlikely to adopt similar standard
- EU and Non-EU cooperation needed for [interoperability](#)
- Possible NATO - EU coordination in the civil standards area
- **NATO Civil Initiative**



NATO CIVIL STANDARDS INITIATIVE



- Use suitable civil standards to the maximum practicable extent
- Develop NATO standard only when no applicable civil standard is available
- Promote existing NATO standards to civilian use
 - Make available to a maximum number of users
 - In accordance with NATO security rules
- Promote interoperability

NATO/EAPC(NCSREPS)D(2006)0001)



DRIVERS FOR MILITARY USE OF CIVIL STANDARDS



- The Perry Memo: Perry, William J. *"Specifications and Standards – A New Way of Doing Business"* DoD Memorandum. 29 June 1994.
- Office of Management and Budget (OMB) Circular No. A-119 (Revised), *"Federal Participation in the Development and Use of Voluntary Consensus Standards and in Conformity Assessment Activities"* February 10, 1998.
- Public Law 104-113, The National Technology and Transfer and Advancement Act of 1995
- DoD 4120.24M *"DoD Standardization Program (DSP) Policies and Procedures"*, March 9, 2000
- NATO Framework For Civil Standards (C-M(2004)0009)
- *"Participation in Non-Governmental Standards Bodies is a 'good business model'"* G. Saunders DSP Journal Jan/Mar 2009.



BENEFITS OF “GOING CIVIL”



- Reduction in cost of maintaining standards
- Leverage resources
- Avoid duplication of effort: *Don't remake the wheel*
- Gain access to wider spectrum of standards
- Make available to a maximum number of users
- Remain abreast of industry advancements
- Use the experts: SDOs focus on drafting standards



NATO CRITERIA FOR STANDARDS DEVELOPMENTAL ORGANIZATION



- Develop standards that are widely recognized and used in NATO and PfP Nations
- Use **Open, Transparent, Consensus** procedures
- Use due process in adjudication of comments or complaints from materially affected parties
- Develop standards that are relevant to NATO standardization requirements
- Be recognized as developing standards of high technical quality and global relevance



CHRONOLOGY OF 1ST-EVER TRIAL OF NATO STANDARD TRANSFER



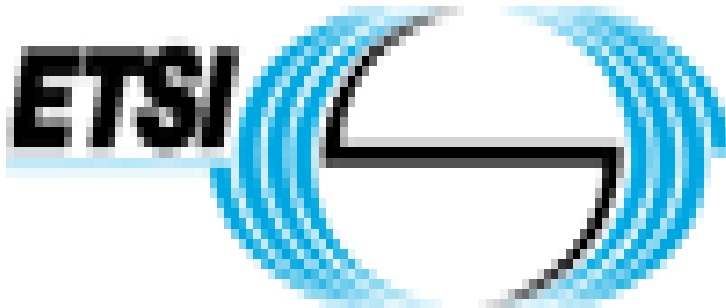
- Sep 07: Initial meeting Custodian & Civil Standards Coordinator
- Oct 07: European Committee for Electrotechnical Standardization Comité Européen de Normalisation Electrotechnique (CENLEC) contacts NSA and offers to form partnership
- Dec 07 and Mar 08: NATO - CENELEC exploratory meetings
 - CENELEC suggests it is only EU authorized SDO for EMF
- Custodian wants to skip marketing survey
- Chairman of NATO Civil Standards Management WG wants to follow trialing plan and “***establish the track record***”.
- May 08: **CENELEC: “Cannot set exposure limits”**
 - **Lesson Learned: follow the entire plan, no short cuts**



NATO Standardization Agency Technical Cooperation Agreements



American National Standards Institute



**Technical
Cooperation
Agreement not a
firm requirement**



CHRONOLOGY OF TRANSFER TRIAL



- June 08: First Market survey limited to SDOs with Technical Cooperation Agreements (TCA)
- July 08: Response not sufficient
- Sep 08: Second survey: IEEE included at Custodian request
- Oct 08: Two SDO respond: IEEE and International Electrotechnical Commission (IEC)
 - **Second Lesson Learned:**
 - Include Custodian or Technical Expert in each step
 - Technical experts are usually informed on SDOs
 - **IEC also prohibited from setting exposure limits**
 - **Third Lesson Learned:** Most appropriate SDO may not have a TCA



IEEE/ICES SELECTION FACTORS



- IEEE/ICES operates under the extensive rules, requirements, and audit procedures of the IEEE Standards Association to ensure **openness, transparency** and due process at every level
- **IEEE/ICES only SDO that has charter for setting EMF exposure limits and assessment**
- Members of ICES participated in previous editions of NATO STANAG 2345 as well as AFRL directed NATO Advanced Research Workshops on RF standards
- Chair of IEC TC106; Secretary of IEEE/ICES; IEEE Board
- Chair NATO NSA CSMWG; IEEE Board of Governors



IEEE/ICES SELECTION FACTORS



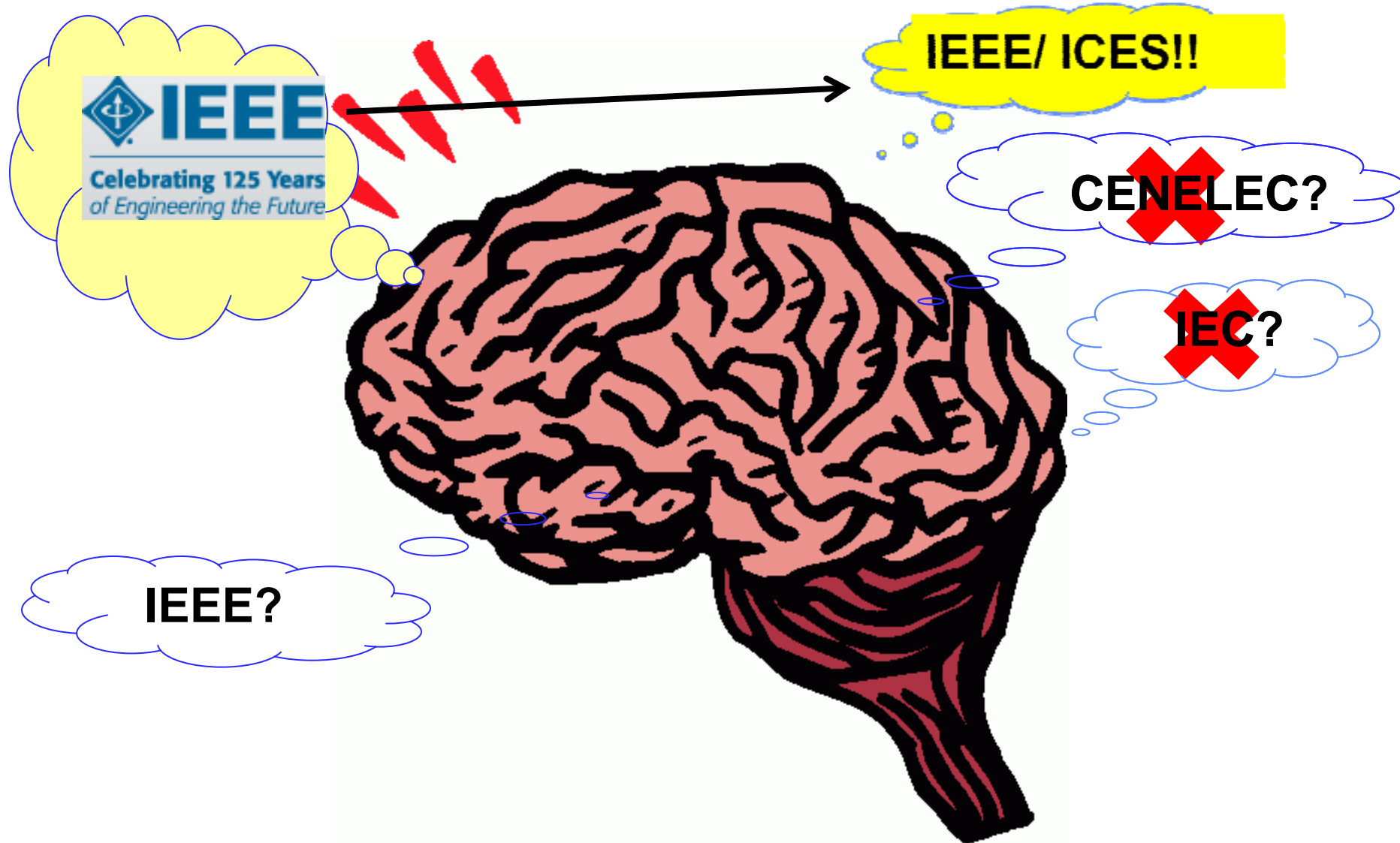
- IEEE International Committee on Electromagnetic Safety (ICES) operates under the extensive rules, requirements, and audit procedures of the IEEE Standards Association to ensure **openness, transparency and due process** at every level
- ICES meets NATO requirements for **openness and consensus**
- ICES members participated in prior editions of STANAG 2345 and NATO Advanced Research Workshops on RF standards
- Chair of IEC TC106 is also Secretary of IEEE/ICES high frequency subgroup and a member of the IEEE Board

The Bottom Line

IEEE/ICES: The only Civil Standards Developmental Organization that has a charter to set EMF exposure limits



A NO BRAINER!

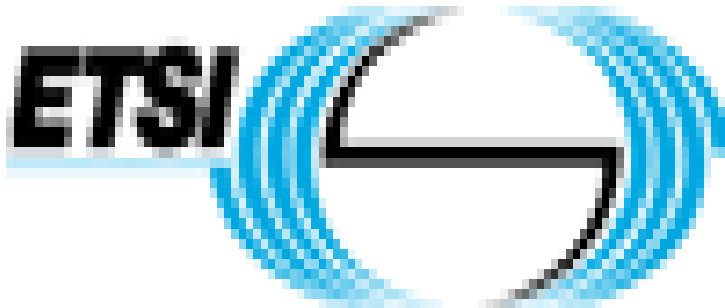




NATO Standardization Agency Technical Cooperation Agreements



American National Standards Institute





NATO PRESS RELEASE: TECHNICAL COOPERATION AGREEMENT WITH IEEE



Standardization Agency

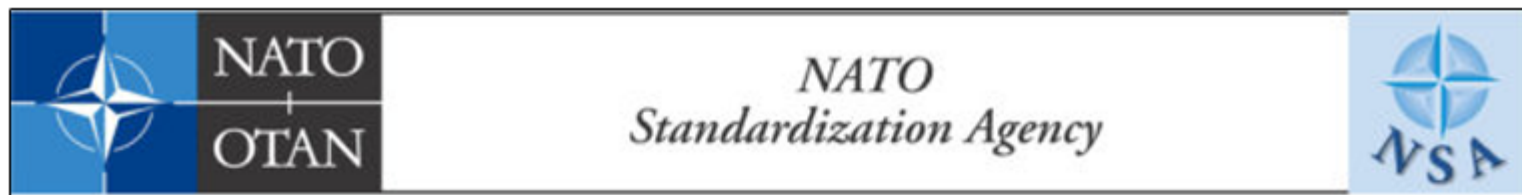


NATO Standardisation Agency (NSA) and the Institute of Electrical and Electronics Engineers (IEEE) Standards Association signed a Technical Cooperation Agreement (14 May, 2009).

- Share knowledge of standards development activities
- Avoid duplication whenever possible
- Exchange information about standards development activities in the [electrical, electronics, computer, and related fields](#).
- Exchange technical data and information regarding standards, standards development and standards revisions in areas related to [human health and safety](#)
- [Covers all IEEE standards](#)



TECHNICAL COOPERATION AGREEMENT NSA-IEEE SIGNED



**TECHNICAL COOPERATION AGREEMENT
SIGNING BETWEEN THE NSA AND IEEE - 14 MAY 2009**



FIRST TRANSFER OF A STANDARDIZATION AGREEMENT



Technical Cooperation Agreement
between the
Institute of Electrical and Electronics
Engineers, Incorporated
(IEEE)
and the
NATO Standardization Agency
(NSA)

*"I am very glad to establish this new relationship with IEEE, which constitutes the basis for the very first transfer of a NATO STANAG to a civil Standards Developing Organization," said Vice Admiral Juan A. Moreno, Director NSA. "For the **first time in NATO's 60 year-old history, a STANAG will be converted into a civil standard that will meet civil and military requirements.**" NATO News 15 May 2009*

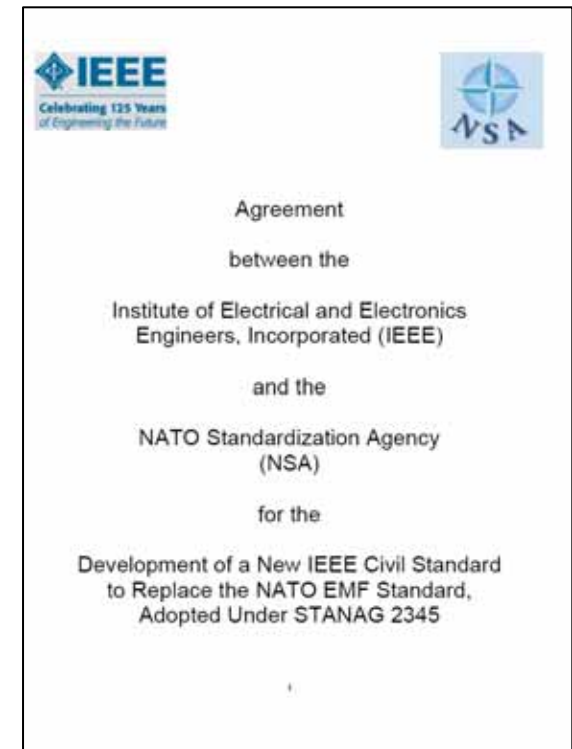


SPECIFIC AGREEMENT BETWEEN NATO AND IEEE



“New IEEE Military Workplace Standard” signed 30 July 2009

- IEEE shall develop, maintain, revise, and update a new IEEE **military workplace standard** that will address normative military occupational/workplace-specific exposure limits to electric, magnetic and electromagnetic fields
- Seven pages, 24 Sections
 - Introduction
 - General Provisions
 - **Grant and Reservation of Rights**
 - Outline of Action Plan





THE NATO STANDARDS TRANSFER PROCESS



- Selection of NATO standardization documents for transfer Done
- Market survey (1st Jun 08, 2nd Sep 08) Done
- SDO response (1 Oct 08) and selection of the SDO (22 Jan 09) Done
- Technical Cooperation Agreement (14 May 2009) Done
- Specific Agreement for standard (1 August 2009) Done
- SDO accepts NATO standard Done
- SDO forms technical group (1st meeting 22-23 July 2009) Done
- Revise or draft new (expected in 9 months)
- Publish (additional year)
- NATO adoption / recognition of civil standard (6-12 months)



ACCELERATED PROGRESS IN 2009



2009

- 22 Jan: NATO Medical WG approved transfer to IEEE
- 24 Apr: Delegated Tasking Authority, Medical Board approves
- 14 May: Technical Cooperation Agreement NSA-IEEE signed
- 30 Jul: Specific Agreement with IEEE signed
- 22-23 Jul : 1st meeting of IEEE TC95 NATO Working Group
- 10 Sep: Project Authorization Request (PAR) to IEEE New Standards Committee (NesCom)
- 28-29 Sep: 2nd meeting of IEEE TC95 NATO Working Group

2010

- 13-15 Jan : 3rd meeting of IEEE TC95 NATO Working Group



WAY AHEAD FOR TRANSITION OF STANDARD UNDER STANAG 2345



- SDO Technical Committee coordinates with the Custodian
- Custodian coordinates with other NATO subject matter experts
- SDO publishes the “New IEEE Military Workplace Standard”
- Nations subject matter experts determine if the standard meets NATO requirements (and National requirements)
- Custodian, on behalf of the Tasking Authority (TA), works to develop a document to formally adopt the civil standard.
- The NATO Standardization Agency supports the development of the adoption notice/document
- TA (Custodian) develops a covering STANAG 2345
- NATO nations ratify/agree to the document, and NSA promulgates the document



DOOR OPENED FOR NATO INVOLVEMENT IN EU COMMISSION



- 3 Feb 09: Director NATO Standardization Agency letter to EU
 - Requests NATO participation in EC Directive review
 - Cites potential impacts to military operations and interoperability and safety concerns
- 18 Feb 09: Custodian invited brief to EU Commission WG; Ljubljana, SLO
- 21 Apr 09: Director General European Union Commission invites NATO to participate in future stakeholder meetings
- 9 July 09: Briefing on impacts to EU Commission WG: Luxembourg, LUX
- 6-8 Oct 09: Umea, SWE: Invited guest speaker to EU Presidency Conference on electric and magnetic fields (EMF) worker safety



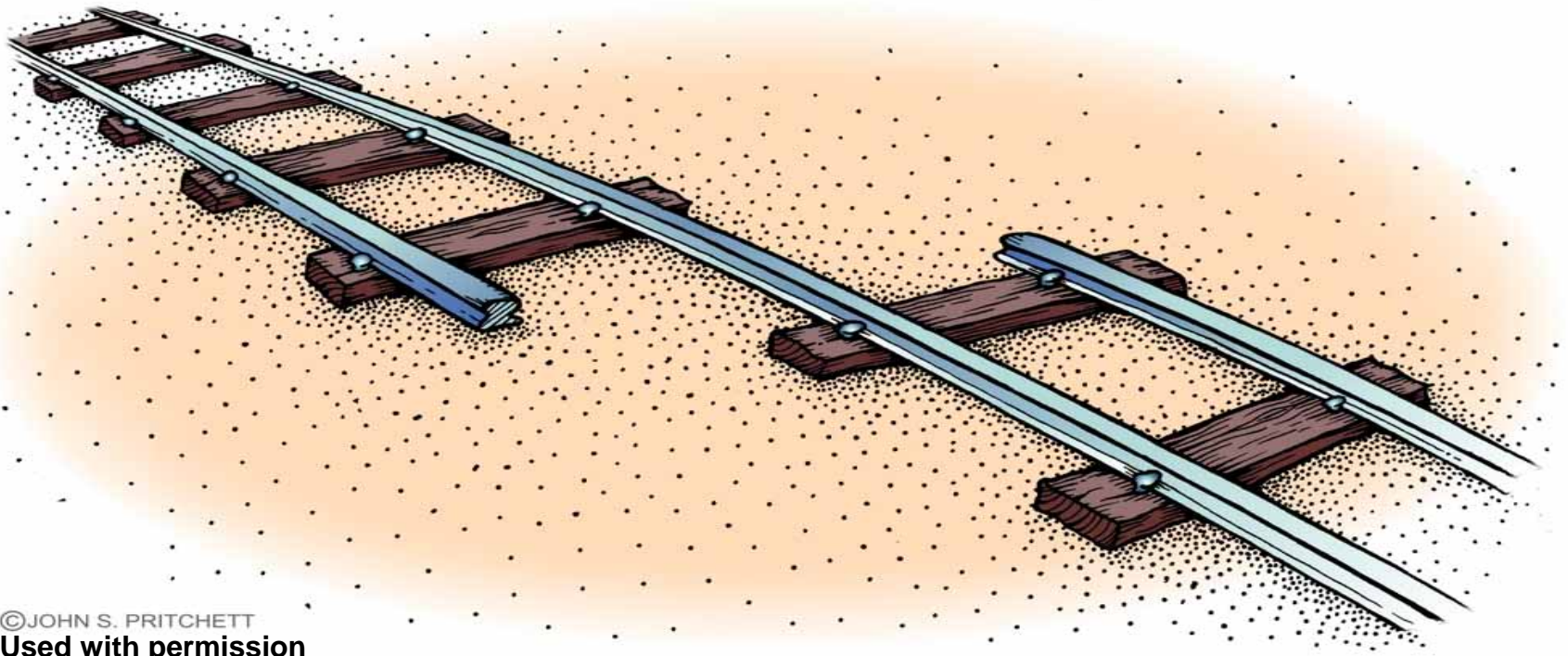
SUMMARY



- Medical Standards Board approves transfer to IEEE
- Technical Cooperation Agreement NATO/IEEE signed
- Specific Agreement signed
- IEEE working group formed
- NATO custodian on IEEE TC95 NATO Working Group
 - DoD on editorial working group for new IEEE C95.1
 - NATO standard template for new IEEE C95.1
 - IEEE C95.1 basis by reference for DoDI6055.11, **21 Aug 09**
- EU Commission invites NSA to working group: A Door Opened
- New IEEE Mil Standard in 9-12 months
- Transfer-conversion ON TRACK



EU and Non-EU Standards Harmonization?



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Close..... But Work Still to Be Done for Interoperability



QUESTIONS?



Thank you for your attention!

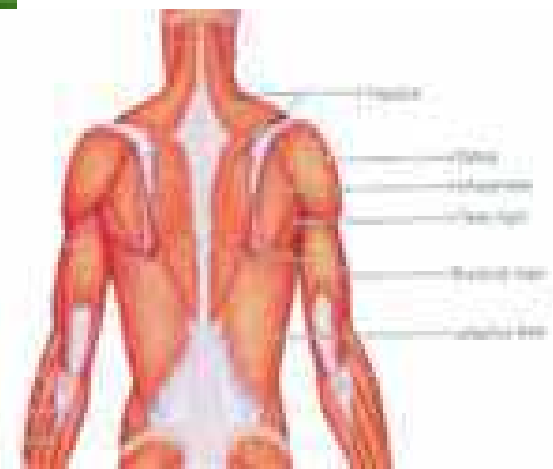
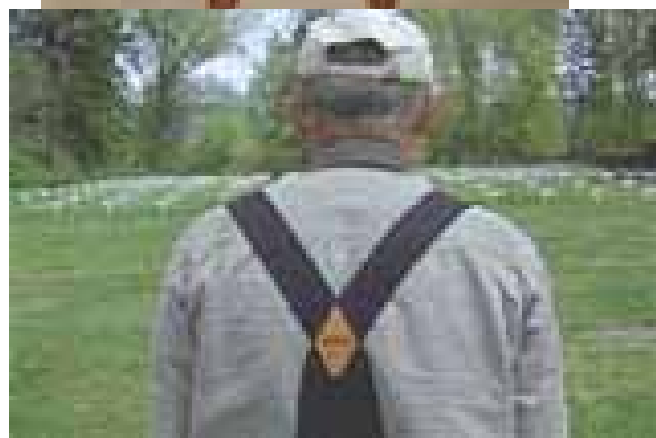


**???????R ?
QUESTIONS**

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BACK-UPS





INCLUSION OF MILITARY RELEVANT NEEDS



*“If not totally suitable: **include defence needs** in the body of the civil standard or as an Annex;”*

*“If not totally suitable: include **military options or ‘grading’** to cover defence needs in the Civil Standard.”*

NATO/EPAC (NCSREPS)D(2007)0001

“...there are circumstances that require unique defense specifications and standards because of the nature of the system and in these cases a “defense unique standard” may be the better option...”

G. Saunders, NATO Policy on Civil Standards, 7 Mar 2009