Recent Trend of TC 77 and its Subcommittees

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Outline

- Overview of TC 77: Scope, Structure, and Officers
- IEC 61000 Series (EMC Publications)
- Electromagnetic Environment
- Generic EMC Standards
- Generic Immunity Standards
- EMC and Functional Safety
- Recent Topics of TC 77 and Its Subcommittees
TC 77 Scope

- Standardization – to prepare standards, technical specifications and technical reports in the field of electromagnetic compatibility (EMC), with particular emphasis on general application and use by product committees and the electrical industry (Horizontal function)

- The scope covers the following aspects of EMC:
  - Immunity and related items, over the whole frequency range: basic and generic standards;
  - Emission in the low frequency range (f ≤ 9 kHz, e.g. harmonics and voltage fluctuations): basic, generic and product (family) standards;
  - Emission in the high frequency range (f > 9 kHz): disturbances not covered by but in co-ordination with CISPR (e.g. mains signalling).
TC 77 Structure

- **TC 77**
  Generic immunity standards, the description/classification of electromagnetic environments, and functional safety.

- **SC 77A: Low frequency phenomena**
  Low frequency phenomena (f ≤ 9 kHz).

- **SC 77B: High frequency phenomena**
  High frequency continuous and transient phenomena (> 9 kHz).

- **SC 77C: High power transient phenomena**
  To protect civilian equipment, systems and installations from threats by man-made high power transient phenomena including the electromagnetic fields produced by nuclear detonations at high altitude (High Altitude Electromagnetic Pulse (HEMP)) and sources of Intentional Electromagnetic Interference (IEMI).
TC 77 Structure

- Membership

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- Chairman’s Advisory Group (CAG)
  - Membership
    - Chairmen and secretaries of TC 77 and its subcommittees
    - Chairman and secretary of CISPR
    - Technical officers
  - The last CAG meeting in Ottawa in September 2013.
TC 77 Officers

TC 77

- Hiroyuki Ohsaki, chairman
  -- Ex officio ACEC member
- Klaus-Peter Bretz, secretary
- Bernd Jäkel, assistant secretary
- Pierre Sebellin, technical officer

Subcommittee officers

- SC 77A: Emmanuel De Jaeger – chairman
  Hervé Rochereau - secretary
  -- ACEC member
- SC 77B: Luis Nuño – chairman
  Franck Gruffaz - secretary
  -- ACEC member
- SC 77C: William A. Radasky – chairman
  Richard Hoad – secretary
  -- ACEC member
  Albert Fernandes – assistant secretary
  -- ACEC member
IEC 61000 Series (EMC Publications)

- EMC Standards
  - Basic EMC Standards
  - Generic EMC Standards
  - EMC Product Standards

- IEC 61000 Series
  - Part 1: General
  - Part 2: Environment
  - Part 3: Limits
  - Part 4: Testing and measurement techniques
  - Part 5: Installation and mitigation guidelines
  - Part 6: Generic standards
  - Part 9: Miscellaneous
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Electromagnetic Environment

IEC/TR 61000-2-5 am1 Ed.2.0 (2011-5-26)

Environment - Description and classification of electromagnetic environments

Working Group: TC 77/WG 13

IEC/TR 61000-2-5

- introduces the concept of disturbance degrees and defines these for each electromagnetic phenomena;
- classifies into various location classes and describes them by means of attributes;
- provides background information on the different electromagnetic phenomena that may exist within the environment, and
- compiles tables of disturbance levels for electromagnetic phenomena that are considered to be relevant for those location classes.
Environment - Description and classification of electromagnetic environments

- Maintenance

- Continuous updates of IEC/TR 61000-2-5 due to the likely future changes in the electromagnetic environment.

- EMC issues related to electric vehicles, LTE, digital dividend and smart grid should be considered.

- The conducted electromagnetic environment in the frequency range 2 to 150 kHz should be examined more closely.

- The description of electromagnetic environments in the IEC 61000-2 series shall be aligned in a better way.
## Generic EMC Standards

<table>
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<th>Generic EMC Standards</th>
<th>Emission</th>
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The IEC's Generic EMC standards are for products operating in a particular EMC environment but for which no specific EMC standards yet exist. They are in effect general and somewhat simplified EMC Product standards. ([http://www.iec.ch/emc/](http://www.iec.ch/emc/))
Generic Immunity Standards

- IEC 61000-6-1 Ed. 2.0 (2005-03-09)
  
  *Electromagnetic compatibility (EMC) - Part 6-1: Generic standards - Immunity for residential, commercial and light-industrial environments*

- IEC 61000-6-2 Ed. 2.0 (2005-01-27)
  
  *Electromagnetic compatibility (EMC) - Part 6-2: Generic standards - Immunity for industrial environments*

- IEC/TS 61000-6-5 Ed. 1.0 (2001-07-24)
  
  *Electromagnetic compatibility (EMC) - Part 6-5: Generic standards - Immunity for power station and substation environments*

✓ It is intended to be converted into an International Standard. To be revised into IEC 61000-6-5 Ed. 1.0.
EMC and Functional Safety

- **IEC/TS 61000-1-2 Ed. 2.0 (2008-11-27)**
  
  *General - Methodology for the achievement of functional safety of electrical and electronic systems including equipment with regard to electromagnetic phenomena*
  
  ✓ To provide guidance relating to the achievement of functional safety of electrical or electronic systems exposed to electromagnetic disturbances.
  
  ✓ The next edition is to be published as International Standard.

- **IEC/TS 61000-6-7 Ed. 1.0**
  
  *Generic standards - Immunity requirements for safety-related systems and for equipment intended to perform functions in a safety related system (functional safety) in industrial environments*
  
  ✓ To be used by suppliers when making claims for the immunity of equipment intended for use in safety-related systems against electromagnetic disturbances.
  
  ✓ CDV in October 2013
Recent Topics of TC 77

TC 77 Last Meeting
- In Ottawa, Canada on 23 - 27 September 2013 with CISPR and TC106
- TC 77 Plenary Meeting on 27 September 2013 (Attendance: 20 P-members)

Some specific items
- Coordination in the frequency range 2 to 150 kHz
- Terminology used in TC 77 and the EMC field, and problems related to it.

The next meeting will be in September or October 2015.
Recent Topics of SC 77A

- Conducted disturbances 2 – 150 kHz
  - SC 77A/WG 8
  - To be presented by Mr. Hervé Rochereau

- Maintenance of publications
  - Harmonic limits for LV equipment ≤ 16 A per phase (IEC 61000-3-2 Ed. 4.0 to be published soon)
  - Electromagnetic immunity and emission requirements for dispersed generation in LV networks (IEC/TR 61000-3-15 Ed. 1.0, 2011-09)
  - New TR project on power factor in single phase systems under non-sinusoidal conditions
  - Voltage fluctuations, LF immunity tests, power quality measurement, etc.
Recent Topics of SC 77B

- Maintenance of publications
  - Radiated, radio-frequency, electromagnetic field immunity test (IEC 61000-4-3 Ed. 3.2, 2010-04)
  - Immunity to conducted disturbances, induced by radio-frequency fields (IEC 61000-4-6 Ed. 4.0, 2013-10)
  - AC mains ports broadband conducted disturbance immunity test (IEC 61000-4-31 Ed. 1.0 CD)
  - Radiated fields in close proximity - immunity test (IEC 61000-4-39 Ed. 1.0 CD)
  - Surge immunity test (IEC 61000-4-5 Ed. 3.0, 2014-05)
  - Impulse magnetic field immunity test (IEC 61000-4-9 Ed. 2.0 CD)

- Joint Task Force with CISPR/A
  - TEM waveguide (IEC 61000-4-20)
  - Reverberation chambers (IEC 61000-4-21)
Recent Topics of SC 77C

**Recent publications**

- Testing and measurement techniques - HEMP immunity test methods for equipment and systems (IEC 61000-4-25 am1 Ed. 1.0, 2012-03)

**Work programs**

- Test methods for protective devices for HEMP and other radiated disturbances (IEC 61000-4-23 Ed. 2.0)
- Test methods for protective devices for HEMP conducted disturbance (IEC 61000-4-24 Ed. 2.0 CD)
  - To define a specific test method for combination HEMP power filters
- IEMI immunity test methods for equipment and systems (IEC 61000-4-36 Ed. 1.0 CDV)
  - To develop immunity test methods for a variety of IEMI threat waveforms
- Guide to the Application of HEMP and IEMI Publications
The overview of TC 77, electromagnetic environment, generic immunity standards, and EMC and functional safety, and the relevant EMC publications were introduced.

Recent topics of TC 77, SC 77A, SC 77B, SC 77C were presented.

TC 77 and its subcommittees continue to prepare, review and maintain standards, technical specifications and technical reports in the field of EMC, to keep them current, and to introduce new deliverables reflecting the need of new technologies, changes in the electromagnetic environment, etc. in coordination with CISPR and ACEC.
THANK YOU