IEC TC 31 Standards update

IECEx 2018
International Conference
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8th and 9th August 2018
INTRODUCING

- Mark COPPLER
- Sr. Product Certification Specialist
- DNV GL
Presentation

- IEC and its publications
- TC 31 History
- TC 31 Structure
- Work in process
- Strategic plan
- Recent developments
- Information resources
IEC: In the beginning
St. Louis 1904: palace of electricity

Officially formed in 1906 – Lord Kelvin the first IEC President. Formed to serve needs of industry.

VISION - Worldwide use of IEC standards and conformity assessment systems as the key to international trade.
IEC Membership

P - Members - Voting countries
O - Members – Observer countries

Delegates and Experts are qualified and assigned by the National Committees of the member countries.

If interested - contact your National Committee
Two Pillars of the IEC Organization

- Standards Development and Maintenance
- Conformity Assessment to relevant Standards
IEC Publications

- **International Standard (IS)**
  A document, established by consensus and approved by IEC, that provides, for common and repeated use, rules, guidelines or characteristics for activities or their results, aimed at the achievement of the optimum degree of order in a given context
  \[\geq \frac{2}{3} \text{ vote in favor by TC/SC P-members}\]
  \[\leq \frac{1}{4} \text{ negative vote from all IEC members voting}\]

- **Technical Specification (TS)**
  Published when:
  The subject is still under technical development.
  Insufficient consensus for approval of an IS is available.
  There is doubt that consensus has been achieved.
  Other reason precluding immediate publication of an IS.
  \[\geq \frac{2}{3} \text{ vote in favor by TC/SC P-members voting}\]
IEC Publications

- **Publicly Available Specification (PAS)**
  
  Publication responding to an urgent market need, to speed up the standardization in areas of rapidly evolving technologies. Dual logo publication with an external organization. No conflict with existing ISs by committee concerned. Has a limited period of validity.

  **Approved by simple majority of TC/SC P-members voting**

- **Technical Report (TR)**

  Informative document
  
  Data of a different kind, e.g. Scientific supporting material, Data collection.

  Results of surveys. State of the art.

  Supplementary information or explanation.

  **Approved by simple majority of TC/SC P-members voting**
WORLD Standards Development Organizations
ITU - International Telecommunication Union
ISO - International Organization for Standardization
IEC - International Electrotechnical Commission

Electrotechnical standards $\rightarrow$ IEC, the rest $\rightarrow$ ISO

Standards for equipment for hazardous areas $\rightarrow$ TC 31

Intrinsic safety $\rightarrow$ SC 31G

Area classification and installation $\rightarrow$ SC 31J

Non-electrical, protective systems & quality systems $\rightarrow$ SC 31M
TC 31 History

• **Established 1948**
  To develop explosion protection techniques for Electrical equipment in explosive atmospheres (gases, vapors and mists)

• **Expanded**
  - classification, installation requirements
  - combustible dusts
  - non-electrical equipment

• **Current membership**
  - 40 P - Members (Voting countries)
  - 11 O - Members (Observer countries)
IEC TC 31 Standards adoption

- Widely adopted throughout the world
- Some National Deviations

- Basis for local, regional & International certification (IECEx)

- Used by multinational companies & mfrs. supplying products to the world.

TC 31 and IECEx in the IEC Structure
IEC/TC 31 EQUIPMENT FOR EXPLOSIVE ATMOSPHERES

Scope: To prepare and maintain international standards relating to equipment for use where there is a hazard due to the possible presence of explosive atmospheres of gases, vapours, mists or combustible dusts.

TC 31
Chair: Mark Cooper (US)
Secretary: Nick Magson (GB)
P-Members: 40
Q-Members: 11

SC 31G
Intrinsically-safe apparatus
Chair: Manfred Kaiser (CH)
Secretary: Martin Kleva (HR)
Scope: To prepare and maintain international standards relating to intrinsically-safe apparatus and systems for use where there is a hazard due to the possible presence of explosive atmospheres of gases, vapours, mists or combustible dusts.

SC 31J
Classification of hazardous areas / Installation requirements
Chair: Niall Darmody (IE)
Secretary: Mervyn Reytas (HR)
Scope: To prepare and maintain international standards relating to the use of equipment in hazardous areas, installation requirements, inspection and maintenance, repair, overhaul and replacement of electrical and electronic apparatus for use where there is a hazard due to the possible presence of explosive atmospheres of gases, vapours, mists or combustible dusts.

SC 31M
Non-electrical equipment and protective systems for explosive atmospheres (developing ISO/IEC double logo Ex standards)
(See separate poster)

MT60079-30
Joint MT with IEEEElectrical resistance trace heating

MTs
00079-11
00079-25

MTs
00079-10-1
00079-10-2
00079-13
00079-14
00079-17
00079-18

PT
00079-39

WGs
00079-11

WG 4
Spark less apparatus

WG 1
Underground Mines

JWG 31J
Intrinsically safe

Other IEC TC Liaisons
TC 2: Rotating Machinery
TC 18: Electrical installations of ships and of mobile and fixed offshore units
TC 27: Industrial electrosilicating and electromagnetic processing
SC 05A: Industrial-process measurement, control and automation - System aspects
SC 05B: Industrial-process measurement, control and automation - Measurement and control devices
TC 101: Electrotechnics
TC 102: Fuel cell technologies
TC 106: Insulation coordination
SC 12A: Low-voltage switchgear & controlgear

Some significant matters:
- Operating since 1948
- Only TC with ISO/IEC subcommittee
- First TC to develop a Good Working Practice (approved by SMB and copied by other TCs)
- Use of “horizontal working groups” (e.g., motors, electrosilicating, luminaires)
- Work on aspect of anti-corrosion
- Significant worldwide adoption of standards
- Parallel listing of standards in Europe and elsewhere.

ISO TC liaisons:
ISO/TC 46 - Rubber and rubber products
ISO/TC 87/SC 8 - Materials, equipment & offshore structures for petroleum, petrochemical & natural gas industries - Arctic operations
ISO/TC 197 - Hydrogen technologies

TC 31 Standards
Issued: Equipment: 20
Material Test & Data: 2
Area Classification: 2
Installation: 3
Inspection: 1
Repair: 1
Other: 3
Quality: 1

New under development:
Equipment: 8

Good Working Practice Document

Sectoral initiative on explosive environments equipment
TC 31 Existing publications

Electrical equipment standards:

- IEC 60079-0 General requirements
- IEC 60079-1 Flameproof enclosure Ex d
- IEC 60079-2 Pressurization Ex p
- IEC 60079-5 Powder filling Ex q
- IEC 60079-6 Oil immersion Ex o
- IEC 60079-7 Increased safety Ex e
- IEC 60079-11 Intrinsic safety Ex i
- IEC 60079-13 Pressurized room Ex p
- IEC 60079-14 Electrical installation
- IEC 60079-15 Non-Incendive Ex n
- IEC 60079-16 Analyzer Houses
- IEC 60079-17 Inspection & Maintenance
- IEC 60079-18 Encapsulation Ex m
- IEC 60079-19 Repair, Overhaul and Reclamation
- IEC 60079-25 Intrinsically safe systems
### TC 31 Existing publications

#### Electrical equipment standards:

<table>
<thead>
<tr>
<th>Standard</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>IEC 60079-26</td>
<td>Equipment w/Protection Level Ga</td>
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<tr>
<td>IEC 60079-28</td>
<td>Optical radiation</td>
</tr>
<tr>
<td>IEC 60079-30-1</td>
<td>Trace heating General &amp; testing reqmts</td>
</tr>
<tr>
<td>IEC 60079-30-2</td>
<td>Trace heating design, installation &amp; maint.</td>
</tr>
<tr>
<td>IEC 60079-31</td>
<td>Dust ignition protection by enclosure &quot;t&quot;</td>
</tr>
<tr>
<td>IEC 60079-33</td>
<td>Special protection 's'</td>
</tr>
<tr>
<td>IEC 60079-35-1</td>
<td>Caplights for mines - General reqmts</td>
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<tr>
<td>IEC 60079-35-2</td>
<td>Caplights – Performance &amp; Safety</td>
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<tr>
<td>IEC TS 60079-39</td>
<td>Intrinsically safe systems with electronically controlled spark duration limit (Power I)</td>
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<tr>
<td>IEC TS 60079-32-1</td>
<td>Electrostatic hazards, guidance</td>
</tr>
<tr>
<td>IEC TS 60079-40</td>
<td>Process sealing</td>
</tr>
<tr>
<td>IEC TS 60079-43</td>
<td>Adverse Service Conditions</td>
</tr>
<tr>
<td>IEC TS 60079-46</td>
<td>Equipment assemblies</td>
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<tr>
<td>IEC 60079-32-2</td>
<td>Electrostatics hazards – Tests</td>
</tr>
</tbody>
</table>
TC 31 Existing publications

Area Classification standards:

- IEC 60079-10-1  Zone Area classification – Gas
- IEC 60079-10-2  Zone Area classification – Dust

Non-Electrical standards:

- ISO/IEC 80079-20-1  Materials - gas & vapour classification
- ISO/IEC 80079-20-2  Material characteristics - Combustible dusts test methods
- ISO/IEC 80079-34  Ex Quality Systems
- ISO/IEC 80079-36  Non-electrical equipment - Basic method and requirements
- ISO/IEC 80079-37  Non-electrical equipment - Type of protection constructional safety "c", control of ignition source "b", liquid immersion "k"
- ISO/IEC 80079-38  Equipment and components in underground mines
TC 31 Existing publications
Gas Detection standards:

IEC 60079-29-1 Flammable Gas detectors Performance requirements
IEC 60079-29-2 Flam. Gas detectors Selection, installation, use & maintenance
IEC 60079-29-3 Guidance on functional safety of fixed gas detection systems
IEC 60079-29-4 Performance requirements of open path detectors
## Work in process

<table>
<thead>
<tr>
<th>Document</th>
<th>Description</th>
<th>Stage</th>
<th>Projected Pub.</th>
</tr>
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<tbody>
<tr>
<td>IEC 60079-2 Ed. 7.0</td>
<td>pressurized enclosure &quot;p&quot;</td>
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<td>“o” higher voltages</td>
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<td>IEC 60079-44 Ed. 1.0</td>
<td>Personal Competence</td>
<td>CD</td>
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<tr>
<td>IEC 60079-45 Ed. 1.0</td>
<td>Ignition systems IC engines</td>
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<td>2021-03</td>
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<tr>
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<td>Toxic Detector Performance</td>
<td>TFDIS</td>
<td>2019-03</td>
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<td>IEC 62990-2 Ed. 1.0</td>
<td>Toxic Detector guide</td>
<td>CD</td>
<td>2020-02</td>
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<tr>
<td>IEC 62990-3 Ed. 1.0</td>
<td>O2 Detector Performance</td>
<td>NP</td>
<td></td>
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</tbody>
</table>
TC 31 Strategic Plan

A. STATE TITLE AND SCOPE OF TC
Are there any new or emerging trends in technology that will impact the scope and work activities of the TC? Please describe briefly.

Do you need to update your scope to reflect new and emerging technologies? If yes, will these changes impact another TC’s scope or work activities?

If yes, describe how these will impact another TC(s) and list the TC(s) it would impact.

IEC TC 31 Equipment for explosive atmospheres
Scope
TC 31 - To prepare and maintain International standards relating to equipment for use where there is a hazard due to the possible presence of explosive atmospheres of gases, vapours, mists or combustible dusts.

B. MANAGEMENT STRUCTURE OF THE TC
Describe the management structure of the TC (use of an organizational chart is acceptable) (should be integrated by CD automatically); and, if relevant (for example an unusual structure is used), provide the rationale as to why this structure is used.

Note: Check if the information on the IEC website is complete.

When was the last time the TC reviewed its management structure? Describe any changes made. When does the TC intend to review its current management structure? In the future, will the TC change the current structure, for example due to new and emerging technologies, product withdrawal, change in regulations, etc. Please describe.

Make sure the overview includes:
- any joint working groups with other committees,
- any special groups like advisory groups, editing groups, etc.

IEC/TC 31 has three subcommittees:
- SC 31/G Intrinsically-safe apparatus
- SC 31/J Classification of Hazardous Areas and installation requirements
- SC 31/M Non-electrical equipment and protective systems for explosive atmospheres

The committee TC 31 was established in July 1968 to address the need to develop techniques for ensuring electrical equipment would not provide an explosion risk when used in explosive atmospheres involving gases, vapours and mists. The scope has been progressively expanded to include classification, installation requirements and combustible dusts. Most recently the scope has been expanded to include non-electrical equipment as a joint ISO/IEC development.

Over the more than 60 years of its operation there have been a variety of sub-committees established and disbanded when changes have occurred to working procedures and priorities.
TC 31 Strategic Plan

Trends in Technology

• Functional Safety
• Very cold environments
• Cells & batteries
• Luminaries
• Safety devices / explosion risk
• “Power-i”
• Non-electrical equipment
• High Power
• Refrigerants
• Assemblies & Skids
TC 31 Strategic Plan

Completed Objectives

- Publish first IEC/IEEE standards for electrical resistance trace heating
- Provide summary & significance of changes
- Promote UNECE CROs incorporating adoption of TC 31 standards
- Develop standards for certification of assemblies

In-process & New objectives

- To continually improve the effectiveness and relevance of TC 31
- Investigate the issues associated with the influence of environmental factors in adverse service conditions
- Broader coverage & integration of requirements Group I
- Inclusion of gas detection standards for toxic gases and oxygen within the IEC 60079-29 series
Recent Developments

TC 31 New publications

• IEC 60079-0 ed7 - 12/2017  Equipment - General requirements
• IEC 60079-15 ed5 - 12/2017  Equipment protection type "n"
• IEC 60079-18 amd1 - 8/2017  Encapsulation "m“ dielectric test
• IEC TS 60079-43 ed1 - 11/2017  Equip. in adverse service conditions
• IEC TS 60079-46 ed1 - 8/2017  Equipment assemblies
• ISO/ IEC 80079-20-1 ed1 - 12/2017  Material characteristics gas/vapor
Info Resources - TC 31 Dashboard

Thank you

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