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**July 2024**

**INTERNATIONAL ELECTROTECHNICAL COMMISSION (IEC) SYSTEM FOR CERTIFICATION TO STANDARDS RELATING TO EQUIPMENT FOR USE IN EXPLOSIVE ATMOSPHERES (IECEx SYSTEM)**

**Circulated to: IECEx Management Committee members**

**Title: Report from ExMC WG19 – Application of IECEx to the Hydrogen Economy**

**Introduction**

IECEx Working Group, ExMC WG19 was formed following decision 2021/26 and has continuously worked to position IECEx as a key figure for international conformity assessment within the Hydrogen Economy. ExMC WG19 continues to work closely with other institutions including ISO TC 197 “Hydrogen technologies”, IEC TC 105 “Fuel Cells”, the Hydrogen Council, IRENA (International Renewable Energy Association and AFID (Alliance for Industrial Decarbonisation). Such work has involved:

* Original development and issue of the IECEx Scheme Document, OD 290 to provide harmonisation in IECEx Certification of H2 equipment, components and systems
* The development and successful running of the 2024 IECEx International Hydrogen Conference in Singapore on 28 May 2024
* Monitoring and updating of IECEx OD 290.

As part of its on-going activities, ExMC WG19 held a face to face meeting on 30 May 2024 in conjunction with the 2024 IECEx Hydrogen Conference to progress with the revision and updating of OD 290.

This document provides ExMC with a copy of the report of the 30 May 2024 WG19 Singapore meeting and will be further supplemented by a presentation of the work undertaken and continuing within WG19 during the September 2024 ExMC Meeting.

Members are requested to consider the 4 Recommendations contained within the report:

Recommendation 1 – New Terms of reference

Recommendation 2 – Use of the term Low Emission Hydrogen

Recommendation 3 – Endorsement of the Revised edition of OD 290

Recommendation 4 – Up issuing of IECEx Certificates of Conformity to the latest requirements of OD 290

**IECEx Executive Secretary**

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**INTERNATIONAL ELECTROTECHNICAL COMMISSION SYSTEM FOR CERTIFICATION TO STANDARDS RELATING TO EQUIPMENT FOR USE IN EXPLOSIVE ATMOSPHERES (IECEx System)**

**Meeting of IECEx ExMC Working Group WG19 – Hydrogen Technologies**

**held on Thursday 31st May 2024**

**08:30am to 16:00pm**

**Meeting Location: Concorde Hotel Meeting Room**

**100 Orchard Rd, Singapore 238840**

**MEETING REPORT + AGENDA**

Main object of the meeting was to consider a Draft for the revision of IECEx Operational Document, OD 290, as prepared by the Task Team – re agenda item 5.

**Revised Meeting report issued to included updated Revised draft for OD 290 and addition of Annex A – Items to be raised with ISO TC 197**

**Attendance:**

**Thorsten Arnhold** Convener, Stahl, DE

**Paul Meanwell**, IECEx Chair, ZA

**Katy Holdridge**, IECEx Vice Chair, UL Solutions, US

**Xu Jianping**, IECEx Treasurer, NEPSI, CN

**Tetsufumi Ikeda**, ISO TC 197 Chair, HysSUT, JP

**Andrei V Tchouvelev**, ISO TC 197/SC1 Chair, Hydrogen Council, CA

**Martin Thedens**, IEC TC 31 Chair, PTB, DE

**Jim Munro**, IECEx ExAG Convener, Jim Munro Compliance, AU

**Frank Lienesch**, IECEx ExTAG Chair, PTB, DE

**Marty Cole**, Hubbell, CA

**Qi Lingyi**, Warom, CN

**Lu Qiao** (Lucy), CQM, CN

**Jeff Strath,** CTE, AU

**Klauspeter Graffi**, TUV Rheinland, DE

**Kevin Wolf,** Intertek, US

**Hidenori Tomioka**, HySUT, JP

**Minari Kogane**, TIIS, JP

**Sungmi Jung**, TIIS, JP

**Ulrick Jacobs**, TUV SuD Product Service, DE

**Rob Kohuch**, QPS, CA

**Chris Agius**, IECEx Secretariat

**Geoff Slatter**, IECEx Secretariat

1. **Opening and Welcome,** by Dr Thorsten Arnhold, WG19 Convener

Welcome and introductions

The Convener welcomed members to the meeting and extended a special welcome to experts and Officers of ISO TC 197 and its SC1.

The meeting noted apologies.

1. **WG19 Terms of Reference**

To review Terms of Reference, previously established to start the WG19 work.

The meeting took a discussion and reviewed the current title and ToR of WG19 and agreed to propose the new Title and ToR above in the text box below.

**Current:**

Title: Application of IECEx to the Hydrogen Economy

ToR: To consider the business case for integrating Standards (including ISO and IEC), associated with the Hydrogen Economy into the IECEx System for reporting to the IECEx Executive and if accepted prepare IECEx Scheme documents for approval by the ExMC

**Proposed Revision:**

**Title:** Hydrogen Technologies

**ToR**: Reporting to the ExMC on IECEx matters relating to coverage of Equipment, Systems, Services and Competence of Persons associated with Hydrogen, including the development and maintenance of IECEx Scheme documents dedicated to Hydrogen Energy Technologies and systems under direction from the IECEx ExMC and in consultation with other IECEx Committees, WGs and stakeholder groups.

**RECOMMENDATION 1: That the ExMC accept the proposed new Tittle and Terms of Reference.**

1. **Actual situation in the countries regarding Hydrogen**

Short reports from the WG members

This item was covered during the discussion under item 4.

1. **Feedback from the 2024 IECEx International Hydrogen Conference**

A recap over the 2024 IECEx International Hydrogen Conference held the day prior, 29th May 2024 Singapore:

* Key issues raised
* Items for WG19 to consider that are not already being addressed
* Status on development of International Standards, eg ISO 19880-2

The meeting noted the information presented during yesterday’s IECEx 2024 Conference in Singapore but also noted various initiatives from various countries, noting the importance of promoting the existing standards and conformity assessment services and structures that are currently in place within IEC and ISO. The meeting did note that many of the issues discussed during yesterday’s conference are in line with the current work of this WG19 but did note the message from the IEC TC 105 Chair presentation regarding closer cooperation with and use of the use of IECEx in fuel cells and agreed to have a focus on TC 105 standards and activities.

In addition, the meeting charged the Convener and Secretary to meet with the IEC TC 105 Officers to explore and elaborate on the items raised during the TC 105 Chair’s presentation.

**ACTION: That the WG19 Convener and Secretary meet with the TC 105 officers to elaborate on matters raised during the TC 105 Chair’s presentation at the Singapore 2024 IECEx Hydrogen Conference.**

The meeting also noted the references during the conference to “*Low Emission*” Hydrogen as opposed to colour coding that have been noted in other fora. The meeting agreed to use the reference to Low Emission Hydrogen as opposed to using colour coding.

**RECOMMENDATION 2: That the ExMC accept use of the term “Low Emission” Hydrogen as opposed to colour coding that maybe be used in other discussions.**

1. **Report from Task Team on OD 290 Revision – Dr Jim Munro**

To receive a report on work undertaken within the Task Team to prepare a proposed Draft Revision of OD 290.

The meeting is asked to consider the draft Revision of OD 290, inserted below, with a view to prepare a version for submission to the IECEx Management Committee for their approval during the September 2024 IECEx annual meeting.

**Document for consideration:**

* ExMC WG19-015A – Draft revision of OD 290

The meeting undertook a detailed review of a draft revision to OD 290 as prepared by the WG19 Task Team agreeing to focus the current revision on the application of OD 290 to gaseous hydrogen dispensing equipment with a further review of OD 290 for application to Fuel Cells and IEC TC 105 standards.

Following a detailed review and changes made the WG19 meeting agreed to present a revised version of OD 290 for submission to the ExMC for approval.

As part of the discussions, the meeting agreed to delete the Marking/Label test from the draft OD as this is covered by IEC 60079-0.

**RECOMMENDATION 3: That the ExMC agree with the draft revision for OD 290 as finalised during the WG19 Singapore meeting and agreed to proceed to ExMC Voting via correspondence.**

In arriving at this decision the meeting noted the value in moving forward with a revised version sooner rather than later as this updated draft version is better aligned with the expected version of ISO 19880-2 that should be published in due course, noting that the current draft for ISO 19880-2 while being issued for voting, may require a further version depending on comments received at the voting stage.

The meeting also noted that conveying the value of this latest revised Draft OD 290 to the broader ExMC Membership and requested that the Secretariat and Task Team Leader prepare an explanatory introduction when issuing the draft for ExMC Ballot Voting.

The version that was concluded during the meeting is attached below.



**ACTION: Secretariat to format the Draft agreed during the meeting and issue to ExMC for voting via correspondence.**

1. **Status of Operational Document IECEx OD 290 and Supporting Documents**

Status report and discussion concerning the application of IECEx OD 290 and consideration of any adjustments to IECEx OD 290 or supporting documents, namely

* Technical Capability Document, TCD
* IECEx Standard Test Report form IEC 60079-46 + OD 290 Addendum

**6.1** **IECEx OD 290**

To note the current application of OD 290.

The meeting noted this was covered under earlier agenda but noted 500 CoCs for H2 and 51 CoPC Certificates for Unit 011 in the IECEx On-Line Certificate system.

The meeting also noted the cooperation with ISO TC 197 SC1 regarding content and questions for Unit 011.

The topic of Issued IECEx CoCs to H2 dispensers, prior to the application of OD 290, was raised in terms of should there be any action to update / up-issue Certification of those items covered to ensure compliance with OD 290 requirements?

The meeting discussed this at length noting that normally the up issuing of a certificate to later requirements is not normally required but agreed that this is a special situation, in that while IECEx CoCs issued, at the time, according to the general assembly requirements of IEC 60069-46 may or may not comply with OD 290 and agreed to propose the following recommendation to ExMC (IECEx Management Committee).

**RECOMMENDATION 4 ~~3~~: That the ExMC agree to require issued IECEx Certificates (except Unit Verification CoCs) covering Hydrogen dispensers, issued prior to the application of OD 290 to be up issued to OD 290, or ISO 19880-2, (if available) or cancelled by the end 2027.**

**6.2** **IECEx Technical Capability Document, TCD**

The meeting noted the current edition of the TCD noting the need to add provision for the additional test for “*Proof of Pressure*” with the provision of adding # symbol to allow testing at other locations and removal of the label test from the TCD.

**ACTION: ExMC WG2 is requested to update the IECEx Technical Capability Document accordingly.**

**6.3** **IECEx Standard Test Report For, ExTR for IEC 60079-46 and OD 290 Addendum**

To note the current editions of the Standard Test Report Forms for IEC 60079-46 and OD 290 Addendum

The meeting noted that ExTR draft blanks have been submitted to ExTAG WG1 covering ISO 19880-3, 19880-5 and 17268.

Meeting noted that the Task Team is to now update the ExTR 60079-46 Addendum for OD 290 to present to ExTAG WG1 once the revised OD 290 is approved by the ExMC.

**ACTION: WG19 Task Team to prepare an updated version of the ExTR 60079-46 Addendum for OD 290 to present to ExTAG WG1, once ExMC approves the revised OD 290.**

1. **Status and Feedback from introduction of new IECEx Certificate of Personal Competence Unit, Ex 011 – Hydrogen Safety.**

To consider any feedback on the application of new IECEx Unit of Competence Ex 011. *Basic knowledge of the safety of hydrogen systems*”) according to ISO/TR 15916:2015. To consider other areas associated with Personal Competence, within the IECEx CoPC Scheme.

The meeting also noted the cooperation with ISO TC 197 SC1 regarding content and questions for Unit 011.

**ACTION: Secretariat to contact ISO TC 197 SC1 Chair for assistance with the bank of Questions for IECEx CoPC Unit 011.**

1. **Consideration of status on Coverage of IEC TC 105 Fuel Cell Standards**

To receive an update on the cooperation with IEC TC 105 Fuel Cells and Discussions with IEC TC 105 Officers regarding the establishment of a formal liaison between IECEx and TC 105.

**8.1 To Note IEC TC 105 projects list and possible new Projects, eg IEC 62282-8-202**: Power to Power applications

The meeting noted the positive discussion during yesterdays conference and the presentation by the TC 105 Chair and actioned the Convener and Secretary to hold a follow up meeting with the TC 105 Officers to consider areas of coverage by IECEx, likely to be certain safety standards of TC 105 and aspects of Unit 011 of the COPC Scheme

1. **Status of collaboration activities including**

IRENA, (International Renewable Energy Agency)

Hydrogen Council

The meeting noted the activities of IRENA and agreed that it is important for IECEx to continue to maintain cooperation with IRENA

1. **Promotion/Marketing activities for IECEx coverage of Hydrogen**

Given the success of yesterdays conference the meeting agreed the value of preparing articles for both HazardEx and Etech. Also the meeting noted that the recordings of the conference are to be used by IEC COMMS department for further promotion, eg Youtube etc.

The meeting noted Andrei’s connection with HySafe (an international association for Hydrogen safety), and appreciated his offer to connect with them, noting a planned conference for 2025. Andrei also noted the IEA (International Energy Agency), H2 TCP (Technology Collaboration Programme) Task 43 covers Hydrogen safety.

1. **Other Matters**

Katy raised the need for a review of our IECEx rules to reflect the use of ISO standards not just IEC citing various clauses in IECEx 02 as examples where only IEC Standards are referred to as International Standards, with the meeting agreeing to task the Secretary with an initial review and then consult with ExMC WG1 Convener.

**ACTION: Secretariat to conduct an editorial review to ensure that ISO Standards are not being excluded from the language used in the IECEx Rules of Procedures and prepare amended versions for consideration by ExMC.**

1. **Next meeting**

To be advised but to coordinate with other events, eg Operational meetings / conference

1. **Close**

The Convener closed the meeting at 1545pm thanking the Task Team for their preparatory work and to Andrei and TC 197 folk for the excellent cooperation.

ANNEX A

Items to refer back to ISO TC 197 regarding FDIS 19880-2

**Feedback to ISO 197/SC 1 WG19 from IECEx ExMC WG19**

The proposed revision of IECEx 290, some of which is based on the technical requirements of the latest drafts of FDIS ISO-TC197-WG19\_19880-2 was considered by IECEx ExMC WG19 on 31 May 2024. During the meeting it was agreed that the following recommendations should be submitted to ISO 197/SC1 for changes to the latest draft.

1. There are a number of references to the possible application of local regulations, but this is unlikely to be possible for the process of testing and certification of equipment. It is recommended that this references be deleted or as an alternative moved into notes. The following clauses are affected:
   1. 5.1 h) – suggest delete
   2. 5.2.2.2 b)- suggest delete
   3. 5.4 A.2.4 a) b) c) d) - suggest be reworded as follows:
      1. Piping and fittings used to transport hydrogen in the dispenser shall conform as a minimum to ISO 15649. See A.5.3 for the service requirements.
      2. Component pressure ratings shall meet or exceed the dispenser system MAWP. See Table 1 in ISO 19880-1 and A.5.3.
      3. Piping and fittings shall be made of materials compatible with hydrogen service. See A.5.3.
      4. Piping and tubing design, fabrication, testing and welded joints shall be done in accordance with ISO 15649 as minimum.
   4. 5.5 – delete “As an alternative, an equivalent SIL-rated control may be used when allowed by local/national regulations.”
   5. 5.7 Paragraph 1– delete “or a national or regional piping standard”.
   6. 5.7 Paragraph 2– delete “or national/regional regulations”.
   7. 5.12 a) Delete “and to accuracy required by national or local regulations)”.

There may be other instances we have missed.

1. In 9.5.1 the test involving impact at low temperatures seems to include different requirements for impact of low temperatures over a period of time and the temperature of the impact test. It is also complicated by the need to “quickly clamped into place on the dispenser cabinet” which will inevitably lead to reduction on temperature when the impact test is done. We recommend deleting the words “quickly clamped into place on the dispenser cabinet” and then applying the test in IEC 60079-0.
2. For 9.13 Marking and label adhesion and legibility test – we believe this test is unnecessarily onerous. We don’t require such tests in IEC 60079-0, even where equipment may be used in more onerous environments. We recommend these tests be deleted.