



ISO/TC 197
Hydrogen technologies

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Draft Minutes of the 26th Plenary China 2017-12

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Background: Here are the draft minutes of the ISO/TC 197 plenary meeting that took place in Foshan, China, 2017-12.

This document was prepared with the help of notes provided by Nick Hart and Frédéric Solbes.

Committee URL: <https://isotc.iso.org/livelink/livelink/open/tc197>

Minutes

of the 26th Plenary meeting of ISO/TC 197 on Dec. 7 & 8, 2017, in Foshan, China

1 Opening of the meeting

Andrei Tchouvelev, the Chair of ISO/TC 197, opened the 26th plenary meeting at 9h15. He welcomed everyone and thanked the China National Institute of Standardization (CNIS) for hosting the meeting, the reception and other events.

2 Roll call of delegates

There were 11 P-member countries represented at the meeting:

Canada, China, Czech Republic, France, Germany, Japan, Korea, Netherlands, Norway, United Kingdom and USA.

There was also someone representing Romania, an O-Member of TC 197.

Delegates were asked to sign the attendance list (see ISO/TC 197 doc. **N 949**).

3 Adoption of the agenda

The draft agenda (doc. **N 945**), with switching the sequence of items 11 and 12, was approved unanimously (**Resolution 425**).

4 Appointment of the drafting committee

A drafting committee was appointed, consisting of Frederic Solbes from France, Yuko Yasutake for Japan, and Jim Ferrero, the TC Secretary, approved unanimously (**Resolution 424**).

The complete list of the resolutions from the meeting is found in doc. **N 947**.

5 Review of the 25th Plenary Meeting

Jim Ferrero, the TC Secretary, gave a verbal report of the meeting based on Karen Quackenbush report on the meeting (**N 884**) and thanked her for her assistance.

The verbal report was approved unanimously (**Resolution 426**).

Note: It was mentioned that access to normative references can be arranged through ISO central secretariat or the TC secretary, but these documents should only be emailed out to working group members, not posted as N documents. Karen has been using this process to obtain documents for her working groups.

6 Review of the operational progress and performance evaluations

6.1 Performance evaluations of Chair, TAB and Secretary (N 836)

Andrei provided a PowerPoint (**N 955**) reviewing the responses from the 2016 evaluations.

The criticism of the Chair for not ensuring that the minutes are circulated was understood and considered fair.

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A number of comments had been received on the TAB, and Andrei went to some length to explain the role he sees the TAB playing, and how he sees the TAB benefiting ISO TC 197, with a regional person to consult when there are problems.

Many similar complaints about the lack of meeting minutes. Jim apologised again. He was asked if it would help if meeting reports sent as supporting documentation. He said that this would be gratefully received. CSA have offered to get more involved in secretarial support, but they were unable to attend this meeting. However they will be present in Vancouver at the next meeting.

There will be another performance evaluation sent out for 2017, with a ballot closing at the end on January 2018.

6.2 Performance evaluations of 2016 Strategic Planning and Plenary Meeting (N 837)

Andrei provided a PowerPoint (N 956) reviewing the survey responses for 2016.

Generally, the Strategic Planning meeting was well received. It is anticipated that there will be another in 2018.

There was a range of feedback on the 2016 plenary meeting, but in general it was well received. Due to time constraints, there had unfortunately not been time for the presentation on IEC/TC 105, which had a recommendation of developing a standard on performance requirements for electrolyzers

6.3 Report of Dr. Mao the Vice-Chair for Developing Countries (N 957)

Dr Mao gave a presentation on the status of hydrogen energy in China. There was a 450 page roadmap for Hydrogen Energy published in 2016 (a Bluebook). There is an intention to have 1 million FCEVs, and over 1000 hydrogen refuelling stations (HRS) by 2030, with hydrogen mobility projects progressing in many regions of China, including fuel cell powered, trucks, buses, trains and trams. A tour of a factory developing fuel cell buses took place following the plenary meeting.

Note that it would be good to have presentations from other developing countries in the future (ex. India and Argentina).

7 Progress review of technical programs, grouped by TPDs

7.1 Changes to ISO Directives for 2017

Jim presented the ISO presentation on what is new in 2017 (N 958) and the main changes were:

- Obligation on P-members to vote on Systematic reviews.
- Also obligation on P-members to vote (including abstain).
- New requirement for Chair-elect to ease transition (one year prior to the end of a Chair's term).
Note: it was mentioned that the terminology is misleading as the Chair is not elected.
- Negative vote at DIS requires a technical comment for justification.
- Reduced times for development of WD & CD, plus addressing the comments, with the view that this should promote the possibility of developing standards more rapidly, when necessary and/or possible.
- To aid with efficiency for the development process, Webex is encouraged for WGs and small meetings, and it is now permitted for TC meetings.
- Mandatory review of the TC Strategic Business Plan (SBP) – many SBPs are very old.
- "Clarification" on the process in preparation of a document & associated voting, which have changed again. Skipping FDIS is allowed only if no technical changes are made following the DIS ballot.
- Participation at WG meetings requires registration, only possible for WG members, who must also come from P-Members. Guests/observers are not permitted at WG meetings, but they can participate by invitation at TC meetings.

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7.2 Components and Vehicular Applications (TPD, Craig Webster)

Active WGs: WG 5, WG 18, WG 19, WG 20, WG 22, WG 23, including renewal of convenors

Craig was unable to be present.

Joe Wong presented on behave of Livio Gambone **WG 5** report (**N 969**).

A meeting had been held in November. New drawing for H35HF is needed. It was proposed at the WG meeting to go to DIS2 to allow experts to review the new drawings. Some discussion on whether the document should go to FDIS instead of DIS2, prompted by Andrei, but Japan requested that this approach not be used. Conclusion was to stay with DIS2 as next stage.

Joe Wong presented on behave of Livio Gambone **WG 18** report (**N 970**).

Two documents are being developed for fuel containers and thermally activated relief devices. DIS ballots have been held. Both passed their vote. Meeting of WG18 planned for February 2018, in Torrance, aligned with the GTR#13 meeting. Proposal for FDIS for both documents, even though there were three negative votes on the ISO DIS 19881. The FDIS 19881 and FDIS 19882 will be prepared after the February meeting.

Prof. Watanabe-san presented the **WG 19** Dispensers report (**N 971**)

DIS result was approved, but with 4 negative votes. The most recent meetings had been held in September, and again in December, in conjunction with WG 24. Due to the overlap between WG 24 and WG 19, there are significant problems in the document. Also, an understanding of what dispensers can include (or not include) has led to a need to clarify what kind of dispensing systems are covered in the document, as the “dispenser cabinet” at the station may not include all of the equipment needed for the process of dispensing. If such a system is to be covered within the dispenser document, further clarification will be needed.

Proposal is to suspend the development process of ISO 19880-2 until ISO 19880-1 reaches the FDIS stage, but to allow the WG to continue to work to address the comments. No date has been proposed for the next meeting.

Resolution 427 to approve the temporary suspension of this work item until the project ISO 19880-1 is sufficiently stabilized, at which time WG 19 will restart with a DIS2 ballot was unanimously approved.

Prof. Watanabe-san **WG 20** Valves report (**N 972**)

ISO DIS 19880-3.2 vote was approved, with only 1 negative vote. At a WG meeting in Japan in June, the technical changes were effected to address the DIS2 comments, an FDIS has been prepared and submitted to TC. This is currently in the editing process, the ballot is expected at the end of 2017 or early in 2018.

Jim Ferrero presented on behave of Karen Quackenbush **WG 22** Hoses report (**N 973**)

Meetings were held in February and September. ISO CD 19880-5.2 received fewer technical comments and moving to DIS is expected early/middle 2018. To avoid overlap with ISO 16964, as raised last year by Hervé, the scope of the ISO 19880-5 has been focused on dispenser hoses, however, hoses built to ISO 16964 are not indicated as being specifically excluded. Glenn will work with Karen to clarify the scope. Note that the scope cannot have requirements, but it can have exclusions.

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Jim Ferrero presented on behalf of Karen Quackenbush **WG 23** Fittings report (**N 973**)

A meeting was held in September between the leadership of WG 20 and WG 23. It is now anticipated to have a CD ballot in 2018, with the next meeting planned for September 2018.

Convenors for re-nomination:

Resolution 428 for Livio Gambone, Shogo Watanabe and Karen Quackenbush to be renewed as convenors for 3 year terms (although noting that the WGs may finish their work before this) was unanimously approved.

7.3 Built Environment and Safety (TPD, Jay Keller)

Active WGs: **WG 24**

WG 24 Report **N 974** by Glenn Scheffler & Guy de Réals, plus Nick Hart (secretary)

The management team reported on the progress with ISO 19880-1 since the publication of ISO TS 19880-1 in 2016 and the change of co-convenors:

- The draft has passed through CD and CD2 stages, and the DIS is being finalised for release for ballot in early 2018.
- Meetings had been held in June, September and December, with recent meetings being held in conjunction with WG19 due to the significant amount of overlap between the two projects.
- The next meeting is anticipated to be held in Europe in June 2018, potentially followed by a meeting, also in Europe, in September, to prepare the FDIS (or DIS2 as required).
- At this stage, further work on fuelling protocols anticipated by WG24 has been postponed.

More work with the various dispenser component standards was reported, with the intention of harmonising the pressure rating requirements across the ISO/TC 197 standards. It is recognised however that this will not address potential issues in Europe due to the differences between the EC type approval regulations for vehicles, and those based around the SAE guidance (i.e. the GTR#13), and that refuelling pressures across Europe may need to be limited through European standards (i.e. EN 17127).

It was suggested that after the publication of ISO 19880-1, there will be a need to do some work on station certification (not necessarily a standard, maybe a TR) and to take a close look at communications between the vehicle and the station.

7.4 Production, Storage and Handling (TPD, Hervé Barthélémy)

Active WGs: WG 15, WG 21, WG 25 (**N 896**), WG 26 (**N 899**), including renewal of Convenor for WG 21 and disbanding WG 17

WG 15 report: Hervé Barthélémy on behalf of Laurent Allidieres (who provided some notes)

Prior to the report, Andrei gave an explanation of the reasoning for including Annex B, to allow current practices across certain parts of the world to be enabled to be followed as a compromise. Andrei's recommendation is to include Annex B.

A pre-DIS had been sent to experts, a range of comments received, including new comments. It had not been the intention to request, or address, any new comments. A meeting was held in Sept. to look at the existing comments from the previous ballot, and to cover anything that was felt was needed to be amended to cover the comments. It seems that the convenors intention is to not treat any new comments prior to going to DIS ballot.

It seems however that the US and also the Japanese, have (re)submitted comments on how they feel the document, specifically Annex B, should be developed prior to the DIS ballot. Hervé proposed to move to DIS

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without addressing the new comments, and invite the same comments to be submitted as DIS comments. Andrei was concerned that this would invite negative votes. There was also a request from China to include multi-layer vessels, for the document to be of use for China, but this is considered a change in scope and thus it is not anticipated at this time.

The conclusion was to go to DIS, in the expectation that negative votes will be received, but that a comment on Annex B and Shallow cycles, and the proposed comment resolution, will be developed between the US and Hervé and Laurent during the DIS ballot. It was pointed out that this standard is important for Europe and there should be a parallel vote by CEN for the Vienna Agreement.

An agreement to go to DIS ballot while in parallel US and France will work on the issue concerning Annex B, and then circulate this to the working group, was unanimously approved (**Resolution 431**).

WG 21 report: Jim Ferrero on behalf of Karen Quackenbush (N 973)

The balloting process for the document (compressors) is currently suspended. A meeting was held in Japan in February. ISO/CD 19880-4 should be submitted for ballot in early 2018, with the next meeting proposed in June 2018.

WG 25 report: Hervé Barthélémy on behalf of Dominique Perreux (N 976)

ISO/DIS 16111 ballot result had 2 negative votes (see **N 866**), however the document will go to FDIS and be sent to the TC secretary for ballot in 2018.

Separately, a preliminary TR (ISO 16113) was prepared for 3 subjects not covered by the scope of 16111:

- Metal hydride assemblies >150 litres
- Metal hydride assemblies intended for hydrogen fuelled vehicles
- Metal hydride assemblies for stationary/station applications

There seems to be a lack of experts interested in the TR drafting process, and China was requested to seek experts for this being as they are using this technology for forklifts. The document N 896 will be recirculated using a CIB with a deadline for any comments.

WG 26 report: Bob Boyd on behalf of Larry Moulthrop (N 976)

Meeting held in May, to develop the revised ISO 22734. The convenor and WG have requested to skip CD and go directly to DIS and there is currently a CIB ballot for this.

7.5 Stationary and Fuel Cell Applications (TPD, Hidenori Tomioka)

Active WGs: WG27, WG 28, TC 158/WG7 (Hydrogen analytical methods)

Preparatory presentation from Tomioka-san:

WG27 - ISO CD 14687.2 (Fuel quality) was approved with no negative comments. Meetings held in May and November to address CD2 comments, and prepare the DIS, to be sent to TC for ballot in early 2018.

WG28 - ISO DIS 19880-8 (Fuel quality control) was approved with no negative votes. A meeting held in Nov. to address DIS comments, and prepare the FDIS that is to be sent to ISO TC 197 for ballot in early 2018.

JWG7 – ISO CD 21087 has been balloted, and DIS is being prepared. A meeting was held in November to address CD comments and prepare the DIS, to be progressed through ISO TC 158.

WG27 report: Co-convenors Takagi-san and Tajima-san (N 977)

Presentation explaining the document, and progress of the working group, and major changes to the document. Key points had been summarised by Tomioka-san (see above). Next working group meeting to review DIS comments anticipated in September, location TBC.

Request for increased timeframe for the development of the document. It was clarified that an FDIS stage is likely to be needed, so the proposed publication date of end 2018 is optimistic.

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Resolution 430 to extend the timeline from 36 to 48 months was unanimously approved

WG28 report: Hidenori Tomioka (N 978)

See information above. No working group meeting is planned, unless the FDIS ballot fails.

JWG7 report: Hidenori Tomioka on behalf of Martine Carré (N 979)

WG meeting was held in May 2017 and the CD ballot was carried out by ISO TC 158. The CD 21087 was circulated within WG27 and WG28, but was not circulated by ISO TC 197. One disapproval from Germany is being addressed by the convenor. There was a WG meeting held in November to address CD comments and prepare DIS, to be submitted January 2018.

It was requested that ISO TC 197 follow ISO 21087 documents related to balloting, so that comments can be collected from TC 197 members. On day two, Spencer Quong offered to help Jim follow-up on the ballots for JWG 7.

Day Two (Friday Dec. 8th, 2017) 09 h to 14 h

8 Documents Published: ISO/TS 19883:2017

ISO/TS 19883:2017 *Safety of pressure swing absorption systems for hydrogen separation and purification*, developed by WG 17 with Gao Yuchuan, from China as convenor was published 2017-03. It was felt that the TS should be used for at least one year before considering to transform it to an IS. TS documents are reviewed after three years by an SR. If there is a desire to restart the work on an IS, there should be a NWIP.

Resolution 429 for the disbanding of WG 17 was unanimously approved.

9 Systematic Reviews and Documents more than six years old

None

10 New work item proposals

There were no NWIPs proposed.

11 Liaisons and report of liaisons

11.1 Existing Liaisons (ex. ISO/TC 20 SC 14 (N 937), ISO/TC 22 SC 37, TC 22/SC 41, TC 58 (N 938), TC 58/SC 2 (N 939), TC 58/ SC 3, TC 158, TC 220 (N940), IEC/TC 31 (N 942), IEC/TC 105, CEN/TC 268 (N 941), CEN-CLC/TC 6 (N 960), EIGA (N 943), etc.)

There were 3 presentations:

Tomioka-san presented on IEC/TC 105 (N 962), who are suggesting a performance standard for electrolyzers, which had been intended to be communicated last year.

Guy de Reals presented on CEN/CLC TC 6 (N 960), hydrogen in energy systems. Some discussion on the Terms and Definitions document (probably a TR) that has been proposed, a number of safety related documents, including mobile refuelling stations (with some uncertainty whether this needs to cover mobile or transportable fueling stations), and the connection of electrolyzers to an electrical grid. The document for terms and definitions could be developed using the Vienna Agreement so that it could be used by ISO.

Andrei explained the background to the formation of CEN/CLC TC 6 as an outcome of the SFEM hydrogen discussions that had taken in the recent years, and highlighted that SFEM WG hydrogen is also continuing in parallel to CEN/CLC TC 6. The next meetings are April 12 and Oct. 4, 2018.

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Herve presented on HySafe (**N 961**). The next meeting will be in Australia in 2019 (the last meeting was held in Hamburg, in September, 2017). There is renewed interest in liquid hydrogen (cryogenics) and there are plans for experiments. A new activity will be to prepare a book on hydrogen safety.

11.2 Proposal for A liaisons from ECMA (**N 903**)

The European Cylinder Makers Association (ECMA) wants to be more involved in TC 197 activities (ex. WG 15, WG 18, WG 24 and WG 25). They provided their 2017 report (**N 944**).

Resolution 432 for the acceptance that a A liaison be established with ECMA was unanimously approved.

12 Business Plan for TC 197

There is still a need to do something about the revision of TC 197's Business Plan and there was a request for volunteers to help work on this. Spencer Quong said that he would help the secretary work on the revision.

12.1 Mini-Round Table on *Standardization of Hydrogen Components*

Andrei made a presentation concerning problems with some hydrogen components (**N 967**). First he discussed the particulate filter requirement in draft 19880-1 for 5 micron. There are some variations in what are believed to be the same filters being defined differently by different manufacturers (e.g. Parker and Swagelok: filters with pore sizes ranging from 5-10 microns described as 5 micron and 7 micron filters respectively). There was some discussion on this, explaining the complexity of this area. There was no real resolution or action from this discussion, but it was agreed that this is an area to look at in the future and may eventually be the subject of a NWIP.

Secondly the issues encountered with pressure safety valves on the market being too large leads to secondary issues such as enlarged separation distances.

Thirdly there was some discussion on the different terminology for definitions of fueling and hose assemblies.

Tomioka-san made a presentation on hydrogen components (**N 966**).

12.2 Marketplace/Members Updates on H2 Programs and experience

Presentations from Japan (**N 964**), the Netherlands (**N 963**) and Romania (**N 965**).

The use of mobile refuelling stations in Japan was highlighted by Andrei, and it was requested that Japan think about a NWIP for mobile refuelling stations.

13 Permanent editing committee

Resolution 433 confirmed unanimously the composition of its Permanent Editing Committee. The members are comprised of:

- Ms. Karen Quackenbush, United States (if she accepts, as she was absent from the meeting);
- Mr. Jim Ferrero, TC 197 Secretary

The permanent editing committee is responsible for:

- Updating and editing enquiry drafts (DIS) and Final Draft International Standards (FDIS) considered at meetings or circulated between meetings;
- Ensuring their conformity with Part 2 of the ISO/IEC Directives.

14 Future ISO/TC 197 Meetings (possible locations and approximate dates)

Resolution 434 unanimously accepts SCC-CSA's offer to host the plenary meeting in Vancouver on Dec.6 - 7, 2018.

Joe Wong made a presentation (**N 968**) on behalf of CSA, with the following preliminary information:

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- Working group meetings on December 3rd & 4th
- Strategic planning meeting (SPM) on December 5th
- Plenary meeting on December 6th & 7th, with evening meal hosted by CSA on December 6th, and an optional visit to the CSA laboratory on December 7th.

The Netherlands requested the date be changed due to a national holiday during that week, but it was decided to maintain the planned dates.

For 2019, Europe, **France** offered to host the plenary meeting (TBC), probably early December 2019.

For 2020, Asia (Note: After the meeting **Korea** indicated that they may like to host the 2020 plenary meeting)

For 2021, North America

For 2022, Europe possibly Romania.

15 Other business:

Jim reported some changes in the membership of TC 197, with Brazil leaving, and Belgium becoming an O-member.

ISO/TC 197 extends its appreciation for the hospitality and support of our hosts, CNIS and SAC/TC 309, the mirror committee of ISO/TC 197, for hosting the Plenary and working group meetings as well as accommodating our Strategic Planning Meeting as a part of the Second Hydrogen Energy Fuel Cell Summit, and for their generous contributions as the sponsors for the lunches and dinners. We wish to express our sincere gratitude to Mr. Wang, Dr. Mao, Dr. Li, Dr. Zong and the others for all of their hard work.

Acclamation by ISO/TC 197.

16 Approval of resolutions

Resolutions were reviewed, wording was amended as appropriate and all resolutions were unanimously approved.

17 Closure of the meeting

The meeting ended at 13h45.