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Report of the 19th Plenary Meeting of ISO/TC 197

16 May 2010 in Essen, Germany

Dear members:

We are pleased to provide you with the *Report of the 19th Plenary Meeting of ISO/TC 197 on 16 May 2010 in Essen, Germany*. Please refer to the minutes of meeting (**N 495**) for an overview of the discussions that took place during the meeting.

This report is comprised of the following N documents, which shall be considered as an integral part of it.

N document	Subject
N 495	Minutes of the 19th plenary meeting of ISO/TC 197
N 496	Attendance list
N 497	Resolutions (E) taken during the 19th plenary meeting of ISO/TC 197
N 498	Résolutions (F) adoptées lors de la 19^{e} réunion plénière de l'ISO/TC 197
N 499	Progress report of WG 5 *Gaseous hydrogen land vehicle refuelling connection devices*
N 500	Progress report of WG 8 *Hydrogen generators using water electrolysis process*
N 501	Progress report of WG 9 *Hydrogen generators using fuel processing technologies*
N 502	Progress report of WG 11 *Gaseous hydrogen — Fuelling stations*
N 503	Update on the work of ISO/TC 197 WG 11 TG 1
N 504	Update on the work of ISO/TC 197 WG 11 TG 2 *Gaseous hydrogen dispensing*
N 505 and N 506	Progress report of WG 12 *Hydrogen Fuel — Product Specification — Part 2: PEM fuel cell applications for road vehicles*
N 507	Progress report of WG 13 *Hydrogen detection apparatus — Stationary applications*

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N document	**Subject**
N 508 and N 509	Progress report of WG 14 *Hydrogen Fuel — Product Specification — Part 3: Proton exchange membrane (PEM) fuel cell applications for stationary appliances*
N 510	Progress report of WG 15 *Gaseous hydrogen — Cylinders and tubes for stationary storage*
N 511	China's presentation on hydrogen purification system using pressure swing adsorption process
N 512	Update on the activities of ISO/TC 58/SC 3 WG 24 *Factors of safety for composite cylinders*
N 513	Brazil's presentation
N 514	China's presentation
N 515	Germany's presentation
N 516	Italy's presentation
N 517	Japan's presentation
N 518	Netherlands' presentation
N519	USA's presentation
N 520	India's information

We hope this report provides you with all the information that you require. Please advise if you have any comments including errors and omissions.

We wish to express our most sincere thanks to all participants for their contribution to this fruitful meeting.

Yours sincerely,

Sylvie Gingras, Secretary of ISO/TC 197
Bureau de normalisation du Québec
on behalf of the Standards Council of Canada

Circulation to:

- ☒ **P**-members
- ☒ **O**-members
- ☒ **A** liaisons
- ☒ ISO Central Secretariat
- ☒ WG convener
- ☐ WG experts
- ☒ TC Chairman

Minutes

of the 19th plenary meeting of ISO/TC 197 on 16 May 2010 in Essen, Germany

1 Opening of the meeting

Mr. Randy Dey, the Chair of ISO/TC 197, opened the 19th plenary meeting by welcoming the attendees to Essen. He invited Mr. Ulrich Schmidtchen, Secretary General of the German Hydrogen and Fuel Cell Association (DWV), to present the host's opening remarks.

Mr. Schmidtchen warmly welcomed the attendees to Essen. He indicated that tremendous progress had been accomplished since the last WHEC Conference in Germany 14 years ago. He noted that 70 MPa hydrogen storage would have been unrealistic at that time. He underlined the need to make further advances and invited all to contribute to this work.

The Chair thanked Mr. Schmidtchen for his speech. He also thanked Mr. Uwe Klaas, the representative of DIN, the German member body of ISO, for the organization of the meeting.

2 Roll call of delegates

The Chair reported that 11 member countries were represented at the meeting, namely Argentina, Brazil, Canada, China, France, Germany, Italy, Japan, the Netherlands, the Republic of Korea, and the USA. He provided administrative information with regard to how the meeting would be conducted. He invited the delegates to introduce themselves. Ms. Sylvie Gingras, the Secretary, asked the delegates to sign the attendance list (ISO/TC 197 doc. **N 496**).

3 Adoption of the agenda

The draft agenda (doc. **N 446 R1**) was reviewed and approved.

4 Appointment of the drafting committee for this meeting

A drafting committee was appointed, consisting of Ms. Karen Hall from the USA and the Secretary of ISO/TC 197. During the meeting, the resolutions were drafted in English only (ISO/TC 197 doc. **N 497**). The French translation of the resolutions is provided with this meeting report (ISO/TC 197 doc. **N 498**).

ISO/TC 197 agreed that a drafting committee for this 19th plenary meeting be established as follows:

- **Karen Hall, USA**
- **Sylvie Gingras (Secretary of ISO/TC 197).**

The resolutions would be drafted in English and translated in French by the Secretariat thereafter.
(resolution **334**)

5 Approval of the Report of the 18th plenary meeting

The *Report of the 18th plenary meeting on 14 October 2009 In Seoul, Korea (*ISO/TC 197 doc. **N 448**) was discussed under this item of the agenda. It was approved as drafted.

ISO/TC 197 approved the Report of the 18th plenary meeting of ISO/TC 197 (doc. N 448) as drafted
(resolution **335**)

6 Report of the Chairman

Mr. Dey presented the highlights of the *Report of the Chairman*, which had been circulated prior to the meeting as ISO/TC 197 document **N 475**. He provided further explanations on the work of the ISO/TC 197 ad hoc group on hydrogen components. He indicated that the next steps would include a final quality check and an identification of the clauses of the standards that require hydrogen specific requirements for those standards that belong in Category 2.

Mr. Dey also indicated that he was also in the process of creating the ISO/TC 197 Chair's ad hoc group on hydrogen storage. He indicated that the ISO/TC 197 Secretariat would soon circulate a N document to populate this ad hoc group that would look at matters related to ISO/TC 197 WG 6, WG 15 as well as the ISO/TC 197 relationship with ISO/TC 22 *Road vehicles* and ISO/TC 58/SC 3 *Gas cylinder design*.

7 Report of the Secretariat

Ms. Gingras indicated that the *Report of the Secretariat* (doc. **N 468**) reflected the situation of the technical committee at the time of its drafting. It would be used as the basis for the discussions during the meeting.

8 Status of all items of the programme of work

The Chair explained that, under this item of the agenda, working group conveners would be asked to provide a brief update of the progress achieved by their working group since the last ISO/TC 197 plenary meeting.

The Chair explained that good progress was being made by the ISO/TC 197 working groups. He indicated that efforts were aimed in each group at arriving at harmonized requirements between the various regions of the world. He indicated that it was not an easy task but that it was through these working group discussions that it was possible to arrive at a consensus position that rally the various regions of the world.

8.1 WI 17268: Progress report of the convener of WG 5

The report (ISO/TC 197 doc. **N 499**) from Mr. Livio Gambone, the convener of the ISO/TC 197 WG 5 (joint with ISO/TC 22) *Gaseous hydrogen land vehicle refuelling connection devices* was discussed under this item of the agenda. ISO/DIS 17268 is out for vote until 25 June 2010. It includes the definition of the 70 MPa profile and a number of improvements.

The USA expressed concerns about the need to validate the new design proposed by ISO/TC 197 WG 5 and the proposed short timetable to FDIS with a target date of October 2010. The USA indicated that connectors were a critical safety component and that most of the vehicles on the road did not use this new design. The Chair agreed that it was a valid comment and concurred with France that the convener should be asked if test results were available.

8.2 WI 15869: Progress report of the convener of WG 6

Under this item of the agenda, the Chair of ISO/TC 197 reported that the restructuring exercise of ISO/TC 197 WG 6 (joint with ISO/TC 58/SC 3 and ISO/TC 22) *Gaseous hydrogen and hydrogen blends — Land vehicle fuel tanks* was almost completed with good representation from the various group of stakeholders including OEMs. He indicated that the work would soon resume with some input from the ISO/TC 197 Chair's ad hoc group on hydrogen storage.

8.3 WI 22734: Progress report of the convener of WG 8

Mr. Dey provided the report of ISO/TC 197 WG 8 *Hydrogen generators using water electrolysis process* (ISO/TC 197 doc. **N 500**). ISO/DIS 22734-2 *Hydrogen generators using water electrolysis process — Part 2: Residential applications* has been approved and the WG is addressing the comments in preparation for the FDIS text.

8.4 WI 16110: Progress report of the convener of WG 9

The report from Mr. Falco Thuis, the convener of ISO/TC 197 WG 9 *Hydrogen generators using fuel processing technologies,* was presented under this item of the agenda (ISO/TC 197 doc. **N 501**). The convener reported that **ISO 16110-2** *Hydrogen generators using fuel processing technologies — Part 2: Test methods for performance* has been published in February 2010. The Chair thanked the convener and the WG members for their good work and asked the convener to keep an eye on the technology.

8.5 WI 20100: Progress report of the convener of WG 11

Mr. Dey provided the report of WG 11 *Gaseous hydrogen — Fuelling stations* (ISO/TC 197 doc. **N 502**). The WG is working on the preparation of the DIS text. This work is very interesting as it is breaking new grounds.

Mr. Frederic Barth, the leader of TG 1, presented the work of his task group on separation distances (ISO/TC 197 doc. **N 503**). After the presentation, the USA made a comment that they believe that more work still needed to be done to achieve harmonization. The head of the US delegation indicated that there was a disagreement on the characterization of leaks. Mr. Barth confirmed that all questions had been addressed but if there were any outstanding matters they should be brought forward. This was supported by Mr. Dey, who explained that he had

been closely following the TG 1 work. He indicated that TG 1 had been working on this for two years and he reported that the members from the USA had been quite involved in the discussions. He invited the USA to look into this matter further and work within the WG.

Mr. Steven Rouvroy, the leader of TG 2, presented the work of his task group on the dispensing system (ISO/TC 197 doc. **N 504**). He explained that TG 2 had focused its efforts on the safety aspects of refuelling as well as the main requirements of the fuelling protocol.

Germany and Japan raised questions on how the international standard would interact with regulations. The German member body was concerned that regulations would take precedence over standards. Mr. Dey explained that the intent of the work of ISO/TC 197 WG 11 was to avoid differences in the infrastructure build up. He indicated that once the international standard is published, it would reflect global consensus; however, it would be up to each country to adopt it in their regulations. The standard would most likely be adopted as a national or regional standard through the country adoption process and then referred to in the national or regional regulations. He said that the World Trade Organization (WTO) encouraged countries to look at international standards when they develop their technical regulations.

The Netherlands expressed the need to expand the scope of the standard to cover retrofit and multi-fuel fuelling stations. He indicated that most of hydrogen fuelling stations were integrated into existing gasoline or natural gas fuelling stations. It was agreed that this work would be assigned a high priority. The work on this would start as soon as the current work is finished.

ISO/TC 197 agrees that ISO/TC 197 WG 11 *Gaseous hydrogen — Fuelling stations* will start working on a fast-track basis on retrofit and multi-fuel refuelling as soon as the present work is finished.

(resolution **336**)

Mr. Dey also indicated that he would like to have additional WG members that are knowledgeable in the forklift applications since the WG would also look at warehouse indoor refuelling. He asked the P-members to consider this request as technical input would be required on this topic.

8.6 WI 14687-2: Progress report of the convener of WG 12

Mr. Yasuo Takagi provided the report of WG 12 *Hydrogen fuel — Product Specification — Part 2: PEM fuel cell applications for road vehicles* (ISO/TC 197 doc. **N 505** and **N 506**). He indicated that the WG would soon complete the definition of acceptable contaminants levels and work on the definition of practical sampling and test methods for their inclusion in the DIS.

The Chair thanked Mr. Takagi for the update. He indicated that a lot of coordination would be required on the topic of fuel quality. Part 1, 2 and 3 of ISO 14687 would eventually need to be integrated. This would be done once all these standards have been published.

Regarding Part 2, the Chair indicated that he was pleased to note that the work was proceeding to DIS. A lot of R&D would have to go into the standard for the development of the test methods. As a first step, the WG could be looking at simple test methods that could be improved in the future. Regarding the contaminant levels, a lot of effort had gone into their definition since WG 12 initiated this work. The Chair indicated that he expected that they should now be well defined and accepted.

The USA confirmed that they were quite satisfied with the contaminant levels. The member body from France expressed some concerns about the recent discussions regarding the lowering of contaminant levels. The USA indicated that they were not aware of any changes in the contaminant levels. Both USA and Japan were asked by the Chair to look further into this matter.

8.7 WI 15399: Progress report of the convener of WG 13

Mr. Ichiro Matsubara provided the report of WG 13 *Hydrogen detection apparatus — Stationary applications* (ISO/TC 197 doc. **N 507**). He indicated that the FDIS had been approved on 1 May 2010 and that it was proceeding to publication.

8.8 WI 14687-3: Progress report of the convener of WG 14

Mr. Osamu Tajima provided the report of WG 14 *Hydrogen Fuel — Product Specification — Part 3: Proton exchange membrane (PEM) fuel cell applications for stationary appliances* (ISO/TC 197 doc. **N 508** and **N 509**).

The member body from France asked why so many categories of fuels were being considered for Grade E. Since the purpose of the standard is to define fuel specification for PEM fuel cell applications, France was of the opinion that there should not be such a wide range of categories of fuels. PEM fuel cells would not accept such a wide range of fuels.

The convener explained that Category 1 would be for pure hydrogen while Categories 2 to 5 would apply to the various technologies of reformers. Basically, it would be the type of reformer that would dictate the fuel quality.

The USA concurred with France that they did not understand the need for such a wide range of categories of fuels. The USA was concerned that it would create confusion in the market place. The USA was of the opinion that, once the consolidation of all the grades of fuels is done as suggested by the ISO/TC 197 Chair, the industry would need to have a single and practical standard.

The Chair of ISO/TC 197 agreed that the grades of fuels should be limited to only those required by the market place.

8.9 WI 15399: Progress report of the convener of WG 15

Mr. Frederic Barth provided the report of WG 15 *Gaseous hydrogen — Cylinders and tubes for stationary storage* (ISO/TC 197 doc. **N 510**). He indicated that the WG would have its first meeting on 19 May 2011 in Essen.

9 Establishment of the work priorities

9.1 Update of target dates for work in progress and confirmation/withdrawal of items on which no progress has been made

This agenda item was combined with item 8. The following resolution was adopted to record the target dates agreed.

ISO/TC 197 confirmed the need for all the work items currently registered in its programme of work and, considering the report of the working group conveners, agreed with the following target dates:

WG	Work item	Title	Target dates
5	**17268**	**Gaseous hydrogen land vehicle refuelling connection devices**	**FDIS: 2010-10 IS: 2011-04**
8	**22734-2**	**Hydrogen generators using water electrolysis process — Part 2: Residential applications**	**FDIS: 2010-11 IS: 2011-05**
11	**20100**	**Gaseous hydrogen — Fuelling stations**	**DIS: 2010-11 FDIS: 2011-11 IS: 2012-05**
12	**14687-2**	**Hydrogen Fuel — Product Specification — Part 2: PEM fuel cell applications for road vehicles**	**DIS: 2010-10 FDIS: 2011-10 IS: 2012-04**
14	**14687-3**	**Hydrogen Fuel — Product Specification — Part 3: Proton exchange membrane (PEM) fuel cell applications for stationary appliances**	**CD: 2010-11 DIS: 2011-11 FDIS: 2013-05 IS: 2013-11**

WG	Work item	Title	Target dates
15	15399	**Gaseous hydrogen — Cylinders and tubes for stationary storage**	**CD: 2011-01 DIS: 2012-01 FDIS: 2013-07 IS: 2014-01**

(resolution **337**)

9.2 Published standards

As part of this agenda item, the Chair indicated that the results of the systematic review of **ISO 13984** *Liquid hydrogen — Land vehicle fuelling system interface* should be discussed. He indicated that the results, which had been released as ISO/TC 197 doc. **N 444** on 29 March 2010, tended to show that it should be reconfirmed. He asked the P-members their opinion. He added that Sweden had forwarded their recommendation prior to the meeting. Sweden had recommended that the standard should be reconfirmed on the basis that they believed the existence of the standard was valuable and they were foreseeing a broader use of the document. The USA indicated that the document was not much used for the moment as only BMW uses liquid hydrogen fuelling; however, they agreed that it should be kept alive.

After the review of the results of the systematic review of ISO 13984:1999 *Liquid hydrogen — Land vehicle fuelling system interface*, ISO/TC 197 agreed that this international standard should be reconfirmed.

(resolution **338**)

The Chair then presented the other published standards (ISO/TC 197 doc. **N 468**, Clause 7). The USA expressed concerns about ISO 14687-1 *Hydrogen fuel — Product specification —Part 1: All applications except proton exchange membrane (PEM) fuel cells for road vehicles*. The USA indicated that they were afraid that there would be confusion among the various grades of fuels. The Chair agreed that there was a need to look at all the grades of fuels included in Parts 1, 2 and 3 of **ISO 14687** when the work of ISO/TC 197 WG 14 is more advanced. He concurred with the USA that eventually all the grades of fuels would have to be included in one standard for streamlining purposes.

9.3 New work item proposals and creation of working groups

Under this item of the agenda, Germany was invited to present their new work item proposal (NWIP) on the review of ISO/TR 15916 *Basic considerations for the safety of hydrogen systems,* which was being circulated for approval as ISO/TC 197 doc. **N 472** until 19 July 2010.

Mr. Ulrich Schmidtchen, the proposed convener for this work, indicated that there was a need to revise the technical report. New systems were being developed, which required that the document be updated to reflect the state-of-the-art. The Chair of ISO/TC 197 agreed that it was timely to proceed with the revision and encouraged the P-members to nominate experts for this work. He also confirmed that this document would remain a technical report as it was not a document that could be converted into an international standard.

China was also invited to present a future NWIP on hydrogen purification system using pressure swing adsorption process. Mr. Geng Wang presented the current activities in China in this field as well as the outline of the proposed international standard (ISO/TC 197 doc. **N 511**). Mr. Wang indicated that he would be pleased to convey any questions to Mr. Gao Yuchuan, who had prepared the presentation.

10 Strategic discussion of committee's work

10.1 National presentations

The Chair explained that P-members had been invited to present their National Hydrogen Energy Program through ISO/TC 197 document **N 447**. He then invited Brazil, China, Germany, Japan, Italy, the Netherlands and the USA to make their presentations.

All the presentations are attached to this meeting report (ISO/TC 197 doc. **N 513 – N5 19**). Also included in ISO/TC 197 doc. **N 520** is the information provided by India.

10.2 Membership

The current membership list was reviewed (ISO/TC 197 doc. **N 468**, Clause 3). The Chair indicated that there had been no addition since the last plenary meeting.

10.3 Ad hoc group on hydrogen components

This item was discussed as part of item 6 of the agenda, the ISO/TC 197 Chair's report.

10.4 Ad hoc group on hydrogen vehicle fuel system (HFVS)

This item was discussed as part of item 6 of the agenda, the ISO/TC 197 Chair's report.

10.5 Chair's ad hoc group on hydrogen storage

This item was discussed as part of item 6 of the agenda, the ISO/TC 197 Chair's report.

11 Permanent editing committee

The role and composition of the permanent editing committee was discussed and confirmed under this item of the agenda.

ISO/TC 197 confirmed the composition of its permanent editing committee. The members are comprised of:

- **Karen Hall, USA;**
- **Sylvie Gingras (Secretary of ISO/TC 197).**

This 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;**
- **ensuring the equivalence of the texts in the official languages.**

. (resolution **339**)

12 Liaisons and report of liaisons

12.1 Existing liaisons

12.1.1 ISO/TC 11 Boilers and pressure vessels

The report (ISO/TC 197 doc. **N 474**) provided by Mr. John Koehr, the observer appointed by TC 11 to follow the work of ISO/TC 197, was discussed under this item of the agenda. The Chair indicated that Parts 1 and 2 of **ISO 16528** *Boilers and Pressure Vessels* were under systematic review until 15 September 2010.

The Chair reported that a number of standards had been accepted as conforming to ISO 16528-1 *Boilers and Pressure Vessels — Part 1: Performance requirements*. They are shown on the **N 474** report and on the ISO/TC 11 web site.

12.1.2 ISO/TC 22 *Road vehicles*

The update on the activities of ISO/TC 22, circulated as ISO/TC 197 doc. **N 476** on 8 May 2010, was discussed under this item of the agenda. The Chair reported that the ISO Technical Management Board (TMB) had recently appointed Mr. Michel Potvin from Belgium as the new ISO/TC 22 Chair. He indicated that the ISO/TC 197 leadership would soon meet with him to discuss items of common interest.

12.1.3 ISO/TC 58 *Gas cylinders*

The update on the activities of ISO/TC 58, circulated as ISO/TC 197 doc. **N 478** on 8 May 2010, was discussed under this item of the agenda.

12.1.4 ISO/TC 58/SC 3 *Gas cylinder design*

The update on the activities of ISO/TC 58/SC 3, circulated as ISO/TC 197 doc. **N 477** on 8 May 2010, was discussed under this item of the agenda.

Mr. Norm Newhouse, the convener of ISO/TC 58/SC 3 WG 24 *Factors of safety for composite cylinders*, was invited to provide a short update on the work of this working group (see ISO/TC 197 doc. **N 512**)

12.1.5 ISO/TC 220 *Cryogenic vessels*

The update on the activities of ISO/TC 220, circulated as ISO/TC 197 doc. **N 469** on 15 April 2010, was discussed under this item of the agenda.

12.1.6 IEC/TC 31 *Equipment for explosive atmospheres*

An update on the activities of IEC/TC 31 was provided under this item of the agenda. The Chair indicated that hydrogen experts would be invited to participate in the revision of IEC 60079-10-1 *Explosive atmospheres — Part 10-1: Classification of areas — Explosive gas atmospheres* when the revision work is initiated.

The Chair also indicated that the leadership of ISO/TC 197 expected to work with the leadership of IEC/TC 31, the ISO Central Secretariat and the IEC Central Office to discuss means of cooperation regarding ISO 26142 *Hydrogen detection apparatus — Stationary applications* and IEC 60079-29-1 *Gas Detectors – Performance requirements of detectors for flammable gases.* The Chair indicated that it would not be an easy task and that discussions had been initiated with the ISO Central Secretariat.

12.1.7 IEC/TC 105 *Fuel cell technologies*

The update on the activities of IEC/TC 105, circulated as ISO/TC 197 doc. **N 471** on 22 April 2010, was discussed under this item of the agenda.

12.2 Establishment of new liaisons and cancellation of liaisons

The list of existing liaisons was reviewed under this item of the agenda (ISO/TC 197 doc. **N 468**, Clause 4). The Chair indicated that a request for liaison had been received from ISO/TC 252 Project committee: *Natural gas fuelling stations for vehicles.* The Chair indicated that it would be important that natural gas fuelling stations do not use the same fuelling connectors as the hydrogen fuelling connectors.

Canada suggested that a liaison could be established with IEA Task 19 and Germany suggested a liaison with HySafe. France indicated reservations on the establishment of these liaisons. France was of the opinion that there is a difference between pre-normative research and standardization activities. Both activities need to work in coherence but they should be kept separate. R&D should not comment directly in standards. Canada agreed that the role of both R&D and standards development was different. The Chair indicated that the leadership of ISO/TC 197 would look into this in order to determine what kind of arrangement should be put in place.

12.3 Cooperation with other organizations

Under this item of the agenda, the Chair presented a quick update on the work of the World Forum for Harmonization of Vehicle Regulations (WP.29) on the Global Technical Regulations (GTR) for hydrogen and fuel cell vehicles (HFCV) as well as the work of the ECOSOC *Sub-Committee of Experts on the Transport of Dangerous Goods* (SCETDG).

13 Other business

No other business was discussed.

14 Requirements concerning a subsequent meeting

The Chair informed the delegates that China had offered to host the 20th plenary meeting of ISO/TC 197. He invited Mr. Geng Wang to say a few words about the invitation. Mr. Wang mentioned that China would be pleased to welcome the delegates in China and that the details about the date and location would be worked out with the ISO/TC 197 leadership.

Before breaking for the drafting of the resolution, the Chair on behalf of the members thanked Germany for hosting the meeting. These comments were reflected in the following resolution:

> **ISO/TC 197 thanked our hosts, DIN, the Deutsches Institut für Normung, the German Hydrogen and Fuel cell Association and the Energy Agency NRW and in particular, Mr. Frank Baumann and Mr. Andreas Ziolek, for generously providing meeting space for the ISO/TC 197 plenary and working group meetings and for their excellent hospitality.**
>
> (resolution **340**)

15 Approval of resolutions

After the meeting resumed, the draft resolutions were distributed to the P-members. The draft resolutions were reviewed and the attendees expressed their agreement.

> **ISO/TC 197 approved all the resolutions taken during this 19th plenary meeting (nos. 333 to 340).**
>
> (resolution **341**)

16 Closure of the meeting

The Chair thanked the attendees for their excellent contribution and closed the meeting.