



ISO/TC 197  
Hydrogen technologies

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Secretariat: SCC (Canada)

**WG 19 Treated CD 19880-2 Comments 2017-04**

Document type: Other committee document

Date of document: 2017-05-16

Expected action: INFO

Background: Here is the compilation of comments from the CD 19880-2 ballot and their treatment by WG 19.

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

## Template for comments and secretariat observations

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ANSI US	84	0 Introduction		T	None of the referenced standards have been used to evaluate actual devices. It is too early to use these as a go by for ISO standards	Replace the CSA references with the current ISO counterparts that are under development, with the understanding that the references to these ISO standards would be deleted if they are not completed at the time this ISO document is ready for publication.	Acknowledged the concern. This document has been in development in conjunction with other ISO documents. These are cited as the starting point. They will be replaced with proper ISO documents as they are ready in Normative References. 19880-1 TR can be referenced? Bibliography?
AFNOR FR 1		General			<p>"The french Committee fully appreciates the work already done by WG19 and WG20 in order to achieve the 2 Committee Drafts:</p> <p>ISO/CD 19880-2 Gaseous hydrogen -- Fueling stations -- Part 2: Dispensers ISO/CD 19880-3 Gaseous hydrogen -- Fueling stations -- Part 3: Valves.</p> <p>Nevertheless, the consultations for circulation of this draft as a DIS seem a little premature.</p> <p>There are still some technical pending issues and we would appreciate to have an additional period of time for reviewing the content and listing the detailed technical comments.</p> <p>Furthermore, it would be recommended to check in detail the consistency of these CDs with the content of expected TR 19880-1 on fueling station, before circulation as a DIS.</p> <p>We propose to postpone or reopen these consultations after the next face to face meetings of WG19 and WG20, planned in June 2015 "</p> <p>The comments in the lines below are a first list of comments non exhaustive because we need more time to review the document.</p>		WG19 will wait for WG24 TR and DIS for going to the next step. WG19 will align its document with that of WG24.
ANSI US		General			The US is very supportive of this work. We recognize this is an important document, and is integral to the development of a cohesive series of documents to facilitate gaseous hydrogen refuelling. We have identified a number of technical issues, described below, which we are confident	Work through technical issues in preparation of a DIS, without skipping a development stage.	See above.

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					can be resolved within the working group during preparation of a DIS. We would like to ensure this document goes through the DIS stage, and is not accelerated directly to the FDIS stage. We believe the working group convenor and members also desire working through the DIS stage to help ensure the best possible International Standard results.		
BSI GB		General	All		<p>Whilst the request for a vote on the question “<b>Do you agree to the circulation of the draft as a DIS?</b>” may be due to confusion, it is the opinion <b>of the UK</b> that the work on dispensers and the dispensing process being carried out within WG24 as part of the station is further advanced in a number of areas that may be applicable to the dispenser standard.</p> <p>Whilst some of these appear to be identified as not being in the scope of the dispenser document (line 95), it would seem appropriate to discuss whether or not some of these missing sections should be included in the dispenser standard before moving forward to presenting a DIS for vote.</p> <p>Also, it doesn't seem to be appropriate to refer to recommendations in a Technical Report as a requirement for this standard– presumably this reference will be changed to the ISO standard 19880-1, and cannot therefore be published until the document ISO 19880-1 is also published?</p> <p>As such it is difficult to agree with the circulation of the current draft as a DIS.</p>	<p>It is difficult to know how to resolve the situation where the station general requirements document (19880-1) is several stages behind the dispenser document, but the dominating effort is being put into resolving the issues in WG24, rather than WG19.</p> <p>This has the undesirable consequence of either needing to do the work simultaneously, in parallel, or having the dispenser document progress to voting before the WG19 text is ready to address everything that is desirable.</p>	See above
BSI GB		General	Chap 5 /6 all	Ge	<p>Much work has been carried out to prepare an indication of the type of tests expected of the dispenser at the station with regards to fuelling testing, and functional testing prior to fuelling as Annex B of ISO WDTR 19880-1 in WG24.</p> <p>This is currently under development but there are tests listed that would be appropriate to test on the dispenser if deemed within scope of this document? (see line 95 of the ISO CD 19880-2)</p>		<p>Agree to provide methods for testing against protocols, but WG19 will not discuss any protocols.</p> <p>Any new protocol will be inserted as an annex.</p>
JISC	General			ed	Change the format of the document to that of ISO (insert	Change the format of the	Agree

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JP32					Foreword and Copyright Notice, etc.).	document to that of ISO (insert Foreword and Copyright Notice, etc.)	
JISC JP33	General			ed	Change all the units to SI. Wrong ones: inch, in, foot,; ft, feet,, psi, pound per square inch, sec, second, minute, hour, hr, lb, pound, F, °F, degrees Fahrenheit, degrees Celsius, kilopascal, cc,		Agree
BSI GB		Proposal for Annex		Ge	Work on a test device for testing the fuelling protocol has been developed as Annex B of ISO WDTR 19880-1 in WG24. This is currently under development but it might be appropriate to include in the dispenser standard.		Agree in principle. B.2 will be included but the rest are for WG24. It is because WG19 is for type approval.
BSI GB		0 Proposal for Annex		Ge	Development of information to explain the different pressure terms has been developed as Annex D of ISO WDTR 19880-1 in WG24.	Consider appropriateness to include in this document, or retain for the fuelling station.	NOT AGREE. PLEASE DISCUSS IN WG24.  INFO MAWP DEPENDS ON MAKERS.
AFNOR FR		1	Scope		This standard provides the requirements and test methods on the safety of complete hydrogen dispensers with the normal working pressure of 35 MPa and/or 70 MPa for gaseous hydrogen fueling stations.	<i>Check consistency with 19880-1 &amp; List of exclusion</i>	DISAGREE. DISPENSERS DON'T DIFFERENTIATE VEHICLE TYPES. IT IS A MATTER OF PROTOCOL.
BSI GB		1	Figure 1	Te	Is it typical to include a filter in the breakaway?	Confirm, and if not the case, consider removal to prevent misunderstanding that could cause a larger than desirable pressure drop between the dispenser pressure sensors(s) and the vehicle.	Figure 1 is an example, THE FILTER POSITION IS NOT GOOD IN THE FIGURE. FILTER SHOULD BE UPSTREAM. WILL CHANGE THE LOCATION.  WILL SPECIFY A MECHANICAL PRESSURE GAUGE IN 4.2.9 a WILL FOLLOW THE DIRECTION OF WG24.
ANSI	89-103	1		Tech	It is seems that we have a serious problem with the scope.	Address all equipment dealing	Agree in principle. Components

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US					<p>Are we trying to –</p> <ol style="list-style-type: none"> <li>1) Define the requirements for a subsystem that performs the dispensing function whether the components/assemblies are located physically at the dispensing area or elsewhere in the filling station?</li> <li>2) Address equipment only physically located at the dispensing area?</li> </ol> <p>For example, pressure protection of the dispenser may be conducted at the dispenser, “behind the wall”, or both locations. Also, flow control and pre-cooling may be located in either location.</p> <p>If we do not select option 1, where are these functions defined?</p>	<p>with the dispensing function whether physically located in the dispenser or not. State that clearly in the scope.</p> <p>Modify the diagram to include all necessary functions including pressure protection at a PSV.</p> <p>The only components that need to exist in the dispensing area are –</p> <ol style="list-style-type: none"> <li>1) Shutoff</li> <li>2) Filter</li> <li>3) Break-away</li> <li>4) Hose assembly</li> <li>5) Nozzle</li> <li>6) Temperature and pressure sensors</li> </ol> <p>The other functions can be fulfilled in the dispensing area or elsewhere at the filling station depending on design decisions by the supplier. This equipment has to be either supplied with the dispenser or be specified as part of the dispenser installation requirements.</p>	external to the dispenser will be included such as PLC.
ANSI US	104-108	1		Tech	What does this mean? The dispenser requirements document is all about safety so therefore this document contains nothing?	Delete 104-108.	See above.
ANSI	113	2				Replace all references to	Agree to refer to ISO documents. Will

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US						ANSI/ASME B31.3 with ISO 15649 throughout draft.	do.
JISC JP		3.Terms and definitions	General	ed	Use the alphabetical order.	Rearrange to follow the alphabetical order.	Agree. NOT ESTABLISHED YET, AND WILL DO IT AT THE END.
JISC		3.4 dispenser	Note 1 to entry	ed	No need "1 to entry"	Change as only "Note"	DISAGREE. FORMAL REQUIREMENT OF ISO DIRECTIVES.
JISC		3.5 breakaway device		ed	Match to 3.23, 19880-1.	hose breakaway device device installed on a dispensing hose that separates when a given pull force is applied and closes the flow of hydrogen to prevent gas leakage and protects the dispenser from damage from a vehicle driving away	AGREE.
JISC		3.7 enclosure	3.7	ed	Match to 3.10, 19880-1.	protective housing that may enclose equipment in order to protect it from the environment, provides noise attenuation, or provides safety to the areas surrounding the equipment	AGREE. NICK WILL PROVIDE THE FINAL WORDING.
JISC		3.8 fill pressure	Note 1 to entry	ed	No need "1 to entry"	Change as only "Note"	SEE ABOVE.
ANSI US	172	3.8		T	Fill pressure location is not specified.	To be consistent with other standards, the fill pressure should be measured just before the break away on the dispenser. Include a requirement regarding measurement (see US comment regarding line 449)	Change to: Fill pressure shall be measured downstream of the filter or any other flow resisting component and upstream of the hose breakaway device. Figure 1 is to be revised to <b>Use WG24 v.10: 7.1.2</b>

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							Dispenser sensor location with shall for this sentence.
JISC JP		3.9 fitting	3.9	ed	Match to 3.13, 19880-1.	connector used to join any pressure retaining components in the system	AGREE
JISC JP		3.10 fuelling station	3.10	ed	Match to 3.18, 19880-1.	facility for the dispensing of compressed hydrogen vehicle fuel, often referred to as a hydrogen refuelling station (HRS) or hydrogen filling station, including the supply of hydrogen, and hydrogen compression, storage, and dispensing systems	AGREE
JISC JP		3.11 hose	3.11	ed	Match to 3.16, 19880-1.	fuelling hose flexible conduit used for dispensing gaseous hydrogen to vehicles through a fuelling nozzle	FUELING IS THE OFFICIAL SPELLING. TO BE CONFIRMED BY WG24 OR WG22 (19880-1 OR -4).
JISC JP		3.13 hydrogen gas	3.13	ed	Overlapping reference to ISO 14687-2.	Correct to a single reference.	AGREE.
JISC JP		3.16 maximum allowable working pressure	3.16	ed	Match to 3.27, 19880-1.  CORRECTION 3.26	maximum pressure that a component may experience in service, including upset conditions, independent of temperature, before initiating mitigation options, typically the basis for the set point of the pressure relief device protecting the vessel or piping system.  Note: The maximum allowable working pressure may also be defined as the design pressure, the maximum allowable operating pressure, the maximum permissible working pressure, or	Definition from 19880-1

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						the maximum allowable pressure for the rating of pressure vessels and equipment manufactured in accordance with national pressure vessel codes	
JISC JP		3.17 nominal working pressure (NWP)	3.17	ed	Match to 3.30, 19880-1.	pressure for which the dispenser is intended to be operated for a given gas temperature of 15 °C. Note: This defines a full vehicle tank gas density, of either 35MPa or 70MPa at 15°C.	Definition from 19880-1
JISC JP		3.18 pressure	3.18	ed	Change to gauge pressure because there is no need for pressure to be described in Pa in ISO documents.	pressure in this document is a gauge pressure unless otherwise specified.	AGREE AND DONE. (CHANGE THE PRESSURE UNIT TO PaG -> NICK TO CHECK IT OUT)
JISC JP		3.22 automatic valve	3.22	ed	Match to 3.7.1, 19880-3. Change the sequence to follow the alphabetical order.	automatic valve on/off valve for controlling flow of gas that is not manually operated	AGREE, BUT WG20 CHANGED AUTOMATIC VALVE TO EXTERNALLY ACTUATED VALVE.
JISC JP		3.13		ed	Overlap.	gas whose composition complies with ISO14687-2 or <del>ISO 14687-2</del>	AGREE.
JISC JP		3.18		ed	Use SI for units.	expressed as <del>psi</del> or Pa	See above. This is not necessary.
JISC JP		3.18		ge	Clarify the pressure description.	Describe pressure as gauge pressure as the standard description.	Agree. See above.
JISC JP		4.2.1	o)	ed	Delete.	<del>NOTE: Also see ANSI/NFPA 2 and API RP 2003.</del>	Agree ISO 19880-1 may help.
JISC		4.2.1	t)	ge	Limit the reference to normative documents to IS; make non-	A dispenser shall be protected against lightning strikes in	Agree.

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JP					IS as informative.	accordance with <b>applicable local standards such as</b> API RP 2003.	When -1 is ready, can use it.
AFNOR FR		4.2.1	Point a) lines 249 to 252	Te	<p><i>“All components used in compressed hydrogen gas dispensing equipment shall either be listed by a nationally recognized certification agency as complying with an applicable standard, or shall be evaluated by the certification agency for the intended application as part of the dispensing equipment”</i></p> <p>There is not such requirement at European level : the requirement is generally to be “CE marked” for components or sub system. A recognized notified Body may be needed for example for compliance with Pressure Equipment Directive (Type III or type IV equipment). This requirement mainly concerns Japan and US.</p>	<b>Proposal to delete point a)</b>	Please see the change.
AFNOR FR		4.2.1	Point c) ii) et iii)  Lines 258 to 261		<p><i>“ii) evaluated by the certification agency for the intended application as part of the dispensing equipment, or iii) evaluated by the manufacturer and approved by the local AHJ for the intended application as part of the dispensing equipment.”</i></p> <p>Same comment as previous point</p>	<b>Proposal to delete point c) ii) &amp; iii)</b>	Please see the change.
AFNOR FR		4.2.1	Point g)  Lines 269 to 272		<p><i>“A dispenser shall have provisions for operation in conjunction with an Emergency Shut-down System (ESS). Activation of the ESS shall cause the dispenser to disable the flow of gas to the vehicle, and shall shut off the electrical supply to the dispenser. (See 5.4 Dispenser shut-down test).”</i></p> <p>Some safety function may need to remain energized.</p>	<p><i>“A dispenser shall have provisions for operation in conjunction with an Emergency Shut-down System (ESS). Activation of the ESS shall cause the dispenser to disable the flow of gas to the vehicle, and shall shut off the electrical supply to the dispenser. (See 5.4 Dispenser shut-down test) <u>some safety functions may</u></i></p>	<p>Agree in principle.</p> <p>Similar comment from BSI below.</p> <p>Change 4.2.1 g to 'gas flow only.'</p>

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						<i>need to remain energized.</i> "	
BSI GB		4.2.1	a	Ge	This duplicates 4.2.1 (c), without the desired flexibility.	Remove 4.2.1 (a) :	Agree New proposal : Evaluated by the manufacturer and approved by the local AHJ, where applicable. This new proposal is to be discussed with a French comment.
BSI GB		4.2.1	g	Te	Does shut off the electrical supply to the dispenser mean fully de-energise the dispenser? Whilst this may end up a requirement in the UK for forecourt dispensers when an E-stop button is pressed, I'm not certain this is the case in other scenarios, or in other countries? Also, this isn't clarified in 5.4 I don't think? Should it be a part of the test?	Clarify what is meant by "and shall shut off the electrical supply to the dispenser."  Consider if this is needed as part of 5.4.	Agree. Remove "and shall shut off the electrical supply to the dispenser."
BSI GB		4.2.1	l	Te	There is a question mark over the suitability of 1.38 MAWP due to the need for the preventing the vehicle pressure from exceeding 1.25 MAWP. Setting the PRV higher than this may require a SIL equivalent for the dispenser pressure control that is higher than that assumed in this document.	Consider this value following the outcome of the LOPA study being carried out in WG24.	Please see the change
BSI GB		4.2.1	m (l)	Ge	Unclear what "...the temperature and pressure range specified by the manufacturer" means?  If the dispenser manufacturer, then I wouldn't have thought there is a single "temperature range" for the dispenser - components upstream of the pre-cooler for instance do not need to be rated to the same temperatures as those after the pre-cooler?	Consider replacement text:  Equipment (or components) shall be designed for the expected operating conditions, and the permissible ambient conditions as specified by the dispenser manufacturer.	Agree.  The proposed sentence has been modified through discussion.  Changed to : Equipment (or components) shall be capable of operating under the operating conditions, environment, and ambient conditions as specified by the dispenser manufacturer.
BSI GB		4.2.1	q	Te	Further detailed text is available in ISO TR 19880-1 relating to excess flow valves, pressure drop alarms, mass flow meter alarms etc....	Consider including appropriate language from ISO DTR 19880-1 clause 7.2.3.5 or amend as appropriate.	Discussed and agreed to leave the original wording. Also agreed to reflect detailed provisions in -1 to -2 where appropriate when -1 is fixed. Ex. Hose

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							rupture test to 5.5 Test method.
BSI GB		4.2.1	r	Te	<p>What does activated mean? Should it prevent pressure testing being carried out whilst the nozzle is mounted on the dispenser for instance? Can the HMI respond to any instruction before the nozzle is removed? And does this require a pressure sensor on the nozzle mounting to show that the nozzle has been removed? (It could just be lying on the floor?...)</p> <p>Or does it mean that the fuelling cannot start before the nozzle is connected to the vehicle</p>	Clarify intention of "activated"	<p>Agree in principle. Please see the change made.</p> <p>Change done in the meeting.</p>
BSI GB		4.2.1	t	Te	Is this essential, even where the station provides adequate lightning protection? For instance, where the dispenser is installed under a canopy?	Clarify, and consider removal if covered sufficiently in the station general requirements.	Agree. The prevention of lightening is a matter of the station as a whole
BSI GB		4.2.1	w	Te	Is this a requirement for during construction and assembly? If so, this doesn't sound possible to achieve?	Clarify, and consider removal. (Unless this is a design criteria for operation – if so, maybe the heading need to be changed?)	Agree.
AFNOR FR		4.2.1.	Point h)  Lines 273 to 276	Te	<p><i>"In the event of a loss of electrical power, the compressed hydrogen gas dispenser shall shut down in a safe manner. The current fueling event, if one is in progress, shall be terminated and the flow of gas to the fueling nozzle shut off automatically. Once power is restored, the dispenser may resume operations; however, a new fueling event must be initiated using standard procedures."</i></p> <p>The hose should also be depressurized.</p>	<p><i>"In the event of a loss of electrical power, the compressed hydrogen gas dispenser shall shut down in a safe manner. The current fueling event, if one is in progress, shall be terminated and the flow of gas to the fueling nozzle shut off automatically. <u>The hose will be depressurized.</u> Once power is restored, the dispenser may resume operations; however, a new fueling event must be initiated using standard procedures."</i></p>	<p>Agree.</p> <p><i><u>The hose will be depressurized.</u></i></p>

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AFNOR FR		4.2.1.	Point p)  Lines 299 to 303	Te	<p><i>“Manual block and bleed valves to purge the dispenser shall be provided. The block valve may be accessible to the public. The bleed valve shall be inaccessible to the public, and shall be provided with a locking mechanism, or housed in a permanent enclosure with a lockable access to prevent accidental operation of the valve. The bleed valve shall allow the hydrogen piping and components in the dispenser to be depressurized for service.”</i></p> <p>Could you explain the rationale behind this requirement. There is no need to have a block + a bleed valve. A bleed valve may be sufficient if collected to a vent stack.</p> <p>In addition, a manual bleed valve should remain optional.</p>	<b>Proposal to delete point p)</b>	<p>Agree.</p> <p>They are not a safety requirement.</p>
AFNOR FR		4.2.1.	Point r)  Lines 307 to 310	Te	<p><i>“Nozzles shall be positioned such that removal from their mounting is required before the dispenser can be activated. A dispenser shall require a minimum of two operations to initiate gas flow to the vehicle. One operation shall ensure the nozzle is properly connected to the vehicle to enable fuel flow. The second operation shall be to authorize the fueling.”</i></p> <p>Which kind of operation shall ensure that the nozzle is properly connected: is-it a manual control? There is no possible automatic control</p>	<p><i>“Nozzles shall be positioned such that removal from their mounting is required before the dispenser can be activated. A verification should be performed. A dispenser shall require a minimum of two operations to initiate gas flow to the vehicle. One operation shall ensure the nozzle is properly connected to the vehicle to enable fuel flow. The second operation shall be to authorize the fueling.”</i></p>	<p>Disagree. Please see the changes made to the paragraph, in particular, to the following: Nozzle is properly connected and locked.</p> <p>Done in the meeting.</p>
ANSI US	253-265	4.2.1		Tech	<p>Discussion of approval of components by a national authority doesn't seem appropriate. This document should be referring to the technical requirements as being defined by the other working groups to which the components should apply.</p>	<p>Refer to components standards being developed by other WGs (pending completion).</p> <p>If no specific standard is currently under development, refer to Clause 8 of 19880-1 for general</p>	<p>Agree in principle, but there are no standards available from other WGs for the time being. Please see the modification made.</p>

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						requirements to ensure compliance with material compatibility in hydrogen piping code in accordance with ISO 15649 and ignition of potential flammables in accordance with IEC 60079.	
AFNOR FR		4.2.3	Point a)  Lines 345 to 348	Te	<p><i>“Each dispenser shall be equipped with an overpressure control system that includes a mechanical pressure safety valve or control device that will protect both vehicle and the components of the dispenser from overpressure in the event of extreme controller malfunction. Each dispenser nozzle shall be protected.”</i></p> <p>No need to repeat the last sentence as it is clearly mentioned at the beginning of the paragraph.</p> <p>What is a “control device” ? Is it an overpressure control system.</p>	<p><i>Proposed text:</i></p> <p><i>“Each dispenser shall be equipped with a mechanical pressure safety valve or any other overpressure control system that will protect both vehicle and the components of the dispenser from overpressure in the event of extreme controller malfunction”</i></p> <p><i><u>“A risk assessment could be used to determine which overpressure control system is needed”</u></i></p>	Agree. Please see the modification of the proposed text. Done in the meeting.
BSI GB		4.2.3	a	Te	Is there a need to single out the nozzle in addition to the general “components of the dispenser”?	Remove second sentence	See above.
BSI GB		4.2.3	b	Te	There is a question mark over the suitability of 1.38 MAWP due to the need for the preventing the pressure from exceeding 1.25 MAWP. Setting the PRV higher than this may require a higher SIL equivalent than assumed in this document.	Consider this value following the outcome of the LOPA study being carried out in WG24.	Agree. Pending the progress of WG24.
JISC JP		4.2.3	d)	ge	Limit the reference to normative documents to IS.	Pressure relief valves when used to protect the dispenser shall be designed and installed in	Agree. To be done.

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						accordance with ISO 4126 or applicable local codes.	
JISC JP		4.2.3	e)	ed	Use "standards" instead of "codes".	The discharge opening of all pressure relief valves shall be vented to a safe location, as specified in applicable local <del>codes</del> <b>standards</b> such as CGA G-5.5.	Agree. To be done throughout the document.
JISC JP		4.2.4	f)	ed	Use "standards" instead of "codes".	f) Formed supply piping and tubing shall have all bends made in accordance with applicable local <del>codes</del> <b>standards</b> such as ANSI/ASME B31.3.	Agree.
ANSI US	369-374	4.2.4	3	Te	The filter requirement should match other ISO documents, such as 19880-2. Also, 10 micron filters have been shown to allow large particles which may damage vehicle components.	Revise to be in alignment with ISO 19880-1.	Agree. Pending WG24. <b>Changes made to "5 micron and 99%"</b>
AFNOR FR		4.2.5	Lines 378 to 380	Te	<i>"All valves used in the high pressure parts shall be certified, listed or accepted under the national standards."</i>  Too specific to Japan or US	Proposal to delete the sentence  <i>"All valves used in the high pressure parts shall be certified, listed or accepted under the national standards."</i>	Disagree, but please see the modification. Done.
JISC JP		4.2.6	a)	ge	Limit the reference to normative documents to IS; make non-IS informative.	Hydrogen vent systems discharging to the atmosphere shall be in accordance with <b>applicable local standards such as</b> CGA G-5.5.	Agree
ANSI US	390	4.2.6 b)		T	The depressurization feature is only applicable to type C nozzles, not type A nozzles	Word the paragraph so that it only applies to type C nozzles.  <b>When a nozzle has only a supply hose (no vent hose), a dispenser shall be equipped with a means to depressurize</b>	Disagree. The depressurization of hosing is performed by the dispenser system but not by the nozzle. This provision is not related to nozzles per se. ISO17268 describes nozzle types.

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						the fuel hose when fueling is interrupted through activation of the ESS, or power to the dispenser is lost, so as to enable disconnection of the fuel hose from the vehicle.	Agree. : See additional text shown at left in yellow highlight
DIJISC JP		4.2.7	b)	ed	Use "standards" instead of "codes".	Piping and tubing design, fabrication, testing, and welded joints shall be done in accordance with an applicable local piping code- <b>standards</b> such as ANSI/ASME B31.3.	Agree.  Done
JISC JP		4.2.7	e)	ge	Any standards other than international standards should not be normative.	- Volume change and extraction as specified in ISO 3601-3 except that the conditioning shall be for 96 hours at 20.7 MPa at a temperature of 65°C for compressed hydrogen gas, and for 70 hours immersion in <b>applicable local code such as</b> IRM903 oil and methanol.	Agree.  Done
ANSI US	433	4.2.8 c)		GE	Is there a test for the leak rate proposed? Does it include precooled, high pressure h2?	Remove second sentence of this clause as this leakage rate will be included in the ISO standard on hoses under development by WG 22.	Agree. Done.
ANSI US	439	4.2.8 d)		T	Reference ISO document regarding nozzle requirements.	Revise sentence to read" "Nozzles shall be in accordance with ISO 17268 or SAE J2600."	Agree in principle, but SAE is removed. Done.
AFNOR FR		4.2.8	Point d)  Line 435	Te	<i>"Nozzles shall be listed by a nationally recognized agency as complying with SAE J2600."</i> Too specific to Japan or US. Mention ISO 17268	<i>"Nozzles shall comply with ISO 17268."</i>	Agree.  <b>Consolidated language into point b</b>

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JISC JP		4.2.8	d)	ge	Limit the reference to normative documents to IS.	Nozzles shall be listed by a nationally recognized agency as complying with <b>SAE J2600 ISO 17268</b> .	See above.
JISC JP		4.2.8	e)	ge	Any standards other than international standards should not be normative.	A breakaway device certified, listed, or accepted by a nationally recognized agency as complying with <b>applicable local standards such as</b> HGV 4.4 shall be provided in the hose assembly between the dispenser frame and the fueling nozzle.	Agree. <b>Done, wording further revised.</b>
AFNOR FR		4.2.9	Line 449	Te	<i>"a) The dispenser shall be equipped with a device to indicate the delivery (hose) pressure".</i>  For now a pressure gauge in the dispenser is not always required. What is it needed for? This is a manufacturer choice for maintenance	<i>Proposal to Delete point a)</i>	Agree in principle. Shall is changed to should.
ANSI US	449	4.2.9 a)		T	Need to establish allowable position for pressure measurement for dispenser control.	Revise to read: "The dispenser shall be equipped with a device to indicate the delivery (hose) pressure <u>for dispenser control. This sense line for this device should be tapped into the dispensing line within 1 metre upstream of the break away on the dispenser.</u> "	See above. Disagree. The gauge is for indication only but not for control.
AFNOR FR		4.2.10	Point d Line 470	Te	<i>"f the dispenser offers slow speed fueling below 5 g/s, the dispenser shall not fuel the vehicle to pressures exceeding the NWP. If the ambient temperature is below 15°C, the dispenser shall compensate for low temperatures and fill the</i>	<i>Clarification needed</i>	It is in conflict with J2601 because J2601 doesn't allow any slow filling. However, this is a safe method for slow fill and consistent with 19880-1.

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					<p><i>vehicle tank to less than the NWP and stop the fueling so the tank contents are no greater than 98% state of charge and less than service pressure if the tank system were to be equilibrated at 15°C.”</i></p> <p>The meaning is not really clear and some points seem to be in contradiction with SAE J2601</p>		Agree to leave in slow filling option
BSI GB		4.2.10	All	Ge	This chapter is considerably smaller than Chapter 7 in the current draft ISO TR 19880-1. Is there information about the fueling protocol that should be included, either as an informative Annex to this document, or within 4.2.10? (recognising line 95, “Scope”)	Discussion needed over what content from Chapter 7 of ISO WDTR 19880-1 is critical and should be in the dispenser standard.	Agree. Bob’s homework to propose the essential req. to be written out in -2 and references back to -1.
BSI GB		4.2.10	a	Ge	<p>It is not clear at this stage whether, when talking about numerous dispensers on a forecourt, the control system will be per dispenser, or based on a single overall station control system?</p> <p>How would this change the document if the control system was elsewhere in the station and combined into one control system? Would everything else be achievable?</p>	Include the flexibility for a dispenser to be controlled by a different control system.	<p>Agree. Please propose a text to reflect the comment in conjunction with Bob because he originally wrote this.</p> <p>Please include some kind of wording to say that centralized control needs fail-safe features. <b>See revised text</b></p>
BSI GB		4.2.10	a	Ge	<p>Is it not the case that the dispenser should meet process requirements that are defined by the standardised vehicle specification?</p> <p>All fuelling protocols should be designed to prevent certain things happening, for example:</p> <ul style="list-style-type: none"> <li>Exceeding a vehicle tank temperature of 85 deg C</li> <li>Exceeding a pressure of 125% NWP</li> <li>Exceeding 60 g/s (for light duty vehicles of CHSS volume 2-10 kg)</li> </ul> <p>These requirements should be irrespective of the fuelling protocol, which is essentially a way to achieve these ultimate goals under certain performance criteria?</p>	Include a clear list of what the fuelling protocol should achieve rather than referring to requirements of fuelling protocols.	See the revised text
ANSI US	253-265	4.2.10 and 4.2.12		Tech	Dispenser normal control and fault management requirements should be consistent with latest version of 19880-1.	Move all dispenser control functions to a new section 4.3.	Agree. See the change.

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					Additionally, these control requirements are not really “construction” requirements.	Include normal dispenser functions (including the protocol) in 4.3.1 based on latest definition in 19880-1, and include fault management dispenser functions (including the emergency shutdown) in 4.3.2 based on latest definition in 19880-1.	
ANSI US	464	4.2.10 c) (i)		T	Description of items to be calculated is too specific.	Revise (i) to be in alignment with ISO 19880-1	Agree. Pending WG24.
ANSI US	470	4.2.10 d)		T	J2601 flow rates are as low as 1.2 g/s	Revise to be in alignment with ISO 19880-1.	Agree. Pending WG24.
ANSI US	480-481	4.2.10	c(ii)	Te	NWP is a better measure since non-communication dispensers will not be able to measure the SOC. It also matches the requirements in J2601	Revise to be in alignment with ISO 19880-1.	Agree. Pending WG24. This paragraph was removed as is now redundant text
JISC JP		4.2.10	e)	ge	Limit the reference to normative documents to IS.	f the dispenser uses an IRDA communication method to gather information, the data language shall use a format such as what is described in <del>SAE J-2719</del> <b>ISO 14678-2</b> , and shall:	Agree. Done
BSI GB		4.2.10	f	Te	Is this consistent with the SAE J2601 term “top-off”.	Please clarify – it might be much lower if top-off means the same, or maybe the word “fuel” should be used”?  If “fuel” – this doesn’t appear to be in 19880-1 – is it a requirement not to fill a vehicle with >94 % SOC at the start?	Agree and see the change made.  Done.

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BSI GB		4.2.10	g	Te	Should this read 5 bar (0.5 MPa), as allowed in SAE J2601?	Consider changing to 5 bar	Agree and done.
JISC JP		4.2.10	g)	ed	50 bar is not an SI	To be changed as 50 bar → 5 MPa	See above.
AFNOR FR		4.2.11	Point b)  Lines 483 to n485		<p><i>“b) Electrical classifications for dispensers shall be defined as Zone 2 in IEC methodology or in accordance with the manufacture’s risk assessment. Protection techniques identified in IEC 60079-10-1 are acceptable for electrical and electronic equipment in hazardous locations.”</i></p> <p>Why should it be as zone 2?</p>	<p><i>“b) Electrical classification for dispensers could be defined according to IEC 60079-10-1 or in accordance with the manufacture’s risk assessment. Protection techniques identified in IEC 60079-10-1 are acceptable for electrical and electronic equipment in hazardous locations.”</i></p>	<p>Agree in principle. Please see the changes made to a and b.</p> <p>Done in the meeting.</p>
BSI GB		4.2.11	b	Te	Is the Zone 2 always applicable in the case of limited air flow in the dispenser enclosure? This may necessitate a Zone 1?  Also typo in manufacturer’s.	Remove Zone 2 and replace with: “....shall be defined according to IEC 60079-10-1, or in accordance with the manufacturer’s risk assessment.”	See above.
BSI GB		4.2.11	b	Te	60079-10-1 does not identify protection techniques, just the methodology for calculating the zone.	Replace by:  Protection techniques identified in <u>the IEC 60079 series of standards</u> are acceptable.....	See above
ANSI US	510	4.2.12.3		T	The requirements to evaluate the software should be determined by the hazard review	Revise to be in alignment with ISO 19880-1.	Agree. Pending WG24.
JISC JP		4.2.12.3	a)	ge	Limit the reference to normative documents to IS; make non-IS informative.	Software used to control the dispenser’s emergency shutdown system shall be evaluated in accordance with <b>applicable local</b>	<p>Agree. To be done.</p> <p>SIL is difficult to control by software</p>

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						<b>standards such as</b> UL 1998 Standard for Software in Programmable Components.	function.
AFNOR FR		4.2.12.4	Line 512 & 517	te	<p><i>a) Software used to control the dispenser's emergency shutdown system shall be evaluated in accordance with UL 1998 Standard for Software in Programmable Components</i></p> <p><b>&amp;</b></p> <p><i>"b) Electronic control circuits relied upon for fueling station safety shall be evaluated to UL 991."</i></p> <p>These requirement do not mentioned ISO standards and should remain optional</p>	<p><i>a) Software used to control the dispenser's emergency shutdown system could be evaluated in accordance with standards such as UL 1998 for Software in Programmable Components</i></p> <p><b>&amp;</b></p> <p><i>"b) Electronic control circuits relied upon for fueling station safety could be evaluated according to standards such as to UL 991."</i></p>	<p>Agree in principle. Changed to should.</p> <p>Note: a) is from 12.3 b) is from 12.4</p> <p>Review UL991 for an equivalent IS.</p>
JISC		4.2.13	b)	ge	Limit the reference to normative documents to IS; make non-IS informative.	Electronic control circuits relied upon for fueling station safety shall be evaluated to <b>applicable local standards such as</b> UL 991.	Agree. Done.
JISC JP		4.2.13		ge	Use standards instead of codes.	A purging system, if used, shall be approved by a third party agency as complying with the applicable local <del>codes</del> <b>standards</b> such as ANSI/NFPA 496.	Please see the change.
ANSI US	522	4.2.13		T	What is a purging system, is it for purging the H2 lines after a fill, for maintenance, or for purging control enclosures	Delete this subclause and reference IEC 60079 to address ignition of potential flammables in an electrical system.	Agree and done. <b>See revised text</b>
JISC JP		4.2.14 <b>this section is now 4.5</b>	a)	ed/ge	<p>Wrong clause references.</p> <p>Limit the reference to normative documents to IS.</p>	All markings shall be suitable for application to surfaces upon which applied and shall demonstrate suitable legibility as	Agree and will review the entire document for cross-referencing.

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						specified under Section <del>2.43</del> <b>5.11</b> <del>Marking Material Adhesion and Legibility, CSA HGV4.1:2013 Standard for Hydrogen Dispensing Systems.</del>	
JISC		4.2.14 <b>this section is now 4.5</b>	a) Class II A1	ed	Wrong clause references	Shall be made of metal having a minimum thickness of 0.30 mm, shall be securely attached by mechanical means and shall comply with <del>said</del> Section <del>2.43</del> <b>5.11</b> <del>Marking Material Adhesion and Legibility.</del>	Agree and will review the entire document for cross-referencing.
JISC JP		4.2.14 <b>this section is now 4.5</b>	a) Class II A2	ed	Wrong clause references	Shall be made of metal having a thickness of 0.15 mm to 0.30 mm, shall have mechanical attachment means at all corners with a maximum spacing of 150 mm between mechanical fasteners and shall comply with <del>said</del> Section <del>2.43</del> <b>5.11</b> <del>Marking Material Adhesion and Legibility.</del>	Agree and will review the entire document for cross-referencing.
JISC JP		4.2.14 <b>this section is now 4.5</b>	a) Class II A3	ed	Wrong clause references	Shall be made of metal having a thickness less than 0.15 mm. Such plates shall be attached by means of non-water soluble adhesive which will comply with <del>said</del> Section <del>2.43</del> <b>5.11</b> <del>Marking Material Adhesion and Legibility.</del>	Agree and will review the entire document for cross-referencing
JISC JP		4.2.14 <b>this section is now 4.5</b>	a) Class II A4	ed	Wrong clause references	Shall be made of pressure sensitive metal foil requiring no solvent or activator, provided such plates comply with <del>said</del> Section <del>2.43</del> <b>5.11</b> <del>Marking Material Adhesion and Legibility.</del>	Agree and will review the entire document for cross-referencing.
JISC JP		4.2.14 <b>this section</b>	a) Class III A1	ed	Wrong clause references	Shall be made of material not adversely affected by water, shall be attached by means of non-water soluble adhesive and shall	Agree and will review the entire document for cross-referencing.

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		is now 4.5				comply with <del>said Section 2-13 5.11 Marking Material Adhesion and Legibility.</del>	
JISC JP		4.2.14 this section is now 4.5	a) Class III A1	ed	Wrong clause references	These materials shall not be located on surfaces having temperatures exceeding 150°C.	Agree.
JISC JP		4.2.14 this section is now 4.5	a) Class III A2	ed	Wrong clause references	Shall be made of material not adversely affected by water, shall be attached by means of non-watersoluble adhesive and shall comply with <del>said Section 2-13 5.11 Marking Material Adhesion and Legibility.</del>	Agree and will review the entire document for cross-referencing.
JISC JP		4.2.14 this section is now 4.5	a) Class III B	ed	Wrong clause references	Shall be printed directly on the part with waterproof marking not adversely affected by a temperature of 80°C and shall comply with <del>said Section 2-13 5.11 Marking Material Adhesion and Legibility.</del>	Agree and will review the entire document for cross-referencing.
JISC JP		5.1	d)	te	Gases other than hydrogen are also used in leak tests.	Hydrogen, helium, hydrogen mixtures or helium mixtures	Agree in principle and will harmonize with WG24. done
JISC JP		5.2.1	Line 616	ed	Change "hour" to the SI unit:"h"	To be changed: 24 hour→ 24 h	Agree.
AFNOR FR		5.2.2	Lines 616 to 618	Te	<i>"All manual and automatic process valves shall be held in the open position. In the case of a 70 MPa dispenser, the vented (to atmosphere) dispenser hose, nozzle and breakaway device must be tested separately."</i>  Why this requirement is limited to 70 Mpa only?	Please clarify	This is 5.2.3. Agree in principle. Please see the changes made.
JISC JP		5.2.3	Line 627, 628,630,	ed	Change "hour" to the SI unit:"h"		Agree and to be done.

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			631,633, 634				Removed the time requirement
JISC JP		5.2.3	Line 624	ed	Change "percent" to the SI unit:"%"		Agree <b>and done.</b>
JISC JP		5.4.1		ed	Wrong clause references	A dispenser shall disable the flow of gas to the vehicle when the ESS is activated. (See 4.2.1 ¶ g)	Agree and to be done. <b>Draft has changed (see 4.4.2)</b>
JISC JP		5.4.2 5.5.2	Line 664, Line 683	ed	Change "Three seconds" to "3 s" in SI.	To be changed as Three seconds → 3 s	Agree
AFNOR FR		5.5.2.	Line 680	Te	<i>"This test shall be conducted 5 times."</i>  Shall it be applied 5 times on each dispenser to be installed ? Why? What is the rationale behind this requirement?	<i>Please clarify</i>	This is a relatively quick test, and five has been inherited from the NGV. In order to check repeatability, five seems reasonable. The tank size is inserted based on J2601.
JISC JP		5.6.1	Line 639	ed	Change "One second" to "1 s" in SI.	To be changed as One second → 1 s	Agree.
JISC JP		5.6.2	Line 705, 708	ed	Change "Two hours" to "2 h" in SI	To be changed as two hours→ 2 h,	Agree but <b>Language has been removed</b>
AFNOR FR		5.6.2	Line 695  Table 1	Te	Table 1  Shall it be applied 5 times on each dispenser to be installed ? It is tricky to perform a breakaway test with gas in the pipe	Review number of test	Agree in principle. Please see the changes made.
JISC JP		5.6.2		ge	Limit the reference to normative documents to IS; make non-IS informative.	A direct tensile force shall be applied beginning at a force less than 222 N and increasing until the device separates. The device shall separate and, if pressurized, the flow of gas from the inlet half shall cease and shall not continue	Agree

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						to leak in accordance with <b><u>applicable local standards such as</u></b> ANSI/CSA HGV 4.4-2013, Section 2.2 Leakage. The flow of gas from the outlet half shall either (1) cease and shall not continue to leak in accordance with <b><u>applicable local standards such as</u></b> ANSI/CSA 4.4, Section 2.2 Leakage, or (2) control the depressurization of the hose.	
JISC JP		5.6.2		ge	Limit the reference to normative documents to IS; make non-IS informative.	Upon completion of the testing specified above, each "one time use" sample shall comply with said Section 2.2, Leakage in the separated configuration. The reusable sample shall comply with <b><u>applicable local Chstandards such as</u></b> ANSI/CSA 4.4, Section 2.2 Leakage in both the separated configuration and when reassembled.	Agree and to be done.
JISC JP		5.7.2	Line 729	ed	Change "1000 volts" to "1000 V" in SI.	To be changed as 1000 volts → 1000 V	Agree
JISC JP		5.7.2	Line 735, 736, 737	ed	Ohms should be written as 1Ω.  Amperes should be A, and volts should be V.	To be changed as Ohrms → Ω  Volts dc → V DC  Ampare → A	Agree and to be done.
JISC JP		5.8.1	Line 743	ed	One ohm should be written as 1Ω.	To be changed as 1 ohm → 1 Ω	Agree and to be done.
JISC JP		5.8.2	Line 749, 750	ed		To be changed as 20 ampares → 20 A	Agree and to be done.

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MB/ NC <sup>1</sup>	Line number	Clause/ Subclause	Paragraph/ Figure/Table	Type of comment <sup>2</sup>	Comments	Proposed change	Observations of the secretariat
					20 amperes should be 20 A, and 12 volts, 12 V.	12 volts→ 12 V	
JISC JP		5.9.2	Line 759&768 762	ed	500 volt-ampere is to be 500 VA  1 minute is to be 1 min	To be changed as 500 volt-ampere → 500 VA 1 minute → 1 min	Agree and <del>to be</del> done.
JISC JP		5.9.2	a) Line 767&768&77 2, 771	ed	1,000 volts is to be 1 000 V, 250 volts is to be 250 V  500 volts is to be 500 V  1/2 hp (373W) is to be 373 W	To be changed as 1,000 volts → 1 000 V 250 volts → 250 V 500 volts → 500 V 1/2 hp (373W) → 373 W	Agree and <del>to be</del> done.
JISC JP		5.9.2	b) Line 773&774	ed	1 minute is to be 1 min 60 herts is to be 60 HZ	To be changed as 1 minute → 1 min 60 herts → 60 HZ	Agree and <del>to be</del> done.
JISC JP		5.10,2	a) Line 789	ed	4 in is to be 101.6 mm	To be changed as 4 in → 101.6 mm	Agree and <del>to be</del> done.
JISC JP		5.10,2	c) Line 797	ed	15 minutes is to be 15 min	To be changed as 15 minutes → 15 min	Agree and <del>to be</del> done.
JISC JP		5.11.2	c) Line 840, 841	ed	175°C(360°F) is to be 175°C  120°C(250°F) is to be 120°C	To be changed as 175°C(360°F)→ 175°C 120°C(250°F)→ 120°C	Agree and <del>to be</del> done.
JISC JP		5.11.2	Line 844	ed	24 hours is to be 24 h	To be changed as 24 hours → 24 h	Agree and <del>to be</del> done.
JISC JP		5.6.1 (Nittokoki)	Line 690	Te	The breakaway load is set at 222N to 667N, but should be 220 N to 1000 N in order to match that in WG24 WDTR	To be changed as 222N→220N 667N→1000N	Agree and <del>to be</del> done.

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					19880-1.		
JISC JP		5.6.2 (Nittokoki)	Line 711	Te	The breakaway load is set at 222N, but should be 220 N in order to match that in WG24 WDTR 19880-1.	To be changed as 222N→220N	Agree and to be <b>done</b> .
JISC JP		5.10.2	Line 788~	te	It differs that the test method between the referenced IEC 60529 and the test method stated in 5.10.a) thru g)	Delete the test method stated 5.10.2 A) thru g) and also delete the Figure 3, 4.	Agree. <b>Please see the changes.</b>
JISC JP		7.	d) ii )	ge	Delete ANSI/NFPA since they are local codes..	The installation shall be in accordance with the requirements of the AHJ. <del>In the absence of local codes, the installation shall be in accordance with the following:</del> i <del>ANSI/NFPA 2;</del> ii <del>ANSI/NFPA 70 as applicable.</del>	Agree in principle. Please see the modification.

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