DRAFT
RECOMMENDATION

TC 8/SC 5
(UK)

INFORMATION

Revision of R 49-1

Water meters intended for the metering of cold potable water and hot water.

Part 1: Metrological and technical requirements

Draft submitted for CIML online ballot on 2013.02.07

Voting closes on 2013.05.07

ORGANISATION INTERNATIONALE
DE MÉTROLOGIE LÉGALE

INTERNATIONAL ORGANIZATION
OF LEGAL METROLOGY

Draft Recommendation - Revision of R 49-1

Template for comments and secretariat observations

Date: 2012-10-31	Document: **prEN ISO 4064-1.2**

1	2	(3)	4	5	(6)	(7)
MB[1]	**Clause No./ Subclause No./ Annex** (e.g. 3.1)	**Paragraph/ Figure/Table/ Note** (e.g. Table 1)	**Type of com-ment**[2]	**Comment (justification for change) by the MB**	**Proposed change by the MB**	**Secretariat observations** on each comment submitted
FR			ge	Due to a lack of consensus inside the French mirror committee, France will cast the vote : abstention. It is important to notice that the vote could be changed in a positive vote if those comments are taking into account.		This comment was taken into account during the Joint Working Group discussion.
GB			Ge	It should be noted that GB is in favour of ISO 4064-1 but that the implication and inclusion of clause 6.3.2 prevent supporting the document – please see comment below.		This comment was taken into account during the Joint Working Group discussion.
US	~ ~	~ ~	ge	General comment on R49: While actively participating at every stage of the development of this draft (OIML R49/ISO 4064), the US has decided to abstain on the three parts of the 3CD because there are no plans to use the final recommendation/standard in the US in the near-term.		This comment was taken into account during the Joint Working Group discussion.
PL	v	Foreword	ed/ge	Please remember to correct the date of publication of this document. The information that final publication took place in 2011 is wrong.		Agreed
AU		1, Para 2	ed	We suggest rewording the first sentence to read "…used to measure the volume of cold potable water and hot water." The term "volume flow" is unnecessary. And it is best to align the order of water types with that used in the title of the Standard/Recommendation.		Agreed
ID	1. Scope	Paragraph 1 & 2	Ed	Paragraph 1 :.....cold potable water and hot water..... Paragraph 2 :.....hot water and cold potable water..... Inconsistent title statement between paragraph	It is recommended the statement of title in the paragraph 2 to be sama as statement of title in the paragraph 1 ".....cold potable water and hot water……"	Agreed

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JP	2 & 3		ed	The reference of 2 and the title of 3 are mixed and should be separated as it was in the previous DIS.	2 Normative references ISO 4064-2:201x, Water meters for cold potable water and hot water – Part 2: Test methods [≡OIML R 49-2:201x] 3 Terms and definitions	Agreed
AU		3, Heading	ed	There appears to be an error in the heading of clause 3. The reference to Part 2 in included in the heading of clause 3 when it should be contained within clause 2.		Agreed
AU		3 and multiple. Please also see the correspon ding comment for Part 2.		There appears to be a number of interchangeable terms used throughout the Standard/Recommendation to describe the organisations responsible for performing type approval testing and issuing type approval certification. We suggest that terminology be developed and implemented to describe these organisations in a uniform way. We would suggest the following terminology, however would be open to discussion on the matter: Approving Authority:- the person or organisation responsible for evaluating the water meter and issuing type approval certification in accordance with this Standard/Recommendation. Testing Laboratory:- the person or organisation responsible for testing the water meter in accordance with this Standard/Recommendation. The Testing Authority maybe the same entity as the		Not agreed, but rationalise use of 'body', 'type evaluation', etc. – see below.

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				Approving Authority. The following clauses are indentified as requiring such uniform terminology. In many cases the terminology used is similar and consistent with that proposed above. However, in each case consideration should be given to what power is given to a testing laboratory and what is retained by the approving authority where they are separate entities. • 7.2.2 – “the service responsible for type evaluation” • 7.2.9.3 – “the body responsible for the evaluation” • 7.2.9.3 – “the body responsible for the type evaluation” • 7.2.11.1 – “the body responsible for the approval” • 7.2.11.2 – “the body that approved the initial type” • 7.2.11.3 – “the body that approved the initial type” • A.2 – “metrology service”		7.2.2 –substitute ‘ body responsible’ for ‘service responsible’. Use 'type evaluation' throughout. In A.2 1st use: substitute 'body responsible for type approval' for ‘metrology service’. In A.2 2nd use: substitute 'testing laboratory' for metrology service’.

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						Delete last sentence of A.2.
ISO	3		ed	The preamble differs from that generated by the STD template (updated version: Directives, Part 2, 6.2.2)	Adapt the STD (or Directives, Part 2 6.2.2) preamble for use in DIS 4064-1. List any documents for which the user requires full-text access in Clause 2. Note that Directives, Part 2, D.1.5 specifies how to indicate terms and definitions modified from other sources	Edit (Sec.)
PL		3	ed/ge	Title of clause '3' is inconsistent with the title of the contents. The reference to standard ISO 4064-2:201x (please remember correct year of publication) should be a part of clause above (clause 2). The secretary has promised that clause name and text have been adjusted, but presented result is not satisfactory.		Agreed
US		3	ed/ge	Do not understand the large bolded font here with "ISO 4064-2:201x" … remove.		Agreed
US		3	ed/ge	Reference to the VIM needs to be to the 2012 version (posted to the OIML website in April 2012). All definitions should be double-checked against the 2012 version of the VIM.		Agreed: VIM references (including actual definitions): MRH D 11 references - MA
AU		3.1.1, NOTE 3	ed/ge	The phrase "In this Part of ISO 4064/OIML R 49" is used repeated throughout the document. However in many instances, including this one, it is technically incorrect as the definition of a water meter should apply to all Parts of the	We suggest that the phrase "In this Part of ISO 4064/OIML R 49" is revised to read "In ISO 4064/OIMl R 49", "In all Parts of ISO 4064/OIML R 49" or similar. We also note that in some instances	Agreed – to be checked and changed as necessary.

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				Standard/Recommendation, not just Part 1. While Part 2 states that all terminology used in Part 2 comply with those given in Part 1, any ambiguity or confusion in this matter is best avoided.	reference only to Part 1 is appropriate.	
FR		3.1.1		The answer from the secretariat to our previous comment says that the gearing is a “calculator”. We still believe that in the whole text the way the word calculator is used is not meant to cover the gearing but if the notes stays as it is we recommend to add a sentence saying “the gearing is the calculator in a mechanical meter”.		Add to 3.1.4: ‘NOTE The gearing is considered to be the calculator in a mechanical meter .'
AU		3.1.3, NOTE	ed/ge	The electromagnetic coil of a electromagnetic flowmeter is not the sensor. In this case, it is more correct to say that the sensor is the electrodes that are located on either side of the measuring section. It is the electrodes that are directly affected by the phenomenon of water flow which induces a potential across the measuring section. The electromagnetic coil allows for the generation of the potential but they are not involved in “sensing” it.		Substitute 'the electrodes on an electromagnetic meter' for ‘electromagnetic coil’.
AT	3.1.14 and 3.1.15			Is the separation/definition of complete and combined meter obligatory?		Yes – both are referred to.
AT	3.1.15			No point at the end of the sentence		Agreed
AU		3.1.20 –	ed/te	We do not understand the need to have	As such, we suggest a single term is	Not agreed. Reply from

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		3.1.24		definitions for a “cartridge meter” and a “meter with exchangeable metrological module”. From our reading of the Standard/Recommendation, there is no discernable difference between the two concepts.	used to describe a meter that allows the removal/exchange of a cartridge/module whilst retain the pipeline interface.	Chris Obst is as follows: ‘We did decide to differentiate the area because of cartridge meters referring to domestic metering and submetering predominantly with under wall located connection interfaces, hence not easily accessible and visible. As a matter of principle it is possible to use ones own cartridge meter in a competitor´s connection interface. That is why we have defined all relevant interface dimensions precisely in the standard and have on top of that created a coding system on interfaces as well as on cartridge meters showing cleary whether interface and meters can be connected properly and safely. The exchangeable modules, however, are another "cattle of fish". They are meant to be the interchangeable inserts known from C&I meters. The purpose is to leave

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						heavy interfaces in the line and exchange an old module by a new one verified at the factory. The interfaces are usually easily accessible and there is no intention to put ones own module into a competitor´s interface, i.e. it is all about ease of installation on one´s own product on location instead of taking complete meters out of the line and taking them back to the repair shop. That is why we have not defined any precise connection dimensions of those connection interfaces. In CEN/ TC92/ WG2 we decided at the time to take these principle differences into account by giving them different denominations. That has been taken over into the new document from EN14154 and I would like to ask you to accept it like that as we all have learnt to go along with these terms now. ‘

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PL		3.1.20 Note	ed/ge	The wording "…in part 4 of this standard" is correct in standard ISO 4064-1, but is missing in OIML R49-1 (OIML R 49 consist only of 3 parts), so it will be better to change phrase 'this standard' to direct presentation number of standard (i.e"…in Part 4 ISO 4064).		Agreed
JP	3.1.22		ed		In the definition, "unit" should be "module".	Agreed
JP	3.1.23		ed		In the definition, "unit" should be "module".	Agreed
CEN Consultant	3.2.3		GE	The note in paragraph 3.2.3 appears to allow an indication, including a primary indication, to be a memorized value only. It assumed that this would mean that the primary indication does not need to be displayed or printed. This would appear to contrast with 6.7.1.1, which states that the indicating device must include visual means, and 6.7.2 that stipulates the types of indicating device that must be present. . As a minimum there must be a non-permanent display for at least 10s	To include within the note that an indication must be displayed or printed OR to remove the note as it may potentially may lead to a belief that the display need only to be memorised	Agreed – delete Note.
AT	3.2.4			Formula is not in the same notation as the formula in 4.2.6		Edit. (Sec.)
AU		3.2.4, NOTE 2	ed/ge	As stated above, the phrase "In this Part of ISO 4064/OIML R 49" is technically incorrect as the definition should apply to all Parts of the Standard/Recommendation, not just Part 1.	We suggest that the phrase "In this Part of ISO 4064/OIML R 49" is revised to read "In ISO 4064/OIMl R 49", "In all Parts of ISO 4064/OIML R 49" or similar.	Agreed
JP	3.2.5		ed	According to the explanation just above 3.1, just "meter" should be used. In addition to it, there is no use or no definition of "measuring system" except this place in the text.	"for a given measurement, measuring instrument, or measuring system" should be amended to "for a meter".	Agreed

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AU		3.2.9	ed/ge	We suggest including a reference, possibly in the form of a NOTE to clause 5.1.2 which defines the value of a significant fault.		Agreed
AU		3.3.2, NOTE	ed/ge	As stated above, the phrase “In this Part of ISO 4064/OIML R 49” is technically incorrect as the definition should apply to all Parts of the Standard/Recommendation, not just Part 1.	We suggest that the phrase “In this Part of ISO 4064/OIML R 49” is revised to read “In ISO 4064/OIMl R 49”, “In all Parts of ISO 4064/OIML R 49” or similar.	Agreed
PL		3.3.2 Note	ed/ge	Perhaps it would be useful to add reference to sub-clause 4.1.3 (i.e “In this Part of ISO 4064/OIML R49, flowrate is expressed in m^3/h – see sub-clause 4.1.3”)		Agreed
AT	3.3.11		ed	In the German version is used “P” it should be used “p”		Noted and agreed.
CA	3.4.7		ed	Canada is fundamentally opposed to including matters relating to testing in the R 49-1 document. Instead they should be included in the R 49-2 document.		Noted – 3.4.7 is a definition.
AT	4.2.6			Formula is not in the same notation as the formula in 3.2.4		Agreed
CA	4.1.3		ed	Strongly agree with the use of “durability test” instead of “endurance test”.		Thank you
PL		4.1.3	ed/ge	Like previous comment – after sub-clause “…where Q_1 values are expressed in m/h” it would be useful to add reference to NOTE: in sub-clause 3.3.2.		Not agreed.
CA	4.1.4		te	Canada is fundamentally opposed to prescribing values for Q3. This should be left up to the manufacturer to state the max flow rate that their meter is designed to flow at. In		Noted – but this has been discussed and agreed.

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				addition the current values at the high end of the table are not aligned with the max flow rates of medium and large size North American manufactured meters.		
CN		4.1.5		"Q2/Q1=1.6" is appled to water meters with Q3≤16m^3/h. "Q2/Q1=1,1.6,2.5,4 or 6.3" may be chosen for other water meters with Q3≥25m^3/h by manufctorer.		Not agreed. Further discussion is required on points for initial verification: this matter will be for consideration at the next Revision.
ID	4.2.7 Reverse flow	Paragraph 1 & 3	Ed	Paragraph 1 and paragraph 3 related to water meter designed for reverse flow measurement	It is proposed to combine statement in the paragraph 3 into the end of paragraph 1. (paragraph 1) to be. The permanent flowrate and the measuring range may be different in each direction.	Agreed. Para. 4 to become final sentence of para. 2.
CA	4.2.10		te	Canada is fundamentally opposed to prescribing values for Q3/Q1. This should be left up to the manufacturer to state the max turndown ratios that their meters are capable of operating at. The purchasers of water meters will ultimately decide if a specified turndown ratio is appropriate for the anticipated ranges of flow rate that their meter will be operated at. If Q3/Q1 ratios are kept…. are there cases where a value of Q3/Q1 less than 40 might be acceptable. We realize that this point has been previously discusses and decided upon at previous meetings.		This comment is on 4.1.4. Understood, but this has been discussed and agreed. Agreed to stick with what was agreed in Gaithersburg.
AU		4.2.10	ed	We suggest replacing the dashes/dot-points with numbers/letters to assist with referencing.		Agreed – further rationalisation needed.

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				E.g. 1), 2), 3) or a), b), c) or i), ii), iii) etc…		Where numbering/lettering is used, this should be consistent. Some dots/dashes should be numbered/lettered. Remaining dots/dashes need to be consistent.
JP	4.3.3	7th para.	ed	"checking devices" is wrong.	Amend to "checking facilities".	Agreed
CN		4.3.3		It should be noted what effection of moving parts to water meters below Q_1		Spring loaded flow accelerators have been shown to cause problems.
AU		5.1.2	ed	We suggest replacing the dashes/dot-points with numbers/letters to assist with referencing. E.g. 1), 2), 3) or a), b), c) or i), ii), iii) etc…		Editorial
AU		5.1.4	ed	We suggest replacing the dashes/dot-points with numbers/letters to assist with referencing. E.g. 1), 2), 3) or a), b), c) or i), ii), iii) etc…		Editorial
AU		5.2.1	ed/ge	As stated above, the phrase "this Part of ISO 4064/OIML R 49" is technically incorrect as the requirement should apply to all Parts of the Standard/Recommendation, not just Part 1.	We suggest that the phrase "this Part of ISO 4064/OIML R 49" is revised to read "ISO 4064/OIMl R 49", "all Parts of ISO 4064/OIML R 49" or similar.	Agreed
AU		5.2.1	ed	We suggest replacing the dashes/dot-points with numbers/letters to assist with referencing. E.g. 1), 2), 3) or a), b), c) or i), ii), iii) etc…		Editorial
FR		6		We still believe there is a need for a general requirement to cover "non exploitation of mpe" and " do not favour any party". The new text in 7.3.6 is not sufficient.	We propose to add the following sentence as new 6.1 9. "The meter shall not exploit the mpe nor favour any party".	6.1.9 to be included: 'The water meter shall be of such design, composition and construction that it does not

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						exploit the mpe or favour any party.'
NL		6	te	We still believe there is a need for a general requirement to cover "non exploitation of mpe" and " do not favour any party". The new text in 7.3.6 is not sufficient.	We propose to add the following sentence as new 6.1 9. "The meter shall not exploit the mpe nor favour any party".	See above.
GB	6.3.2		Te	Recently, the national committee for water meters has been requested to clarify the application of the requirement in clause 5.3.2 of OIML R49-1:2006: *"If the accuracy of the water meter is likely to be affected by the presence of solid particles in the water (turbine and displacement type water meters, for example), it shall be provided with a strainer, or filter, fitted at its inlet or in the upstream pipeline."* We find that this exact wording has been carried over to ISO/DIS (2) 4064-1 clause 6.3.2. Committee members feel strongly that this clause should be deleted as a requirement in ISO/DIS (2) 4064-1, for the following reasons: • There is no associated performance test to confirm the correct application of this requirement. • During initial verification of the meter, the water quality at the point of installation cannot be assessed. • It can be technically argued that this clause requires all water meters to have a strainer or filter fitted in the inlet or upstream pipeline, which is contrary to	Delete 6.3.2 as this is adequately dealt with in ISO/DIS 4064-5 (clause 6.3): "*If, for the specific installation conditions, the accuracy of measurement of volume flow by the water meter is likely to be affected by the presence of suspended particles in the water, then it may be installed with a strainer or filter. The strainer or filter shall be placed either at the inlet of the water meter or in the pipework upstream.*"	6.3.2 to be: *Under specific installation conditions, a strainer, or filter, fitted at the inlet of the meter or in the upstream pipeline may be required. Note: national regulations may apply. See also clause 6.3 of ISO 4064-5.*

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				established best practice. • As helpful guidance during installation and not a requirement, the application of strainers or filters is adequately dealt with by clause 6.3 of ISO/DIS 4064-5: *"If, for the specific installation conditions, the accuracy of measurement of volume flow by the water meter is likely to be affected by the presence of suspended particles in the water, then it may be installed with a strainer or filter. The strainer or filter shall be placed either at the inlet of the water meter or in the pipework upstream."* It should be noted that ISO 4064:2005 correctly places this wording in part 2 as an installation requirement with no associated meter requirement in part 1. Experts from our committee have been involved in the drafting process of ISO/DIS 4064 and we are strongly in favour of the document. However, it is not until a requirement is tested out in detail that the full implications can be contemplated and in this case our committee feels strongly that, given this new understanding, a negative vote be forwarded until the offending clause 6.3.2 is removed.		
AU		6.5, NOTE 2	ed/ge	The allowance provided for in the NOTE, that is, that the maximum pressure loss may differ from and exceed the pressure loss at Q3, is potentially ambiguous and contrary when read in conjunction with the preceding paragraphs of the clause. We acknowledge that it is unlikely that confusion would arise from the current	We suggest that the NOTE read as follows: "In the flowrate range Q3<Q≤Q4 the maximum pressure loss can differ from, and may exceed, the pressure loss at the permanent flowrate Q3."	Change NOTE to 'For some meters, over the flowrate range $Q_1 \leq Q \leq Q_3$ the highest pressure loss does not occur at Q_3.'

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				wording of the NOTE, it is best avoided nonetheless.		
DE	6.6.2	Note 3	ed	Q_3 2,5 ; R200 ; H ; → ; 123456 ; 08 ; ABC Meaning of the arrow is not described.	Add description of the meaning of the arrow.	Agreed – under h, add 'by means of an arrow'.
CN		6.6.2 f)		It should be marked with “year and month of maunfacture”, and “note 4” should be altered simultaneously . It would be misunderstanded as others if only marking the last 2 digits of the year of manufacture .		Add 'or the month and year of manufacture'.
PL		6.6.2.j	te	Some manufacturers state that if meter scan be operated in both position horizontal and vertical, it is not required to mark permissible position of operation. In our opinion manufacturer should skip this mark only, if intermediate position (i.e. not only horizontal and vertical, but position with the flow axis intermediate angle to the vertical and horizontal too) is permissible. Perhaps it would be useful to precise this requirement.		Not agreed – only options are to test in H or in V or in 'all positions' (see 7.4.2.2.7.5)
						Extra Japan comment to q): Should be changed to 'environmental classification' Further comment on r): Should be changed to 'Electromagnetic environmental class'. Parts 1 and 2 inconsistent –

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						needs resolution Make consistent with D 11.
FR	6.1 & 7.3.6		te	We propose a negative vote due to the same comment as last year : the text proposed even with the additional text does not bring an acceptable solution to fit to the essential requirement of the directive on measuring instruments However if the draft would be modified to include the requirement as in MID " The meter shall not exploit the maximum permissible errors or systematically favour any party" then we could change our vote in a positive one. Reminder of the reaction on the previous draft : The rule proposed is not correct as it comes back to the same wording that we discussed in the past for gas meters which do not guarantee anything. The manufacturer could have one point at a non significant flowrate which is within half of MPE and all the rest of the points greater than half the mpe so exploiting the mpe and in addition to the benefit of one party only. (This is exactly what we don't want in Europe) taking into consideration the additional problem identified by Canada that, (with the text as it was, a meter could pass a type test and still fail at initial verification using identical data, depending on which data points were used at initial verification) it seems that the section 6 should include a requirement similar to the one used for initial verification in order to be consistent. "The meter shall not exploit the maximum permissible errors or systematically favour any party" could be included in both sections 6.1 and 7.3.6. in order to avoid that a meter that has passed type approval fail at initial verification.	Add : The meter shall not exploit the maximum permissible errors or systematically favour any party.	Resolved above.
PE	6.7.2.1		te	About unambiguous visual indication of the indicated volume. In analogue dispositive when the meter has	Add this paragraph The pointers in each decades must be	A requirement for readings to

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				needles (pointers), the decades must be synchronized, however there is always a small gap between these, it would be desirable to decide a limit or left to the discretion of the competent authority of each country.	synchronized, the maximum limit for this small gap between these, shall be "1/5 of smallest division" or will be determined for competent authority of each country.	be unambiguous is given in 6.7.1.1. Any addition to this requirement should be held until the next Revision.
AU		6.7.2.2, 4)	ed	The numbering used appears to be in a strange font. Please check.		Will be checked
AU		6.8.2	ed	The numbering should be indented.		Agreed
FR		7.2		A paragraph should be added to explain how the requirement on non exploitation of MPE and not favor any party is checked during type approval (evolution of the performance during time, influence of the different type of installation…)		No proposal given, so this could not be discussed further. For consideration at next Revision.
NL		7.2	te	A paragraph should be added to explain how the requirement on non exploitation of MPE and not favor any party is checked during type approval (evolution of the performance during time, influence of the different type of installation…)		See above
CN		7.2.3.1		Q4 is not within flow range of rated operating condition. No needed for instric error test under Q4 (includeing before and after endurance test.)		This would be a major change at this stage, and some meters do experience Q4. For future consideration.
CN		7.2.3.2		Repeatabily requirment should only applied to meters of class 1. It seems to be a little confusion when three times measurments for Q1,Q2 and Q3, and twice measurments for other flowrates test.		Not agreed – discussed in Gaithersburg. In 7.4.4 of Part 2 under 1) h) add 'NOTE Three points are always required for a) b) and

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				Requirement about “same sign note of errors” should be added in type evaluating test.		e) since it is at these flowrates that the repeatability is calculated’. This requirement is in Part 2, 7.4.5 – it should be moved to Part 1. Also expand 7.2.3 to include actual MPE requirements.
CA	7.2.4		ed	Delete the word “test” and “applied”. It now becomes a stand alone requirement and not a test. It will now be written in a similar manner to ed Sections 4.2.7, 4.2.8 and 4.2.9. (no mention of tests).		Delete table 7 from Part 1 and make associated adjustments – these do not constitute a change of technical requirements, since the same table is also given in Part 2. Delete ‘tests’ from the titles of 7.2.4, 7.2.5 and 7.2.6.
CN		Before or after 7.2.4		Besides overload tempreture test, overload flowrate test shoud be listed in performance tests. In fact, continuous test under Q4 in table 7 may be considered as the overload flowrate test, as defined for some other flowrate meters. Such a test may be independent from endurance test ,and is appliabe for all water meters. After overload flowrate test, instric error test should carried out at nominal flowrates of *Q*1, *Q*2 and *Q*3. Error test at Q4 is not necessay since Q4 is not within flow range of rated operating condition.		See response above – this would be a major change. It will be discussed at the next Revision.
US		7.2.4-	ed/g	Agree with the Netherlands comment on the last		Agreed. In particular delete

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		7.2.12.3	e	draft. There should not be the use of the word "Tests" in these sections. These sections, and their headings, should all be written as "requirements." This is an important conceptual issue. Anything having to do with "tests" and "test methods to meet the requirements" should be in Part 2.		'tests' from the titles of 7.2.4, - 7.2.12.3.
CN		7.2.5		For meters without moving parts (e.g. eletromagnetic meters),other equivalent test methods instead of endurance test described in 7.2.5 may be permitted .		This has been discussed before. It is too large a change to make now. It will be discussed at the next Revision.
CA	7.2.1, 7.2.2, 7.2.3, 7.2.5, 7.2.6, 7.2.7 and 7.2.8.		te	Canada is pleased that there is a section for repeatability. However we believe the requirement for the meter to be repeatable and the allowance for 1/3 the MPE should be located in Section 4.2 of the document (Accuracy class and maximum permissible error). In addition why was the value of 1/3 chosen for the repeatability requirement? In R117 the value is 2/5. Why would it be lower for water meters than it is for other meters which arguably measure liquids which have a significantly higher unit cost.		This was discussed at the last meeting, and 1/3 was agreed.
ID	7.2.6.2 & 7.2.6.3	Paragraph 1	Ed	The variation in the error has not been defined yet	Included in the list of terms and definitions	Definition desirable but not agreed. For consideration at the next Revision.
CN		Table 7		For meters with MAT≤50□,test water temperature requirement in endurance test		This is too great a change to make at this stage. For

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				should be in rated condition instead of being within 20□±5□. Because it is difficulte to control test water tempreture of large water tank or pool. And for meter with MAT≥90□, it would be more pratical and economical to specify test water temperature within 90□±5□.		consideration at the next Revision.
ID	7.2.6 table 7	Last column	Ed	Text in the column is "center aligned" that may give confusion	It is recommended to be "left aligned'	Agreed
AU		7.2.6.3	ed	There is an unnecessary page break preceding Table 7.		Agreed
CA	7.2.9, 7.2.10 and 7.2.11		ed	These subsections section should be deleted as they pertain to testing which is covered in R49-2.	All reference to tests should be in R 49-2. Anything that is an accuracy requirement should be included in section 4.2.	Dealt with above
AU		7.2.12.2	ed	The numbering should be indented.		Agreed
PL		7.3.3	ed/ge	The requirement that during testing meters in series, there shall be no significant interaction between water meters – in practise it is difficult to control during verification. We propose to consider placing information that in this case it is necessary to remember about installation sensitivity class.		Agreed – add ': upstream and downstream straight lengths (and straightener if required) shall be in accordance with the flow profile sensitivity class of the meter'.
AT	7.3.4			Exact definition of "nominal" will be good, because to realize a flowrate at exact Q1 for example is just possible within a flow rate stability of +- 2,5%		Definition given in Part2
CN		7.3.4		It should be considered that verification work efficiency is too low under Q1 and Q2. It will		For consideration at Revision. A Revision will be

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				take a long time because both of Q1 and Q2 are small values and very close. Q2 is not a idal test flowrate in initial and subsequent verification of water meter. We suggest using reference flowrate instead of Q2.		undertaken at the earliest opportunity after publication.
CA	7.3.6 - 7.2.9		ed	Should these sections be in R 49-1. How are they handled in other OIML Documents. Are these more of a national requirement than an OIML Recommendation. These requirements are already specified in Canadian W&M Regulations.		See responses below. BIML to comment.
CN		7.3.6		No requirement needed for "same sign note of errors" in initial verification of water meter. This technical requirement should be for type evaluate test, not for initial verification. We suggest to delete this clause .		Agreed that same sign requirement at Type Approval needs to be reinstated in Part1 – see response below to US
PL		7.3.6	ed/ge	We propose to add that the alternative procedure to checking of water meters at other flow rates could be the procedure readjust of the meter.		No change agreed
US		7.3.6 (7.2.3)	te	The US TAG does not support the same sign rule and recommends removing it from the standard. (Previously submitted document from the US details several shortfalls of the same sign rule proposals.) The requirements for Initial Verification and Type Approval must be the same. It is not acceptable to be able to pass the Type Approval and fail the Initial Verification with the exact same test results.	Option 1: Preferred proposal for Section 7.3.6 of Part 1 • Delete Section 7.3.6 of Part 1 Option 2: • Alternative proposal for Section 7.3.6 of Part 1, if Option 1 is not acceptable. Change Section 7.3.6 of Part 1 to read "The meter shall not exploit the MPE or	Not agreed to delete. Note: same sign requirement at Type Approval needs to be reinstated in Part1, 7.2.3 below Note (is currently in Part 2, 7.4.5 only).

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					systematically favour any party."	
CA			ed	Replace "**may be obtained**" with "**shall be conducted**". The idea was that you don't fail a meter on initial inspection if it produces results that were the same as at the time of type approval. Therefore you have to test at the other flow rates prescribed in 7.2.3.		Agreed: 'shall be obtained'.
FR		Missing 7.4		We recognise that in annex C (which is informative only) there are a few words concerning mpe in service. This is not what we meant by asking more details concerning periodical verification. Usually OIML recommendations cover this aspect by a chapter similar to the one on initial verification and giving advice on the examinations and tests to be performed. The field of water meter should be a concern for OIML for other purposes than just taking into consideration the needs for type approval and production.		Some changes agreed to annex C – see below. Text needs to be proposed for anything further.
AU		A.2	ed	We suggest replacing the dashes/dot-points with numbers/letters to assist with referencing. E.g. 1), 2), 3) or a), b), c) or i), ii), iii) etc…		Editorial
CN		A.2		What are "mobile meters "? The definition or note about mobile meter should added		Agreed - definition: 'meter mounted on a vehicle' should be added.
AU		A.3	ed	For consistency, the electromagnetic environments should be numbered. E.g. 1), 2) or a), b) or i), ii) etc…		Editorial

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AU		B.1	ed	We suggest replacing the dashes/dot-points with numbers/letters to assist with referencing. E.g. 1), 2), 3) or a), b), c) or i), ii), iii) etc…		Editorial
AU		B.2.2	ed	We suggest replacing the dashes/dot-points with numbers/letters to assist with referencing. E.g. 1), 2), 3) or a), b), c) or i), ii), iii) etc…		Editorial
AU		B.3.2	ed	We suggest replacing the dashes/dot-points with numbers/letters to assist with referencing. E.g. 1), 2), 3) or a), b), c) or i), ii), iii) etc…		Editorial
CN		Annex C		Subsequent verification should be applied according to nation's legal metrology regulation.		Agreed: add this sentence.
PL		Annex C		The title of Annex doesn't present essence of contents – we propose the title 2Permissible errors in service".		Title to be changed to 'Permissible errors in service and subsequent verification'

Comments:
The U.S. position on the issue is as follows;

The US TAG does not support the same sign rule and recommends removing it from the standard. Please reference the attached document detailing several shortfalls of the same sign rule proposals.

If deleting subclause 7.3.6 of Part 1 is not acceptable, alternatively the Same Sign Rule should change to comply with option # 3 to align with the WELMEC / MID.

The requirements for Initial Verification and Type Approval must be the same. It is

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				not acceptable to be able to pass the Type Approval and fail the Initial Verification with the exact same test results.		
				Option 1: Preferred proposal for subclause 7.3.6 of Part 1 Delete Subclause 7.3.6 of Part 1 Option 2: Alternative proposal for subclause 7.3.6 of Part 1, if Option 1 is not acceptable. Change Subclause 7.3.6 of Part 1 to read “The meter shall not exploit the MPE or systematically favour any party.”		

<u>Options considered for addressing the MPE issue highlighted by France's comment to clause 7.3.6 of ISO/DIS 4064-1//OIML 2CD R 49-1 (see document JWG N 42 ≡ ISO/TC 30/SC 7 N 411)</u>

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Two issues to be addressed:

i) the request from France to solve the problem that, at initial verification, it is possible for a meter to pass when only one data point, which could be at a non-significant flowrate, is within half the MPE, while all the rest are not;

ii) the problem identified by James Welsh, that, with the text as it is currently, a meter could theoretically pass a type test and still fail at initial verification, using identical data, depending on which data points are used at initial verification.

Some of the discussed options for the text

Initial Verification

[1. Leave unchanged.

- no longer an option – a problem having been identified, it must be solved.]

2. Make change to address French comment.

- 'the error at Q2 shall not exceed one half of the maximum permissible error'
- 'the error at Q3 shall not exceed one half of the maximum permissible error'
- 'the error at either Q2 or Q3 shall not exceed one half of the maximum permissible error'.

3. Make change in accordance with WELMEC/MID.

- ' The meter shall not exploit the MPE or systematically favour any party.'

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4. Make change 3 plus one of the changes in 2.

5. To address James Welsh's point only, Steve Bruce proposed the following:

' In the situation where none of the errors are within half the maximum permissible error, either an adjustment may be made or additional errors at other flow rate(s) as specified in 7.2.3.1 may be determined to fulfil this criterion.'

[Note: to address this point completely, the following text would be needed: 'If all the errors (of indication) of the water meter determined for initial verification have the same sign but none of them is within half the maximum permissible error, additional errors at other flow rate(s) as specified in 7.2.3.1 may be obtained: if one of these errors is within half the maximum permissible error or of the opposite sign this criterion is deemed fulfilled.']

Type Approval

During the discussion, it was suggested that it might be necessary to make a change to the type approval requirements. This would be a more fundamental change, and was opposed by some experts, who thought that it was changing the type approval requirements to solve in an inadequate way the problem raised by the initial verification requirement (and might in effect lead to halving the MPEs). It was suggested that this would be unacceptable to some countries which currently support the document.

Subject: ISO/DIS 4064-1 Item 7.3.6 – *Same Sign Rule* for Initial Verification

The ISO 4064 water meter standard covers numerous applications for both cold potable water and hot water. Applications vary from simple batching processes requiring minimal turndowns (Q3/Q1 ratios), to more complex uses requiring very wide turndowns over extended years of field service. Meter sizes can vary from as small as ¼" (DN6) to well over 54" (DN 1400). A wide variety of different technologies (positive displacement, velocity, electromagnetic, ultrasonic, vortex shedder, etc…) is required to

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satisfy these numerous applications. The ISO 4064 standard needs to establish requirements that promote fairness, equity, and transparency in the marketplace and shall not bias any particular application or technology.

I) Three alternative approaches to a "same sign rule" have been suggested to address concerns raised by France:

a—"the error at Q2 shall not exceed one half of the maximum permissible error." Or,
b—"the error at Q3 shall not exceed one half of the maximum permissible error." Or,
c—"the error at either Q2 or Q3 shall not exceed one half of the maximum permissible error."

US TAG does not support any of these alternatives, since none will adequately address the wide variety of applications covered by ISO 4064. For example, it is wrong to assume that all applications covered within this standard will have their 'more significant consumptions' at Q2 or at Q3. Additionally, *Figures 1, 2, and 3* show how these proposals can result in instances where a 'passing' meter will more greatly exploit the MPE than a 'failing' meter.

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Figure 1: A meter fails ½ MPE at Q2, while another meter passes yet "more greatly exploits the MPE".

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Figure 2: A meter fails ½ MPE at Q3, while another meter passes yet "more greatly exploits the MPE".

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Figure 3: A meter fails ½ MPE at Q2 and Q3, while another meter passes Q3 yet "more greatly exploits the MPE".

II) A fourth alternative sought to address the inadequacies with the existing draft's 'same sign' requirements. The existing wording can result in situations where a meter can pass type approval testing, yet fail initial verification testing. This alternative proposal is:

"*If all the errors (of indication) of the water meter determined for initial verification have the same sign but none of them is within half the maximum permissible error, additional errors at other flow rate(s) as specified in 7.2.3.1 may be obtained: if one of these errors is within half the maximum permissible error or of the opposite sign this criterion is deemed fulfilled.*"

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US TAG opposes this proposal as well. Some designs and technologies allow for individual calibration during initial verification, while others do not. This proposal could impose a bias against meters that cannot be calibrated during initial verification. In addition, test practices and constraints for meters provided in low production volumes (on the order of tens of units per year) are much different from those of meters provided in high production volumes (on the order of hundreds of thousands of units per year). To comply with the above proposal, manufacturers may be forced to recalibrate and re-test meters during initial verification, and/or may be forced to test meters at up to three additional flow rates. This may have significant cost impacts on products designed for high volume. Additionally, Figure 4 shows how this proposal could still result in instances where a 'passing' meter will more greatly exploit the MPE than a 'failing' meter.

1 **MB** = Member body (enter the ISO 3166 two-letter country code, e.g. CN for China; comments from the ISO/CS editing unit are identified by **)
2 **Type of comment:** **ge** = general **te** = technical **ed** = editorial
NOTE Columns 1, 2, 4, 5 are compulsory.

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Figure 4: A meter fails ½ MPE at all flow rates, while another meter passes yet "more greatly exploits the MPE".

(In point of fact, US TAG is not aware of any 'same sign' proposal – in which one or more individual test results would be held to tighter requirements than the existing MPEs – that would not have the same potential to allow some 'passing' meters to more greatly exploit the MPE than a 'failing' meter.)

III) US TAG does not support the current wording in Item 7.3.6 regarding the *same sign rule* (ISO/DIS 4064-1 dated 2011-05-12). We support deleting Item 7.3.6 from the standard. If this deletion alone is not acceptable, we would instead support replacing the *same sign rule* with 'Option 3' from David Michael's Joint Working Group e-mail dated 12 December 2011, which reads, "*The meter shall not exploit the MPE or systematically favour any party.*" Our understanding is that this approach would be in accordance with similar WELMEC/MID provisions.

Please reference the above hypothetical accuracy graphs. Again, these illustrate several plausible situations where proposed approaches to *The Same Sign Rule* have the potential to accept meters with 'more biased' accuracy curves than meters that would fail under these same proposals.

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