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Country Code[1]	Clause	Paragraph/ Figure/Table	Type of comment[2]	Comments	Proposed change	Convener's responses
0001 MIRS-OIML	4.1		te	Verb 'making' (measurements) shall be substituted by 'performing' (measurements). Definition would encompassed a broader spectre.	device used for performing measurements, alone or in conjunction with one or more supplementary devices	Not agreed. Not clear why "performing" covers a broader spectrum than "making".
0002 IUPAC	4.1	Note	ed	note accidentally defines a stand-alone instrument as measuring system	amend 'is' to 'can be considered as'	Substantially accepted for Note 1. Phrasing has been improved.
0003 ISO 400	4.1	Term	ge	We experience different terms use for the common term covering both "indicating measuring instrument" and "material measure". In VIM4 the term is "measuring instrument". In ISO 17025 the term is "measuring equipment". In ISO 10012 the term is also "measuring equipment".	We just encourage JCGM and ISO to use the same common term. For example, the term "measuring equipment" could be added as an individual term in the VIM. For us the choices of term in itself is less important - for us it is important that the VIM and ISO standards uses the same term.	Not agreed. The terms "measuring instrument" and "measuring system" have a history in the VIM going back to the VIM1.
0005 ILAC	4.2		te	A measuring system may include a measurement standard or a material measure.	Consider add "and/or a measurement standard" after "measuring instruments" in the first line to allow for a broader view on what an instrument is.	Partially Agreed, see however 0008.
0006 ISO 401	4.2	definition	ed	There is no difference between "quantities of specified kinds" and "specified quantities" here. Simplify the text.	Change text to: set of one or more measuring instruments and often other components, assembled, and adapted to give information used to generate measured values within specified intervals for specified quantities.	Not agreed. What needs to be specified here is the kind, and not any given individual quantity of that kind.
0007 IUPAC	4.2	definition	ed	'set' sometimes has a specific meaning	consider 'assembly'	Not agreed . "Set" has been used historically back to the VIM1.
0008 IUPAC	4.2	definition	ed	Unnecessarily verbose for substitution; details could easily be in Notes	Consider "assembly of measuring instruments and other components, used for measurement "And add a note to say NOTE nn A particular measuring system is usually assembled for measured values within specified intervals for quantities of specified kinds	Partially agreed. Definition is reworded. See the new version
0009 VNIIM	4.2	Note	te	Some important terms and definitions related to modern measuring systems have not been included into the Draft, in particular, relation between "artificial intelligence systems" and "measuring systems".	To amend Note 5:"Measuring system can be a part of artificial intelligence system."	Not agreed. Not clear which note it refers to.
0010 ISO 402 0011 EC-133	4.2	Note 4	te	The statement that a measuring system can be used a "measurement standard" is incorrect.Measurement standards (e.g., documentary standard, reference materials) are specific metrology tools that are used for benchmarking. They are used in conjunction with a measuring system.	Please delete Note 4.	Not agreed. According to Note 1 to 5.1, a measurement standard can be a measuring system. See comment 0008. Also this is simply acknowledging ISO 17025 usage.

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0012 **PTB** **0013** **PTB-OIML**	4.2	definition	ed	There is no difference between “quantities of specified kinds” and “specified quantities” here. Simplify the text.	Change text to: Set of one or more measuring instruments and often other components, assembled and adapted to give information used to generate measured values within specified intervals for specified quantities.	Not agreed. See 0006.
0014 **IUPAC**	4.3	definition	te	Definition inadequate – fails to distinguish indicating instrument from any other instrument.All measuring instruments meet this definition – an instrument that did not generate a signal giving information about the measurand could not be used for measurement.	define as“instrument which displays a measured value for the measurand [for which it is constructed]” If desired, add notes, for example “The measured value, or indication, can require correction, for example derived from calibration, to provide a sufficiently accurate value”	Not agreed. See Note 2 to 4.1.
0015 **ISO 403** **0016** **EC-134**	4.3	Note 1	te	Interference, for instance, can cause that the output signal from a measuring instrument does not (fully) correspond to the measurand.The note refers to an undesired interaction with the “object”. An object is usually considered as a tangible entity. In practice, interferences are often at the level of the analyte.	The following revision may be considered:“The quantity being measured that is mentioned in the definition might not be the same as the measurand, for example when the measuring instrument does not properly interact with the analyte under measurement.”	Not agreed. The term “analyte” is not defined in the VIM.
0017 **ISO 404**	4.3	Note 3	ed	NOTE 3 currently reads:An output signal may be presented in visual or acoustic form. It may also be transmitted to one or more other devices	Consider using a more unambiguous wording:An output signal is presented in visual or acoustic form. It can be transmitted to one or more other devices	Not agreed. The presentation is usually in visual or acoustic form, but not necessarily.
0018 **ISO 405** **0019** **EC-135**	4.3	term	te	This definition is not really needed	Delete the definition	Not agreed. This entry dates back to the VIM1. See Note 2 to 4.1”
0020 **ILAC**	4.4		te	This term is obvious and fully covered by note 3 in 4.3.	Delete 4.4.	Not agreed.This entry dates back to the VIM1.
0021 **ISO 406** **0022** **EC-136** **0023** **EC-137**	4.4	term	te	This term is not needed. It just blows up the document without contributing anything to a clearer understanding of the subject.	Delete the definition to make the document more usable.	Not agreed. The concept is clear, so a term is needed. This entry dates back to the VIM1
0024	4.4	term and definition	te	the term and definition are redundant if ‘indicating instrument’ is correctly defined further, the VIM omits the	delete the definition and replace with “indicating device displaying device set of components of a	Not agreed. Keep for historical purposes, goes back to VIM 1.

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IUPAC				concept of 'displaying device' used in OIML documents and elsewhere, relating to a part of a measuring instrument	measuring instrument intended to indicate the measured value"[ISO 19970, ISO 8310 and others	
0025 **ILAC**	4.5		te	This term is so obvious that it should not be needed to define. Further this definition does not well include digital displays.	Delete 4.5	Not agreed. Term dates back to the VIM 1.
0026 **ISO 407** **0027** **EC-138**	4.5	definition	ed	The term "characteristic divisions" could be considered as it is more specific than "marks"	Consider following revision:"component of a displaying measuring instrument, consisting of an ordered set of characteristic divisions together with any associated values"	Not agreed. It is not clear what could be a characteristic division**.**
0028 **ISO 408** **0029** **EC-139**	4.5	term	te	This term is not needed. It just blows up the document without contributing anything to a clearer understanding of the subject.	Delete the definition to make the document more usable.	Not agreed. Keep for historical purposes, goes back to VIM 1.
0030 **ILAC**	4.6		te	A material measure is not really a measuring device. That should be with standards. Or is this actually meant to cover generating instruments e.g. signal generators?	Delete 4.6 and make sure not to loose all information in 4.6 and refer to 5.1.	Not agreed. Kept for historical purposes.
0031 **ISO 409** **0036** **ISO 411** **0037** **PTB** **0038** **PTB-OIML**	4.6	definition	te	The definition is too general to define material measures. I.e., according to the definition a voltage source with different voltages is a material measure. But such device is not a material measure.	Change text to: measuring instrument that represents or supplies one or more fixed values of a quantity.	Not agreed. See 0030.
0032 **IUPAC**	4.6	definition	te	This definition appears indistinguishable from 'measuring instrument' – all measuring instruments provide values of quantities throughout their life (ie permanently).Another important and omitted characteristic of such devices is that the values are a feature of their construction (albeit sometimes measured post construction) and are therefore not variable.	consider something like "measuring instrument [providing| carrying], by construction, one or more fixed values of a quantity"([a|b] denotes alternatives) Add a Note to say that a material measure can in principle carry values of more than one quantity (example; Certified reference material certified for lead, cadmium and tin content)	Not agreed. A material measure is considered to be a measuring instrument, as in Note 1 of 4.2. Definition and Examples both discuss possible multiple values/quantities.
0033 **IUPAC**	4.6	definition	ed	Unnecessarily verbose Also, permanence is not a defining characteristic	Shorten by omission of unnecessary qualifiers, such as "in a permanent manner during its use," . "of one	Not agreed, see 0031/32

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					or more given kinds," etc and include these in explanatory notes	
0034 **ISO 410** **0035** **EC-140**	4.6	term	te	This term is not needed. It just blows up the document without contributing anything to a clearer understanding of the subject.	Delete the definition to make the document more usable.	Not agreed. The term is designating an important concept, mentioned in many other entries.
0039 **ILAC**	4.7		te	This definition means that the amplifier that converts the signal from a strain gauge (variation in resistance) in the form of a current into an output current/voltage. However, that amplifier is not a transducer.	Clarify the definition e.g. "component of a measuring system that in a specified way converts an input quantity of one kind to an output quantity of another kind" Example 2 A strain gauge converts exerted strain to a variation in resistance.	Partly agreed. The definition has been clarified. In the examples, deleted "electric current transformer", because not a transducer but a converter. The strain gauge is already given as example. There is no reason to define a strain gauge and not the other transducers.
0040 **IUPAC**	4.7	definition	te	It might be more useful to define this n terms of signals and input value, as the idea of a relation between two quantities is not immediately obvious. For example, what is the 'relation' between mass and frequency? Orthogonality? Independence? etc	Consider "component of a measuring system that provides a signal related to the value of an input quantity"	Partially agreed, see 0039.
0041 **RNMF_FR**	4.7	Example	te	Bourdon tube should not be considered as a transducer	To remove in the Example "Bourdon tube"	Agreed. Example removed.
0042 **ISO 412** **0046** **ISO 414** **0047** **PTB** **0048** **PTB-OIML**	4.8	definition	te	The difference between "measuring transducer" (4.7) and "sensor" (4.8) is not very clear. Some of the examples for both definitions are very similar.The same problem already exists in VIM 3: 3.8.	Clarify the definition to distinct between transducer und sensor, especially the examples in 4.8 and 4.7.Add NOTE: A sensor is the first element of a measuring chain (4.10).	Agreed. Definitions updated.
0043 **IUPAC**	4.8	definition	te	Definition poorly constructed - 'directly affected by a phenomenon, body, or substance carrying a quantity' does not mean that the sensor responds to the quantity of interest. For example, a thermocouple can be directly (and adversely) affected by sharp application of a warm rock, but the direct effect is not related to temperature.	Simplify "sensor: element of a measuring instrument that is directly affected by the measurand"[ISO 145511](This is a definition appropriate for quantities; sensors can also register presence or absence of something – often a substance or phenomenon. This is called a 'detector', in the present draft so there is little risk of confusion)	Partially agreed. Definition changed to "component of a measuring system that is directly affected by the quantity being measured "

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0044 **ISO 413** **0045** **EC-141**	4.8	term	te	This term is not needed. It just blows up the document without contributing anything to a clearer understanding of the subject.	Delete the definition to make the document more usable.	Not agreed
0049 **ILAC**	4.9		te	The difference to the sensor seems to be, that there is a threshold value below which the detector is blind. Often however it is the electronics that is “blind” but even here measurement techniques using e.g. lock-in amplifiers is a way to retrieve data from something that could look like noise.	Consider merging the definition of a sensor and detector as distinguishing those is more or less arbitrary.	Partly Agreed. The definitions are clarified further. It is recognized that sensor and detector overlap.
0050 **IUPAC**	4.9	definition	ed	unnecessarily verbose and potentially restrictive	delete “when a threshold value of an associated quantity is exceeded” and move the sense of this to a note explaining that this is a common operating principle.	Partially agreed.
0051 **IUPAC**	4.9	definition	te	is a ‘substance’ a ‘detector? See also comment on ‘indicator’ below	delete ‘or substance’	Agreed
0052 **ISO 415** **0057** **PTB** **0056** **ISO 417** **0058** **PTB-OIML**	4.9	Example	te	Litmus paper is not a good example for a detector. There exists also litmus paper with a “coarse pH scale” that has many thresholds.	Delete “litmus paper”.	Agreed
0053 **IUPAC**	4.9	Note 2	te	In chemistry, an indicator is a substance (eg litmus, phenolphthalein), and it would probably be incorrect to refer to such a substance as a detector in the VIM sense even though its properties could be used to construct a detector. For example litmus paper is used to detect (or, strictly, indicate) pH above or below 7 (it does not ‘detect’ pH), but in litmus paper the indicator – litmus – is only part of the detection system.	delete the note	Agreed
0054 **ISO 416** **0055**	4.9	term	te	This term is not needed. It just blows up the document without contributing anything to a clearer understanding of the subject.	Delete the definition to make the document more usable.	Not agreed

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EC-142						
0059 **ISO 418**	4.10		te	Example 2 describes a mechanical pressure gauge but not a measuring chain.	Delete example 2.	Agreed.
0060 **ISO 419**	4.10	definition	te	Unnecessary definition? Unclear that this is a sufficiently important concept to justify definition in the VIM	Delete 4.10	Not agreed
0061 **IUPAC**	4.10	definition	ed	'element' has not previously been used in this context; 'component' is used in 'measuring system'	replace with 'component' or 'device'	Agreed
0062 **IUPAC**	4.10	definition	te	unnecessarily restrictive?Consider beam splitters where phenomena are detected by phase change or attenuation of one portion of the beam, or an amplification system accompanied by noise suppression using a negative feedback loop – are these a 'single path'? And do the different portions form a 'measuring chain'?	review and ensure that the definition is applicable to multi-path systems.	Agreed. "a single" is removed.
0063 **ILAC**	4.10	Example 2	T	This example is probably a bit old fashioned at the higher levels of metrology. It is difficult to find anyone calibrating Bourdon tubes.	Delete Example 2	Agreed.
0064 **ISO 420** **0065** **EC-143**	4.10	term	te	This term is not needed. It just blows up the document without contributing anything to a clearer understanding of the subject.	Delete the definition to make the document more usable.	Not agreed
0004 **PTB-OIML** **0066** **ISO 421** **0067** **PTB**	4.10	Example 2	Technical	Example 2 describes a mechanical pressure gauge but not a measuring chain.	Delete example 2.	Agreed
0068 **IUPAC**	4.11	Note 1	ed	'might' implies (rare) possibility. Here, the long form should be used and as a comment on use of the term a recommendation is appropriate	amend 'might' to 'should'	Agreed.
0069 **ISO 422**	4.11	term	ge	The term "adjustment" can have multiple meanings and it should therefore always be well defined. In that respect, the term "adjustment of a measuring system" is more explanatory than the general term "adjustment".	Please keep the VIM3 order of importance, i.e.: Primary term: adjustment of a measuring system Secondary term: adjustment	Not agreed. The general strategy about the choice of terms in this vocabulary is that they need to be meant in the context of metrology, to which the VIM is devoted. Both terms are kept, however.

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0070 EC-144	4.11	term	ge	The term “adjustment” can have multifold meanings and it should therefore always be well defined. In that respect, the term “adjustment of a measuring system” is more explanatory than the general term “adjustment”.	Please keep the VIM3 order of importance, i.e.: Primary term: adjustment of a measuring system Secondary term: adjustment	See 0069
0071 RNMF_FR	4.12	definition	te	The zero adjustment of a measuring system can sometimes not provide a zero indication depending on its resolution and the nature of the quantity measured.The note associated to the null measurement uncertainty (3.31) refers to this concept.	To add a note :“In the same way as the true value, the zero value of a quantity is often unknowable with which an uncertainty can be attributed (see 3.31 null measurement uncertainty)”.	Not agreed. This will be more confusing than helpful.
0072 ILAC	4.12	Note 1	te	This note added to the VIM 3 version is rather straight forward and provide no additional help.	Delete note 1.	Accepted. Both terms have been kept, however.
0073 IUPAC	4.12	Note 1	ed	As in 4.11, ‘might’ is a statement of a rare possibility. here; a recommendation is more appropriate	amend ‘might’ to ‘should’	Agreed. See 0068.
0074 IUPAC	4.13	definition	te	The definition is consistent with usage if ‘value’ is a measured value – a number and reference. However, substitution for ‘value’ makes ‘indication’ a quantity in the present draft. This would be incorrect; an indication is an observed value, not a quantity.	Correct definition 1.20 (see comment on 1.20).If not, change ‘value of a quantity’ to ‘measured value’ in 4.13, with (if needed) a note to the effect that an indication might need a correction, established during calibration, to provide an accurate value for the measurand.	Not agreed. No explicit suggestion provided for ‘correcting’ definition of ‘value of a quantity’.
0075 RNMF_FR	4.13	Note 1	ed	There is a reference to the “Step 2” of the calibration of a measuring instrument but Step 1 is not cited anywhere in the document		Agreed to change “Step 2” to “The second step”..
0076 ILAC	4.13	Note 1	te	A large fraction of calibrations as performed by calibration laboratories accredited to ISO/IEC 17025 does in general not include establishment of a relation between indications and measured values except in the (often) very few calibration points. This should therefore not be indicated as a characteristic of all calibrations.	Delete Note 1.	Disagree. Note 1 is now Note 2. Also, see 0075.
0077 ILAC	4.13	Note 2	te	The note is too unclear to be helpful and probably incorrect and is probably too old-fashioned. Replace with digital displays, that is normal nowadays.	Consider delete the example or change example to be “For example the indication might be a voltage displayed digitally, whereas the quantity being measured might be a pressure”.	Partly agreed. New example has been provided.
0078 INRIM	4.13	Note 2	te	More precisely	…. pointer on the display of the measuring ….	Partly agreed. See 0077
0079 IUPAC	4.13	Note 2	te	The point of an indicating measuring instrument is surely that it returns a value of the measurand; not an intermediate value such as a transducer voltage.If this	Delete Note 2	Partly agreed. See 0077

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				definition is specific to an indicating measuring instrument, Note 2 is redundant.		
0080 ILAC	4.13	Note 3	T	This is hard to understand that anyone could mix an indication to be a quantity. Indications are not to be understood as quantities	Delete the added Note compared to VIM 3.	Agreed
0081 IUPAC	4.13	Note 3	te	The note is either redundant (i) or incorrect (ii)(i) The definition already characterises an indication as a quantity through 'value of a quantity' at 1.20.(ii) If that is not the case, and an indication is (as previously understood) a numerical value and not a quantity, the statement can only be correct if the understanding referred to is flawed.	Delete Note 3	Agreed
0082 ISO 423	4.13	term	te	This term is not needed. It just blows up the document without contributing anything to a clearer understanding of the subject.	Delete the definition to make the document more usable.	Not agreed
0083 EC-145	4.13	term	te	This term is not needed. It just blows up the document without contributing anything to a clearer understanding of the subject.	Delete the definition to make the document more usable.	Not agreed
0084 INRIM	4.13	Note 1	te	It is not clear how the sentence "Indications are thus independent of whether the instrument has been calibrated" depends logically on the preceding one.	Consider clarifying the sentence, e.g.: For given input quantity values, indications are thus unaffected by the calibration. or removing it.	Partly agreed. See 0077
0085 ISO 424	4.14	definition	ed	too long for a definition. The list is unnecessary; also, 'supposed' indicates doubt whereas background reading requires actual absence of signal from the quantity of interest.	shorten to omit list and include the characteristic that the quantity of interest does not add to the reading.	Agreed, see 0086
0086 IUPAC	4.14	definition	ed	unnecessarily verbose. Can be shortened by omitting the unnecessary list and noting that 'not contributing' includes the case of absence of the quantity. In addition, a background reading is one where the reading actually arises solely from the background – supposition is not necessary.	change to "indication obtained when the quantity of interest is not contributing to the indication"	Agreed
0087 IUPAC	4.14	notes	ed	an explanatory note could help understanding when the "background" is affected by a closely related quantity	Consider adding Note A background indication can arise in part from response to a quantity of the same kind as the measurand. Example: In determination of the concentration of iron in drinking water, a trace concentration of iron in the analytical reagents used can contribute to the background reading even when there is no iron in a water sample being used to	Partially accepted. New Note and Example have been added.

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					obtain the blank reading. In this case, blank reading will often be used to correct the instrument reading.	
0088 **RNMF_FR**	4.14	subtitle	te	Subtitle of “blank indication” is “background indication”. For some method/procedure there is a clear distinction/difference between blank and background. The definition seems correct for blank but not for background. While the background can be due to the system itself (electronic noise, fluid circulation noise, vibrations, environment, etc).	To withdraw “background indication”	Not agreed. No procedural distinction is typically attributed to any difference between blank indication and background indication.
0089 **ISO 425** **0090** **EC-146** **0091** **ISO 426** **0092** **EC-147**	4.14	term	te	This term is not needed. It just blows up the document without contributing anything to a clearer understanding of the subject.	Delete the definition to make the document more usable.	Not agreed
0093 **ISO 427** **0094** **EC-148**	4.16	Note 1	te/ed	Note 1: The long form is incomprehensible	Improve wording	Not agreed. No suggestion offered.
0095 **ILAC**	4.17		te	This term is relevant for standards as well as measuring devices. Actually nominal value is not generally used with measuring instruments. What is the nominal value of a voltmeter? All the examples are standards and not instruments.	Consider to move this term to the standards section.	Partially agreed. Measurement standards mentioned in the definition.
0096 **ISO 428** **0097** **MB IMEKO-149**	4.17		te	nominal value nominal value of a quantity nominal value of a quantity of a measuring system rounded or approximate value of a characterizing quantity of a measuring system that provides guidance for its appropriate use…NOTE 2 The terms “nominal value” and “nominal value of a quantity” should not be used for referring to nominal property values.	The use of the term “value” does not look consistent with the NOTE 1 in 1.2. It may be attributed to the “measurand”. Suggested alternative: Value of a quantity of a measuring system chosen by convention as its reference (it is not equal to 1.24).	Not agreed. A nominal value as defined here is not a conventional value. This would be a major change to the definition in VIM 3 as well as 1 CD VIM4.
0098 **ILAC**	4.17	definition	te	The definition incorrectly excludes instruments, which is the main use for nominal values. ‘measuring system’,	insert ‘instrument or’ before ‘measuring system’	Not agreed. Instrument is included generically in a measuring system.

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				even as defined here, is insufficient because 4.2 clearly implies an assembly, not a single item.		
0099 IUPAC	4.17	definition	ed	unnecessarily verbose, uses an unfamiliar and undefined term (“characterizing quantity”) and excludes application to instruments forming part of a system. The examples provided are clear enough to reduce detail in the definition	amend to approximate value that provides guidance for use of a measuring system or instrument and amend the Notes similarly for brevity as ‘characterizing quantity’ is not needed	Partially agreed.
0100 IUPAC	4.17	Example 1	ed	‘resistance’ misspelled	correct spelling	Agreed
0101 ISO 429	4.17	Example 3	ge	In using the term nominal value, it is assumed that a specific and (more) precise value will be used in actual practice. Very often, however, 0.1 mol/l as an expression of amount-of-substance concentration of a solution simply means that this level of accuracy is sufficient and no (more) precise value is required.	This example is inappropriate to illustrate nominal value of a quantity and should be deleted.	Not agreed
0102 NPL, UK	4.17	Example 3	te	The term “…as used in a measuring instrument” is meaningless in this chemical example.	Remove the text “as used in a measuring instrument” as it is superfluous.	Agreed
0103 VNIIM	4.17	Example 3	ge	In using the term nominal value it is assumed that a specific and (more) precise value will be used in actual practice. Very often, however, 0.1 mol/l as an expression of amount-of-substance concentration of a solution simply means that this level of accuracy is sufficient and no (more) precise value is required.	This example is inappropriate to illustrate nominal value of a quantity and should be deleted	Not agreed
0104 IUPAC	4.17	Note 1	te	‘might’ in inappropriate context	amend to ‘should’	“should” already was present. See revised Notes.
0105 ISO 430 0106 EC-150	4.17	Note 2	ed	For a correct interpretation of Note 2, the reader should be invited to consult the term nominal property (entry 6.1).	Please revise Note 2 as follows: The terms “nominal value” and “nominal value of a quantity” should not be used for referring to values of a nominal property. The term “nominal property” should be highlighted	Not agreed. Seems same message.
0107 IUPAC	4.17	terms	te	There seems no good reason to include “nominal value of a quantity” as an alternative – either the short term is applicable, or the long term must be used to be clear that the reference is to a measuring system or instrument.	Delete “nominal value of a quantity”	Not agreed
0108 ILAC	4.18		te	In ISO/IEC 17011:2017 clause 7.8.3 c) the CMC of calibration laboratories are specified including a	Add measurement range as a synonym and delete working interval which is seldom used. Then Note 1 can be deleted.	Partially accepted. Note 1 has been kept.

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				"measurement range". Therefore, include this as a synonym together with "measuring range"..		
0109 **IUPAC**	4.18	definition	ed	unnecessarily verbose – measuring systems are already specific to a quantity and the detail in the definition impedes understanding (especially on substitution)	Shorten to interval of values that can be measured with specified instrumental uncertainty [by a measuring instrument or measuring system]	Partly agreed, definition simplified.
0110 **ISO 431** **0111** **EC-151**	4.18	term	te	Is the term "measuring interval" really used? "Working range" or "working interval" are much more common.	The term "measuring interval" should be dropped in favour of one of the established terms.	See 0108.
0112 **ILAC**	4.19		te	It is not clear what a state of a measuring instrument is. Either define that state or just delete this rather obvious term. This could equally well be applied to terms 4.20-4.22 which might be parts of an instrument specification in certain areas. But is that really metrology?	Delete 4.19 – 4.22.	Not Agreed. Def. 4.19 is updated as per 0118.
0113 **ISO 432** **0115** **MB IMEKO-152**	4.19		te	Text: operating condition state of a measuring instrument or measuring system when it is in operation	See above: See the Reference in comment ISO 008:Reference: F. Pavese: "On the classification in random and systematic effects", AMCTM XI, 2018, in A.B. Forbes, N.F. Zhang, A.G. Chunovkina, S. Eichstädt, F. Pavese, (Eds.): "Advanced Mathematical and Computational Tools in Metrology and Testing XI", vol.11, Series on Advances in Mathematics for Applied Sciences vol 89, World Scientific, Singapore, October 2018, pp. 58–69	See 0112
0114 **ISO 433**	4.19		te	The new definition of operating condition refers to the "state of the instrument". However, in the EXAMPLE it refers only to environmental conditions (voltage, temperature, …) which are parameters "outside of the instrument". While the intention is clear, this is inconsistent and needs to be discussed and clarified. The operating conditions are usually perceived as external influence conditions and not as a "state of the instrument". This is an inconsistency. However, if the WG sticks to the present definition, then please reword the notes and examples so they are written "from the perspective of the instrument" that finds itself in its operating condition.	WG kindly asked to discuss. This is a conceptual problem. Proposal: Operating condition Set of one or more external parameters influencing the measuring instrument or measuring system when it is in operation	Not accepted. An operating condition is not a parameter.
0116 **ISO 434**	4.19	definition	te	This definition is wrong. The operation conditions are not the state of the measurement system (working/not working/working badly), but the conditions under which	Correct	See 0112

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0122 **EC-153**				this state is achieved (temperature of 22.3 C). By the way, 4.8 also uses the term “operation conditions” not as state but as conditions.		
0117 **IUPAC**	4.19	definition	te	‘condition’ is singular in this document (see, eg, reproducibility condition); the ‘state’ of a system involves multiple quantities/conditions	For simplicity, amend term to ‘operating conditions’ or change definition to “condition characterising the state of a measuring system when it is in operation” with a note to the effect that the characterisation of the state of the system usually requires several conditions	See 0112
0118 **IUPAC**	4.19	definition	te	This term (or one very like it) is often used to refer to the conditions external to the instrument or measuring system (eg a specified environmental temperature or humidity range).	Consider extending to“ condition characterising the state of a measuring system or its environment when it is in operation”	Accepted in principle. See 0112
0119 **NMIA submission to OIML** **0121** **AU-OIML**	4.19	definition	ge	The definition of operating condition should include consideration not just of the measuring instrument/system but the environmental conditions as well. recognise that the note provides an explanation of this concept. However the environmental conditions are a fundamental part of the operating conditions of any measuring instrument/system and must be included in the definition directly.	We suggest the term is revised as :environment and configuration of a measuring instrument or measuring system when it is in operation	See 0112
0120 **UK-OIML**	4.19	definition	ge	“state of a measuring instrument or measuring system when it is in operation. ”It is important to include the environment in which the instrument is operating which are important, for example when considering the durability of the instrument.	Proposal: “State of a measuring instrument or measuring system when it is in operation under conditions of use.”	See 0112
0123 **PT/ IPQ**	4.19	Example	ed	According to entry 4.18, the correct term is “measuring interval”.	Replace: “the actual measurement range employed. ”By: “the actual measuring interval employed.”	Noted, however Example is deleted.
0124 **ISO 435** **0128** **EC-155**	4.20	definition	ed/te	Typo: “[…] measurement system perform as designed ”While it is correct to speak about the design of a measuring instrument or a measuring system, the term design is often understood as a set of conditions fixed by manufacturer of an instrument or a device. Instead, a measuring system is often developed and validated in-house by laboratories.	Please consider the following corrected and revised definition: “operating condition that must be achieved in order that a measuring instrument or measuring system performs as designed or developed”	The word “designed” does not exclude developed systems, so rather keep it simple and not make the change.
0125 **ISO 436**	4.20	definition	te	Rated by whom? Rated as what? The term “rated” is very unfortunate and not readily understandable. A term like “necessary”/”acceptable” etc. should be used.	Improve the definition	Partially agreed. Definition is considered clear enough.

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0127 **EC-154**						The Note has been updated to state that the rated operating condition is typically provided by the manufacturer.
0126 **IUPAC**	4.20	definition	ed	unnecessarily verbose	Shorten to extreme operating condition that a measuring instrument or measuring system must withstand without adverse effect on subsequent use	Not agreed. Definition is considered clear enough. See 'limiting operating condition.
0129 **INRIM**	4.20 & 4.22	definition	te	MPEs of measuring instruments or systems hold under predefined operating conditions, as specified by who sets the MPE (typically the instrument manufacturer in a data sheet).Two possible terms are eligible to indicate the operating conditions under which MPEs hold: "rated operating condition" (4.20) and "reference operating condition" (4.22).The justification for the former is that "as designed" may well be interpreted as "where its specification (MPE) holds". In fact, how could an instrument be designed to work with unquoted performance, that is at operating conditions where the MPE does not hold?The justification of the latter is that they are "prescribed for evaluating the performance", which is exactly the point.In many application fields, the accepted and widely used term for this meaning is "rated operating conditions", whereas "reference operating conditions" are those where the instrument performs best, as the NOTE 2 says. In some cases, the conformance assessment of an instrument to its MPE is made by testing at reference operating conditions first, and then by testing when varying one condition at a time within the rated operating conditions.	In 4.20, add a "NOTE 2 When a measuring instrument or measuring system is specified by a maximum permissible error (MPE), the rated operating conditions are the operating conditions at which the MPE holds. "In 4.22, change "operating condition prescribed for evaluating the performance of …" to "operating condition prescribed in evaluating the performance of …".	Not agreed. This note seems overly "perform as designed" includes meeting MPE requirements.
0130 **ISO 437** **0131** **EC-156**	4.21	Note 2	te	It is not clear what is meant by "limiting values of a quantity being measured" Would these correspond to the extremes of a measuring interval (4.18)?	Please clarify "limiting values of a quantity being measured"	Not agreed. The note explains that the limiting values can be the same as the quantity measured or e.g. environmental conditions.
0132 **ILAC**	4.21, 4.29, 5.11			The term 'metrological property' appears in a few definitions in Chapter 4 and in one definition in Chapter 5, concerning measuring instrument and measurement standard. An explanation of the term is necessary for understanding of the related definitions, e.g. is it referring to the stated value and uncertainty of a measurement standard or the calibration characteristic and uncertainty of a measuring instrument ? (although it is suggested to delete 4.21)	To add explanation for 'metrological property'.	Partially agreed. "performance" is now used to replace "metrological properties" here.

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0133 **ILAC**	4.22	Note 1	te	The note should rather say about the values of the quantity being measured rather than values of the measurand	NOTE 1 Reference operating conditions specify intervals of values of the quantity being measured and of the influence quantities.	Not agreed.
0134 **ISO 438** **0135** **EC-157**	4.22	term	te	This term is not needed. It just blows up the document without contributing anything to a clearer understanding of the subject.	Delete the definition to make the document more usable.	Not agreed. This is a well-known term, going back to the VIM1.
0136 **ISO 439**	4.23		te	The present VIM definition is applicable to small and large elements in the quotient. While present industrial use is to apply it mostly over the full range. See for example: https://www.test-and-measurement-world.com/Terminology/Difference-between-Linearity-and-Sensitivity.html#:~:text=Definition%3A,-%E2%80%A2&text=It%20is%20defined%20as%20ability,curve%20and%20idealized%20straight%20line.&text=For%20a%20linear%20instrument%20the,entire%20range%20of%20the%20instrumentWe propose to add a NOTE that it might be necessary to state together with the sensitivity, to which range and at which working point the value was assessed	Add Note: Note: Sensitivity should be accompanied with a statement at which working point and over which range it was assessed.	Agreed, but Note 1 already addresses this point.
0137 **ILAC**	4.23	definition	te	The limitation to “measuring instrument” is at least misleading if not wrong for several measurement procedures. There are not only instrumental settings/parameters which are influencing the sensitivity.	Replace ‘measuring instrument’ by “measuring system”	Accepted.
0138 **ISO 440** **0139** **EC-158**	4.23	definition	te	Sensitivity does not only refer to measurement instruments, but also to measurement procedures. For example, a HPLC instrument has neither sensitivity nor selectivity, but a procedure to determine herbicides by HPLC-DAD has both.	Replace “property of a measuring instrument” by “property of a measuring system, used with a specified measurement procedure, whereby…”	Partially accepted, see 0142
0140 **ILAC**	4.23	Note 1	te	This is quite obvious and in general guidance to use of synonyms are not provided for every term in VIM4.	Delete Note 1.	Accepted. See 0068.
0141 **IUPAC**	4.23	term	te	this term is often (perhaps usually) used to refer to the ability of a system to detect or respond to low levels, especially in a qualitative context.	Consider adding a context-specific definition for sensitivity used in the sense of ‘good detection capability’	No recommendation provided.
0142 **RNMF_FR**	4.23, 4.24,	definitions	ed	In many definitions in the document, the term “measuring instrument” is followed by “or measuring system.	To replace “measuring instrument” by “Measuring instrument or measuring system”	Partially accepted.

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	4.25, 4.29			Shouldn't it be correct to write it in the same way in the definition of sensitivity, selectivity, resolution and stability?		
0143 **ISO 441**	4.24		te	To retain the existing VIM 3 definition unaltered. In considering only the property of measuring system, the definition of VIM 3 is more appropriate as it takes into consideration 'Specified Measurement Procedure', which is missing in VIM 4.To substantiate, a simple examplea spectrophotometer is made selective by selecting certain specified monochromatic radiation by use of appropriate dispersing device (Prism or grating) coupled with monochromator. An ion selective electrode is made more selective by use of buffers, masking / complexing reagents. It is true with practically most of the measuring equipments / instruments	property of a measuring system, used with a specified measurement procedure, whereby it provides measured quantity values for one or more measurands such that the values of each measurand are independent of other measurands or other quantities in the phenomenon, body, or substance being investigated	Partially accepted. Text is updated to harmonize the VIM3 and VIM4 definitions.
0144 **ISO 442** **0145** **ISO 443**	4.24		ge	Include 'and quantities' in the definition To bring in more clarity in the definition of selectivity The term "Indications" alone being used is confusing. If the purpose is also to apply for non-calibrated instruments as indicated, where only indications are followed, then both the words "Indications and quantities" are better to be used.	property of a measuring system and measuring instrument, whereby it provides indications and quantities that are independent of indications and quantities other than the quantity being measured but that are of the same kind as the measurand	Don't understand the comment.
0146 **ILAC**	4.24	definition	te	The definition should rather say about the values of the quantity being measured (twice) rather than values of the measurand	property of a measuring instrument, whereby it provides indications that are independent of quantities other than the quantity being measured but that are of the same kind as the quantity being measured	Partly agreed. Text is updated to harmonize the VIM3 and VIM4 definitions.
0147 **ILAC**	4.24	definition	te	"property of a measuring instrument" is at least misleading if not wrong in many cases as other parameters of the measurement procedure have often a significant influence on selectivity	Replace "property of a measuring instrument" by "property of a measuring system, used with a specified measurement procedure, whereby…"	Agreed. See 0142.
0148 **ISO 444**	4.24	definition	te	Selectivity does not only refer to measurement instruments, but also to measurement procedures. For example, a HPLC instrument has neither sensitivity nor selectivity, but a procedure to determine herbicides by HPLC-DAD has both.	Replace "property of a measuring instrument" by "property of a measuring system, used with a specified measurement procedure, whereby…"	Agreed. See 0142.
0149 **AU**	4.24	definition	te	The new text for selectivity adds a new concept with the wording "but are of the same kind as the measurand". This is less clearly presented than the previous definition (4.13) that compared with other measurands The	Consider reverting the definition to include the previous wording that relates this to the concept of	Partly agreed. See 0146.

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				understanding of this new definition relies on how readers determine the term “same kind”. There may be components that will affect the quantity that will not be of the same kind as the measurand depending on interpretation of this term. The examples do not make it clear to what exactly the “same kind” relates.	not including other measurands, this is definitely clearer for the chemical and biological community	
0150 RNMF_FR	4.24	definition	te	For chemical analyses, selectivity can also apply to measurement methods. This applies more to methods than to instruments	To modify as follows: “Property of a measuring instrument or a measurement method, whereby it provides indications…”	Partially agreed.
0151 EC-159	4.24	definition	te	Selectivity does not only refer to measurement instruments, but also to measurement procedures. For example, a HPLC instrument has neither sensitivity nor selectivity, but a procedure to determine herbicides by HPLC-DAD has both.	Replace “property of a measuring instrument” by “property of a measuring system, used with a specified measurement procedure, whereby…”	Partially agreed.
0152 ILAC	4.24	Note 2	te	The note should rather say about "analyte" rather than "measurand"	NOTE 2 In chemistry the property of a measuring instrument being selective to only one analyte in a sample is often termed “specificity”.	Not agreed. Note has been deleted.
0153 ISO 445	4.24	Note 2	te	For chemistry in general, the term specificity can have other related meanings (e.g., biochemistry), and is not only used to characterize a property of a measurement instrument. In analytical chemistry specifically, selectivity is typically considered the extent to which indications are independent of quantities of substances other than the analyte, using a given procedure. Specificity is an absolute term (perfect selectivity). Verification of the ability of measurement instruments to unequivocally provide indications that are completely independent from other quantities is often impractical and usage of “specificity” to describe this property in analytical chemistry has been discouraged through IUPAC recommendations (Pure Appl. Chem., Vol 73, No. 8, pp. 1381 – 1386, 2001).	Omission of NOTE 2Or“NOTE 2 In analytical chemistry the property of a measuring instrument being unequivocally selective to only one measurand in a sample is often termed “specificity”, which should not be equated with “selectivity”, and is often difficult to verify in practice”	Agreed. Note 2 deleted
0154 IUPAC	4.24	Note 2	te	The note somewhat mischaracterises the (2002) IUPAC distinction between the terms. Selectivity is always about the degree to which a system responds to a single quantity, but selectivity is a matter of degree, whereas ‘specific’ is used for essentially perfect selectivity	Replace note 2 with “The use of the terms “selectivity” and “specificity” in chemistry is discussed in Vessman et al, “Selectivity in analytical chemistry”, Pure Appl. Chem., Vol. 73, No. 8, pp. 1381–1386, 2001	See 153.

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0155 **IUPAC**	4.24	Note 3	ed	The note is almost completely unreadable	Delete the note or change to refer to suitable texts; for example“The determination and expression of selectivity in chemistry are discussed in, for example, Thompson et al, “Harmonized Guidelines for Single Laboratory Validation Of Methods Of Analysis”, Pure Appl. Chem., Vol. 74, No. 5, pp. 835–855, 2002, and Vessman et al, “Selectivity in analytical chemistry”, Pure Appl. Chem., Vol. 73, No. 8, pp. 1381–1386, 2001NB: reference to the second of these could also replace Note 2, as the paper	Agreed to delete note 3.
0156 **ISO 446** **0157** **EC-160**	4.24	term, definition, Note 1, Note 2, Note 3	te	In contrast to the terms sensitivity (4.23) and resolution (4.25), which are indeed properties of measuring instruments, selectivity is in the first instance a (performance) property of a measurement procedure (cf. method). For this reason, selectivity is one of the essential performance characteristics to be assessed during method validation studies. Hence, “measuring procedure” should be included in the definition.Excluding “measurement procedure” from the definition and its associated Notes 1, 2 & 3 will cause a major conflict with existing internationally agreed method validation procedures.	Please consider the following revised definition: “property of a measurement procedure, whereby it provides indications that are independent of quantities other than the quantity being measured but that are of the same kind as the measurand Replace “measuring instrument” by “measurement procedure” in Note 1, 2 & 3	Partly agreed. See 0149.
0158 **IUPAC**	4.25	Note 1	ed	possibility (‘might’) in inappropriate context	use ‘should’	Note 1 has been deleted.
0159 **ISO 447** **0160** **EC-161**	4.25	Note 2	te	The resolution of a measuring instrument also depends on interference caused by quantities other than the quantity being measured. Also, it is not clear what is meant with: “Resolution can depend on the value of the quantity being measured”, in other words, how can the indication of a measuring instrument affect the instrument’s resolution?	Please reconsider the first sentence of Note 2 or provide an explanation how the value can affect the resolution. Mention “interference by quantities other than the quantity being measured” in Note 2	Accepted. Note has been clarified.
0161 **ISO 448** **0164** **EC-162**	4.25	Note 3	te	I agree to integrating former VIM3 entry 4.15 as note 3 to entry 4.25 in VIM4. The resolution of a displaying device, i.e., the smallest characteristic division at which scale of a displaying measuring instrument can be read, is often known as “readability” (lab jargon).Note that the term “displaying device” is not explained in the VIM4. For consistency, the term should preferably be replaced by “displaying measuring instrument”The second part of	Please mention “readability” in Note 3 Replace “measuring device” by “displaying measuring instrument” Shorten Note 3 by deleting “whereas the resolution of a measuring instrument is determined […].”	Partly agreed. Text is updated.

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				Note 3 basically repeats the definition and can therefore be deleted.		
0162 **ISO 449**	4.25	Note 3	te	The difference between the indicated resolution and measurement resolution of a measuring instrument could perhaps be described more simply in a revised note.	Propose revising Note 3 to read as follows or similar: "Note 3: The resolution of a measuring instrument may be more easily understood by the terms "Displayed/Indicated resolution" and "Effective resolution". "Displayed/indicated resolution is the resolution determined by the scale markings or least significant digit on a digital display on an indicating instrument. "Effective resolution" is the resolution which affects the measurement result, and which should be considered as the uncertainty contributor when analysing measurement uncertainty. For example, a digital display may have a least significant digit of 1 mV, however in use, when incrementing the measured voltage, this digit increments in steps of 5 mV. 1 mV is then the "displayed" resolution whereas 5 mV is the "effective" resolution.	Partly agreed. Text is updated.
0163 **IUPAC**	4.25	Note 3	ed	Note contradicts definition. Definition says 'change in indication' but Note 3 says "the resolution of a displaying device is determined from detectable changes in indications of the displaying device," – that is, the Note says the definition is that for the resolution of a displaying device, and not for a measuring instrument. In addition, the definition refers to changes in the quantity being measured, not in the measured value as stated in the Note	Review definition against Note 3 and decide which concept is to be defined. Then align definition and note. Also consider defining resolution of a measuring instrument and resolution of a displaying device separately. Also consider deleting the Note, or that part of it from "The difference is …"	Partly agreed. Text is updated.
0165 **National Institute of Standards (NIS), Egypt**	4.25	definition	te	The term ''least reading of a displaying device'' is usually used and famous between Metrologists. But there is a confusion between the resolution of a displaying deice and this term.	Please, we think that it is needed to define the least reading of a displaying device as ''the smallest difference between displayed indications that can be meaningfully distinguished.''	Not agreed. This is not clearer editorially.
0166 **ISO 450**	4.26 and 4.27		te	It is unclear from these definitions as to the difference between "discrimination threshold" and "dead band". Whilst "deadband is clearly defined as the interval or range of value (±) it is not clear as to whether "discrimination threshold" refers only to the semi-range. If they both refer to the full interval or range of values, there doesn't appear to be any difference.	Propose changing 4.26 to read, "largest smallest change in the quantity being measured that causes no detectable change in the corresponding indication." This would then clearly indicate the two terms to be defined to have two distinctly different meanings.	Not agreed. This is not easier to read.

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0167 **ILAC**	4.28		te	This definition only applies to chemistry, but for the physical quantities it needs to be defined also. Otherwise clarify that this definition is restricted to chemistry.	Consider clarify the definition.	Agreed. Definition has been revised.
0168 **IUPAC**	4.28	definition	ge	We are pleased to see that the principle here now aligns well with established usage and definitions for detection limit	No action required	Noted
0169 **RNMF_FR**	4.28		ge	Shouldn't "quantification limit" be defined as well? Quantification limit are mentioned in some regulation texts. Should be defined somewhere	To add a note on "quantification limit"	No explicit suggestion offered.
0170 **PT/ IPQ**	4.28	Entry and Note 4, respectively	ed	According to NOTE 4 of entry 1.1 of the present document, "the symbols for quantities are written in italic", therefore the symbols for the probabilities α and β shall be written in italic.	Replace: "a material is β, given a probability α of…NOTE 4 IUPAC recommends default values for α and β equal to 0.05."By:"a material is β, given a probability α of…NOTE 4 IUPAC recommends default values for α and β equal to 0.05."	Accepted (Note 4 deleted)
0171 **ISO 451**	4.28	Note 2	te	In measurement science, the detection limit is a "performance characteristic" rather than a "feature". The latter term is too abstract for use in the give definition.	Please replace "feature" by "performance characteristic"	Accepted. This complies well with wording ISO 17025.
0172 **ISO 452** **0174** **VNIIM**	4.28	Note 2	ge	Detection limit is intended to be established independent of a given laboratory.	A given laboratory should not be mentioned with regard to detection limit.	Accepted.
0173 **EC-163**	4.28	Note 2	te	In measurement science, the detection limit is a "performance characteristic" rather than a "feature". The latter term is too abstract for use in the give definition.	Please replace "feature" by "performance characteristic"	See 0171
0175 **ISO 454** **0176** **ILAC**	4.29		te	"in" time versus "over" time	Propose replacing the word "in" with "over".	Agreed
0177 **ISO 453** **0178** **EC-164**	4.29	term	ge	"Stability" is a generic term refers to the quality or state of any system that is unchanging under specific conditions and over a specified time interval. For instance, stability is also an essential property of a reference material. Since the given entry particularly addresses the stability of a measuring instrument, the main term to be referred to should be "stability of a measuring instrument".	Keep VIM3 entry	This is the VIM 3 entry. The short and long forms have been interchanged only. Whole chapter is about measuring devices, including material measures.

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0179 **ISO 456** **0180** **ILAC**	4.30		te	This is then the same as “measurement error”. See earlier comments on 3.20 “Measurement bias”.	Propose removing 4.30 altogether	Not agreed, kept for historical reasons.
0181 **IUPAC**	4.30	definition	te	Poorly constructed and not consistent with general concept of bias a) the definition is not specific to an instrument so _any_ measured bias is consistent with the definition b) This defines bias as an observable value instead of a quantity to be estimated	i) correct the general definition of bias, (see comments on 3.20 above) iii) define instrumental bias as “bias in the measured values provided by a measuring instrument”	Disagree. See response to 3.20.
0182 **ISO 455** **0183** **EC-165**	4.30	term & definition	te	The indication from a measuring instrument is always the result of a “measurement”. Therefore, the applicability of this definition strongly overlaps with the definition of “measurement bias” (3.20).Measurement bias is composed of different components related to, for instance, sample preparation, rated operating conditions, and measuring instruments. The overall measurement or experimental bias is evaluated by comparing with the reference value of a certified reference material. It is not clear to me whether the instrumental bias can be determined by a direct comparison with a reference value without the need of first determining the (overall) measurement bias.	Please elaborate how instrumental bias is seen in relation to measurement bias and provide one or more examples.	See 0181.
0184 **National Institute of Standards (NIS), Egypt**	4.30	definition	te	Instrumental bias is defined in VIM4 as ‘‘average of replicate indications minus a reference value’’. This definition causes confusion to reader, because two types of conditions are stated individually in chapter 3, one for repeatability and the other for reproducibility.	We think that a note in needed with this definition to clarify whether replicate indications is taken under repeatability conditions or reproducibility conditions.	Not agreed. Need concrete proposal.
0185 **ISO 457**	4.31		te	"gradual … change "It is undefined and superfluous to name the change "gradual".	Delete "gradual" from the definition	Not agreed. The usually slowly change is encompassed by “gradual”.
0186 **ISO 458**	4.31		te	"undesirable" changeIt is acknowledged, that drift is in most cases undesirable, however, VIM should not deal with desires but with facts. The definition does not lose any value when "undesirable" is deleted.	Delete "undesirable" from the definition to read: "gradual change over time in indication of a measuring instrument due to its limited stability for the same quantity being measured"	Agreed
0187 **ISO 459**	4.31		ge	Delete ‘Gradual ’As the definition mentions the change over time, ‘Gradual’ is not necessary.	Gradual undesirable change over time in indication of a measuring instrument due to its limited stability for the same quantity being measured	see 188

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Country Code[1]	Clause	Paragraph/ Figure/Table	Type of comment[2]	Comments	Proposed change	Convener's responses
0190 **ILAC**						
0188 **IUPAC**	4.31	definition	ed	Unnecessarily verbose 'undesirable' is not needed at all in this context (no reader of the VIM wants drift due to instability) and 'limited stability' suffices for understanding	change to "gradual change over time in indication of a measuring instrument due to its limited stability"	Agreed.
0189 **AU**	4.31	definition	ge	Suggest removing "gradual undesirable" as this is a value judgement	Remove the words "gradual undesirable"	See 0185 and 0186.
0191 **NPL, UK**	4.31		te	The word 'gradual' precludes any sudden changes in the instrument. Whilst many examples of drift are gradual, some may be instantaneous, e.g. sudden shock to PRT temperature sensors, material changes in gauge blocks causing step-wise length change, laser tube mode flips.There is no term in the VIM which would include such changes and they should be grouped under the category of instrumental drift.	Delete the word 'gradual'.	See 0185 and 0186.
0192 **ISO 460** **0193** **EC-166**	4.31	term & definition	te	Similar to instrumental bias (see previous EC comment), also "instrumental drift" is usually observed as a systematic drift for measurement results obtained in a consecutive manner. It is not clear to me how to distinguish between drift that is related intrinsically to a measuring instrument from drift caused by changing non-instrumental conditions. For this reason, the term "analytical drift" is commonly used.	Please elaborate how instrumental drift is seen in relation to measurement or analytical drift and provide one or more examples.	Not agreed. No proposed explicit change in wording is provided. The Note addresses this somewhat.
0194 **ILAC**	4.32		te	You can have many characterisations of responses to signals and step response is only one. This is much more instrument "vocabulary" than metrology.	Delete term from VIM.	Not agreed. This has historical context back to the VIM 1.
0195 **IUPAC**	4.32	definition	ed	unnecessarily verbose definition	Consider "time from an [abrupt |instantaneous]* change in a quantity to the instant when a corresponding indication settles within specified limits "Further elaboration should be placed in Notes*[a|b] denotes suggested alternatives.	Not agreed.
0196 **IUPAC**	4.32	definition	ed	"abrupt" is ambiguous – does it mean zero time, unexpected, or some arbitrary short time?" Instantaneous" preferable as it is consistent with 'instant' later and defines the term in such a way that the time has an exact single value in theory; experimental realisations can then take account of the nonzero impulse time as experimental rather than unquantifiable definitional uncertainties.	change 'abrupt' to 'instantaneous'	Not agreed. Abrupt is well understood and used in VIM 3.

1 **Country code (enter the ISO 3166 two-letter country code, e.g. CN for China)**
2 Type of comment: ge **= general** te **= technical** ed **= editorial**

Template for comments and convener's observations

Date:2023-07-03	Document:	Project:

Country Code[1]	Clause	Paragraph/ Figure/Table	Type of comment[2]	Comments	Proposed change	Convener's responses
0197 **ISO 461**	4.33	Note 2	ge	NOTE 2 is not necessary as material measures are included in measuring instruments (see 4.6 and NOTE 2 to 4.2)	Remove NOTE 2 for 4.33.	Not agreed. Kept for historical reasons dating back to VIM 1.
0198 **ISO 462**	4.33	definition	te	The “accuracy class” is usually not a class of measurement instruments but a specified accuracy. For example, ASTM E288 specified accuracy classes for volumetric glassware, but does not contain the glassware itself. Having said that, it is clear that the most frequent definition of accuracy classes is laid down in international standards.	Clarify	No explicit suggestion provided.
0199 **IUPAC**	4.33	definition	ed	unnecessarily verbose definition	Reduce to “class of measuring instruments or measuring systems that meet stated metrological requirements ”and place the remainder of the definition in Notes; eg “NOTE The metrological requirements in the definition are intended to keep measurement errors and instrumental uncertainties within specified limits under specified operating conditions”	Not agreed. This needs to be kept together for the purpose of legal metrology.
0200 **EC-167**	4.33	definition	te	The “accuracy class” usually is not a class of measurement instruments but a specified accuracy. For example, ASTM E288 specified accuracy classes for volumetric glassware, but does not contain the glassware itself. Having said that, it is clear that the most frequent definition of accuracy classes is laid down in international standards.	Clarify	No suggestion. This would however be included because measuring systems may include standards and material measures. See Note 2.
0201 **ILAC** **0202** **ISO 463**	4.33	notes	ge	Not all measuring instruments are categorised by a “class definition” to ensure they are fit for their intended measurement application. Not all measurement applications prescribe the use of a specified class measuring intrument or measuring system.	Proposing adding a note: “Note 3: Accuracy Class is not on its own a technically valid indicator as to the fitness for purpose of a measuring instrument, unless prescribed by a validated method.”	Agreed.
0203 **IUPAC**	4.25, 4.26	definitions	te	The definitions appear functionally identical in that they appear to describe exactly the same value approached from different directions.	Combine to a single definition with two permitted terms	Not agreed. Those are different issues.

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