Organisation Internationale de Métrologie Légale

International Organization of Legal Metrology

COMMENTS TEMPLATE

Template revision date: 2017-12-08

TC 5/SC 2/p 3:	**Revision of D 31: General Requirements for software controlled measuring instruments**		
PG comments on 1CD:	TC5-SC2-p3-N019		
Circulation date:	25 Oct. 2018	Convener: Mr. Esche, Mr. Grasso Toro	**Closing date for voting and/or comments: Tuesday 10 April 2017 at 23:59 CET**
Date comments submitted:	**10 Apr. 2018**	Please type your comments in this form and post it (in Word format) as soon as possible and no later than the closing date in the PG Workspace (Technical work → PG Workspaces)	

PLEASE INSERT THE COUNTRY CODE AND THE PART AND CLAUSE NUMBER IN EACH ROW.
PLEASE DO NOT MODIFY THE NUMBER OF COLUMNS IN THE TABLE.

Country Code[1]	Part	Clause/ Subclause	Paragraph/ Figure/ Table/	Type of comment[2]	COMMENTS	PROPOSED CHANGE	OBSERVATIONS OF THE CONVENER/PG on each comment submitted
AT-01		3.1.19		Te	Hash function: Collision resistant is crucial for a good hash function, which is missing in this definition.	Suggest to extend the definition.	Since the definition in 1CD quotes ISO/IEC 9594-8:2014, we should refrain from changing it. Moreover, collision resistance already seems to be covered by the quoted note. Another note would, therefore, not provide additional information. At the Dordrecht meeting, it was agreed to reject the comment.
AT-02		3.1.26		Ge	Legally relevant software part: The definition seems self-explaining and is therefore redundant.	Suggest to delete the term and definition.	The suggested modification makes sense, but should be discussed. After discussion in Dordrecht, the definition changed to "all software modules…subject to legal control".
AT-03		5.2.1.2.d		Ge	"The measurement process (..) must not be delayed or blocked by other processes." In an operating system, there can always be interrupts which must be handled immediately. How is this meant to be realized?	Further clarification required.	Related to CA-13, AT-03, DE-03. The requested clarification is no longer needed because of changes resulting from CA-13 and DE-03.

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

Country Code[1]	Part	Clause/ Sub clause	Paragraph / Figure/ Table/	Type of comment[2]	COMMENTS	PROPOSED CHANGE	OBSERVATIONS OF THE CONVENER/PG on each comment submitted
AT-04				Ge	Requirements stated in this document should comply with the requirements laid down in the "Guidance for Industry Part 11, Electronic Records; Electronic Signatures — Scope and Application"		Requirements laid down in the cited guidance document refer to persons who maintain records or submit designated information electronically in compliance with FDA regulations. There is no indication that these requirements may be generally applicable to Legal Metrology world-wide, especially since the document also refers to organizational measures. Moreover, the document specifically offers the opportunity to use alternative methods to fulfill FDA's demands. While the document may prove helpful in improving individual requirements, we should not apply it to all of D31 blindly. Suggestions for improving specific requirements would be most welcome. At the Dordrecht meeting, it was agreed to reject the comment.
AU-01	1	5.1.1	4th para	ed	Regarding the list that follows the 4th paragraph; is assumed that all of the conditions are required to be satisfied. In theory it could be acceptable if only (3) is satisfied.	Please amend the paragraph to read: "…if it satisfies **all** of the following conditions:..."	Yes, the requirement was meant to concatenate conditions 1 to 4. The suggested change will improve clarity of the CD. The suggested change has been included in 2CD
AU-02	1	5.1.4.1	2nd para	ge	What is meant by an "appropriate reaction"? It is assumed that the software will provide for an alarm or log or invalidate the measurement if a fault is detected.	Please clarify the first sentence. For example: If software is involved in fault detection, it shall incorporate appropriate mechanisms for: • detecting faults in the measurement process; and • raising alarms and/or notifications when a fault is detected.	The required clarification already seems to be given by the next sentence "The relevant OIML Recommendation may prescribe that the instrument / component is deactivated or an alarm / record in an error log is generated in case a fault condition is detected." The first bullet point of the suggested change appears to be somewhat self-evident. Sentence has been rephrased to "If software is involved in fault detection, an appropriate reaction is required. For example, the relevant OIML Recommendation may prescribe that the instrument / component is deactivated or an alarm / record in an error log is generated in case a fault condition is detected."

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AU-03	1	5.1.4.2	2nd para	ge	What is meant by an “appropriate reaction”? It is assumed that the software will provide for an alarm or log or invalidate the measurement if a fault is detected.	Please clarify the first sentence. For example: If software is involved in fault detection, it shall incorporate appropriate mechanisms for: • detecting faults in the measurement process; and • raising alarms and/or notifications when a fault is detected.	We assume that the proposed change was meant to refer to durability protection rather than fault detection. The required clarification already seems to be given by the next sentence "The relevant OIML Recommendation may prescribe that the instrument / component is deactivated or an alarm / record in an error log is generated in case a fault condition is detected." The first bullet point of the suggested change appears to be somewhat self-evident. Text has been rephrased to "If software is involved in durability protection, an appropriate reaction is required. For example, the relevant OIML Recommendation may prescribe that the instrument / component is deactivated or an alarm / report is generated in case durability is detected as being jeopardized."
AU-04	1	5.2.2	3rd para	ed	The first and second sentences appear to contradict each other. The first says that the use of a UC is not appropriate, the second says that when using a UC additional precautions should be taken.	Delete either the first or second sentence.	Related to DE-04. Agreed, we feel that the first sentence should be deleted. Nevertheless, this should be discussed at the Dordrecht meeting. At the meeting, the 1st sentence was deleted because of DE-04, 2nd sentence was subsequently also deleted. Previous paragraph extended by inserting an additional requirement.

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AU-05	1	5.2.3	1st para	ge	Requirements regarding the storage of data should apply at all times, not only before their legal use. For example, it may be appropriate for data to be retained after a transaction is settled for interrogation purposes. We acknowledge the Convenor's response to NL59 from the last WD. However storage and transmission are separate concepts and while we agree that the requirements of 5.2.4. appropriately apply transmissions before their legal use, in the case of 5.2.3 the requirements should not be limited. The sentence should read: If measurement values are stored for legal purposes the following requirements apply: A note could also be added that directs the responsible TC/SC/Project group to decide upon appropriate storage conditions for different applications.	The sentence should read: If measurement values are stored for legal purposes the following requirements apply: A note could also be added that directs the responsible TC/SC/Project group to decide upon appropriate storage conditions for different applications.	Agreed. The suggested note would also be helpful and has been included in 2CD.
AU-06	1	5.2.3.3.b	1st para	ge	The deletion of legally relevant data is subject to the specific instrument, application and relevant national requirements. We recommend that the question of data deletion should be left to the responsible TC/SC/Project group to resolve.	The clause should be reworded to direct the responsible TC/SC/Project group to define conditions for data deletion.	Agreed. Nevertheless, D31 should at least provide a universal guideline to follow. We could include the following sentence after the note: "PGs may define alternative conditions for data deletion." At the meeting, it was agreed to add the sentence to the note.
AU-07	1	5.2.3.4	3rd para	ed	Where relevant, the Recommendation may define requirements and test methods for internal clocks.	Please add a note: Where relevant, the Recommendation may define requirements and test methods for internal clocks.	Related to AU-09. Agreed, although this should not be a note. Suggest to rephrase to "Where relevant, PGs may define requirements and test methods for internal clocks." New clause 5.1.5 was modified as suggested since 5.2.3.4 and 5.2.4.5 were moved there.
AU-08	1	5.2.4.3	1st para	ge	What does 'inadmissibly influenced' mean in practice? How should this be tested? Does it relate to the error of indication or the pulse output? This requirement should extend to not just the effect of transmission delays but transmission in general. Or does this only relate to remotely controlled measuring instruments; whereby the measurement process, and therefore the measurement result, could be influenced by a transmission delay in control signals?	Clarification is required as to what is meant by 'inadmissibly influenced' and how this could be assessed.	We could add a note saying, "PGs may define which influence is considered inadmissible for specific types of instruments." A new clause 4.4 was subsequently introduced at the meeting.

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AU-09	1	5.2.4.5	3rd para	ed	Where relevant, the Recommendation may define requirements and test methods for internal clocks.	Please add a note: Where relevant, the Recommendation may define requirements and test methods for internal clocks.	Agreed, although this should not be a note. Suggest to rephrase to"Where relevant, PGs may define requirements and test methods for internal clocks." New clause 5.1.5 was modified as suggested since 5.2.3.4 and 5.2.4.5 were moved there.
AU-10	1	5.2.7.2	1st para	te	In the case of a local update, it may be the case that only an electronic seal is required to be broken. It need not necessarily be a physical seal only.	Reword the 3rd sentence as: A seal needs to be broken for the update to take effect.	Some countries may not allow alternatives to physical seals. The proposal was discussed at the Dordrecht meeting. Subsequently, the term "physical" was deleted in 5.2.7.2, the reference to "responsible person" was deleted in 5.2.7.3.
AU-11	1	5.2.7.3.a	1st para	te	What is meant by 'automatic' in the first sentence? Surely any update requires the intervention of an operator. This appears to contradict 5.2.7.3.f.	Please clarify the first sentence. Perhaps once the update is initiated the process may be largely automated.	Related to CA-07. Clarity of the requirement could be improved by adding the following note: "Triggering of the traced update process may require intervention/manual actions by the user of the measuring instrument." The note has been added in 2CD.
AU-12	1	5.2.7.3.e	2nd para	ed	Could the paragraph be displayed as a list for ease of reading?	Could the paragraph be displayed as a list for ease of reading?	Agreed. Formatting has been changed as suggested.
AU-13	1	6.3	title	ge	The term "Validation methods" is somewhat confusing. Validation is defined in terms of ensuring the requirements for verification are adequate for the intended purpose. However, this section concerns the selection of evaluation methods and procedures used during type evaluation of software. The section (and concept) should be called "Evaluation methods" or similar.	The section should be renamed "Software evaluation methods", "Evaluation methods", or similar.	Related to DE-07, DE-08, CZ-04, AU-19. In Dordrecht, it was agreed to use "software examination" instead of "validation" wherever applicable. Individual occurences were changed to "software evaluation" for consistency with other clauses. Consequently, changes were made to Annex B.
AU-14	1	6.3.2.3	result	ed	The criteria should be more definitive.	Reword the sentence as: Software controlled features under consideration function correctly or not.	Related to UK-10. The proposed modification from UK-10 has been adopted in 2CD.

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AU-15	1	6.3.2.4	App	ge	The focus of this methods should be the evaluation of software separation. Dataflow analysis should be considered a secondary issue, or possibly even a means of evaluating the separation.	The method should focus on the evaluation of software separation, with data flow analysis and variable searches provided as examples of how such an evaluation could be performed. However more straightforward methods of design assessment may be more appropriate.	In many countries, the method is also used to test possible influences of open interfaces on the legally relevant software, the correct imlementation of storage functionality etc. We do not see the need to restrict the applicability of the method if the responsible PG wants to use it for a specific instrument. Suggestions for additional methods of design assessment would be very welcome. In Dordrecht, it was agreed to reject the comment.
AU-16	1	6.3.2.4	result	ed	The criteria should be more definitive.	Reword the first sentence as: It can be validated whether software separation according to 5.2.1.2 is achieved or not.	Related to UK-11. Agreed, the term "OK" seems very informal. The proposed modification from UK-11 has been adopted in 2CD.
AU-17	1	6.3.2.5		ge	We do not support the concept of CIWT. The examination of code, line by line, would place additional burden and risk upon both the instrument manufacturer and type evaluation authority for very little benefit. Software is just another component of a measuring system, and while it is important to ensure that it functions correctly, this should be in the context of the performance of the measuring instrument as a whole, rather the line-by-line examination of source code.	Delete 6.3.2.5	While functional checks will usually be the primary source of information on an instrument's suitability for a measuring task, some jurisdictions require the software to have no hidden/undeclared functions that could intentionally or unintentionally influence a measurement result. Such undeclared functions cannot be discovered by functional testing alone. Since CIWT is not a mandatory procedure and is only proposed for the extended examination level in conjunction with other methods (see Table 2 in 1CD), the method should not be removed. At the Dordrecht meeting, it was agreed that CIWT is useful for certain tests and to reject the comment.

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AU-18	1	6.3.2.6	App	ge	SMT would appear to be an exceedingly onerous method of software evaluation – both for the manufacturer and the type evaluation authority. If it is to be retained, greater emphasis should be included to inform TC/SC/Project groups that this should only apply in only the most necessary cases.	The wording regarding exceptional cases in “Complementary procedures” should be moved to “Application” and strengthened.	Agreed, the sentence "This is an enhanced method, additional to 6.3.2.2 or 6.3.2.5. It is only effective in exceptional cases." would fit much better in the "Application" section. After discussion at the meeting it was agreed to move the phrase "exceptional cases" to "Application" and to rephrase the sentence.
AU-19	1	6.4	title	ge	The term “Validation procedure” is somewhat confusing. Validation is defined in terms of ensuring the requirements for verification are adequate for the intended purpose. However, this section concerns the selection of evaluation methods and procedures used during type evaluation of software. The section (and concept) should be called “Evaluation procedure” or similar.	The section should be renamed “Software evaluation procedure”, “Evaluation procedure”, or similar.	Related to DE-07, DE-08, CZ-04, AU-19. In Dordrecht, it was agreed to use "software examination" instead of "validation" wherever applicable. Individual occurrences were changed to "software evaluation" for consistency with other clauses. Consequently, changes were made to Annex B.
AU-20	1	6.4 and 8	Table 2	ge	It appears that the selection of “B” is intended to mitigate against various “in-use” risks – be it fraud, commodity value, etc. However, individual “in-use” risks may vary in occurrence and severity from economy to economy, as well as application to application within the same instrument category. The selection of “B” will generally impose significant costs and risks upon the manufacturer and type evaluation authority. As such, how can a Recommendation seek to balance the variable “in-use” risks against the risks imposed on manufacturers as a result of CIWT/SMT/DFA; as the Recommendation is intended to be adopted uniformly in all OIML Member States? The selection of “B” in any Recommendation may result in unjustifiable costs being placed on manufacturers in some jurisdictions (due to higher risks in other jurisdictions), which in turn may limit the adoption and use of the Recommendation internationally. In addition, it is not clear how the selection of procedure “B” will actually mitigate many of the “in-use” risks that are provided as justification.	If “B” is to be selected by a Recommendation, clear justification must be provided as to the identified “in-use” risks that necessitate “B” and exactly how the methods CIWT/SMT/DFA will resolve those risks. Furthermore, the Recommendation must include a complete risk assessment that analyses and balances both the “in-use” risks and the risks to be borne by the manufacturer and type evaluation authority as a result of the selection of “B”.	The suggested modification would provide even better guidance to PGs on when to use examination level B. A new sentence was added to clause 6.4 in Dordrecht.

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CA-01	5.2.7.3.c	5.2.7.3.c	example	tech	It was agreed that authenticity and integrity checking need not be restricted to having a fixed software part if manufacturers could find alternate methods to ensure authenticity and integrity. However, the example in 5.2.7.3c still uses ‘fixed software’ Please remove “fixed” from the example linked to these sections as the constrain has been removed from the Aunthenticity, and the Integrity check functions, and from the public key.	Remove reference to ‘fixed software’ from example. (II) The authenticity check is accomplished by cryptographic means such as a public key system. The owner of the type evaluation certificate (in general the manufacturer of the measuring instrument) generates an electronic signature of the revised software or software part using the secret key in the manufactory. The public key is stored in a legally relevant software part of the measuring instrument receiving the software revision. The signature is checked using the public key when loading the revised software into the measuring instrument. If the signature of the loaded revised software is OK, it is installed and activated; if it fails the check, the loaded revised software is discarded, and the instrument continues to operate with the current version of the software or switches to an inoperable mode.	Related to CZ-09, CA-11. We originally did not see the need to update the example, since "fixed" legally relevant software still constitutes an acceptable solution. Nevertheless, an updated example would help clarify the modified requirement. The Solution proposed here has been adopted.

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CA-02	5.2.3.2	5.2.3.2		tech	Please include a description of the metering systems to which the recommendation of 5.2.3.2 apply. The entire 5.2.3 section can benefit from description of the target measuring instruments. My comments (electric centric) around 5.2.3.2 assumes it is intended for an embedded system where all the legally relevant parts (HW, SW, Parameters, Data, etc.) of the meter are under a mechanical seal and digital access is by secure means. Signing the stored data (billing registers, interval data) is problematic as the data set grows over time for interval metering, and changes over time for consumption registers and maximum demands. If the data is going nowhere is there a need for a signature? Inside the closed system, every LR software, LR parameter, or LR thing that acted to produce the data must be authentic, either by verification testing or by traced update. If everything around the data is authentic, then the data must itself be authentic. The stored data can be encrypted to protect it, and when it is being packaged for export, a signature of it can be created and appended to the package. Integrity checking is best achieved in the metering system by periodic write vs. read of the storing medium (flash memory). For export, a final hash of the data set contributes to the signature.	5.2.3.2 (or a new section) The stored data of a metering instrument that meets the requirements for the traced update of all legally relevant software and legally relevant parameters, shall be kept in an encrypted format. Integrity checks should be performed on the storage medium periodically. For export over an open network, the stored data must be signed to allow for integrity and authenticity checking by the receiving system.	The argument raised here is valid, since in a system with only known software there is no need to verify the origin of measurement data. We feel that in such a scenario 5.2.3.2 is automatically fulfilled. However, this would also be true for all other requirements where a solution may always deviate from the proposed acceptable solution. Maybe a general statement on the applicability of requirements is needed.

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CA-03	5.2.3.3b	5.2.3.3b			There is a need for better record keeping for certain meter events, especially a reconfiguration event. Here the meter owner is choosing to use the meter differently. It can be as simple as moving the meter from one service to the next, from storage to a service. Or, it can be more involved as changing the Demand Type, disabling/enabling consumption quantities, or reprogramming a display sequence. For any of all of these events the owner may choose to perform a “Clear Billing”. “Clear Billing” events will be “stored” in an approved event log type (A or B), and the stored log data will meet 5.2.3.2 Please add to recommendation 5.2.3.3b to allow for the entries of a “Clear Billing” log to be recognized as the true billing registers record of the device at the time the events occurred. This request is driven by the Canadian Electrical specification below: LMB-EG-07 3-2.7.8 Register Resets. Registers displaying integrated quantities, e.g. kW·h, kQ·h, etc., shall not be resettable, i.e. reset to zero, unless the accumulated total readings are stored in another memory or register location for recall at any time	5.2.3.3.b Stored legally relevant data may be deleted if either: • the transaction is settled; • these data are printed by a printing device subject to legal control. • “The appropriate security provisions” are in place to capture, store, and protect (encrypted format) the data in an approved log (type A or B).	The third option proposed here seems to provide long-term storage by means of a logbook to which data may be moved during a "clear billing" event. This would, therefore, not constitute a case of data deletion, but of a simple data transfer. A sentence could be added to the clause to clarify that stored data does not need to be permanently localized in one storage unit as long as all requirements are met. The issue was solved at the Dordrecht meeting because of changes resulting from AU-06. A new note 2 was added to 5.2.3.3.a.
CA-04	3.1				Should there be a definition for legally non-relevant?	Add definition	As "legally relevant" is already defined (3.1.24), there is no need to define the opposite term as well. At the Dordrecht meeting, it was agreed to reject the comment.
CA-05	3.1				Add definition for Operating System	Add definition	We should refrain from re-defining general terms. Nevertheless, the new operating system requirements could benefit from such a definition. It should be checked if other standardization bodies have already provided a definition. At the meeting, it was agreed to reject the comment. However, examples for operating systems were formulated on Day 2 and included in clause 5.2.5.7.

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CA-06		5.2.4.5			This clause is a repeat of clause 5.2.3.4		Related to JP-12, UK-07, NL-15, JP-13. The repetition was intentional since it was agreed at the Berlin meeting to separate requirement sets for storage and transmission. Both requirements have been deleted and a new general clause 5.1.5 has been introduced as suggested by NL-15.
CA-07		5.2.7.3.a		Edit	it is somewhat ambiguous to say traced updates should be automatic. Presumably some initial intervention by an operator should also be permitted in cases where updates are initiated and exercised by a process that requires connection to some temporary com facility, for example.		Related to AU-11. We assume that the comment refers to clause 5.2.7.3.a. Clarity of the requirement could be improved by adding the following note: "Triggering of the traced update process may require intervention/manual actions by the user of the measuring instrument."
CA-08	various			Edit	The use of the term “component” is peculiar. The previously used terms like devices, sub-assemblies and modules were more appropriate. Normally items such as capacitors, resistors, IC’s etc would be considered as components of a measuring instrument. These are not the type of things that I would typically associate with software. However, these components can be part of a module, or a subassembly that may include software. Sometimes however, in the case of a measuring “system” like one that is comprised of several lower level measuring instruments providing a composite measurement value one could refer to the lower level instruments as components.	If the term component is maintained it should be clarified in terms of its suitability or applicability in relation to systems as opposed to instruments. Use of the term software component would be acceptable. Use of the term component on its own is ambiguous.	It was agreed at the Berlin meeting to use the term components henceforth and we would be very reluctant to revert that decision. Maybe a note could be added to clause 5.1 to clarify the use of the word. At the Dordrecht meeting it was agreed to reject the comment.
CA-09	3.1.12			Edit		Note: The secret key is used when software or data are secured. The public key is used when software ~~are~~ **or** data are validated before use.	2CD has been corrected as suggested.
CA-10	5	5.1		Edit	needs comas for readability	At the time of publishing this Document**,** the general requirements represent the state of the art in information technology (IT). They are in principle applicable to all kinds of software controlled measuring instruments **and** components of measuring instruments, and should be considered in all OIML Recommendations.	Commas wer added in 2CD as suggested.

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CA-11	5	5.2.7.3.c		Gen	Example: Since the fixed software requirement was removed, this example is not as relevant anymore. My opinion in general of examples is that when they are too descriptive, if feels as if we are giving instructions. This example in particular reads more like a step by step guide on how to implement the solution. To me, the requirement and what it aims to accomplish is clear; it should be up to the manufacturer to show that their device meets the requirement and not for us to tell them how. I like better how the example for integrity is phrased 5.2.7.3.d. This can be accomplished by adding a checksum or hash code of the loaded software and verifying it during the loading procedure. It gives the example without the step by step. Perhaps the example for 5.2.7.3.c. could be simplified to follow that format?		Related to CA-01, CZ-09. We originally did not see the need to update the example, since "fixed" legally relevant software still constitutes an acceptable solution. Nevertheless, an updated example would help clarify the modified requirement. The Solution proposed by CA-01 has been adopted.
CA-12	5	5.2.3.2 5.2.4.2		Edit	Examples: The examples are similar but one refers only to CRC32 while the other to BCC, CRC16, CRC32, etc. Example under 5.2.3.2 was revised but example under 5.2.4.2 was not.	Was this intentional? Have all examples been reviewed for consistency with revisions to guidelines.	Related to FR-03. No, this was not intentional. While all examples were checked for consistency, this one must have slipped through. We have updated the example in 5.2.4.2 to mirror the one in 5.2.3.3.
CA-13		5.2.1.2.d			I am not sure about the use of the word "interrupted" here. It seems too stringent. How do you guarantee this on a universal computer? I think "should not be inadmissibly influenced" or some other more generic wording would be more appropriate. Example (2)(II) seems to imply that it is sufficient that the OS ensures that there is sufficient resources available for the LR processes. This is more general than requiring that the LR processes not be interrupted. I am not sure how Example (1)(I) relates to 5.2.1.2 d. My understanding of 5.2.1.2 d. is that it's about priority of LR software over LNR software. Not sure how the example illustrates this.		Related to CA-13, AT-03, DE-03. Maybe the "interrupted" should be changed to "inadmissibly interrupted" to clarify that processing on a PC-based system is allowed. Example (1)(I) seems to refer to requirement 5.2.1.2.b rathern than 5.2.1.2.d and should be moved there. At the meeting, it was agreed to add "inadmissibly" and to move the example.
CA-14		5.2.1.2.d			The sentence under the example of 5.2.1.2 d. also needs some editing:	Examples from 5.2.1.2.a, 5.2.1.2.c**(I)** and 5.2.1.2.d (1)**(I)/(2)(I)** are acceptable as a technical solution only for a normal risk level (I).	Related to JP-10. OK, the sentence was mistakenly not updated after the revision of the examples. 2CD has been modified accordingly. A reference to a new example in 5.2.1.2.b was also included.

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CZ-01		3.1.25		ed	The term “sub-assembly” is used only in paragraph 3.1.25 in definition of legally relevant parametr. Every other occurence of the term was replaced by a term “component”. It should be changed also here – independently to OIML V 1.	Change definition into: legally relevant parameter = parameter of a measuring instrument, (electronic) device, component, software or a module subject to legal control	OK, this is in line with the intention of 1CD. The definition has been amended and TC1 will be informed of the modified definition once 2CD has been accepted.
CZ-02		Foreword		ed	Following up the previous comment it should be change the “List of changes....”at the second page.	~~"Sub-assembly" is still used in cited V 1 definitions.~~	The list of changes has been updated.
CZ-03		3.1.14		ed	At Berlin´s meeting we agreed to add into definition of error log a sentence: “All failures should be recorded, as long as the instrument is able to react at all.”	Add the quoted sentence into definition of Error log.	The quoted sentence appears neither in the original minutes of the Berlin meeting (TC5_SC2_P3_N020) nor in the collated comments for 1WD (TC5_SC2_P3_N012). In any case, the sentence would constitute a requirement and should be part of clause 5.1.4. However, the existing requirement alrady seems to cover the suggested change. "If software is involved in fault detection, an appropriate reaction is required. The relevant OIML Recommendation may prescribe that the instrument / component is deactivated or an alarm / record in an error log is generated in case a fault condition is detected." Therefore, additional changes do not seem to be needed. At the Dordrecht meeting, it was agreed to reject the comment.
CZ-04		3.1.49		ed	The definition of “verification of a measuring instruments” was vanish from the list of definitions. I propose to leave it here.	Add the definition: “Verification of a measuring instrument [OIML V 1:2013, 2.09] = Conformity assessment procedure (other than type evaluation) which results in the affixing of a verification mark and/or issuing of a verification certificate.”	Related to DE-07, DE-08, AU-19. The original defintion of "verification" was removed, since V2-200 now proposes a different wording. However, the definition from V1 could be beneficial for those instances of "verification", where the actual process is adressed. The change was agreed at the Dordrecht meeting and the new definition was added to 2CD.

Country Code[1]	Part	Clause/ Sub clause	Paragraph / Figure/ Table/	Type of comment[2]	COMMENTS	PROPOSED CHANGE	OBSERVATIONS OF THE CONVENER/PG on each comment submitted
CZ-05		5.1.1		te	At Berlin´s meeting was suggested to distinguish between “buid-for-purpose” instruments and “PC applications”. But at the updated document I have not found it.	It should be sufficient for build-for-purpose instruments software identified by version and then also integrity must be protected (e.g. by locking the microprocessor). For PC applications CRC-16/32 of hash shall be used.	While the topic was discussed in Berlin, the conclusion was to not include specifications/requirements for type P and type U instruments. The rationale for this was not to copy WELMEC terminology into OIML documents and to provide generally applicable requirements instead. This decision was recorded both in the original minutes of the Berlin meeting (TC5_SC2_P3_N020) and in the collated comments for 1WD (TC5_SC2_P3_N012), see comments for UK-4 in both cases. At the Dordrecht meeting, it was agreed to reject the comment.
CZ-06		5.2.3.2	Example II	te	Storage of data: Why the “hardware security module” should be used for generating the private and public keys used for signing and etc.? What does “hardware security module” mean?		The comment has been noted, but no changes to 2CD were needed since "HSM" is fixed term. In many IT products, that use cryptography, hardware security modules are used to securely generate asymmetric key pairs. The module also ensures that the private key cannot be read-out and cannot be modified, thus providing the possibility to use the key for authentication. A detailed description can, for instance, be found here: https://www.sans.org/reading-room/whitepapers/vpns/overview-hardware-security-modules-757

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CZ-07		5.2.4.2	Example II	te	Why the “hardware security module” should be used for generating the private and public keys used for signing and etc.? What does “hardware security module” mean?		The comment has been noted, but no changes to 2CD were needed. In many IT products, that use cryptography, hardware security modules are used to securely generate asymmetric key pairs. The module also ensures that the private key cannot be read-out and cannot be modified, thus providing the possibility to use the key for authentication. A detailed description can, for instance, be found here: https://www.sans.org/reading-room/whitepapers/vpns/overview-hardware-security-modules-757
CZ-08		5.2.5.1.c		te	This paragraph requires: “Changes to the configuration of the operating system shall be traceable.” But how it can be done in practise? E.g. regular updates of operating system?		This is directly related to the work of SG2 and was discussed in Dordrecht in conjunction with the presentation of SG2 results. Operating system updates can be treated like any other update according to clauses 5.2.7.2 or 5.2.7.3. Changes that do not affect the identification of the operating system do not need to be traceable, see 5.2.5.7.b.
CZ-09		5.2.7.3.c	Example II	ed	In the former version of the document there was“fixed legally relevant software” named (in paragraph 5.2.6.3.b), but the paragraph was changed and now there is not “definition” of fixed legally relevant software anymore (see 5.2.7.3.b). But in the example is said: “The public key is stored in a fixed software part...”. It should be rewritten accordingly.		Related to CA-01, CA-11. We originally did not see the need to update the example, since "fixed" legally relevant software still constitutes an acceptable solution. Nevertheless, an updated example would help clarify the modified requirement. The Solution proposed by CA-01 has been adopted.
CZ-10		5.2.7.3.f		ed	At the first sentence there are two verbs – delete one.	“Depending on the needs and on national legal legislation it may be necessary for the user or owner of the measuring instrument ~~to have~~ to give his consent to a traced update.”	Agreed. The sentence has been corrected in 2CD.
DE-01		5.2	Paragraph	ed	The sentence “They have to be considered in addition to those described in 5.1.” should be amended to use valid normative vocabulary.	Change to “They shall be considered in addition to those described in 5.1.”	OK, editorial change was included in 2CD.
DE-02		5.2.1.2.b	Paragraph	te	The sentence “The declared software interface shall not be circumvented.” Is a duplicate of "All communication shall be performed exclusively via this interface."	Delete the sentence "The declared software interface shall not be circumvented.".	Agreed, 2CD has been changed accordingly.

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DE-03		5.2.1.2.d	Paragraph	te	The sentence “The legally relevant process should not be interrupted by legally non-relevant software.” Still offers the possibility to deviate from the requirement and is thus not strict enough. Germany would consider any software that can interrupt the legally relevant software also to be legally relevant. To such software, the requirement would then not apply.	Change to “The legally relevant process shall not be interrupted by legally non-relevant software.”	Related to CA-13, AT-03, DE-03. Agreed. After discussion, a new clause 4.4 was included stating that the meaning of "inadmissible" should be specified by responsible PGs.
DE-04		5.2.2	Paragraph	te	Germany considers the paragraph “The use of a universal computer is not appropriate as part of a measuring instrument…” to be overly restrictive. Both universal computers and built-for-purpose devices may be able to fulfil requirements.	Delete the paragraph.	Related to AU-04. Should be discussed in Dordrecht, since built-for-purpose-systems are considered more secure in some countries. After discussion, it was agreed to delete the sentence altogether.
DE-05		5.2.3.2	Paragraph	ed	In the sentence “Means shall be provided whereby keys can only be input or read if a seal is broken.”, an explanation is needed, what exactly is meant by “keys”. Originally, the meaning was made clear by the previous sentence which has now been deleted.	Change to “If appropriate, means shall be provided whereby cryptographic keys can only be input or read, when a seal is broken.”	The clarification would be beneficial and 2CD has been modified accordingly.
DE-06		General		ge	D31 currently uses the terms “measurement value”, “measurement data” and “measurement result” inconsistently. V2-200 only uses the term “measurement result”.	Use “measurement result” in the same manner that V2-200 does. Introduce new definition of “measurement data” as data that will be processed to produce a final measurement result. Omit the phrase “measurement value”.	This would constitute a dramatic change in D31 and should be discussed. After discussion at the meeting, a subgroup was formed to suggest 2-3 clearly defined terms to be used in D31. The subgroup has not yet (October 2018) provided any result and will continue its work to either modify D31 in the editorial stage after the vote on 2CD or to provide input for the next revision.
DE-07		3.1.48	Paragraph	te	Since the definition of "validation" was changed, all occurrences should be checked.		Related to DE-08, CZ-04, AU-19, AU-13. In Dordrecht, it was agreed to use "software examination" instead of "validation" wherever applicable. Individual occurrences were changed to "software evaluation" for consistency with other clauses. Consequently, changes were made to Annex B.
DE-08		5.2.7	Paragraph	te	Since the definition of "verification" was changed, all occurrences should be checked.		Related to CZ-04, DE-07, AU-19. At the Dordrecht meeting, it was decided that "verification" always addresses "verification of an instrument" a note was added to the new definition.

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DE-09		7	Paragraph	te	Since the definition of "verification" was changed, all occurrences should be checked.		Related to CZ-04, DE-07, DE-08, AU-19. Seems to be a duplicate of DE-08. At the Dordrecht meeting, it was decided that "verification" always addresses "verification of an instrument" a note was added to the new definition.
DE-10		3.1.33	Paragraph	te	Significant defect definition lacks the negative aspect of a defect/fault.	Change to: “impairment of the properties or functions of the measuring instrument or a fault”	Since the revised definition was agreed upon in Berlin, the proposed change should be discussed in Dordrecht. After discussion, the definition was changed and a note was added to clause 3.1.33.
DE-11		3.1.33	Paragraph	te	If the current definition is kept, all instances of “fault” in the text need to be checked. It appears that the word often refers not to a measurement error but to a significant defect, see new definition 3.1.18.	Replace “fault” with “significant defect” where appropriate. Rename 5.1.4.1 “Support of fault detection” to “Detection of significant defects” and 5.1.4.2 to “Durabilty Protection”	OK. Various changes in several clauses were done at the meeting. Titles of 5.1.4.1 and 5.1.4.2 were also adopted accordingly.
DE-12		3.1.31	Paragraph	ed	Remove typo at the end of the note.	Change to: “Note: This may be achieved by hardware, software or a combination of both.”	OK, typo has been corrected. Related to JP-02, SI-01, IR-01, UK-03
DE-13		6.4	Table	ed	Remove duplicate “components”		OK, has been corrected in 2CD.
DK-01					No comments (21-03-2018)		OK
FR-01	3	3.1.46		ge	Is the concept of “universal computer” again used or needed?	If the term remains in the document, a definition of “Embedded Software in a Built-for-purpose Measuring Instrument” should be integrated.	The term "universal computer" is used both in examples and requirements. To make the concept distinguishable from other systems, an additional definition of "build-for-purpose" will not hurt. In Dordrecht, a new definition "built-for-purpose device" was added, the definition "universal computer" was subsequently updated to "universal device". Further changes were done in clauses 8.2 and 5.2.5.3.
FR-02	5	5.1.1 Software identification		te	Necessity of displaying identification without specific tool (for market surveillance for example)	5.1.1 Software identification Software of a measuring instrument/component shall be clearly identified. The identification may consist of more than one part but at least one part shall be dedicated to the legal purpose. The identification shall be displayed **without specific tool** or printed: - on command or - during operation or - at start up for a measuring instrument that can be turned off and on again.	Requirements always have to be fulfilled by the instrument. An additional tool could, therefore, not be used to fulfill 5.1.1. Nevertheless, an addition may be useful here to improve clarity. Suggestion to rephrase as follows: "The identification shall be displayed or printed **by the measuring instrument**." This was agreed at the Dordrecht meeting.

Country Code[1]	Part	Clause/ Sub clause	Paragraph / Figure/ Table/	Type of comment[2]	COMMENTS	PROPOSED CHANGE	OBSERVATIONS OF THE CONVENER/PG on each comment submitted
FR-03	5	5.2.4.2		te	State of art considers CRC16 as not enough pertinent for integrity checking.	The program of the sending device calculates a checksum of the dataset (algorithm such as BCC, CRC32, etc.)	Related to CA-12. Agreed, it was not intended to use CRC-16 in the example. While all examples were checked for consistency, this one must have slipped through. We have updated the example in 5.2.4.2 to mirror the one in 5.2.3.3.
FR-04	8			ge	Risk assessment	Give some examples of standards for risk assessment as mentioned like based in ISO 15408	Clause 8 entitled "Risk Assessment" is not intended to provide guidance on how to perform such an assessment. Instead, it is left to PGs to perform a risk assessment and select the appropriate risk level as they see fit. After discussions in Dordrecht, a sentence was added in clause 8.2 with additional changes to 8.1 and 8.2.
IR-01		3.1.31		ed	“asdf” at the end of Note is redubdant.	Please omit “asdf”	OK, typo has been corrected. Related to JP-02, SI-01, UK-03, DE-12
IR-02		5.2.3.2 , 5.2.4.2		te	In example II, Regarding the content of page 2: “Use of the term "module" is avoided if hardware is meant. It is used for software parts” It seems that using the term “hardware security module” is not appropriate.	Please replace appropriate term.	In many IT products, that use cryptography, hardware security modules are used to securely generate asymmetric key pairs. The module also ensures that the private key cannot be read-out and cannot be modified, thus providing the possibility to use the key for authentication. Since this is a commonly used term, we should not modify it. A detailed description of HSMs can, for instance, be found here: https://www.sans.org/reading-room/whitepapers/vpns/overview-hardware-security-modules-757. At the Dordrecht meeting, it was agreed to reject the comment.
IR-03		6.3.2.1	Reference	ed	The standard publication date has been written incorrectly	Please replace “IEC 61508-5, 2010” with “IEC 61508-5: 2010”	Related to JP-16, JP-17,JP-20, IR-04, IR-05. Agreed. The reference has been corrected.
IR-04		6.3.2.5, 6.3.2.6	Reference	ed	The standard publication date has been written incorrectly	Please replace “IEC 61508-52010” with “IEC 61508-5: 2010”	Related to JP-16, JP-17,JP-20, IR-03, IR-05. This appears to be a copy-and-paste error and has been corrected in 2CD.
IR-05	Annex A		Table-Ref. 9	ed	The standard publication date has been written incorrectly	Please replace “IEC 61508-5:20105” with “IEC 61508-5: 2010”	2CD has been corrected as suggested.

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IR-06	Annex A		Table		Ref. 10 and 11 have been written incorrectly	Please replace “[100]” with “[10]” and “[111]” with “[11]”	2CD has been corrected as suggested.
JP-01		1	New 3rd para.	ge	No description was added in 1CD as the result of argument on “no extra declaration” given at Berlin Meeting. Please be reminded of the agreement in Berlin (see Observation and of Convener/PG for CA-3 and JP-1 in TC5_SC2_P3_N020-2018-01-01).	We request adding the following text as the third paragraph. “This document does not ask manufacturers for extra declarations that documentation is correct and complete. But, any country may require the declaration, as a part of software examination process specified in 6.2.”	In fact, as a result of the discussion a sentence was added to the end of clause 6.2. In Dordrecht, it was agreed to insert the suggested sentence in clause 6.2 after discussion.
JP-02		3.1.31	Note	ed	Typo “both.asdf” at the end of Note.	Delete “asdf”.	OK, typo has been corrected. Related to SI-01, IR-01, UK-03, DE-12
JP-03		3.1.22	1st para.	te	The difference between “interruptible” and “non-interruptible” is not clear. This comment is related to JP-4 on 3.1.29.	Add some concrete examples of “interruptible cumulative measurement”.	In Dordrecht, examples were added to clause 3.1.22 (now 3.1.23).
JP-04		3.1.29	1st para.	te	The difference between “interruptible” and “non-interruptible” is not clear. This comment is related to JP-3 on 3.1.22.	Add some concrete examples of “non-interruptible cumulative measurement”.	In Dordrecht, examples were added to clause 3.1.29 (now 3.1.30).
JP-05		3.2		ge	We are not familiar with either “type evaluation certificate” or “TEC”. Do they mean “type examination certificate” in OIML B 18?	Following B 18 (2017), use the term “type examination certificate” instead of “type evaluation certificate” in the draft. Define the abbreviation “TEC” to mean “type examination certificate”.	Related to JP-18, NL-01, NL-02, NL-05, NL-06, NL-20 to NL-22, NL-24 to NL-30. At the meeting, it was decided to delete the abbreviation TEC, since "certificate" (see B-18) will be used henceforth.
JP-06		5.1	1st para.	ed	Two words “instruments” and “components” are connected.	Insert a comma between “instrument” and “components”.	"and" has been instered as suggested in CA-10.
JP-07		5.1.1	1st para.	ge	It was agreed to replace the word “token” with “representation” in Berlin meeting (see Observation and of Convener/PG for JP-6 in TC5_SC2_P3_N020-2018-01-01). The word “token” was replaced with “part” in 1CD however.	Replace “part” (formerly “token”) with “representation”.	Actually, this is a mistake in document TC5_SC2_P3_N020. The original excel sheet with the record of the meeting TC5_SC2_P3_N012 listed both the words "part" and "representation". We feel that in clause 5.1.1 "part" should be used, since a division of the identification (into several parts) is adressed. For the identification as a whole the term "represent" is still used in clause 3.1.35. At the Dordrecht meeting, it was agreed to reject the comment.

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JP-08		5.1.1	11th para. Before Note	te	It is not clear in the paragraph just before the "Note" whether "the type evaluation certificate" is equivalent with "TEC".	Use the term "type examination certificate" instead of them (see also our comment JP-5 to 3.2).	Related to JP-18, NL-01, NL-02, NL-05, NL-06, NL-20 to NL-22, NL-24 to NL-30. Agreed. This seems to be a mismatch between V1 and B18. V1 only knows the term "type evaluation". At the meeting it was agreed to change TEC to "certificate" throughout the document.
JP-09		5.1.3.2.d	Note	te	The last sentence "The assignment of a public key to a subject can be verified by using the public key …" is not clear; thereby the whole paragraph of Note is not understandable.	Rephrase the whole Note.	Agreed. Suggest to rephrase to "… The authenticity of the signed software can be verified by using...". 2CD has been modified accordingly.
JP-10		5.2.1.2.d	P	ed	In the first sentence under Examples, there is an inconsistency between the numbering of items in Examples and the acceptable example "5.2.1.2.d (1)" for a normal risk level (I).	Add "(3)" to the third example followed by "(II) Legally relevant….". Change "5.2.1.2.d (1)" to "5.2.1.2.d (1) and (2)" in the first line after the examples.	Related to CA-10. OK, the sentence was mistakenly not updated after the revision of the examples. 2CD has been modified accordingly. A reference to a new example in 5.2.1.2.b was also included.
JP-11		5.2.3.3.a	Note	te	The meaning of "Questions of storage capacity" is not clear.	Rephrase the term for clarification.	Agreed. Sentence has now been changed to, "In that case, storage capacity may not be legally relevant."
JP-12		5.2.3.4	P	te	The requirement is hardly distinguishable from that of 5.2.4.5 given for transmission via communication lines. This comment is related to JP-13 on 5.2.4.5.	Change the title to "Time stamp for storage of data".	Related to CA-06, NL-15, UK-07. The repetition was intentional since it was agreed at the Berlin meeting to separate requirement sets for storage and transmission. After discussion in Dordrecht, both requirements have been merged into a new general clause 5.1.5 as suggested by NL-15.
JP-13		5.2.4.5	P	te	The requirement is hardly distinguishable from that of 5.2.3.4 given for storage of data. This comment is related to JP-12 on 5.2.3.4.	Change the title to "Time stamp for transmission via communication lines".	Related to CA-06, JP-12, UK-07, NL-15. The repetition was intentional since it was agreed at the Berlin meeting to separate requirement sets for storage and transmission. Both requirements have been deleted and a new general clause 5.1.5 has been introduced as suggested by NL-15.
JP-14		5.2.5.1.b	P	te	The term "The configuration of the operating system" is not clear.	Specify the items to be identified with this term or add concrete examples.	After discussion in Dordrecht, examples were added to SG2 results (clause 5.2.5.7).
JP-15		6.3.2.3	Ref. [100]	ed	The reference number "[100]" is not correct.	Replace "[100]" with "[10]".	Related to JP-21, IR-06, IR-06. This appears to be a copy-and-paste error and has been corrected in 2CD.

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JP-16		6.3.2.5	Ref.	ed	The standard “IEC 61508-5:2010” is shown incorrectly.	Correct “IEC 61508-52010” to “IEC 61508-5:2010”.	Related to JP-17,JP-20, IR-03, IR-04, IR-05. This appears to be a copy-and-paste error and has been corrected in 2CD.
JP-17		6.3.2.6	Ref.	ed	The standard “IEC 61508-5:2010” is shown incorrectly.	Correct “IEC 61508-52010” to “IEC 61508-5:2010”.	Related to JP-16,JP-20, IR-03, IR-04, IR-05. This appears to be a copy-and-paste error and has been corrected in 2CD.
JP-18		6.4 (c)	P	ed	Does the “test certificate” mean TEC?	Change “test certificate” to “type examination certificate” and use “TEC” if it means “type examination certificate” (see comment JP-5 on 3.2).	Related to NL-01, NL-02, NL-05, NL-06, NL-20, NL-21, NL-22, NL-24 to NL-30. In Dordrecht, it was agreed to mention test report, evaluation report and certificate in the clause.
JP-19		8.1	P	ed	The term “electronic measuring instruments” may not be appropriate.	Replace the term with “software controlled measuring instruments”.	Agreed. Change was adopted in 2CD.
JP-20		Annex A	Ref. [9]	ed	The standard “IEC 61508-5:2010” is shown incorrectly.	Correct “61508-5:20105” to “IEC 61508-5:2010”.	Related to JP-16, JP-17, IR-03, IR-04, IR-05. This appears to be a copy-and-paste error and has been corrected in 2CD.
JP-21		Annex A	Ref. [100]	ed	The reference number “[100]” is not correct.	Replace “[100]” with “[10]”.	This appears to be a copy-and-paste error and has been corrected in 2CD.
JP-22		Annex A	Ref. [111]	ed	The reference number “[111]” is not correct.	Replace “[111]” with “[11]”.	This appears to be a copy-and-paste error and has been corrected in 2CD.
NL-01		General		ge	This 1CD several times refers to a Type evaluation certificate or TEC The use of TEC being the abbreviation of type evaluation certificate is not in line with OIML terminology while a type evaluation certificate does not exist in OIML. As per 1 January 2018 the OIML CS has been established. The OIML-CS defines an OIML certificate and an Type Evaluation Report (TER) OIML documents shall be clear on whether an OIML certificate or a TER is meant.	Please harmonize with OIML B 18 and OIML-CS-PD-05 concerning the OIML Certificates. Change instances of “type evaluation certificate” and “TEC” into “TER” or “OIML certificate.	Related to JP-18, NL-02, NL-05, NL-06, NL-20, NL-21, NL-22, NL-24 to NL-30. At the meeting, it was decided to use "certificate" instead of "type evaluation certificate" or TEC.
NL-02		3.1.2		ge	See OIML B 18 and OIML-CS-PD-05.	Change “type evaluation certificate” to “OIML certificate”.	Related to JP-18, NL-01, NL-02, NL-05, NL-06, NL-20 to NL-22, NL-24 to NL-30. Agreed. This seems to be a mismatch between V1 and B18. V1 only knows the term "type evaluation". At the meeting it was agreed to change TEC to "certificate" throughout the document.
NL-03		3.1.12		ed	“electronic Signature”	Change to “electronic signature”	The typo has been corrected in 2CD.

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NL-04		3.1.17		ed	defining “code” by “file” is somewhat confusing and incorrect format (2 sentences) please consider to apply the Wikipedia definition and use “machine code” instead If it is necessary to be more specific an the alternative is provided in the “proposed change” column for replacing “file”	Suggestion “Machine code machine language set of instructions directly executable by a computer's central processing unit (CPU). “ alternative: “**digital information available in the software or firmware** installed on the comput**ing** system of the measuring instrument **(MI), or a MI’s module** (EPROM, hard disk, etc.)” Suggest to delete the second sentence or amend it to read: “**Note:** This code is interpreted by the **central processing unit (CPU) of the MI** and **converted** into certain logical, arithmetical, decoding, or data transporting operations”	Since "machine code" would exclude some types of executable code such as Java-applications, we would prefer the second option: "executable code - digital information available in the software or firmware installed on the computing system of the measuring instrument (MI), or a MI’s module (EPROM, hard disk, etc.)" The definition has been modified and the suggested note has been added to 2CD.
NL-05		3.1.44		ge	See OIML B 18 and OIML-CS-PD-05.	Remove the reference to “evaluation certificate”.	Related to JP-08, JP-18, NL-01, NL-02, NL-05, NL-06, NL-20 to NL-22, NL-24 to NL-30. Meeting decision in Dordrecht: V1 2.04 definition is in conflict with B18, delete "evaluation" before certificate from defintion (done). TC1 will be informed when 2CD has been agreed upon.
NL-06		3.2		ge	See OIML B 18 and OIML-CS-PD-05.	Define the abbreviation TER in clause 3.2. Remove the definition of TEC from clause 3.2.	Following the discussion in Dordrecht (see changes related to NL-18 in clause 6.4) the term "certificate" is used throughout the document. The abbreviation "TEC" has been removed. Since the abbreviation "TER" is not used anywhere in the current draft, it was not included in clause 3.2.
NL-07		4.1		ge	“The provisions of this Document apply only to new OIML Recommendations and OIML Documents under revision.” Documents is incorrect “The OIML project groups (Technical Committees, Subcommittees) should use this guidance Document to establish software related requirements in addition to the other technical and metrological requirements of the applicable OIML Recommendation” Today all drafting is performed in OIML Project Groups so Technical Committees, Subcommittees should be deleted	Correct to read: “The provisions of this Document apply only to new OIML Recommendations and OIML **publications** under revision.” or “The provisions of this Document apply only to new OIML Recommendations and OIML **Recommendations** under revision.” The OIML **P**roject groups should use this guidance **d**ocument to establish software related requirements in addition to the other technical and metrological requirements of the applicable OIML Recommendation	Since D31 is only intended for drafting OIML Recommendations, we would prefer the second suggested option together with the corrected sentence. The second option has been included in 2CD.

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NL-08		4.3		ed	"..partly with different levels"	Suggestion: "..partly with several different (risk) levels"	Since we are only proposing two risk levels "several" seems to be the wrong word. The sentence was rephrased to "…partly with different (risk) levels"
NL-09		5.1		ed	instrumentscomponents	to be corrected	The missing slash has been included in 2CD.
NL-10		5.1.1	11	ge	The software identification should be stated in a certificate. The means of identification and the instructions on how to display the software identification should not be in the OIML certificate but in the TER.	Replace by: "The software identification shall be stated in the OIML certificate. The means of identification (e.g. software version, hash value, checksum) and the instructions on how to display the software identification shall be stated in the TER."	Suggested change has been in cluded in 2CD.
NL-11		5.1.3.2.d		ed	"....must not be delayed or blocked by other processes" incorrect use of "must" (see OIML B 6-2)	Correct to read "**....shall** not be delayed or blocked by other processes"	OK, we seem to have missed that occurence of "must". We assume that the comment refers to clause 5.2.1.2.d. The correction was done there.
NL-12		5.1.3.2.d		te	Example 1 states that "The initial value of the event counter has to be registered in the TEC". This is not possible for device-specific parameters as the event counter value is different for each instrument.	Replace by: "The initial value of the event counter has to be marked durably on the instrument."	In general, if there are no device-specific parameters, registration of the initial value in the TEC is still possible. However, since examples should be precise, the suggested change has been included in 2CD. However, "shall" was replaced by "is" to avoid the use of normative language in examples.
NL-13		5.2.1.2.d	2	te	The example does not match the requirement. The requirement is about priority of software parts. The solution is about encryption of measurement data. Encryption does not guarantee priority.	Replace by "(1) (I) a priority level is assigned to the legally relevant function which is higher than for normal processes and which cannot be decreased by a user/operator of the measuring instrument."	Agreed. Also, the original example (1) (I) has now been moved to 5.2.1.2.c as described in the response to CA-13.
NL-14		5.2.3.3.a		ed	Incorrect use of "must" in all 3 occurrences (see OIML B 6-2)	Replace "must" by "shall"	OK, we seem to have missed that occurence of "must". The mistake has been corrected in 2CD.
NL-15		5.2.3.4		ge	Since this sub clause concerning the time stamp is identical to 5.2.4.5 it might be moved to the general requirements part	It is suggested to combine both and move the result to 5.1.x.	Agreed. This would also solve issues reported in CA-06, JP-12 and UK-07. The clauses have been deleted and a new general clause 5.1.5 has been introduced.
NL-16		5.2.3.4	1	ge	This paragraph contains a definition that should be covered by 3.1.42. The definition differs from 3.1.42.	Replace by: "The time stamp is in a consistent format, allowing for easy comparison of two different records and tracking progress over time."	Agreed, we should avoid redefining terms within requirements. Should be changed in 5.2.4.5 as well. New clause 5.1.5 was modified as suggested since 5.2.3.4 and 5.2.4.5 were moved there.

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NL-17		5.2.3.4	2	ge	It is not correct to implement a very subjective and undefined general statement about the uncertainty of an internal clock.	Suggest to amend to: "The internal clock of a stand-alone measuring instrument **may** have a **rather** large uncertainty **if** no means are **incorporated** to synchronize **this clock** with the universal time standard. Where the specific field of application **requires high accuracy** information concerning the **exact** time of the measurement it might be necessary to improve the reliability of the internal clock using specific means."	Agreed, the suggested phrasing would be much more appropriate. New clause 5.1.5 was modified as suggested since 5.2.3.4 and 5.2.4.5 were moved there.
NL-18		5.2.4.5	1	ge	see NL-16 and NL-17	see NL-16 and NL-17	Agreed, changes to 5.2.3.4 and 5.2.4.5 are now reflected by the new clause 5.1.5.
NL-19		5.2.5.1.b		ed	Missing note number	Amend the first note to read Note 1.	Correction is no longer needed since the clause has now been replaced by SG2 results.
NL-20		5.2.5.2	1	ge	See OIML B 18 and OIML-CS-PD-05.	Change "type evaluation certificate" to "TER".	Related to JP-18, NL-01, NL-02, NL-05, NL-06, NL-21 , NL-22, NL-24 to NL-30. At the meeting, it was decided to delete the abbreviation TEC, since "certificate" (see B-18) will be used henceforth.
NL-21		5.2.7.1		ge	The software identification of all approved versions are to be included in the OIML certificate.	Replace *"TEC"* by "*OIML certificate*.	Related to JP-18, NL-01, NL-02, NL-05, NL-06, NL-20, NL-22, NL-24 to NL-30. At the meeting, it was decided to use "certificate" instead of TEC.
NL-22		5.2.7.2		ge	Details on verification shall be documented in an TER and not in a certificate.	Replace "TEC" by "TER".	Related to JP-18, NL-01, NL-02, NL-05, NL-06, NL-20, NL-21, NL-24 to NL-30. At the meeting, it was decided to use "certificate" instead of TEC.
NL-23		5.2.7.3.b		te	In a traced update the event counter shall not be effected as well.	Change the second sentence to: "During an update, any existing audit trail information and event counter value shall be retained."	Agreed, event counters were previously missing here. Clause 5.2.7.3.b has been modified as suggested.
NL-24		5.2.7.3.c	1	ge	See OIML B 18 and OIML-CS-PD-05.	Change "type evaluation certificate" to "OIML certificate".	Related to JP-18, NL-01, NL-02, NL-05, NL-06, NL-20, NL-21, NL-22, NL-25 to NL-30. At the meeting, it was decided to use "certificate" instead of "type evaluation certificate".
NL-25		5.2.7.3.c	2	ge	See OIML B 18 and OIML-CS-PD-05.	Change "type evaluation certificate" to "OIML certificate".	Related to JP-18, NL-01, NL-02, NL-05, NL-06, NL-20, NL-21, NL-22, NL-24 to NL-30. At the meeting, it was decided to use "certificate" instead of "type evaluation certificate".

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NL-26		5.2.7.3.e	4	Ge	Details on how to display or print the audit trail should be documented in a TER and not in a certificate.	Replace “TEC” by “TER”.	Related to JP-18, NL-01, NL-02, NL-05, NL-06, NL-20, NL-21, NL-22, NL-24 to NL-30. At the meeting, it was agreed that the certificate is the right place for such information.
NL-27		5.2.7.3.g	1	ge	See OIML B 18 and OIML-CS-PD-05.	Change “type evaluation certificate” to “TER”.	Related to JP-18, NL-01, NL-02, NL-05, NL-06, NL-20, NL-21, NL-22, NL-24 to NL-30. At the meeting, it was agreed delete subclause g. Therefore, no further changes were needed.
NL-28		6.2.1		ge	The software identification of all approved versions should be included in the OIML certificate.	Divide this sub clause in two sub clauses: 6.2.1 Information to be included in the OIML certificate - Identification of all approved software versions. 6.2.2 Information to be included in the TER - Method to display the current software identification on the approved instrument in use. - The securing means and the method to check them (e.g. hardware seals, event counters, audit trails.)	Suggested change has been in cluded in 2CD.
NL-29		7	3	ge	See OIML B 18 and OIML-CS-PD-05.	Change “*type evaluation certificate”* to *“TER”*.	Related to JP-08, JP-18, NL-01, NL-02, NL-05, NL-06, NL-20 to NL-22, NL-24 to NL-30. In Dordrecht, it was agreed to use "certificate" (see B18) instead. This was changed in the entire document.
NL-30		Annex B	checklist 5.2.73	ge	See OIML B 18 and OIML-CS-PD-05.	Change “*type evaluation certificate”* to *“TER”*.	Related to NL-01, NL-02, NL-05, NL-06, NL-20, NL-21, NL-22, NL-24 to NL-29. In Dordrecht, it was agreed to change this occurrence to "certificate" and to modify the title of Annex B.
SI-01		3.1.31		ed	Typographic error: asdf at the end of the Note.	Deletion of the typographic error.	OK, typo has been corrected. Related to JP-02, IR-01, UK-03, DE-12
SI-02		5.1.1		te	Example of software identification by a calculated checksum should stay as an example, as it is also stated in software identification definition and is also stated as an acceptable solution in WELMEC 7.2 Guide. In many cases, where the use of high level programming language is present, version number is not enough to identify the software.		OK, adding another example to 5.1.1 would not hurt. In Dordrecht, the comment was agreed upon and the example from D31:2008 was copied to clause 5.1.1.
SI-03		5.2.1.1.b		ed	“It shall be demonstrated that the functions and data of components, that are legally relevant, cannot be inadmissibly influenced by commands received via the interface to the other, legally non-relevant parts.” Statement should be written clearer.	It shall be demonstrated that the functions and data of components, that are legally relevant, cannot be inadmissibly influenced by commands received via the interface from the other, legally non-relevant parts.	Agreed, 2CD has been changed accordingly.

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UK-01	1	3.1.6, etc		ed	"dataset" is mentioned in several paragraphs, but not defined in the terminology	Propose inserting a terminology for "dataset" e.g., "a collection of data records for computer processing"	At the Berlin meeting, the Dutch representative reminded participants that we should not redefine general terms. However, it could be argued that "dataset" may have special meaning in legal metrology. Should be discussed. At the meeting, it was agreed to reject the suggested change.
UK-02	1	3.1.17 and 3.1.40		ed	"source code" and "executable code" should have similar text	Propose aligning 3.1.17 with 3.1.40 by replacing the text "file" with "program". Alternatively, "data file" is an acceptable wording as it is used in other parts of the document. executable code ~~file~~ *program or data file installed on the computer system*	We agree that the definition for "executable code" needs improvement. The proposed text in NL-04 seems to be an even better solution. At the meeting, clause 3.1.17 (now 3.1.18) was modified as suggested.
UK-03	1	3.1.31		ed	This note is not clear: Note: This may be achieved by hardware, software or a combination of both.asdf	Propose deleting the text "asdf" from the note.	OK, typo has been corrected. Related to JP-02, SI-01, IR-01, DE-12
UK-04	1	3.1.43		ed	"communication lines" is mentioned in several paragraphs, but not defined in the terminology.	Propose inserting a terminology to clarify the text "communication lines" e.g., "*a means by which data is transmitted from one device to another*"	Again, this seems to be a general term that should not be re-defined in D31. At the Dordrecht meeting, it was agreed to reject the comment.
UK-05	1	5.2.1		ed	Last paragraph text and slash combination requires editing: *"OIML Recommendation may specify the software / hardware / data or part of the software/hardware/data that are legally relevant"*	Align the text and slash combination in the sentence, and in other parts of the documents as appropriate. Additionally, the text "OIML Recommendation" should be plural	Agreed. 2CD has been corrected accordingly.
UK-06	1	5.2.7.3.d		ed	"checksum" is mentioned in several paragraphs, but not defined in the terminology	Propose defining "checksum" e.g., "an error-detection means in which each transmitted dataset is accompanied by a numerical value based on the number of set bits in the message	Again, this seems to be a general term that should not be re-defined in D31. An accurate definition may, for instance, be found here: *Jeff Rutenbeck "Tech Terms: What Every Telecommunications and Digital Media Professional Should Know", CRC Press, 12.11.2012 - 288 page.* At the Dordrecht meeting, it was agreed to reject the comment.
UK-07	1	5.2.3.1 to 5.2.4.5		ed	There are repeats of the same requirements, for example, 5.2.3.1 is the same requirement as 5.2.4.1, 5.2.3.2 is the same as 5.2.4.2, and 5.2.3.4 is the same as 5.2.4.5.	Check and delete the repeat requirements where appropriate.	Related to CA-06, JP-12, NL-15. The repetition was intentional since it was agreed at the Berlin meeting to separate requirement sets for storage and transmission. After discussion in Dordrecht, both requirements have been merged into a new general clause 5.1.5 as suggested by NL-15.

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UK-08	1	5.2.2		ed	Only “Recommendation” is used in this sentence.	For consistency, use the full text “OIML Recommendation” where applicable.	In keeping with the rules laid down in B6-2, the term "Recommendation" is used in all technical requirements (Clauses 5-8) document. "OIML Recommendation" is only used in clauses 1-4. This is in line with the Dordrecht results, where "certificate" is used instead of "OIML certificate" etc.
UK-09	1	5.1.2, 5.2.7.3.e and 5.2.7.3.f		ed	“national legal legislation” and “national legislation” are used in parts of the document.	For consistency, propose harmonising the text to “national legislation” where appropriate.	The change would improve the clarity of the document since "legal legislation" seems to be be an unnecessary repetition in itself, anyway. 2CD has been modified accordingly.
UK-10	1	6.3.2.3,		ed	The following fifth paragraph could be worded differently: “Software controlled feature under consideration is OK or not OK.”	Propose rewording as follows or similar: “Software controlled feature under consideration is acceptable or not acceptable.”	Related to AU-14. Agreed, the term "OK" seems very informal. The proposed modification from UK-10 has been adopted in 2CD.
UK-11		6.3.2.4		ed	Fourth paragraph: “It can be validated whether software separation according to 5.2.1.2 is OK or not OK”	“Proposal: It can be validated whether software separation according to 5.2.1.2 is acceptable or not acceptable”	Related to AU-16. Agreed, the term "OK" seems very informal. The suggested change has been adopted in 2CD.
					US comments submitted at the Dordrecht meeting		
US	3.	3.1.4		ed	Add article "a"	which enables **a** significant defect to be detected	Agreed
US	3.	3.1.7		te, ed	Encryption can be performed with hardware. The word "like" implies that this example is excluded.	~~software~~ means ~~like~~ **such as** encryption/decryption	Agreed
US	3.	3.1.12		ed		The public key is used when software ~~are~~ **or** data are validated before use.	Agreed
US	3.	3.1.37		ed	Unclear. I don't understand why parameters/data are separately called out as well as *data domains*	~~logic~~ software entity such as a program, subroutine, library, parameter or data set, and other object**s** including their *data domains* that may be in relationship with other entities	Agreed
US	3.	3.1.42		te	Unfortunately time is not always monotonically increasing…consider EU Summer Time. Timestamp may also be applied to a measurement.	unique ~~monotonically increasing~~ time value, e.g. in seconds or a date and time string denoting the date and/or time at which a certain **measurement,** event or fault occurred	Accepted with changes
US	5.	5.1		ed		They are in principle applicable to all kinds of software controlled measuring instruments **and** components of measuring instruments,	“and” will be introduced

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US	5.	5.1.2		te	The statement "No hidden or undocumented functions or parameters shall exist." causes me some concern. What is this statement really trying to accomplish? Is this already covered by "5.1.3.2.b Only clearly documented functions (see 6.1) may be activated by the user interface, which do not influence the metrological characteristics of the instrument."		noted
US	5.	5.2.1.1.a		ed	Missing period in Example 1.	In this system only the electricity meter is the legally relevant instrument. Other legally non-relevant devices may exist and may be connected to the interface that complies with clause 5.2.1.1.b.	Agreed
US	5.	5.2.1.2.d		te	This paragraph is overly restrictive and describes solutions instead of requirements. Any software executing on an operating system will be interrupted quite often. The legally relevant software only needs priority of resources and execution if the lack thereof would cause an incorrect measurement.	If software separation is employed, execution of non-legally relevant software shall not cause the legally relevant software to provide an invalid, incorrect or unduly delayed measurement result.	Already solved by C1 (DE-03, CA-13).
US	5.	5.2.3.3.a		te	As stated, the amount of storage space could be required to be infinite.	The storage device must have sufficient permanency to ensure that the data are not corrupted under normal storage conditions. There shall be sufficient memory storage for ~~any particular~~ **the intended** application.	Agreed

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US		5.1		ge	Only two risk levels have been defined. The high risk level requires source code examinations. In Europe (highly represented in OIML) only certain type of taximeters and some national regulated instruments require source code examinations. There are 3 possibillities: 1) The vast majority of the OIML recommendations will be designated to the normal risk level. That means there will be no difference anymore between e.g. repeatable and non-repeatable measurements which is now often an argument to require additional protection. 2) Many instruments will be placed in the raised risk level and become subject to source code examinations leading to a large increase of the costs of a type examination. 3) The D 31 guide lines will not be adopted in many of the recommendations. Instead, many recommendations will have their own software requirements. Although I think more levels should be defined, it is not feasible to implement them in the document at this stage of the project.		noted
US		5.1.2		te	The requirement that the algorithms and functions are correct is a functional requirement of the instrument. Not a requirement of the structure of the software. The correctness of the functionality of the instrument does not fall in the scope of D 31 and is part of the specific recommendation	Delete this clause	Reject to delete the clause. Functional testing of the software is done by means functional tests as described in the applicable Recommendation.
US		5.1.3.1	1st	te	This subclause covers Intentional misuse. But the next subclause 5.1.3.2 covers fraud. What is the difference between fraud and intentional misuse? Perhaps 5.1.3.1 should cover accidental changes only while intentional misuse is covered by 5.1.3.2	Remove intentional misuse from the first paragraph	5.1.3.2 renamed to “Evidence of an intervention”
US		5.1.3.2.c		te	Parameters are settings that need to be protected regardless whether they are type specific or device specific. There is no need to make a distinction.	Use the word “legally relevant parameter” instead of “type specific parameter” and “device specific parameter”	Distinction is still needed. Changes done to 5.1.3.2.c after discussion
US		5.2.1.2.d		te	I agree with earlier comment. Prioritizing is important for time-critical measurements. Many instruments (e.g. NAWI) are not time critical.	Add a sentence that 5.2.1.2.d is only applicable to time-critical measurements or use previous proposal	Already solved by C1 (DE-03, CA-13).

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US		5.2.2	5th	te	The first sentence states that a universal computer is not appropriate as part of a measuring instrument. However, the next sentence states that additional protection is needed in case of use of a pc. This is contradicting.	Change “not appropriate” to “less appropriate”	Already solved by C2.1 (AU-04, DE-04).
US		5.2.5.1.c		te	Is it possible to make changes to the configuration of the OS traceable? Is this already implemented in Windows, Linux, Android and IOS?		Solved by examples in SG2 results.
US		5.2.5.3	2nd	te	“Keep the operating environment fixed”. What is meant with the operating environment? Is that the OS? Is bug fixing not allowed?	Further explanation of operating environment	Agreed to delete both sentences. Examples are now given in SG2 results.
US		5.2.7.3.g	3rd bullet	te	Legally non-relevant software is by definition updatable. There is no need to repeat this in the type evaluation certificate.	Remove 3rd bullet	Deleted because of T2 (NL-27)
US		6.2	1st	te	ISO/IEC 14598 seems to be withdrawn. It has been revised by ISO/IEC 25040.	Update reference to ISO/IEC standard	Agreed.
US		6.4	Table 2	te	See comment on 5.1.2	Remove requirement 5.1.2.	Reject to delete the clause. Functional testing of the software is done by means functional tests as described in the applicable Recommendation.
US		Annex B	Checklist	te	See comment on 5.1.2	Remove check for requirement 5.1.2.	Reject to delete the clause. Functional testing of the software is done by means functional tests as described in the applicable Recommendation.