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WELMEC

European cooperation in legal metrology

Measuring Instruments Directive 2004/22/EC
Automatic Rail Weighbridges
Corresponding Tables
OIML R 106-1 1997 – MID-006 VI

November 2006

WELMEC

European cooperation in legal metrology

WELMEC is a cooperation between the legal metrology services of the Member States of the European Union and EFTA. This document is one of a number of Guides published by WELMEC to provide guidance to manufacturers of measuring instruments and to notified bodies responsible for conformity assessment of their products. The Guides are purely advisory and do not themselves impose any restrictions or additional technical requirements beyond those contained in relevant EC Directives. Alternative approaches may be acceptable, but the guidance provided in this document represents the considered view of WELMEC as to the best practice to be followed.

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FOREWORD

The Measuring Instruments Directive (MID) 2004/22/EC entered into force on the 30th October 2006. In this new approach directive the presumption of conformity is mentioned in Article 13. In addition to the use of harmonised standards (Art. 13 point 1) a new route is open for the presumption of conformity by using OIML recommendations (Art. 13 point 2).

"*Member States shall presume conformity with the essential requirements referred to in Annex I and in the relevant instrument-specific Annexes in respect of a measuring instruments that complies with the corresponding parts of the normative documents and lists referred to in Article 16(1)(a), the references in respect of which have been published in the Official Journal of the European Union, C series."*

Article 4(i) defines that

"normative document" means a document containing technical specifications adopted by the Organisation International de Métrologie Légale (OIML), subject to the procedure stipulated in Article 16(1)".

In Article 16 (1) (a) the functions of the Measuring Instruments Committee are described as follows:

"*identify normative documents drawn up by OIML and, in a list, indicate the parts thereof compliance with which gives rise to a presumption of conformity with the corresponding essential requirements of this Directive".*

In the WELMEC Committee Meeting in May 2005 WELMEC agreed to support the work of the Commission on this issue and the MI-xxx Annexes of the MID has been given to the Working Groups of WELMEC to develop corresponding tables including comments as a basis for the publication foreseen in the Directive. A timetable has been established and rules for drawing up these tables have been given by the WELMEC Committee. To prepare a proposal at least 3 experts has been involved. The drafts have been discussed in the responsible Working Group (including industry). The results have been sent do the WELMEC Secretariat and the WELMEC Committee Members has been asked for Comments. These drafts have been discussed during the WELMEC Committee Meeting in May 2006 and have been adopted as WELMEC guides.

The documents have been sent to the European Commission for further consideration and for drafting the publication required in the directive. This has been done in a small Working Group with the European Commission (June, July 2006).

The European Commission presented the simplified tables to the Commission Working Group on Measuring Instruments for further comment and subsequently obtained a positive advice from the Measuring Instruments Committee on 25 September 2006.

The simplified tables are published In the Official Journal of the European Union, series C n° 269, p I of 4 November 2006. As guidance, WELMEC is publishing the full tables with all the comments and detailed information underlying the simplified tables to aid all interested and concerned parties.

The European Commission webpage gives the link to the documents of WELMEC.

Automatic Rail Weighbridges (R106-1 1997)

REQUIREMENTS and correspondence

Directive 2004/22/EC Essential requirements of Annex 1 and common part and chapter VI of Annex MI-006	OIML R106-1 1997	Comments
ANNEX 1		
ESSENTIAL REQUIREMENTS		
A measuring instrument shall provide a high level of metrological protection in order that any party affected can have confidence in the result of measurement, and shall be designed and manufactured to a high level of quality in respect of the measurement technology and security of the measurement data.	See details in 2, 3 & 4	Also objective of OIML
The requirements that shall be met by measuring instruments are set out below and are supplemented, where appropriate, by specific instrument requirements in Annexes MI-001 to MI-010 that provide more detail on certain aspects of the general requirements.		Comment only, below are the details of correspondence
The solutions adopted in the pursuit of the requirements shall take account of the intended use of the instrument and any foreseeable misuse thereof.		Also objective of OIML
DEFINITIONS		VIM (reference document shared by BIPM, IEC, IFCC, ISO, IUPAC, IUAPP, OIML)
Measurand The measurand is the particular quantity subject to measurement.		
Influence quantity An influence quantity is a quantity that is not the measurand but that affects the result of measurement.	VIM 2.7 & T.5.1	
Rated Operating Conditions The rated operating conditions are the values for the measurand and influence quantities making up the normal working conditions of an instrument.	VIM 5.5 & T.5.2	
Disturbance An influence quantity having a value within the limits specified in the appropriate requirement but outside the specified rated operating conditions of the measuring instrument. An influence quantity is a disturbance if for that influence quantity the rated operating conditions are not specified.	T.5.1.2	2nd sentence is a comment
Critical change value The critical change value is the value at which the change in the measurement result is considered undesirable.	T.4.2.5	CCV is a limit where SF corresponds to all errors beyond the limit
Material Measure A material measure is a device intended to reproduce or supply in a permanent manner during its use one or more known values of a given quantity.		
Direct sales A trading transaction is direct sales if: – the measurement result serves as the basis for the price to pay and; – at least one of the parties involved in the transaction related to measurement is a consumer or any other party requiring a similar level of protection and; – all the parties in the transaction accept the measurement result at that time and place.		
Climatic environments Climatic environments are the conditions in which measuring instruments may be used. To cope with climatic differences between the Member States, a range of temperature limits has been defined.		Comment

Utility A utility is regarded as a supplier of electricity, gas, heat or water.		
1. **Allowable Errors**		
1.1. Under rated operating conditions and in the absence of a disturbance, the error of measurement shall not exceed the maximum permissible error (MPE) value as laid down in the appropriate instrument-specific requirements. Unless stated otherwise in the instrument-specific annexes, MPE is expressed as a bilateral value of the deviation from the true measurement value	2.2.1 4.1.1	
1.2. Under rated operating conditions and in the presence of a disturbance, the performance requirement shall be as laid down in the appropriate instrument specific requirements. Where the instrument is intended to be used in a specified permanent continuous electromagnetic field the permitted performance during the radiated electromagnetic field-amplitude modulated test shall be within MPE.	4.1.2 4.3.4	No reference to permanent continuous electromagnetic field
1.3. The manufacturer shall specify the climatic, mechanical and electromagnetic environments in which the instrument is intended to be used, power supply and other influence quantities likely to affect its accuracy, taking account of the requirements laid down in the appropriate instrument-specific annexes.	5.1.1	
1.3.1. *Climatic environments* The manufacturer shall specify the upper temperature limit and the lower temperature limit from any of the values in Table 1 unless otherwise specified in the annexes MI-001 to MI-010, and indicate whether the instrument is designed for condensing or non-condensing humidity as well as the intended location for the instrument, i.e. open or closed.	2.9.1 4.3.3 5.1.1 (A.8.1 & A.8.2)	No reference to condensing humidity or location
Table 1		
2.9.1		-10 to +40°C Min of 30°C

	Temperature Limits			
Upper temperature limit	30 °C	40 °C	55 °C	70 °C
Lower temperature limit	5 °C	- 10 °C	- 25 °C	- 40 °C

1.3.2. (a) Mechanical environments are classified into classes M1 to M3 as described below. M1 This class applies to instruments used in locations with vibration and shocks of low significance, e.g. for instruments fastened to light supporting structures subject to negligible vibrations and shocks transmitted form local blasting or pile-driving activities, slamming doors, etc. M2 This class applies to instruments used in locations with significant or high levels of vibration and shock, e.g. transmitted from machines and passing vehicles in the vicinity or adjacent to heavy machines, conveyor belts, etc. M3 This class applies to instruments used in locations where the level of vibration and shock is high and very high, e.g. for instruments mounted directly on machines, conveyor belts, etc. (b) The following influence quantities shall be considered in relation with mechanical environments: – Vibration; – Mechanical shock.		No classes used in R106
1.3.3. (a) Electromagnetic environments are classified into classes E1, E2 or E3 as described below, unless otherwise laid down in the appropriate instrument-specific annexes.	Severity levels are referenced in	No classes used in R106.

E1 This class applies to instruments used in locations with electromagnetic disturbances corresponding to those likely to be found in residential, commercial and light industrial buildings. E2 This class applies to instruments used in locations with electromagnetic disturbances corresponding to those likely to be found in other industrial buildings. E3 This class applies to instruments supplied by the battery of a vehicle. Such instruments shall comply with the requirements of E 2 and the following additional requirements: – voltage reductions caused by energising the starter-motor circuits of internal combustion engines – load dump transients occurring in the event of a discharged battery being disconnected while the engine is running.	each test and are equivalent to E1.	No equivalent to E3
(b) The following influence quantities shall be considered in relation with electromagnetic environments: – Voltage interruptions, – Short voltage reductions, – Voltage transients on supply lines and/or signal lines, – Electrostatic discharges, – Radio frequency electromagnetic fields, – Conducted radio frequency electromagnetic fields on supply lines and/or signal lines, – Surges on supply lines and/or signal lines.	(4.1.2 & 4.3.4) A.9.1 A.9.1 A.9.2 A.9.3 A.9.4	 Only to 1 GHz No conducted rf No surges
1.3.4. Other influence quantities to be considered, where appropriate, are: – Voltage variation, – Mains frequency variation, – Power frequency magnetic fields, – Any other quantity likely to influence in a significant way the accuracy of the instrument.	 2.9.2 & 4.3.7 & A.8.3 / 2.9.3 & 4.3.8 & A.8.4 4.3.5 & T.3.6 & A.7.1	 AC and DC power supply Warm-up time
1.4. When carrying out the tests as envisaged in this Directive, the following paragraphs apply:		Comment
1.4.1. *Basic rules for testing and the determination of errors* Essential requirements specified in 1.1 and 1.2 shall be verified for each relevant influence quantity. Unless otherwise specified in the appropriate instrument-specific annex, these essential requirements apply when each influence quantity is applied and its effect evaluated separately, all other influence quantities being kept relatively constant at their reference value. Metrological tests shall be carried out during or after the application of the influence quantity, whichever condition corresponds to the normal operational status of the instrument when that influence quantity is likely to occur.	 5.1.3.2 A.8 Annex A	 Conditions are listed in each test
1.4.2. Ambient humidity – According to the climatic operating environment in which the instrument is intended to be used either the damp heat-steady state (non-condensing) or damp heat cyclic (condensing) test may be appropriate. – The damp heat cyclic test is appropriate where condensation	 4.3.3 A.8.2	 Non-condensing only

	is important or when penetration of vapour will be accelerated by the effect of breathing. In conditions where non-condensing humidity is a factor the damp-heat steady state is appropriate.		
2.	**Reproducibility** The application of the same measurand in a different location or by a different user, all other conditions being the same, shall result in the close agreement of successive measurements. The difference between the measurement results shall be small when compared with the MPE	4.4.3 A.10	Span stability Reproducibility is in general also covered by all other tests
3.	**Repeatability** The application of the same measurand under the same conditions of measurement shall result in the close agreement of successive measurements. The difference between the measurement results shall be small when compared with the MPE.		Covered by all other tests. No specific mention in 1997 Edition. However, is mentioned in 3.7.4 of R106-1 revision WD
4.	**Discrimination and Sensitivity** A measuring instrument shall be sufficiently sensitive and the discrimination threshold shall be sufficiently low for the intended measurement task.	2.8.1.6 A.6.5.3	
5.	**Durability** A measuring instrument shall be designed to maintain an adequate stability of its metrological characteristics over a period of time estimated by the manufacturer, provided that it is properly installed, maintained and used according to the manufacturer's instruction when in the environmental conditions for which it is intended.	T.3.7 4.1.3 4.4.3 A.10	
6.	**Reliability** A measuring instrument shall be designed to reduce as far as possible the effect of a defect that would lead to an inaccurate measurement result, unless the presence of such a defect is obvious.	3.3, 3.4.2 3.4.3 3.4.4, 3.4.5 4.1.2, 4.3.1 4.3.4	
7.	**Suitability**		
7.1.	A measuring instrument shall have no feature likely to facilitate fraudulent use, whereas possibilities for unintentional misuse shall be minimal.	2.7, 2.10 3.2, 3.3.1	No mention of fraudulent use
7.2.	A measuring instrument shall be suitable for its intended use taking account of the practical working conditions and shall not require unreasonable demands of the user in order to obtain a correct measurement result.	3.2	
7.3.	The errors of a utility measuring instrument at flows or currents outside the controlled range shall not be unduly biased.		1 Not applicable
7.4.	Where a measuring instrument is designed for the measurement of values of the measurand that are constant over time, the measuring instrument shall be insensitive to small fluctuations of the value of the measurand, or shall take appropriate action.		Not applicable
7.5.	A measuring instrument shall be robust and its materials of construction shall be suitable for the conditions in which it is intended to be used.	3.2 & 3.5.2	

7.6.	A measuring instrument shall be designed so as to allow the control of the measuring tasks after the instrument has been placed on the market and put into use. If necessary, special equipment or software for this control shall be part of the instrument. The test procedure shall be described in the operation manual. When a measuring instrument has associated software which provides other functions besides the measuring function, the software that is critical for the metrological characteristics shall be identifiable and shall not be inadmissibly influenced by the associated software.	3.5.1 2.8.3.2 2.8.1 A.11.3	No reference to operation manual in R106 No mention of software
8.	**Protection against corruption**		
8.1.	The metrological characteristics of a measuring instrument shall not be influenced in any inadmissible way by the connection to it of another device, by any feature of the connected device itself or by any remote device that communicates with the measuring instrument.	4.3.6	
8.2.	A hardware component that is critical for metrological characteristics shall be designed so that it can be secured. Security measures foreseen shall provide for evidence of an intervention.	3.3.2	

8.3. Software that is critical for metrological characteristics shall be identified as such and shall be secured. Software identification shall be easily provided by the measuring instrument. Evidence of an intervention shall be available for a reasonable period of time.		**1 Not reference to these software requirements in R 106-1 1997**
8.4. Measurement data, software that is critical for measurement characteristics and metrologically important parameters stored or transmitted shall be adequately protected against accidental or intentional corruption.		**2 Not reference to these software requirements in R 106-1 1997**
8.5. For utility measuring instruments the display of the total quantity supplied or the displays from which the total quantity supplied can be derived, whole or partial reference to which is the basis for payment, shall not be able to be reset during use.		Not applicable
9. **Information to be borne by and to accompany the instrument**		
9.1. A measuring instrument shall bear the following inscriptions: – manufacturer's mark or name; – information in respect of its accuracy, plus, when applicable: – information in respect of the conditions of use; – measuring capacity; – measuring range; – identity marking; – number of the EC-type examination certificate or the EC design examination certificate; – information whether or not additional devices providing metrological results comply with the provisions of this Directive on legal metrological control.	3.6	
9.2. An instrument of dimensions too small or of too sensitive a composition to allow it to bear the relevant information shall have its packaging, if any, and the accompanying documents required by the provisions of this Directive suitably marked.		Not applicable

9.3. The instrument shall be accompanied by information on its operation, unless the simplicity of the measuring instrument makes this unnecessary. Information shall be easily understandable and shall include where relevant: – rated operating conditions; – mechanical and electromagnetic environment classes; – the upper and lower temperature limit, whether condensation is possible or not, open or closed location; – instructions for installation, maintenance, repairs, permissible adjustments; – instructions for correct operation and any special conditions of use; – conditions for compatibility with interfaces, sub-assemblies or measuring instruments.	3.6.1 to 3.6.4	Markings on instrument No mention of "user manual" or information for the user
9.4. Groups of identical measuring instruments used in the same location or used for utility measurements do not necessarily require individual instruction manuals.		Not mentioned
9.5. Unless specified otherwise in an instrument-specific annex, the scale interval for a measured value shall be in the form $1x10^n$, $2x10^n$, or $5x10^n$, where n is any integer or zero. The unit of measurement or its symbol shall be shown close to the numerical value.	2.3 3.4.1	
9.6 A material measure shall be marked with a nominal value or a scale, accompanied by the unit of measurement used.		Not applicable
9.7. The units of measurement used and their symbols shall be in accordance with the provisions of Community legislation on units of measurement and their symbols.	3.6.1 3.6.2	Units of measurement implied
9.8. All marks and inscriptions required under any requirement shall be clear, non-erasable, unambiguous and non-transferable.	3.6.5 3.7	
10. **Indication of result**		
10.1. Indication of the result shall be by means of a display or hard copy.	3.1 3.4.1, 3.4.2	
10.2. The indication of any result shall be clear and unambiguous and accompanied by such marks and inscriptions necessary to inform the user of the significance of the result. Easy reading of the presented result shall be permitted under normal conditions of use. Additional indications may be shown provided they cannot be confused with the metrologically controlled indications.	2.6 3.4.1 3.4.2	
10.3. In the case of hard copy the print or record shall also be easily legible and non-erasable.		Not mentioned
10.4. A measuring instrument for direct sales trading transactions shall be designed to present the measurement result to both parties in the transaction when installed as intended. When critical in case of direct sales, any ticket provided to the consumer by an ancillary device not complying with the appropriate requirements of this Directive shall bear an appropriate restrictive information.		Not applicable

10.5. Whether or not a measuring instrument intended for utility measurement purposes can be remotely read it shall in any case be fitted with a metrologically controlled display accessible without tools to the consumer. The reading of this display is the measurement result that serves as the basis for the price to pay.		Not applicable
11. **Further processing of data to conclude the trading**		

transaction		
11.1. A measuring instrument other than a utility measuring instrument shall record by a durable means the measurement result accompanied by information to identify the particular transaction, when: – the measurement is non-repeatable and; – the measuring instrument is normally intended for use in the absence of one of the trading parties.	3.4.2	Printer is mandatory according to R106
11.2. Additionally, a durable proof of the measurement result and the information to identify the transaction shall be available on request at the time the measurement is concluded.	3.1	Printer is mandatory but durability of printout is not mentioned
12. **Conformity evaluation** A measuring instrument shall be designed so as to allow ready evaluation of its conformity with the appropriate requirements of this Directive.	5	
ANNEX MI-006 **AUTOMATIC WEIGHING INSTRUMENTS**		
The relevant essential requirements of Annex I, the specific requirements of this Annex and the conformity assessment procedures listed in Chapter I of this Annex, apply to automatic weighing instruments defined below, intended to determine the mass of a body by using the action of gravity on that body.	T.1.1	Slightly different wording
DEFINITIONS		
Automatic weighing instrument An instrument that determines the mass of a product without the intervention of an operator and follows a predetermined programme of automatic processes characteristic of the instrument.	T.1.2	Slightly different wording
Automatic catchweigher An automatic weighing instrument that determines the mass of pre-assembled discrete loads (for example prepackages) or single loads of loose material.		
Automatic checkweigher An automatic catchweigher that subdivides articles of different mass into two or more subgroups according to the value of the difference of their mass and a nominal set-point.		
Weight labeller An automatic catchweigher that labels individual articles with the weight value.		
Weight/price labeller An automatic catchweigher that labels individual articles with the weight value, and price information.		
Automatic gravimetric filling instrument An automatic weighing instrument that fills containers with a predetermined and virtually constant mass of product from bulk.		
Discontinuous totaliser (totalising hopper weigher) An automatic weighing instrument that determines the mass of a bulk product by dividing it into discrete loads. The mass of each discrete load is determined in sequence and summed. Each discrete load is then delivered to bulk.		
Continuous totaliser An automatic weighing instrument that continuously determines the mass of a bulk product on a conveyor belt, without systematic subdivision of the product and without interrupting the movement of the conveyor belt.		
Rail-weighbridge An automatic weighing instrument having a load receptor inclusive of rails for conveying railway vehicles.	T.1.3	
SPECIFIC REQUIREMENTS		

Chapter I – Requirements common to all types of automatic weighing instruments		
1. *Rated Operating Conditions* The manufacturer shall specify the rated operating conditions for the instrument as follows:	5.1.1	5.1.1 is common to 1.1 to 1.4 below
1.1. For the measurand: The measuring range in terms of its maximum and minimum capacity.	 2.4 Table 3 T.3.2	 Min Max
1.2. For the electrical supply influence quantities: In case of AC voltage supply: the nominal AC voltage supply, or the AC voltage limits. In case of DC voltage supply: the nominal and minimum DC voltage supply, or the DC voltage limits.	 2.9.2 & 4.3.7 2.9.3 & 4.3.8	
1.3. For the mechanical and climatic influence quantities: The minimum temperature range is 30°C unless specified otherwise in the following chapters of this Annex.	 2.9.1	
The mechanical environment classes according to Annex I, paragraph 1.3.2 are not applicable. For instruments which are used under special mechanical strain, e.g. instruments incorporated into vehicles, the manufacturer shall define the mechanical conditions of use.		
1.4. For other influence quantities (if applicable): The rate(s) of operation. The characteristics of the product(s) to be weighed.	 3.4.4 3.6.4 T.3.5	 Operating speed & liquid loads
2. *Permissible effect of disturbances – Electromagnetic environment* The required performance and the critical change value are given in the relevant Chapter of this Annex for each type of instrument.		Comment
3. *Suitability*		
3.1. Means shall be provided to limit the effects of tilt, loading and rate of operation such that maximum permissible errors (MPEs) are not exceeded in normal operation.	3.1 3.4.4 & 3.4.5	
3.2. Adequate material handling facilities shall be provided to enable the instrument to respect the MPEs during normal operation.	3.1 3.5	aprons
3.3. Any operator control interface shall be clear and effective.	3.4.1	
3.4. The integrity of the display (where present) shall be verifiable by the operator.	4.3.2	
3.5. Adequate zero setting capability shall be provided to enable the instrument to respect the MPEs during normal operation.	3.3.5 & A.6.2 2.8.1.2 & A.6.5	
3.6. Any result outside the measurement range shall be identified as such, where a printout is possible.	3.4.3	no printout allowed

4. Conformity assessment The conformity assessment procedures referred to in Article 9 that the manufacturer can choose between are: For mechanical systems: B+D or B+E or B+F or D1 or F1 or G or H1. For electromechanical instruments: B+D or B+E or B+F or G or H1. For electronic systems or systems containing software: B+D or B+F or G or H1.		
Chapter VI – Automatic Rail Weighbridges		
1. *Accuracy Classes* Instruments are divided into four accuracy classes as follows: 0.2, 0.5, 1, 2.	2.1	
2. MPE		
2.1. The MPEs for weighing-in-motion of a single wagon or a total train are shown in table 9. *Table 9* Accuracy class | MPE 0.2 | ± 0,1 % 0.5 | ± 0,25 % 1 | ± 0,5 % 2 | ± 1,0 %	2.2.1	
2.2. The MPEs for the weight of coupled or uncoupled wagons weighing-in-motion shall be one of the following values, whichever is the greatest: – the value calculated according to Table 9, rounded to the nearest scale interval; – the value calculated according to Table 9, rounded to the nearest scale interval for a weight equal to 35 % of the maximum wagon weight (as inscribed on the descriptive markings); – one scale interval (d)	2.8.2.1	
2.3. The MPEs for the weight of train weighing-in-motion shall be one of the following values, whichever is the greatest: – the value calculated according to Table 9, rounded to the nearest scale interval; – the value calculated according to Table 9, for the weight of a single wagon equal to 35 % of the maximum wagon weight (as inscribed on the descriptive markings) multiplied by the number of reference wagons (not exceeding 10) in the train, and rounded to the nearest scale interval; – one scale interval (d) for each wagon in the train, but not exceeding 10 d.	2.8.2.2	
2.4. When weighing coupled wagons; the errors of not more than 10 % of the weighing results taken from one or more passes of the train may exceed the appropriate MPE given in paragraph 2.2, but shall not exceed twice the MPE.	2.2.1	

<table>
<tr><td>3. Scale interval (d)

The relationship between the accuracy class and the scale interval shall be as specified in Table 10.

Table 10
<table><tr><th>Accuracy class</th><th>Scale interval (d)</th></tr><tr><td>0.2</td><td>d ≤ 50 kg</td></tr><tr><td>0.5</td><td>d ≤ 100 kg</td></tr><tr><td>1</td><td>d ≤ 200 kg</td></tr><tr><td>2</td><td>d ≤ 500 kg</td></tr></table></td><td>2.3
(T.3.4)</td><td>Left columns of table 3</td></tr>
<tr><td>4 Measurement range</td><td></td><td></td></tr>
<tr><td>4.1. The minimum capacity shall not be less than 1 t, and not greater than the value of the result of the minimum wagon weight divided by the number of partial weighings.</td><td>2.4</td><td></td></tr>
<tr><td>4.2. The minimum wagon weight shall not be less than 50 d.</td><td>2.5</td><td></td></tr>
</table>

<table>
<tr><td colspan="2">5. Performance under influence factor and electromagnetic disturbance</td><td></td><td></td></tr>
<tr><td colspan="2">5.1. The MPE due to an influence factor shall be as specified in Table 11.

Table 11
<table><tr><td>Load (m) in verification scale intervals (d)</td><td>MPE</td></tr><tr><td>0 < m ≤ 500</td><td>± 0,5 d</td></tr><tr><td>500 < m ≤ 2 000</td><td>± 1,0 d</td></tr><tr><td>2 000 < m ≤ 10 000</td><td>± 1,5 d</td></tr></table></td><td>2.2.2 (Table 2)</td><td></td></tr>
<tr><td colspan="2">5.2. The critical change value due to a disturbance is one scale interval.</td><td>T.4.2.5
4.1.2/4.3.4/A.9</td><td>Significant fault</td></tr>
<tr><td colspan="2"></td><td></td><td></td></tr>
</table>