Guidelines for VMK Assessment of Timber Measurement Quality

1 Introduction

Standards for checking timber measurement and timber accounting describe the overall regulatory framework. The standards are adopted by the SDC board, after prior consideration by the VMK Council and the Council for Measurement and Accounting (*Rådet för Mätning och Redovisning*, RMR). 'Guidelines for VMK Assessment of Timber Measurement Quality' is another example of a VMK document. Instructions for checks and approval of specific equipment are established by the VMK Council after prior consideration by RMR.

A measuring company that complies with the regulatory framework set up by the parties in 'National Measurement Instructions' and 'Standards for Control of Timber Measurement and Timber Accounting' may apply for authorisation by VMK (*Virkesmätningskontroll*, Timber Measurement Control). VMK then carries out an authorisation assessment.

The regulatory framework for the sector is based on requirements stipulated in the Swedish Timber Measurement Act (VML) and Timber Measurement Ordinance, and regulatory documents issued by the Swedish Forest Agency. By law, only insignificant systematic errors in measurement are permitted.

These guidelines are the sector's interpretation of the Timber Measurement Act. In Annex 2 of the Swedish Forest Agency regulations, accuracy that must be attained at timber lot level is stipulated.

A VMK-authorised measuring company must exercise control over its measurement activities. Check measurements and other monitoring procedures must be implemented to ensure equivalent interpretation and application of measurement regulations and other measurement provisions.

VMK, with the VMK department at SDC as administrator and the VMK Council as decision-making body, is commissioned by the parties to review and authorise measuring companies. This involves continually assessing the quality of timber measurement and timber accounting.

For assessment of timber measurement quality, two levels are used, measuring company and measurement site. At authorised measuring company level, specific targets and requirements for quality in timber measurement are proposed by each board, but general requirement levels must also be applied to enable VMK's review and assessment.

This document considers 1) log-by-log measurement and stack measurement of coniferous saw timber (including special assortments), pulpwood and energy wood; 2) loose-volume measurement; and 3) sieve checks of cellulose chips. Requirement levels for other assortments will be prepared as necessary.

2 Purpose

This document describes how VMK continually assesses the quality of timber measurement. The document does not consider all monitoring carried out by the VMK function, and only focuses on monitoring relating to deviations found in checked results at measuring company and measurement site level. VMK may also monitor new or particularly interesting measurement methods. It is also important to emphasise that the measuring company is always responsible for the quality of timber measurement.

3 Measurement quality and deviations

Within VMK authorisation, deviations are described as *minor*, *major* and *exceptional*. If a deviation is not rectified within one year, the deviation is normally upgraded one level. Exceptional deviations are described in Section 6 together with the possibility of withdrawn authorisation.

Deviations in measurement quality are often caused by factors that can take time to change, such as the ability of the log scaler and other measurement officials to correctly apply applicable measurement instructions, and technical conditions at the measurement sites. There is also some natural variation over the year, such as differences in wood properties, so assessments of measurement quality for this purpose should cover at least one year.

4 Requirements and targets

The authorised measuring companies' own requirements regarding deviation limits are assumed to be approved by both parties. However, individual requirements vary in design, so they cannot directly be used by the VMK Council when continually assessing the quality of timber measurement. This document establishes the limits for systematic deviations that VMK uses in assessment of quality of timber measurement.

Swedish Forest Agency regulations and the Timber Measurement Act indicate requirements regarding accuracy at timber lot level. Today, there is no effective model for monitoring statutory requirements regarding accuracy at timber lot level, but VMK assumes that the measuring companies will develop and implement their own models. Measurement accuracy at timber lot level will be considered in VMK's assessment of timber quality measurement.

5 VMK assessment of timber measurement quality

When deviations at measurement site level are found to be abnormal, the VMK Council contacts the authorised measuring company in question and requests an analysis of causes and a rectification plan. 'Abnormal' deviation at measurement site level varies not just with the measurement method but also with assortment, properties of the raw material, etc. In the assessment, the statistical reliability in the control material must also be considered. These factors make it difficult to establish precise limit values for minor and major deviations, but

an attempt has nevertheless been made in this document, with some flexibility permitted in the limit values. (See final sentences in sections 5.1.2 and 5.2.2.)

In assessment of quality in timber measurement, two levels are used: measuring company and measurement site. Reports of control measurements are to be submitted to VMK annually in accordance with 'Standards for Control of Timber Measurement and Timber Accounting' and no later than 28 February.

5.1 Authorised measuring company level

5.1.1 Requirements

The following requirements apply.

Table 1. Measuring company level: maximum systematic deviations permitted between original measurements and check measurements. Stack measurement refers to physical measurement of the stack, i.e. not a measurement obtained through a check population. Where a check population is used, the log-by-log measurement steps are assessed.

	Coniferous saw timber		**Pulpwood**		**Energy wood**	
	Log	**Stack**	**Log[1]**	**Stack**	**Log**	**Stack**
Gross vol. dev.	±0.5 %	±1.0 %	±1.0 %	±1.5 %	±1.0 %	±1.5 %
Value dev.	±2.0 %	±2.5 %	±2.0 %	±2.5 %	±2.0 %	±2.5 %

1) Automated measurement of pulpwood is on a log-by-log basis.

Table 2. Measuring company level: maximum systematic deviations permitted between original measurements and check measurements.

	Special assortments[2] Log-by-log measurement	**Cellulose chips Sieving check[3]**	**Chips Loose-volume measurement**
Gross volume dev.	±1.0 %		±1.0 %
Value deviation	±3.0 %	±1.0 %	

2) Special assortments include blocks, posts, peeler logs, deciduous saw timber.
3) Chips are measured through a check sieve.

5.1.2 Deviations

A deviation where a limit is exceeded by more than 0.5 percentage points is regarded as a major deviation; smaller deviations are regarded as minor. When a limit is exceeded, the measuring company must submit to VMK an analysis of causes and a rectification plan, and a follow-up report must be submitted after six months.

If a minor deviation is repeated in the subsequent year's report, it is automatically upgraded to a major deviation. Major deviations must be rectified within one year, i.e. before the subsequent year's report to VMK. If this is not done, the deviation is upgraded to exceptional. See Section 6.

VMK may adjust its assessment of the deviation after considering the statistical information and other circumstances.

5.2 Measurement site level

5.2.1 Requirements

Based on the Timber Measurement Associations' own requirement levels, and the outcome of checks in recent years, the deviation limits shown in Tables 3 and 4 apply.

Table 3. Measurement site level: maximum systematic deviations permitted between original measurements and check measurements. Stack measurement refers to physical measurement of the stack, i.e. not a measurement obtained through a check population. Where a check population is used, the log-by-log measurement steps are assessed.

	Coniferous saw timber		**Pulpwood**		**Energy wood**	
	Log	**Stack**	**Log[4]**	**Stack**	**Log**	**Stack**
Gross vol. dev.	±1.5 %	±1.5 %	±1.5 %	±1.5 %	±1.5 %	±1.5 %
Value dev.	±3.0 %	±3.0 %	±2.5 %	±3.0 %	±3.0 %	±3.0 %

4) Automated measurement of pulpwood is on a log-by-log basis.

Table 4. Measurement site level: maximum systematic deviations permitted between original measurements and check measurements.

	Special assortments[5] Log-by-log measurement	**Cellulose chips Sieve check[6]**	**Chips Loose-volume measurement**
Gross volume dev.	±1.5 %		±1.5 %
Value deviation	±3.0 %	±1.5 %	

5) Special assortments include blocks, posts, peeler logs, deciduous saw timber.
6) Chips are measured through a check sieve.

5.2.2 Deviations

For gross volume, a deviation where a limit is exceeded by more than 0.5 percentage points is regarded as a major deviation; smaller deviations are regarded as minor. The corresponding limit for value deviation is 1.0 percentage points. When a limit is exceeded, the authorised measuring company must submit to VMK an analysis of causes and a rectification plan, and a follow-up report must be submitted after six months.

If a minor deviation is repeated in the subsequent year's report, it is automatically upgraded to a major deviation. Major deviations must be rectified within one year, i.e. before the subsequent year's report to VMK. If this is not done, the deviation is upgraded to exceptional. See Section 6.

VMK may adjust its assessment of the deviation after considering the statistical information and other circumstances.

6 Exceptional deviations / Withdrawal of authorisation

Deviations at authorised measuring company level as described in Section 5.1.2, and at measurement site level as described in Section 5.2.2, may be upgraded from major to exceptional.

If a deviation has been upgraded to exceptional, VMK may summon the CEO of the authorised measuring company to the Council to explain the circumstances and measures taken. If an exceptional deviation at measurement site level is repeated, VMK may summon a representative of the measurement site owner to the Council to explain the circumstances and measures taken.

In extreme cases,[1] VMK may withdraw a measuring company's authorisation.

7 Revision history

Version/Date	Change	Initials
26 October 2016	Adopted by the SDC Board after recommendation by RMR and VMK Council.	HR
7 December 2017	Category changed to general VMK document. Production measurements are called 'original scales' and checks are called 'check scales'. Changes in translation throughout document: 'Control collective' changed to 'check population'. New text on requirement levels for special assortments, cellulose chips and loose-volume measurements. Footnotes 2 and 4 removed from Tables 1 and 3, as VMF can now report energy wood separately from pulpwood.	HR

[1] If, for example, the measuring company has not displayed a serious intent to resolve the issue.