

Minutes from the meeting with the StanForD-group 2002-04-08

Place: SkogForsk, Uppsala, Sweden

Present: Magnus Wijk, CC Systems AB (before lunch)
Jörgen Eriksson, ESE Technique
Joakim Nygren, Haglöf Sweden AB
Timo Hokka, Metsäteho
Tapio Räsänen, Metsäteho
Juha-Antti Sorsa, Metsäteho
Tuomo Vuorenpää, Partek Forest
Joar Stenslökken, Silvinova
Anders Emmoth, Ponsse
Lars Björklund, VMR
Ander Nylund, Partek Forest
Bengt-Arne Walldén, Partek Forest
Mika Talola, Timberjack
Sakari Suuriniemi, Timberjack
Leif Orth, Södra
Anders Hansson, SCA
Jaakko Mäkinen, Mitron Oy
Leif Johansson, Timberjack Sales AB

From SkogForsk: John Arlinger, Secretary
Jan Sondell, Chairman
Bertil Lidén

§1 Opening of the meeting

Jan Sondell opened the meeting. The proposed agenda was accepted.

§2 New StanForD documents

The secretary presented two new StanForD documents:

- *Extended documentation of StanForD variables.* The document is a complement to the official StanForD documents. It contains more detailed descriptions of some of the variables as well as examples of how the variables can be used. The document will also contain other information related to

StanForD, for example general description of different file types. It is largely to be based on background material circulated in connection with the StandForD meetings. It is possible for the secretary to update and publish this document at any time between meetings. The document can be found at: www.skogforsk.se/marknad/stanford

- *StanForD Appendix: Definitions of variables – general and country specific* (see Appendix 1, separate document). The document contains more detailed descriptions and definitions of variables than the normal StanForD documents. This appendix replaces the earlier Swedish and German appendixes. The variables are divided up into several different categories primarily based on in which country they are used. The appendix only contains information explicitly approved by a StanForD-meeting and will therefore not be updated between meetings.

The meeting approved the use of these two new documents.

The meeting finally discussed the issue of variable priorities and especially how to handle variables that are mandatory in certain countries or under certain restrictions. It was decided that the secretary will present a proposal at the next meeting.

§3 Updated variable descriptions

The meeting decided to accept the following updated definitions, *new text in italics and underlined*:

VarNo	Typ	Name	New Description
12	4	DATESAVED	Date <u>when file was last</u> saved
13	4	BUIDATE	Time and date when the current bucking (<i>APT</i>) file was originally created in an administrative program <u>under the present name or changed in the harvester</u> .
16	4	STARTDATE	<u>Time and date for starting production at a site for the first time. Mandatory in prd-file</u>
17	4	ENDDATE	Time and date for ending a site. Mandatory <u>Used</u> only when the harvesting machine is not to return to the site. Mandatory in prd-file when site is finished.
19	4	BREAKDATE	Date and time for a <u>temporary</u> break in the harvesting operation, <u>when production is resumed results are stored in the same PRD-file using the same APT-file.</u>
20	4	RESTARTDATE	Date and time for restart on a site where the operations have been interrupted. <u>Can only exist if variable 19 (BREAKDATE) exists, must have a date/time later than variable 19.</u>
50	1	MODIFIED	Descriptive text specifying whether the file contents have been modified and, if so, why. For example, multiple production files have been merged into one.
500	1	DBHHT	Height <u>above stump</u> of DBH, <u>when DBH is a measured value</u> (normally 120 cm above stump in <u>Finland and Sweden, 110cm in Norway</u> Scandinavia), <u>per tree species</u> : 1...var111
500	2	DBHHT	Height above stump of DBH, <u>when DBH is a tree species</u> , calculated value, <u>per tree species</u> : 1...var111
510	1	DBHDERDIST	<u>Distance from but end to position where diameter is measured for derivation of DBH in variable 500, type</u>

VarNo	Typ	Name	New Description
			<u>2/tree species:1..var111</u>

However, the meeting decided that SkogForsk will further improve the definitions for Var19 (BREAKDATE) and Var20 (RESTARTDATE), these are to be sent out with the minutes.

In order to improve (complement) the definition of variable 19 (BREAKDATE) a new variable is suggested by SkogForsk. This variable (Var51, PRDCHDATE) will make it possible to register changes or just a break concerning registration of production results in the PRD-file caused by modifications of the APT-file. This new variable we will be postponed until the next meeting.

Var	Name	Type	Data type	Unit	Description
<u>51</u>	<u>PRDCHDATE</u>	<u>1</u>	<u>string</u>	<u>yyyymmddhhmmss</u>	<u>Date and time for change/modification of APT-file during the harvest of a site, when production is resumed results are stored in the same PRD-file.</u>
		<u>2</u>	<u>string</u>	<u>text</u>	<u>Text describing what changes were made to the APT-file.</u>

§4 Standard for data exchange between machine control systems and other applications

Bertil Lidén and Bengt-Arne Walldén reported from the working team (see appendix 2 and previous minutes).

The meeting decided that:

- The present working group is to be terminated
- SkogForsk will write a document defining the “operational demands” on geographical data to be communicated between different systems. The document will be communicated with manufacturers and users.
- SkogForsk and Metsäteho will organize a new working group when the document has been written. (This item will be discussed at the meeting on the 9th of September 2002.)

§5 Calibration and control of harvester measurements

Jan Sondell presented results from a Swedish working group (outside StanForD) on calibration and control of harvesters (see appendix 3, partly in Swedish). The meeting decided to postpone any decisions concerning new variables. The issue will be brought up again at the next meeting.

The meeting decided to recommend that the KTR-file is not integrated with the PRD-file. The KTR-file will thus be sent together with the PRD-file.

§6 New variables

Changes are written in italic style and underlined.

Log tally volume under/over bark (Var202)

The meeting decided to include the two following variables (Var202, type 2 and type 3) in the standard. These new variables are defined in the same way as Var161, type 1, Code 2. The new variables will, for example make it possible to calculate the relative amount of bark and the top form factor. They will also facilitate comparisons between assortments which volumes are measured using different units.

New variables:

Var	Name	Type	Data type	Unit	Description
<u>202</u>	<u>LOGTALVOL</u>	<u>2</u>	<u>Integer</u>	<u>M3sub</u>	<u>Total solid volume under bark/diameter class/length class/price matrix/tree species:</u> <u>1..var117/1..var118/1..var116/1..var111</u>
<u>202</u>		<u>3</u>	<u>Integer</u>	<u>M3sob</u>	<u>Total solid volume over bark/diameter class/length class/price matrix/tree species:</u> <u>1..var117/1..var118/1..var116/1..var111</u>

The variables will have priority 3 in the PRD-file.

§7 Clarification and definition of variables

Definition of Var241 TOTALVOLUME

This variable is used differently in different harvesters (appendix 4) as reported by Jan Sondell.

The meeting decided to improve the definition of var241 and introduce a new name for that variable and to introduce the new var249 according to the following table

Var	Name	Type	Data type	Unit	Description
<u>241</u>	<u>TOTMERCVOL</u>	<u>All types (1-6)</u>	<u>Integer</u>	<u>M3</u>	<u>Total merchantable solid volume (excluding price matrixes tagged with var136 code 4, as well as var243 and var244)</u>
<u>249</u>	<u>TOTALVOL</u>	<u>1</u>	<u>Integer</u>	<u>m3 (solid u.b.)</u>	<u>Total solid volume under bark (including price matrixes tagged with var136 code 4, as well as var243 and var244) /operator/tree species:</u> <u>1..var211/1..var111</u>
		<u>2</u>	<u>Integer</u>	<u>m3 (solid o.b.)</u>	<u>"</u>
		<u>3</u>	<u>Integer</u>	<u>M3 (solid u.b.)</u>	<u>Total solid volume under bark (including price matrixes tagged with var136 code 4, as well as var243 and var244) /stem type/tree species:</u> <u>1..var122/1..var111</u>
		<u>4</u>	<u>Integer</u>	<u>m3 (solid o.b.)</u>	<u>"</u>
		<u>5</u>	<u>Integer</u>	<u>M3 (solid</u>	<u>Total solid volume under bark (including price matrixes tagged with</u>

				<u>u.b.)</u>	<u>var136 code 4, as well as var243 and var244) /tree species: 1..var111</u>
		<u>6</u>	<u>Integer</u>	<u>M3 (solid o.b.)</u>	"

Var50 MODIFIED

The meeting decided not to make any changes to Var50 according to Jörgen Eriksson proposal. The proposal was to revise the type numbering of variable 50 so that type 5 becomes type 2, type 2 becomes type 3, type 3 becomes type 4 and finally type 4 becomes type 5.

Anders Hansson described his ideas concerning variable 50 and the problems concerning how to register changes to the APT-file done by the driver of the harvester. The main problem is that it is possible to manipulate both APT- and PRD-file directly in the harvester. The meeting decided that Jan Sondell, Bengt-Arne Walldén, Anders Hansson and John Arlinger will prepare and distribute a proposal, separately from the minutes, for the next meeting concerning how to handle the problem of manipulations, etc.

Standard matrix for unclassified timber

Based on a question from Metsäteho, Jan Sondell again presented the idea behind a matrix for unclassified timber (see minutes from 2001-04-02). The meeting decided to recommend that this matrix is always included in the APT-file when it is created in an administrative program. The meeting decided to change the priority of variable 136 to 2.

Var132 LWRLNGTHL, lower length class limit

Timo Hokka, Metsäteho, presented the following problem that was discovered at the Finnish pre-meeting.

There are two different ways to handle lower length class limits (Var 132 T1) combined with cutting window limits.

A short example:

Length classes 400 cm and 430 cm (Var 132 T1) cutting window [-3, 3] (Var 135 T3, T4), log length 427 cm

-In the first case the cutting window is taken into account and the log is registered in class 430 (Timberjack, Ponsse, Mitron, Mevire).

-In the second case the cutting window is not taken into account, the log is registered in class 400, because it's length is shorter than the lower limit of the length class. (Dasa, Valmet) In practice negative cutting window is not used with these machines but it's possible to use it.

Metsäteho suggests, based on the opinion of the Finnish forest companies, that the cutting window is taken into account when classifying the log. The meeting decided to postpone the issue to the next meeting.

Comments from discussions after the meeting: SkogForsk agree with the Finnish proposal and suggests that we decide accordingly at the next meeting.

§8 Items for discussion and information

Variables for monitoring, new codes

The secretary reported from the ongoing work. A proposal was presented to the TSG-group (Swedish user-group for technical co-operation) last month (appendix 5). However they could not make a final decision whether or not to accept the proposal instead they want the work to continue in close co-operation with the forest companies. The secretaries for StanForD and the TSG-group will continue their work. The TSG-group will arrange a seminar concerning this issue on the 29th of October, 2002. All manufacturers will be invited.

Pulpwood handling and assortment allocation of manually bucked logs

Was reported by Jan Sondell. The meeting recommended that quality indications in general ought to be used also for manual extraction of assortments and based on that the bucking computer calculates decides which assortment and dimensions is most economic to crosscut.

Comments by SkogForsk: For a minority of cases the "Suggested solution" on page 2 of Appendix 6 may be necessary, but this option ought not to be promoted. Thus the manufacturers must be free to implement (if not already done) a solution accordingly.

§ 9 Development of StanForD towards XML

Tapio Räsänen informed about the joint project, carried out by Metsäteho and SkogForsk.

New example files and a report (*Towards StanForD-XML*) written by Juha-Antti Sorsa is available at www.skogforsk.se/marknad/stanford.

The main issues of the report was presented by Juha-Antti Sorsa and John Arlinger.

Tapio Räsänen finally presented a suggested schedule for the continuing work on StanForD-XML:

1. Delivery of the report to the StanForD group
2. Setting a working group with manufacturers and other partners
3. Manufacturers' own estimates of development timetables, costs and needed resources
4. Further definitions and examples by Metsäteho/SkogForsk - handling in the group
5. The prototype versions of the XML files - created by each manufacturer, - checking in the group
6. Testing in harvester environment - compression and data transfer tests
7. Final definitions and documentations
8. Planning of the implementation

Partek suggested that it might be a good idea to develop a translator for testing the XML-files.

The meeting decided to set up a larger working group with representatives from SkogForsk, Metsäteho and manufacturers. A meeting will be held on 3rd of September in Helsinki where each manufacturer should have at least one representative.

§11 Other StanForD issues

The secretary will clarify Var196, OVERPROD (code 1 and 2), in accordance with the intentions of Anders Nylund.

The description of code 2 has become irrelevant since the decision to implement variable 190, MAXLOG. The consequence of implementing MAXLOG was that the pricelist only can contain prices and no codes. This in turn means that it is possible to buck a log with a value of 0, consequently the present definition of code 2 is wrong. The conclusion is that code 2 should mean that the production is stopped and logs are forbidden to buck even manually, while code 1 means that the production is stopped but logs may be bucked manually.

The meeting decided to change the definitions of code 1 and 2 (Var196) according to the following:

- 1 = Production stopped, forbidden to buck logs, only manually bucked logs allowed
- 2 = Production stopped, forbidden to buck logs even manually (text from variable 190 type 2)

An additional question was brought up by Anders Nylund and Jörgen Eriksson after the meeting concerning a third code where *bucking to value of the log is allowed but not apportionment bucking*. This issue will be brought up at the next meeting.

§12 Next meeting

Next meeting will take place on Monday October 28th, 2002, at SkogForsk in Uppsala, starting at 10.00 a.m. Proposals for the meeting shall be the secretary by hand not later than on September 1st 2002.

§13 End of meeting

Jan Sondell (chairman) closed the meeting.

Secretary

John Arlinger

Memorandum

To: StanForD-group
From: Bertil Lidén
Date: 11/09/2003
Re: **Standard for data exchange between machine control systems and other applications**

Report

The work of the team (B-A Walldén, Magnus Wijk, Jyrki Pesonen and Bertil Lidén) has not been finished. We suggest a “reengineering” of the team and its task. A professional XML-expert is needed to support the team. Jyrki Pesonen has left Ponsse and consequently also the team.

Background

Applications of GIS in PCs often work under operative systems like Windows while the systems for controlling the machine in most cases work under special operative systems oriented towards “real-time” processing of data.

The need for data exchange between different platforms and operative systems will grow during the coming years. One example is the need for putting together data from bucking computers and GIS-applications like coordinates for each pile of logs.

Problems

Just a few suppliers of software and some manufacturers of harvesters and forwarders have been in contact with the problems of data exchange between different applications and platforms.

Today there have been raised questions of standardization of some elements of the data exchange between GIS/GPS-applications. In order to create a tentative XML-based standard the specification of the different kinds of data must be enlarged.

Data exchange – some examples

From machine control system to GIS-system

- Type of machine
- The range of the crane
- The position of the crane in relation to the machine
- The speed of the machine
- The current operation of the machine
- The production of the machine

From GIS-system to machine control system

- Current position
- The quality of the GPS-signal
- Accurate time reference

The need for new variables

To be able to create a standard for this type of data exchange between different platforms and systems there is a need to define new variables to manage issues like answering frequency, answering method, protocol information etc.

- Minimum accepted time for response
- Time for response
- Time between updates of information
- GPS protocol
- Number of coordinates
- Number of satellites
- Measurement method

Proposal for the work ahead

We would welcome new members but above all an XML-expert to the group. But before that person can be hired the examples and description of what we intend to standardize must be enlarged.

John Arlinger will replace Bertil Lidén in the group.

Swedish StanForD-variables for control, calibration and identity when measuring by harvesters

Basis for this exposition is a Swedish demand specification dated 2002-03-05.

New variables for extraction of control trees

According to the demand specification the following is stated:

*Kontrollträd **skall** kunna tas ut slumpmässigt av apteringsdatorn med inställbart intervall. Intervallet **skall** kunna varieras från 1 på 1 (alla träd) till 1 på 10 000 och styras över trädslag. De slumpmässigt uttagna provträden **skall** kunna stratifieras efter trädvolym eller brösthöjdsdiameter. Sådan stratifiering **skall** kunna loggas.*

*Det **skall** vara inställbart vid vilket kapställe räknat från roten (det vill säga efter det föraren godkänt aktuellt kapställe) föraren får veta att ett träd är kontrollträd.*

*Kontrollträdsfrekvens, stratifieringsmodell och vid vilket kapställe föraren informeras **skall** vara inställbart i apt-filen men även direkt i skördaren. Om inställningen från apt-filen ändras i maskinen **skall** detta loggas.*

Text in italics means new variable numbers, variable names or types. The variables 270 STEMID (STEMNUM) and 361 SAMPLE can be used, completed with new type numbers. The variable 361 SAMPLE will normally be set in the apt-file.

Variable	Typ	Data type	Unit	Description
270 STEMID	1	Integer	1..9999	Identity of stem, number
	2	String	yyyy..ss	Identity of stem, time
	3	Integer	Code	1=calibration stem; 2=control stem; 3=calibration and control stem; 4=refused stem
	4	String	Text	Reason for refusal of control stem
361 SAMPLE	1	Integer	Code	1= all stems, 2= randomly: 1....var110
	2	Integer	Code	Fixed interval, (2 means every second stem, etc.)
	3	Integer	Number	Sampling frequency, denominator
	4	Integer	Code	Code stating the base for sampling frequency
				1=Number of stems; 2=Time; 3= Volume
	5	Integer	mm	Minimum diameter (DBH) for stratification
	6	Integer	mm	Stratification intervals
	7	Integer	Number	Sampling intervals within stratification intervals, starting at minimum diameter

8	Integer	Number	Log number counted from but end where operator get information when control tree is sampled
9	Integer	Number	Number of control measurements to be saved for statistical analyses historical data

Calibration and control variables

To make it possible to monitor the calibration and control measurement of the harvesters, it is desirable either to send the ktr-file together with the prd-file to the administrative office (in Sweden in most cases SDC) or include the actual ktr-data in the prd-file. The following table shows the variables recommended to use. It is recommended to store the five last calibration occasions, also when no adjustment have been made, in the actual prd-file. That means that the value zero is also valid in all variables 40-49 below.

The variables 270 and 361 (see above) must also be stored in the prd-file for each tree.

Variable	Typ	Data type	Unit	Description
18 CONTRDATE	4	String	yyyy...ss	Control measurement date
40 NMLNGTHCA	1	Integer	Number	Number of length calibrations
41 LGTHCALDAT	4	String	yyyy...ss	Length calibration date: 1...var40
42 LGTCALRSN	1	String	Text	Length calibration reason: 1...var40
43 NUMDIACA	1	Integer	Number	Number of diameter calibrations:
44 DIACALDATE	4	String	yyyy...ss	Diameter calibration date: 1...43
45 DAICALRSN	1	String	Text	Diameter calibration reason: 1...43
46 CALLNGTH	1	Integer	cm	Adjusted length classes: 1...43
47 CORRLNGTH	1	Integer	mm	Adjustment per length class
48 CALDIA	1	Integer	mm	Adjusted diameter classes
49 CORR DIA	1	Integer	mm	Adjustment per diameter class
110 STEMSPEC	1	Integer	Code	Stem species, see Appendix
290 NUMLOGS	1	Integer	Integer	Number of logs
291 TOPDIAOB	3	Integer	mm	Top diameter outside bark, manual scaling
	5	Integer	mm	Top diameter of logs outside bark, measured by machine
293 LOGLENGTH	3	Integer	cm	Length of logs, manual scaling
	5	Integer	cm	Length of logs, measured by machine
296 PRICEMATR	1	Integer	Integer	Registered price matrix/var 110 for logs.....
372 NUMBDIA	1	Integer	Integer	Number of control diameters
373 CONTDIA	3	Integer	mm	Measured control diameters, unfiltered, manual scaling
	5	Integer	mm	Measured control diameters, filtered, measured by machine
374 CONTROLPOS	1	Integer	cm	Control position

Some comments to the table

The ktr-file generated by Haglöf's data calliper contains var 16 STARTDATE and var 17 ENDDATE instead of var 18 CONTRDATE.

To save space, a calibration or control tree ought to be sent to the office only once. Such a function, if needed, must be handled by the bucking computer.

Recommendations concerning ways of reporting calibration- and control data to the office (via ktr- or prd-file) will be set up by a working group at SkogForsk in May 2002.

Recommended identity variables

Variables that generally is necessary when using the harvester measurement for buying of timber.

Variable		Typ	Data type	Unit	Description
3	MCHNNO	2	String	Text	Unique machine identity ...
11	RESETDATE	4	String	yyyy...ss	<i>Last time for reset of prd-file</i>
12	DATESAVED	4	String	yyyy...ss	Data saved
16	STARTDATE	4	String	yyyy...ss	Start date
17	ENDDATE	4	String	yyyy...ss	End date
19	BREAKDATE	4	String	yyyy...ss	Break date
20	RESTARTDATE	4	String	yyyy...ss	Restart date
21	SITENO	1	String	Text	Logging unit number
31	EMPLOYER	1	String	Text	<i>Employer</i> (Organisation)
32	BUYER	1	String	Text	Buyer
33	VENDOR	1	String	Text	Vendor
34	CONTRACTOR	2	String	Text	The contractors code
		3	String	Text	The name of the contractor
		4	String	Text	The address of the contractor
		5	String	Text	The e-mail address of the contractor
		6	String	Text	The telephone and fax numbers of the <i>contractor</i>
35	CONTRACTNO	2	String	Text	Contract number in the Swedish VIOL-system
211	OPERATOR	2	Integer	Number	Number of operators
212	OPERATORNAME	1	String	Text	The name of the <i>operator</i> :



Jan Sondell
2002-02-19

Registration of total volume, var 241 TOTALVOLU in harvesters

Actual problem

The wood volume harvested is normally registered in a prd-file according to price matrixes defined in the apt-file. Logs cut of other dimensions than defined in the price lists has been registered in variable 244 OUTSPECVOL (earlier Swedish name was STOLP) or in the variable 243 BUTTVOL (earlier Swedish name was LUMP).

At the StanForD meeting 2001-04-02 a specific matrix for unclassified timber was prescribed with wide length and diameter ranges to be able to catch up all dimensions, which were not defined in the ordinary price matrixes. By using var 136 with a new code 4 the matrix could be withheld from being included in the value calculation when the stem was bucked.

The manufacturers were recommended to implement the actual matrix as a default matrix instead of continuing to register logs outside normal specification in variable 243 and 244. In connection with this a problem has been raised concerning the inclusion of the actual volumes in 243, 244 or the actual new matrix in the total volume (variable 241).

Use of 241 TOTALVOLU in Sweden today

Dasa

In **Dasa 380** the variables 243 and 244 are included in var 241 TOTALVOLU. In **Dasa4** 244 is excluded from 241 and 243 is not used. If you want to register short logs in 243 you must create a special matrix for that. In that case it is included in the 241 volumes.

Valmet

In **VMM-2000** and **Valmet Maxi** volumes stored in 243 and 244 are not included in 241. Only ordinary volumes defined as price matrixes are included.

Ponsse

In **Opti 3.8** neither 243 nor 244 is included in 241. In **Opti 4G** short but logs (from 10 to 149 cm) is not included in 241 but, logs longer than that are included.

Timberjack

In **Timberjack 3000** and **Timbermatic 300** it is possible to design a matrix for unclassified timber and actively choose if the volume shall be included or not in var 241.

Rottne

In **Rottne 4000** all kinds of volumes are included in var 241.

Suggested solution

In the future, particularly when harvester measurement will be the basis for wood purchase, it is necessary to know both the total merchantable volume registered in the ordinary price matrixes defined by the apt-file and the total volume passing through the harvester. This is also important when pricing wood according to stem volume. Knowing both types of volumes it is up to the seller and the buyer to decide which volume to fix the price of.

Therefore a new variable is suggested as follows.

249 TOTMERCVOL Types as for var241 but excluding price matrixes tagged with var 136 T4 BUCKCRIT and 243 and 344.

Another way to solve the problem is to change the name of var 241 to TOTMERCVOL and allocate the name TOTALVOLU to 249.

A **default price matrix** for unclassified timber tagged with var136, type 1, code 4, BUCKCRIT and not included in the bucking calculation ought to be implemented of all manufacturers.

TOTMERCVOL includes all price matrixes involved in the value bucking calculation. TOTALVOLU includes TOTMERCVOL and the unclassified wood matrix or volumes registered in variable 243 and 244.

Var 504 VOLDBHCL must include, as it says, the total volume.

John Arlinger
2002-02-28

Monitoring of forest operations & StanForD

Definitions of time concepts

Background

It was decided, at the StanForD-meeting of 99-04-12, to include new variables to make it possible to handle monitoring of forest operations in a more flexible way. The new variables were 315, 316, 317, 318 and 319.

Definitions of new time concepts used for monitoring forest operations were proposed by the Swedish TSG-group in 2001. These concept has been slightly modified in accordance with the report *Time concepts for machine work. Skogsarbeten, 1969* (in Swedish, original title is *Tidsbegrepp för maskinarbeten*).

The modified proposal from the TSG-group is presented in the following tables. The name of the corresponding StanForD variable can also be found in the first table.

Introduction

All presented time concepts (table 1) except *Calendar time*, *Unutilised time*, *Delay time* and *Effective time* are stored in specified StanForD-variables (Var315 - Var319).

The measures of efficiency (table 3) have the same definitions as in the previously mentioned report.

There is, today, no specific StanForF-variable for storing *Calendar time*, however it might be possible to use data stored in Var 318 by using the first start time and the last end time available in the variable.

Table 1. Time concepts for monitoring forest operations

Name	Beskrivning	StanForD variabel	
Calendar time (Ca)	All available time, for example one week = 7 * 24 h = 168 h, might be calculated by taking all time between first start and last end according to variable 318 (WORKTIME)		
Utilised time (To)	Total time required indirectly or directly to carry out a certain task, that is <i>Effective time</i> plus <i>Delay time</i>	Var316 code 1	
Unutilised time (U)	Calendar time which is not utilised time (Ca-U, for example meal break)		
Effective time	Time required to perform a specified work element which directly or indirectly changes the work object in regard to its form, position or state.		
Main time (M)	Time when machine carries out work for which it is intended, that is for a harvester felling, delimbing, bucking	Var316 code 10	
Other work time (Bo)	Other work that is done by machine, for example salvaging / towing another machine, laying out branches on strip roads etc.	Var316, code 11	
Transport time (Bt)	Machine time in terrain for transport from depot to work place (stand / site / object)	Var316, code 12	
Moving time (Bm)	Moving machine by trailer or by it self, for example when moving from one stand / site / object to another. Preparation before and after moving is included	Var316, code 13	
Administration time (Ba)	Time for handling of pricelists (bucking instructions), sending and receiving data, other administrative work done in the machine	Var316, code 14	
Repair time (Drep)	Reparation, adjustments of machine	Var317, code 10	
Waiting for repair (Drw)	Waiting for repairman or spare part when no machine activities can be carried out	Var317, code 11	
Maintenance time (Dm)	Machine oversight/maintenance according to manufacturer's instruction. Calibration of measuring system included	Var317, code 12	
Work delay (Dw)	Delays / interruptions when machine should have been working for example because of machine getting stuck, extreme climate, ordered restrictions of production or visits	Var317, code 13	
Meal break (Um)	No machine activities due to meal breaks or other activities not included in the utilised time	Var319, code 1	

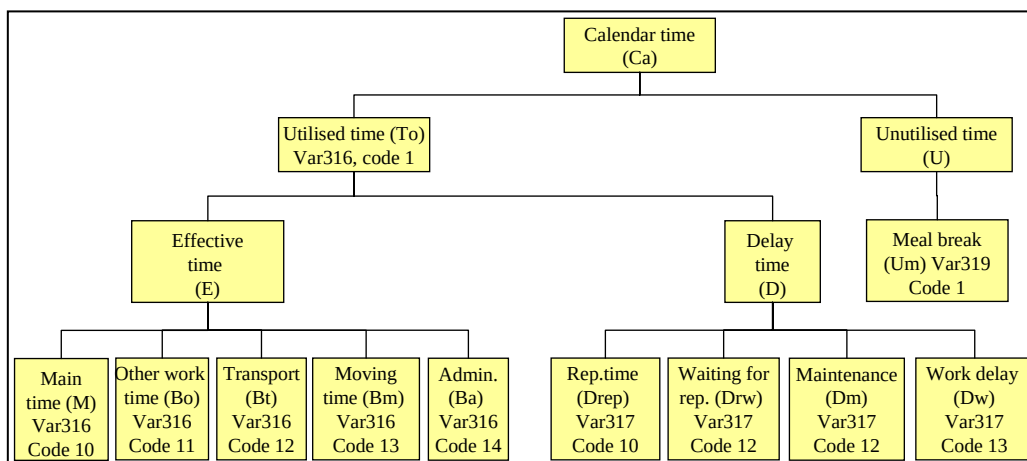
Table 2. Grouping of time concepts

Name of groups	Included time concepts
Effective time	$M + Bo + Bt + Bm + Ba$
Reparation time	$Drep + Drw$
Delay times	$Drep + Drw + Dm + Dw$
Utilised time	$Utilised\ time + Delay\ time$

Table 3. Methods for calculating efficiency measures of forest operations

Name	Method of calculation
Degree of total utilisation	$(\text{Utilised time} / \text{Calendar time}) * 100$
Degree of technical utilisation	$(\text{Effective time} / \text{Utilised time}) * 100$
Degree of delay	$(\text{Delay time} / \text{Utilised time}) * 100$
Degree of reparation	$(\text{Reparation time} / \text{Utilised time}) * 100$

Figure 1. Flow chart describing how the different concepts are related.





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Pulpwood handling and assortment allocation of manually bucked logs

Pulpwood survey

At the meeting in October 2001 with the StanForD group the issue of pulpwood handling was discussed. It has been discussed if there is a need to mark the pulp wood matrix in order to make it easier for the operator in the harvester when bucking pulpwood.

SkogForsk has made a survey of the current state as follows.

Matrix number

Is the pulp matrix given a special number in your system?

No special number is given with the exception of Ponsse. They prescribe that the pulp matrix should be the last one per tree species. Otherwise the system will not work properly.

Quality

In variable 141 the grade/price matrix/tree species is registered. Which quality code do you generally use for pulpwood?

No special quality is used, in many cases anything is allowed. Partek often uses 32, 64 and 128 (6, 7 or 8). Timberjack normally uses 7 (64).

Special marking

Do you mark the pulp wood matrix in a special way?

No one marks it in any special way. Product groups are used of some manufacturers.

The problem with manually bucked logs

Now and then the harvester operator has to override the bucking computer's length decision because of defects, sweeps, etc. on the stem. Normally is it just an adjustment of the length and the log is stored as the same assortment as the computer meant.

Sometimes there is a need for the operator to assign a particular assortment impossible for the computer to know. This problem will possibly increase in the future when several pulpwood assortments may be separated.

Suggested solution

A way to solve the problem is to use separate controls at the operator's panel for different assortments and reserve a code for each control or button and, as a suggestion, defined in the mas-file.

By using the same code in the price matrix specification (Var 121, type 2, assortment code) it is possible to couple the controlbutton at the panel with the apt-file specification.

For Swedish conditions the "VIOL"-code ought to be used. The cods are defined by SDC , S-851 83 Sundsvall (+46 60 16 86 00).