

Minutes from the meeting with the StanForD-group 2004-10-26

Place:	Skogforsk, Uppsala, Sweden
Present:	Leif Orth, Södra Tapio Räsänen, Metsäteho Asko Poikela, Metsäteho Per Annemalm (former Lindberg), Komatsu Ruediger Dehn, DIS Informationssysteme Jörgen Eriksson, ESE-Technique Perttu Isosaari, Mitron Erik Kindlund, Timberjack Roland Karlsson, Rottne Ilari Virtanen, Timberjack Pasi Marttila, Timberjack Tor Marntell, VMR/SDC Anders Emmoth, Ponsse Jan Johansson, SDC Jonas Gustafsson, Sveaskog Jari Korhonen, Ponsse Jyrki Parttinen, Ponsse Niklas Götz, CC Systems
From Skogforsk:	John Arlinger, Secretary Jan Sondell, Chairman

§1 Opening of the meeting

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

§2 Clarifications of variables

UPDATING PRIORITIES

It was decided (suggestion by Jörgen Eriksson) that the following variables are recommended to be included in the drf-file:

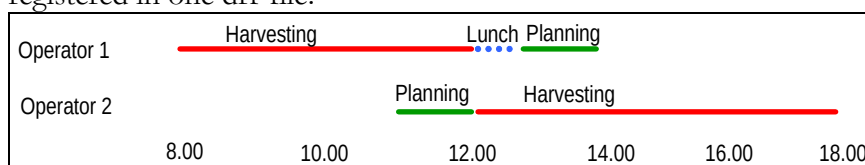
- NUMSTMOP (var223_t1) with priority 3.
- SAVEDATE (var12_t4) with priority 3.

Clarification and modifications

The following updates of variable descriptions were decided (new text is underlined):

Var	Name	Type	Data type	Description
441	TRNSDESC	8	String	Estimated harvesting date <u>Date when harvesting was carried out, applies to logs unloaded at specific transport object: 1...440_t1</u>
318	WORKTIME	2	Integer	Number of work times <u>(for operating machine)</u> per operator: 1...var211_t2
		3	Integer	Type of work time for operating machine, including meal breaks. Overlapping between operators not allowed. 1...var318_t2 / 1...var211_t2 1= Start time, 2= End timer <u>Should always be registered in pairs with Start time first.</u>
		4	String	Start / end of work time <u>for operating machine</u> per operator: 1...var318_t2 / 1...var211_t2
		5	Integer	Number of total work times <u>for operating machine per operator (sum of all times registered in var318_t4):</u> 1...var211_t2
		6	Long integer	Total work time for operating machine <u>per operator (sum of all times registered in var318_t4)</u> , including meal breaks: 1...var318_t5 / 1...var211_t2
		7	String	Total work time for operating machine (including meal breaks if machine is standing still) <u>per operator (sum of all times registered in var318_t4):</u> 1...var318_t5 / 1...var211_t2
328	TOTWRKTI	2	Integer	Number of working time (normally paid time for employee) <u>per operator.</u>
		3	<u>Integer</u>	Type of total working time (normally paid time for employee), including time away from machine and meal breaks. Overlapping between operators allowed. /1...var328_t2 / 1...var211_t2 1= Start time, 2= End timer <u>Should always be registered in pairs with Start time first.</u>
		4	String	Start / end time <u>(normally paid time for employee)</u> per operator: 1...var328_t2 / 1...var211_t2

The following example describes the difference between var318 and 328 if the work time of two different opertors (operating the same harvester) are to be registered in one drf-file:



Operator 1:

WORKTIME (var318_t4) = 8.00 – 12.00

TOTWRKTI (var328_t4) = 8.00 – 14.00

Operator 2:

WORKTIME (var318_t4) = 12.00 – 18.00

TOTWRKTI (var328_t4) = 11.00 – 18.00

Observe that the planning in this case involves work independent of the harvester.

Modification of SPECTIME (var330)

Variable SPECTIME (var330) was implemented in October 2003 (2003-10-28). A major revision of variable 330 was suggested by Jörgen Eriksson in September 2004.

The basic idea is to use the same variables for storing the causes for repair and for disturbance which means that var330 type 5 to 10 (as decided 2003-10-28) are totally excluded from the standard. A new variable (var330_t2) is suggested in order to keep repair and disturbance apart.

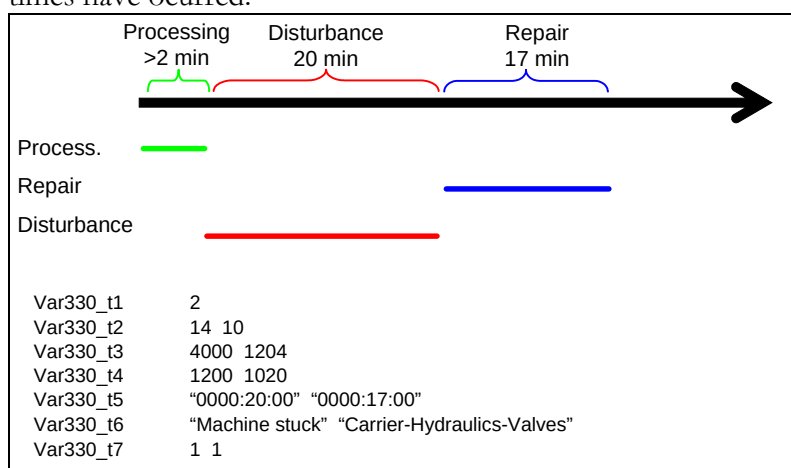
An advantage with this solution is that it will be quite simple to add new types of times in the future by just adding new codes into var330_t2.

It was also suggested by Jörgen that the descriptions in var330_t6 are standardized according to the text in the appendix (presented with the codes for var330_t3). This would be an advantage when developing administrative systems for analysing drf-files.

These suggestions were discussed and accepted by all manufacturers in September 2004 (through E-mail). The meeting therefore decided that var330 is updated according the following table:

Var	Name	Type	Data type	Unit	Description
330	SPECTIME	1	integer	Number	Number of specified times per operator: 1...var211
		2	Integer	Code	Type of specified time (10 = Repair, 14 = Disturbance): 1...var330_t1 / 1...var211_t2
		3	Integer	Code	Type of disturbance or unit repaired (codes in appendix): 1...var330_t1 / 1...var211_t2
		4	Long integer	Sec	Specified time, the sum of this variable is equal to code 10 and code 14 in var317: 1...var330_t1 / 1...var211_t2
		5	string	Hhhh-mmss	Specified time, the sum of this variable is equal to code 10 and code 14 in var317: 1...var330_t1 / 1...var211_t2
		6	String	Text	Description, same text as in appendix (var330_t3) to be used: 1...var330_t1 / 1...var211_t2
		7	integer	No	Number of occasions when times has been registered in var330_t4: 1...var330_t1 / 1...var211_t2 Primarily of interest when summed times are registered in 330_t4
		8	string	text	Free descriptive text: 1...var330_t1 / 1...var211_t2

The following example describes how var330 is used when two different down times have occurred:



§3 New variables

RPRTINTER (var53)

The proposal was based on a suggestion from Jörgen Eriksson.

Some date variables (for example STARTDATE and ENDDATE) cannot always be used in drf-files. These date variables will not be usable if the drf-file is time oriented, meaning that it covers for example a certain month during which the harvester has been working on several different harvesting objects.

In order to easily analyze time oriented drf-files (data for a certain time period which may very well include data from several different sites) it may be a good idea to have variables indicating the start and end times of this period.

The following new variables describing the start and the end of the report interval in the drf-file were decided with priority 2 in drf-files:

Var	Name	Type	Data type	Unit	Description
53	RPRTINTER	1	String	yyyy mmdd hhmmss	Start date for report interval in time oriented file (data in file normally independent of harvesting objects)
53	RPRTINTER	2	String	Yyyy mmdd hhmmss	End date for report interval in time oriented file (data in file normally independent of harvesting objects)

TRNSDESC (var441_t9)

The proposal was based on a suggestion from Jörgen Eriksson.

In order to give the operator the possibility to easily describe a transport object, for example the number of piles, it would an advantage to include a free text variable. It was therefore decided to implement the following variable with priority 2 in prl-files:

Var	Name	Type	Data type	Unit	Description
441	TRNSDSC	9	String	Text	Free descriptive text for a transport object: 1...440_t1

VAR170 BUTTDIAM TYPES 8 – 12

The proposal was based on a postponed suggestion from Metsäteho (see minutes 2004-03-30, appendix 1).

It was decided to introduce the following new variables with priority 3 in spp files:

Var	Name	Type	Data type	Unit	Description
170	BUTT-DIAM	8	Integer	Code	Code for type of diameter extrapolation function / tree species (used only if var170_t1 = 2) : 1...var111_t1. 1 = <i>function as described in appendix</i>
		9	Integer	no	Number of parameters of the diameter extrapolation function / tree species: 1...var111_t1. Order according to var170_t8.
		10	String	Text	Names of the parameters of the diameter extrapolation function (e.g. a ₀₀ , a ₀₁ ...): 1... var170_t9 / 1...var111_t1. Order according to var170_t8.
		11	Integer	Integer	Integer part of the parameter value, negative values are possible: 1... var170_t9 / 1...var111_t1. Order according to var170_t8.
		12	Long integer	1/100000000	Decimal part of the parameter value in 1/100000000ths (maximum 9 decimals): 1... var170_t9 / 1...var111_t1. Order according to var170_t8.

It was decided to include the following text in the appendix describing var170_t8:

Code 1.

$$D_L = [1 + (a0*(1.3-L) + a1*(1.3-L)^2)/100] * D_{1,3}$$

where

D_L = diameter at the distance L from the felling cut point, cm

L = distance from the felling cut point, m

$D_{1,3}$ = measured diameter at the height of 1,3 m (reference height) from the felling cut point, cm

Models for butt end profile parameters:

$$a0 = a00 + a01*D_{1,3} + a02*D_{1,3}^2 + a03*D_{1,3}^3 + a04*D_{1,3}^4$$

$$a1 = a10 + a11*D_{1,3} + a12*D_{1,3}^2 + a13*D_{1,3}^3$$

$$a2 = a20 + a21*D_{1,3} + a22*D_{1,3}^2$$

where

$$D_{1,3} = \min(50; D_{1,3})$$

The parameters should always be registered in the following order in var 170_t9 to t12: a01, a02, a03, a04, a11, a12, a13, a21, a22

NAME AND VERSION OF THE SPP-FILE

The proposal was based on a suggestion from Metsäteho.

The name and the identity of the spp-file should always be registered in all production and control measurement files (prd, pri, stm and ktr). This is needed in order to know what butt end extrapolation has been used.

It was therefore decided to introduce the following new variables:

Var	Name	Type	Data type	Unit	Description	Files and priorities
2	ID	5	string	text	The name of the spp-file	prd, stm, pri, ktr / 2
		6	string	text	Identification information of the spp-file version.	Spp / 1 prd, stm, pri, ktr / 2

NEW VARIABLE FOR MEAN HAULING DISTANCE

The proposal was based on a suggestion from Metsäteho.

Variable DISTANCE (var258) is meant for describing the actual total driven distance of the machine.

A new variable is needed to express the mean hauling distance from the forest to the landing (piles at the roadside). Observe that this is not the actual driven distance but rather an estimated distance, possible to use for capacity calculation and pricing.

It was therefore decided to implement the following new variables:

Var	Name	Type	Data Type	Unit	Description	Files and priorities
259	MEAN-DIST	1	Integer	m	Mean forest haulage distance for all assortments as estimated by operator.	prd / 3 prl / 2
		2	Integer	m	Mean forest haulage distance for all assortments as estimated by operator / operator: 1...var211_t2.	prd / 3 prl / 2

NEW VARIABLE FOR REGISTERING EXTRA WORK

The proposal was based on a suggestion from Metsäteho (appendix 2).

It was decided to postpone the introduction of the suggested new variable.

NEW TYPES OF OPTNLTXT (var200)

The proposal was based on a suggestion from Metsäteho.

Var200_t1 can now include any kind of optional text. It is classified as an old variable (priority 4, should not be used) but it is used quite widely. The problem is that it is used in two different ways: information is sent to the machine in apt or oai-files as well as for different kinds of feedback and registration information from the machines to the company, mainly in prd-files.

Two new types of var200 were proposed. Type 2 should be a variable in which information to the machine is sent in apt- or oai-files and the text could be returned in prd, pri, stm, prl, drf or ktr files with no changes. No changes should be done to the text in the machine. Type 3 should be reserved for the optional text written in the machine. It could be any kind of feedback or

registration information from the machine to the company or entrepreneur. Type 3 can be used in prd, pri, stm, prl, drf or ktr-files. There should be a limit for the text length, 300 characters was proposed to be the maximum.

It was therefore decided to implement the following new variables:

Var	Name	Type	Data type	Unit	Description	Files and priorities
200	OPTNL-TXT	2	long-string	Text	Optional free text for sending information to the machine. Text can be returned in prd, drf, stm, pri, ktr or prl files. No changes are allowed in the machine. Maximum 300 characters allowed.	Apt, oai, prd, drf, stm, pri, ktr, prl / 3
		3	long-string	Text	Optional text for sending information from the machine. Text can be saved in the machine in prd, drf, stm, pri, ktr or prl files. Maximum 300 characters allowed.	Prd, drf, stm, pri, ktr, prl / 3

FINNISH NOMENCLATURE IN HARVESTER COMPUTER

The proposal was based on a suggestion from Metsäteho.

A Swedish nomenclature was decided in 2002-10-28, however no common Finnish nomenclature has been implemented so far for all of these variables. A proposal for a Finnish nomenclature has been made by Komatsu Forest and Metsäteho. It has been accepted by the other machine manufacturers in the Finnish StanForD meeting 2004-10-05.

It was decided to implement the following Finnish translations into the appendix as has been done with the Swedish translations:

StanForD-standard	Finnish menu after change
Var21_t1	Leimikon tunnistetiedot
Var21_t2	Leimikon numero
Var21_t3	Lohkon numero
Var21_t4	Kuvion numero
Var21_t5	Sertifiointi
Var31_t1	Organisaatitiedot
Var31_t2	Alue
Var31_t3	Piiri
Var31_t4	Tiimi / Vastualue
Var31_t5	Varasto
Var32_t1	Ostaja
Var32_t2	Toimituspaikka
Var33_t1	Myyjä
Var33_t2	Myyjä tunnus
Var33_t3	Myyjän nimi
Var33_t4	Myyjän osoite
Var33_t5	Myyjän sähköposti
Var33_t6	Myyjän puhelin- ja faxnumerot
Var34_t1	Yrittäjä
Var34_t2	Yrittäjätunnus
Var34_t3	Yrittäjän nimi
Var34_t4	Yrittäjän osoite
Var34_t5	Yrittäjän sähköposti
Var34_t6	Yrittäjän puhelin- ja faxnumerot
Var35_t1	Sopimusnumero

StanForD-standard	Finnish menu after change
Var35_t2	<i>not used in Finland</i>

§4 New log codes (var256_t1) in pri-files

The proposal was based on a suggestion from Jari Korhonen, Ponsse.

There are many benefits using deciliter-based log codes instead of cubic meter for registering log volumes in pri files:

1. Smaller rounding errors. Using liters can cause as much as 5% error in small logs, deciliters only 0.5% In an example file, the summed difference was several hundreds of liters, 156.953m³ versus 156.7101 m³.
2. Smaller file size. Going from 401+1401 to one single log code (volume in dl) results in saved space. Comment: now that we actually have Int32 in StanForD, who needs this division of data anymore?

It was decided to introduce the new log codes 420-426 using dl as unit for log volumes.

New log codes, registered in var256_t1, describe what kind of data is stored in var257_t1

Log codes	Description
420	Volume according to Var161 but in dl, not m ³ .
421	Volume dl sob.
422	Volume dl sub.
423	Volume dl topob.
424	Volume dl topub.
425	Volume dl smi ob.
426	Volume dl smi ub.

Log codes 400-406 or 420-426 must be used in the pri-file.

§5 Control of harvester measurements

A number of new variables are needed in order to implement an improved system for controlling the measurements of harvesters. The system is based on a function for randomizing control stems. It is described in more detail in ”Kravspecifikation för kvalitetssäkring av skördarmätning 1. Kalibrering och kontroll av skördaren” (Möller, Sondell & Arlinger, 2004, SkogForsk).

It was therefore decided to implement the following new variables:

Var no	Name	Type	File	Description
3	MACHINE	4	Ktr	Caliper identity
5	VERSION	4	Ktr	Version of caliper software
38	CONTRMEAS	2	Ktr	Identity of auditor
38	CONTRMEAS	3	Ktr	Type of stem (ktr-file) according to registration in caliper: 1=OK for calibration, 0= Not to be used for calibration (Only used in caliper)
38	CONTRMEAS	4	Stm, Ktr	Type of stem selection (for control and calibration): 1-Randomized stem, 2-Manually selected stem, 0-Other
38	CONTRMEAS	5	Stm, Ktr	Acceptance/rejection of randomized stem, code 1 in var38_t4

Var no	Name	Type	File	Description
				(used for control and calibration): 1-Accepted, to be manually measured with caliper, 2- Rejected, not to be manually measured with caliper, 0-Other
38	CONTRMEAS	6	Ktr	No of harvested stems since last generation of ktr-file
38	CONTRMEAS	7	Ktr	No of rejected randomized control stems, reset when starting at harvesting object
38	CONTRMEAS	8	Ktr	Control stem number for rejected stems, (identical with var270_t3 in stm-file): 1...var38_t6
38	CONTRMEAS	9	Ktr	Harvesting time for rejected stems (identical with var12_t4 in stm-file): 1...var38_t6
38	CONTRMEAS	10	Stm, Ktr	Reason for rejection of randomly selected stems: 0 = Not rejected, 1 = Stem defect, 2 = Out of reach, 3 = Part of stem mixed up with other stems, 4 = Poor weather, 7 = Bucking system error, 8 = Caliper broken, 9 = Other reasons not defined: 1...var38_t6
270	STEMNO	3	Stm, ktr	Unique stem identity to be used for all types of stems (according to 38_t5) in both ktr- and stm-files. Not to be modified by operator. Incremented with each harvested stem. <u>Reset when starting at harvesting object.</u>
291	TOPDIAOB	6	Ktr	Top diameter of log on bark, measured by auditor: 1...var290_t1
293	LOGLNGTH	6	Ktr	Length of logs, (measured by auditor): 1...var290_t1
296	PRICEMATR	4	Stm, Ktr	Type of price category per log (same codes as in var161_t1): 1...var290_t1
361	SAMPLE	5	Stm, Ktr	Minimum DBH for randomly selected tree
361	SAMPLE	6	Stm, Ktr	Log number when operator is notified that the stem has been randomly selected for control purposes. Is to be done when position for cutting of log has been decided but prior to the actual cutting of the log.
373	CONTDIA	7	Ktr,	Diameter values measured by auditor

The new stem number variable must be reset when starting at a new harvesting object (site). In order to get a unique identity of a stem this number must be combined with the identity of the harvesting object. The harvesting object may be identified using STARTDATE (var16_t4).

As it may be an advantage to be able to connect a stem in a ktr-file with a stem in a pri file, it was decided to specify in the appendix that the same stem number is used in var270_t3, in var257 (log code 500) and in var267 (stem code 500).

STARTDATE (var16_t4) must be repeated for every stem in the ktr file due to the fact that one ktr file may include data from several different sites.

Var16_t4 should occur only once in an stm file as long as all stems in a certain stm file were cut at the same harvesting object (site). A unique STEMNO (var270_t3) shall of course be repeated for every stem.

The same unique stem number (var270_t3) should be used in variable 257 (log code 500) and 267 (stem code 500) in pri files.

§6 New bark functions

John Arlinger informed about the new improved bark functions. The functions presently used in Sweden have quite large systematic errors for Scots pine. The recently developed bark functions for Scots pine and Norway spruce have

been described in “Funktioner för skattning av barkens tjocklek hos tall och gran vid avverkning med skördare” (Hannrup, B., 2004, Arbetsrapport XXX, Skogforsk).

A new bark function for Scots pine has been needed for a long time. The new function mean a significant improvement compared to the old one. The only data not existing today in the harvester is the approximate latitude where the harvester is operating. This should be possible to set through the apt-file.

The precision of the bark function for spruce does not differ significantly from the present functions. However, it is a clear advantage to do the calculations in the same way as for pine.

It is recommended that the pine bark function is used for birch and other broadleaves. New recommendations will be published after further studies.

It is urgent that these new functions are implemented as soon as possible.

It should be possible to control what bark function to use through the apt-file and to register what function has been used in the prd/pri-file.

The following new variables with priority 1 in apt, prd and pri files was therefore decided:

VarNo	Name	Type	Unit	Description
113	BARKPAR	4	0.00001 degrees	Latitude used in bark function
		7	Codes	Type of bark function per species: 1...var111_t1 1= Function according to var113_t1 2= Function according to var113_t2 & var113_t3 3=Skogforsk 2004, Scots pine 4=Skogforsk 2004, Norway spruce

§7 Items for discussion and information

DIAMETERS AND CUTTING WINDOW – A PROBLEM

A document describing the problem was written by Jörgen Eriksson (appendix 1). The issue was discussed at the meeting. It was decided that based on the discussion Skogforsk was assigned to propose a solution in the minutes possible to accept for all participants.

Problem:

The harvester measures the length from the root end of the log and calculates on log lengths accordingly. The mensuration society in Sweden on the other hand extracts the lowest top measurement 0,1 m or further down against the top end and define it as the top diameter of the log. Consequently a longer log length gives a lower diameter and higher risk to get an undersized log. The difference in measurement principles *makes the problem unsolvable* – instead the problem has to be minimized. A normal taper of the timber part of the stem is 10 mm/m or 0,1 mm/cm. The risk in ESE’s example is that the actual problem shows up if the diameter class is 20 mm is 1,5%. If the taper is bigger and the class is narrower the risk may rise to some 5%.

Suggested solution:

1. The base for calculation measurement ought to be extracted from the middle of the cutting window, not from the beginning, as it is today (at least for Dasa).
2. Then calculated log diameter is registered in the production data, not the really measured one. The risk that the real diameter will be undersized ought to be considered by the user and eventually handled by using OVERSIZE var135_t2, which makes it possible to add an extra margin to the actual diameter.

The proposal will be discussed again at the next meeting.

§8 Other issues

Jan Sondell informed about the ongoing projects concerning control and calibration.

§9 Next meeting

Next meeting will take place on Tuesday April 5th, 2005, at Skogforsk in Uppsala, starting at 10.00 a.m. Proposals for the meeting shall be the secretary by hand not later than March 5th 2004.

§10 End of meeting

Jan Sondell (chairman) closed the meeting.

Secretary

John Arlinger

Jörgen Eriksson, ESE-Technique

Diameter and cutting window – a problem

What is the truth, the map or the real world?

A problem, which is built into value optimized bucking systems, is that the log length used in the calculation may not be equal to the cut length.

A “cutting window” (cutting marginal) is normally used in harvesters in order to make it possible for the harvesting head to stop at the right position with a certain tolerance. A difference between calculated and cut length may occur due to this “cutting window”.

The size of the “cutting window” may vary with different heads, settings of the head, climate and other parameters.

Example

A price matrix with length classes, diameter classes and prices is presented below. Forbidden logs are marked with red (through setting in limitation matrix).

Maxvärden																
Längd	Diameter		Rotdiameter		Min toppdiam.		Övermålgd		Kapfönster							
580 cm	999 mm		900 mm		150 mm		0 cm		Undre	Övre						
									2	5 cm						
L / D	150	160	170	180	200	220	230	240	260	280	300	310	320	340	360	380
315	235	252	420	449	458	470	498	512	530	547	552	494	498	502	506	550
340	235	252	420	449	458	470	487	500	518	535	539	562	567	572	576	550
370	274	294	490	524	534	549	476	489	506	523	527	588	592	597	602	550
380	269	288	480	514	523	538	549	564	583	603	608	544	548	552	557	550
400	269	288	480	514	523	538	521	535	553	572	577	594	598	603	608	550
415	288	309	515	551	561	577	504	518	536	554	558	562	567	572	576	550
430	274	294	490	524	534	549	504	518	536	554	558	606	611	616	621	550
440	263	282	470	503	512	526	571	586	607	627	632	556	561	565	570	550
460	291	312	520	556	567	582	498	512	530	547	552	612	617	622	627	550
490	294	315	525	562	572	588	504	518	536	554	558	619	624	629	634	550
500	258	276	460	492	501	515	594	610	631	652	657	550	554	559	563	550
520	297	318	530	567	578	594	515	529	547	566	570	625	630	635	640	550
550	272	291	485	519	529	543	543	558	577	597	601	631	636	641	646	550
560	272	291	485	519	529	543	599	615	637	658	663	588	592	597	602	550

The problem can be illustrated with the following example.

The value optimization has decided that the best alternative is:

Length class 440 cm

Diameter class 230 mm

The setting of the cutting window is 2 cm (lower limit) and 5 cm (upper limit).

The size of the cutting window is equal to 3 cm.

The calculation is thus based on the length $440 + 2$ cm (the lower limit) = 442 cm

The top diameter (used for classification) is measured at the length position $442 - 10 = 432$ cm and is equal to 231 mm.

The position of the head is, when feeding stopped, within the cutting window at 445 cm, that is the upper limit of the “cutting window”. The log is in other words 3 cm longer than the length used in the calculation.

In this case it affects the classified diameter. The diameter of the log is 229 mm at the position $445-10 = 435$ cm, that means that the log is classified into a smaller diameter class.

However this log is forbidden according to the price matrix (see length class 440 mm and diameter class 220 mm above).

The result of the optimization will be the same as above when carried out again. The diameter values of the log are measured and not prognosticated in this case.

The log will be registered in a different price matrix if cut at this position as it is not allowed in the present matrix. If no other matrix exists it will be registered as an unclassified log.

How to solve this this problem in the best way?

The problem cannot be solved by forbidding "cutting windows".

It must be solved without affecting the time it takes to make the cross cutting calculation.

Is it possible to allow registration of a log with a certain diameter (+/-) tolerance?

There are probably a number of solutions. A solution is needed that satisfies every one

NEW VARIABLE FOR REGISTERING EXTRA WORK

A suggestion from Metsäteho.

Different kind of extra or additional work is carried out together with the normal logging work today. Handling and haulage of logging residues or stump treatment operations are some examples. Information on what has been done and the amounts and units of the work are important for both the entrepreneur and the forest company. Forest companies in Finland have already implemented their own applications in the harvesters by which the information can be registered and sent from the machine to the company's information system. These applications have not been designed to use StanForD. However, there is still a need for the entrepreneurs to get the information from their own or their subcontractor's machines. Information on extra work can be site-specific (given total sum of work once for whole site) or operator and work shift specific (every operator registers what he has done after the shift).

There have not been any variables in the standard for registering this kind of information in the machines so far. The information could be given in prd files and those related to the forwarder work in the prl file. The new proposal aims to a common and open way to set the work items and their units with the bucking computer and in its user interface. The actual work items can not be standardized (see example below). They can be company-specific, but it must be possible to set and choose them freely in the application.

The following new variables were proposed:

Var	Name	Type	Data type	Unit	Description
260	EXTRA-PROD	1	integer	No	Number of extra work items (used for working site specific or summed extra work).
		2	integer	No	Number of extra work items per operator: 1...var211_t2. (used for operator specific extra work).
		3	integer	Code	Code for extra work item: 1...var24_t1. Codes can be freely chosen. Example of the codes is in the Finnish appendix.
		4	integer	Code	Code for extra work item per operator: 1...var24_t2/1...var211_t2. Codes can be freely chosen. Example of the codes is in the Finnish appendix.
		5	string	Text	Description of the extra work item: 1...var24_t1. See appendix.
		6	string	Text	Description of the extra work item per operator: 1...var24_t2/1...var211_t2. See appendix.
		7	string	text / code	Additional descriptive class for extra work: 1...var24_t1. There is a need to classify the extra work sometimes according to working conditions (site, stock, weather, time of day, season etc.). These classes are freely chosen.
		8	string	text / code	Additional descriptive class for extra work per operator: 1...var24_t2/1...var211_t2. There is a need to classify the extra work sometimes according to working conditions (site, stock, weather, time of day, season etc.). These classes are freely chosen.
		9	integer	unit in t11	Amount of extra work: 1...var24_t1. Decimals are given in var1024_t10.
		10	integer	unit in t12	Amount of extra work per operator: 1...var24_t2/1...var211_t2. Decimals are given in var1024_t10.
		11	integer	Code	Code for the unit of extra work item: 1...var24_t1. 1 = m ³ , 2 = 0.1 h (tenths of hours), 3 = hhmm (hours and minutes), 4 = km, 5 = kg, 6 = tn (tons), 7 = ha, 8 = number, 9 = other unit
		12	integer	Code	Code for the unit of extra work item per operator:

Var	Name	Type	Data type	Unit	Description
					1...var24_t2/1...var211_t2. 1 = m ³ , 2 = 0.1 h (tenths of hours), 3 = hhmm (hours and minutes), 4 = km, 5 = kg, 6 = tn (tons), 7 = ha, 8 = number, 9 = other unit

Example of some extra work items in Finland

code	work item	in Finnish
1	measurement by harvester	konemittaus
2	colour marking	värimerkkaus
3	stump treatment	lahontorjunta
4	control measurement	tarkastusmittaus
5	planning of the work site	työmaasuunnittelu
6	sorting of timber	puutavaran lajittelu
7	haulage of underlength timber	lyhyen ptl:n ajo
8	haulage of overlength timber	ylipitkän ptl:n ajo
9	haulage after manual logging	ajo miestyöhakkuulta
10	extended forest haulage	jatkettu lähikuljetus
11	manual logging	hakkuuta miestyönä
12	hour-based work	tuntityö
13	handling of logging residues	hakkuutähde käsittely
14	handling of damaged trees (storms)	tuulikaatojen käsittely
15	haulage of logging residues	hakkuutähteen ajo

Several different issues were discussed at the meeting, for example:

- The difference between “working site specific or summed extra work” (type 1) vs. “operator specific extra work” (type 2).
- How to handle non-defined “additional descriptive classes” (type 7 & 8).
- Whether this kind of information belongs to the production files as these files are used today.