

Minutes from the meeting with the StanForD-group 2005-04-06

Place:	Skogforsk, Uppsala, Sweden
Present:	Leif Orth, Södra Tapio Räsänen, Metsäteho Samuli Hujo, Metsäteho Ruediger Dehn, DIS Informationssysteme Perttu Isosaari, Mitron Sakari Suriniemi, Timberjack Erik Kindlund, Timberjack Jon Rudman, Logmax Dan Norman, Ecolog Jan Johansson, SDC Jonas Gustafsson, Sveaskog Anders Emmoth, Ponsse Jari Korhonen, Ponsse Jyrki Parttinen, Ponsse Halvard Olderlund, Komatsu Per Annemalm, Komatsu Joakim Nygren, Haglöf
From Skogforsk:	John Arlinger, Secretary Jan Sondell, Chairman Johan J. Möller

§1 Opening of the meeting

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

§2 Clarifications and modifications of variables

Updating descriptions of tree code in var266

It had been pointed out by Ola Söderlund, Komatsu, that the description of species numbers was different in var256 and var266.

The meeting therefore decided code 2 (species number) in var256 and var266 is updated according to the following (new text is underlined):

- 2 –Species number. The number refers to the order of the species in variable 120. Number = 1...n, n = var111.

Updating descriptions of stem number in var266 and var256

A new stem number (var270_t3) was implemented at the last meeting (2004-10-26). It was then also decided to use the same definition in pri-files. However, the descriptions for var256 and var266 were not updated by the secretary.

The meeting decided that code 500 (Stem number) in var256 (LOGCODE) and var266 (TREECODE) is updated according to the following text (new text is underlined):

- 500 – Stem no. Unique stem identity to be used for all types of stems. Not to be modified by operator. Incremented with each harvested stem. Reset when starting at a new harvesting object.

Updating priorities for var119 and var192 in prd-files

It was suggested by Tuomo Vuorenpää and Tapio Räsänen that variable 192 (MAXDEVIAT) types 1-5 and variable 119 (FREEBUCK) type 1 are to be included prd-files with priority 2.

The main reason being that these variables are sent with the apt-file, but apt-files are not always available when a prd-file is analyzed. There are sometimes a need to know the maximum deviation percentage when the prd-file is analyzed if the stems have been bucked by their maximum value. Var119 is also needed to analyze the bucking on the basis of the prd files.

The meeting discussed whether or not more apt-data is really needed in prd-files without coming to any decisive conclusion. It was decided to postpone the decision to the next meeting.

Updating descriptions var161

Ola Söderlund, Komatsu Forest, had pointed out that the definitions of price categories 6 and 7 (HKS) in var161 are incorrect. The present definition says that *Diameter is rounded to the closest centimetre.*

The meeting decided to change the descriptions according to the following text (new text is underlined):

Diameter is rounded downwards to the closest lower centimetre.

Example the correct way of calculating HKS diameters

middia (mm) → HKS middia (mm)

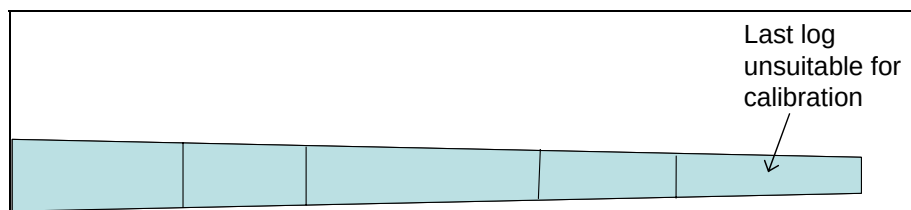
250-259→250 mm, 260-269→260 mm, 270-279→270 mm,

Updating descriptions var38_t3

Var38_t3 was implemented at the last meeting (2004-10-26) with the following definition: *Type of stem (ktr-file) according to registration in caliper: 1=OK for calibration, 0= Not to be used for calibration (only registered in caliper)*

After a field test with a harvester it was realized by Skogforsk that it probably would be better to have this information per log. We may for example have a stem where the four first logs are suitable while the last log is not suitable for

calibration (figure below). It would in such a case be wasteful to exclude the whole stem just because the last log is unsuitable.



A question was sent out (2004-02-15) to all manufacturers within StanForD in order to find out if anyone had implemented this variable. It turned out that it had not been implemented by any one.

The meeting decided to accept the following modification of var38_t3 (new text is underlined):

Type of log (ktr-file) according to registration in caliper: 1=OK for calibration, 0= Not to be used for calibration (Only registered in caliper): 1...var290 t1

§3 New variables

MCHNNO (var3_t5)

A new variable was suggested by Jörgen Eriksson, DASA, in order to be able to describe the name of the machine manufacturer, the designation of the machine model as well as the head using free text.

Example of layout: "Manufacturer" + "Machine model"+ "Harvester head model"

The details are left to the manufacturers. However, the objective is that this variable should be understandable, that is written in plain text and not a complex code. No detailed descriptions of an incomprehensible text string should be needed.

The meeting decided to implement the following new variable with priority 3 in pri- and prd-files:

Var	Name	Type	Data type	Unit	Description
3	MCHNNO	5	string	text	Machine model. Plain text that describes the machine (manufacturer, model, head). Not a code. Example of layout: "Manufacturer"+"Machine model"+"Harvester head Model"

SOUND KNOT VARIABLES (var148 & var149)

Variables (147-149) for automatic calculations of the sound knot diameter were implemented in the apt-file as follows (1999-04-04).

Var	Name	Type	Data type	Unit	Description
147	SOUND-CONST	1	Long integer	1/1000	Constant for determining the limit for green knots/tree species: 1...var111_t1
148	SOUND-FACT	1	Long integer	1/1000	Factor for determining the limit for sound knots/tree species: 1...var111_t1
149	FUNC-	1	Integer	Code	Codes for type of function when selecting a function for determining the sound knot cylinder.

	MODE				1: y=a+bx 2: y = a + bx +cx2
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Some defects with the present variables were detected by Ilari Virtanen, Timberjack and Sigurd Skotte, SilviNova (additional information concerning functions for sound knot diameter calculations can be found in appendix 1):

- Code 2 in var149 was added on the 2nd of April 2001. However no new factor c was added to var148 when the second degree polynomial was implemented.
- An additional factor (BF/SKC) used for defining the tolerance for dead knots is also wanted in the standard.
- It was also suggested by Timberjack that the unit for var148_t2 is changed from 1/1000 to 1/100000000.

The meeting decided to implement the following modifications and new variables with priority 3 in apt-files (new text is underlined):

Var	Name	Type	Data type	Unit	Description
147	SOUND-CONST	1	Long integer	1/1000	Constant for determining the limit for <u>sound knots/tree species</u> (<u>abbreviation "a" in var149</u>): 1...var111_t1
148	SOUND-FACT	1	Long integer	<u>1/1000</u> <u>00000</u>	Factor for determining the limit for sound knots/tree species (<u>abbreviation "b" in var149</u>): 1...var111_t1
		<u>2</u>	<u>Long integer</u>	<u>1/1000</u> <u>0 0000</u>	<u>Factor for determining the limit for sound knots/tree species</u> (<u>abbreviation "c" in var149</u>): 1...var111_t1
		<u>3</u>	<u>Integer</u>	<u>1/1000</u>	<u>Tolerance for dead knots within calculated limit for sound knot diameter / tree species</u> (<u>abbreviation "d" in var149</u>): 1...var111_t1
149	FUNC-MODE	1	Integer	Code	Codes for type of function <u>used when calculating</u> the diameter of the sound knot limit/cylinder. 1: y= (a+bx)* <u>d</u> 2: y = (a + bx +cx2)* <u>d</u> Where: y=factor used for calculating diameter of <u>sound knot limit</u> , x=DBH, a=var147_t1, b=var148_t1, c=var148_t2, d=var148_t3. The default value of d should be 1 if var148_t3 is not <u>used</u> . <u>Diameter of sound knot cylinder = y * DBH</u>

Example describing sound knot calculations:

Using a second degree polynomial (code 2 in var149_t1). Observe the units used for var147 and var148.

DBH (mm) = 300
Constant (var147_t1) = 810
Factor 1 (var148_t1) = -170000
Factor 2 (var148_t2) = 202
SKC/BF (var148_t3) = 1420

Sound knot factor = $0.81 - 0.0017 \cdot 300 + 0.00000202 \cdot 300 \cdot 300 = 0.4818$
Sound knot diameter = $0.4818 \cdot 300 \cdot 1.42 = 205.25$

FRWPROD (VAR448)

Jörgen Eriksson, DASA, has noted that there are no suitable variables in the drf-file for registering the production of forwarders. In many cases (at least in Sweden) several species are mixed together during forwarding thus making it impossible to use for example var249 (TOTALVOL) and var241 (TOTMERCVOL).

The meeting decided to implement the following new variable FRWPROD (var448) with priority 3 in drf-files:

Var	Name	Type	Data type	Unit	Description
448	FRW-PROD	1	Integer	m3sub	Total forwarded volume solid under bark
		2	Integer	m3sub	Total forwarded volume solid on bark
		3	Integer	m3sub	Total forwarded volume solid under bark per operator: 1...var211_t2
		4	Integer	m3sub	Total forwarded volume solid on bark per operator: 1...var211_t2
		5	Integer	kg	Total forwarded mass
		6	Integer	Kg	Total forwarded mass per operator: 1...var211_t2

SHIFTDATA (VAR329)

Ponsse has noted that there are some limitations in using the present drf-file (as implemented 2003-10-28). We can not, e.g. register the number of stems/operator and day if drf-file is written including 5 work days. Some new variables to be added to the drf-file (priority 3) is therefore suggested which includes more time specific production data. The proposal includes production data only for harvesters/harwarders.

We can create reports between any time, even in one work day, with the help of more time specific production data. We can report every "sub-period" with an "extended drf-file" as one shift is divided into many sub-shifts. For example a sub-shift might be "processing" between 7:00-8:00 or meal break 11:34-11:55. Every sub-shift is written to the drf-file separately.

The meeting decided to include the following variables with priority 3 in drf-files:

var116_t1 NUMASST

var121_t1 ASSTDESCR

var121_t2 ASSTDESCR

var161_t1 PRICECAT

var120_t1 TREESPEC

var120_t3 TREESPEC

The meeting decided to implement the following new variable SHIFTDATA (var329) with priority 3 in drf-files:

Var	Name	Type	Data type	Unit	Description
329	SHIFTDATA	1	Integer	No	Number of shifts per operator: 1...var211_t2
		2	String	Yyyymmdd-hhmmss	Shift start time per operator: 1...var329_t1 / 1...var211_t2
		3	String	Yyyymmdd-hhmmss	Shift end time per operator: 1...var329_t1 / 1...var211_t2
		4	Integer	Code	Shift type: 1...var329_t1 / 1...var211_t2 0=not defined, 1=morning, 2=day, 3=evening, 4=night. Selected by operator.
		5	String	Free text	Shift type description: 1...var329_t1 / 1...var211_t2
		6	Integer	No	Number of sub-shifts per shift: 1...var329_t1 / 1...var211_t2
		7	String	Yyyymmdd-hhmmss	Start time of sub-shift: 1...var329_t6 / 1...var329_t1 / 1...var211_t2
		8	String	Yyyymmdd-hhmmss	End time of sub-shift: 1...var329_t6 / 1...var329_t1 / 1...var211_t2
		9	Integer	Code	Work type per sub-shift: 1...var329_t6 / 1...var329_t1 / 1...var211_t2 31610=Processing, 31611=Terrain travel, 31612 = Other work, 31613=Roadtravel, 31710=Repair, 31711=Wait. repair, 31712=Maintenance, 31713=Trailer transp., 31714=Disturbance, 31901=Meal break,
		10	String	Free text	Work type description (se var329_t1) : 1...var329_t6 / 1...var329_t1 / 1...var211_t2
		11	Integer	No	Number of harvested stems during sub-shift: 1...var329_t6 / 1...var329_t1 / 1...var111_t1 / 1...var211_t2
		12	Integer	M3 sob	Produced volume during sub-shift: 1...var329_t6 / 1...var329_t1 / 1...var111_t1 / 1...var116_t1 / 1...var211_t2
		13	Integer	M3 sub	Produced volume during sub-shift: 1...var329_t6 / 1...var329_t1 / var111_t1 / var116_t1 / 1...var211_t2
		14	Integer	M3	Produced volume during sub-shift according to price type (var161_t1): 1...var329_t6 / 1...var329_t1 / 1...var111_t1 / 1...var116_t1 / 1...var211_t2
		15	Integer	No	Produced number of logs(pcs) during sub-shift: 1...var329_t6 / 1...var329_t1 / 1...var111_t1 / 1...var116_t1 / 1...var211_t2
		16	Integer	DI	Fuel consumption during sub-shift: 1...var329_t6 / 1...var329_t1 / 1...var211_t2
		17	Integer	M	Driven distance during sub-shift: 1...var329_t6 / 1...var329_t1 / 1...var211_t2

Some additional information from Ponsse

How is a shift registered/defined?

- The shift is a work day (working on or with machine) for one operator. It can

be started manually or normally, logging in. So, the start of the day in var329 might be REPARATION; 2h before login. The end of the shift is time when driver logs out - always.

Does a shift always start at the same time that the operator logs in?

- No. In OptiprogessControl (Ponsse) we can feed time manually before login. So start time is the time which driver manually feeds. Or the login time if manually feeding has not be used.

How is a sub-shift registered/defined?

- The sub-shifts are all automatic. In one work day (shift) there can be many sub-shifts which all have the same work type. For example, driver starts a day at 14.00 with terrain travel during 4mins, the driver then starts harvesting, 5mins. => 2 sub-shifts for example 14:00:00 - 14:04:00 and 14:04:00 - 14:09:00. Production data in var329 are "connected" to each sub-shift with the help of start and end time.

Is the sum of work type "Processing" in var329 (code 31610) equal to the sum of var316, code 10?

- Yes, exactly, var329 includes "Processing" times in "sub-shifts" and var316 code 10 does include a sum of those.

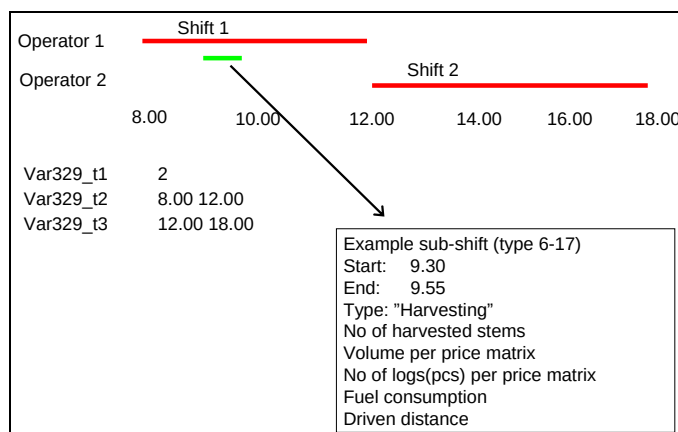
The production data included in the proposal can only be used by a harvester. Some examples:

- The number of stems is unknown by the forwarder
- If pine and spruce pulp logs are mixed when forwarding (very common in Sweden) the variables related to volume will be very difficult to use in the case of a forwarder.

This means that we may want to add some variables for registering forwarder production in the near future.

Example

The example describing what kind of data that can be extracted from variable 329.



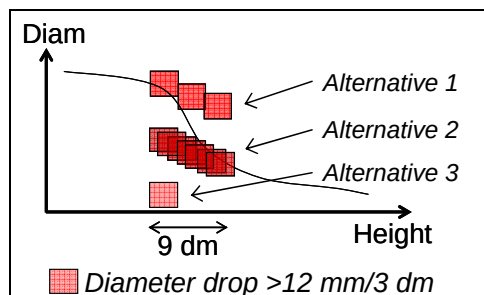
§4 Large decreases in measured stem diameter ("diameter drops")

Proposal for StanForD-meeting 2005-04-05

Counting the number of unrealistically large decreases in the measured diameter of a stem (often called "stam hack" in Swedish) is a measurement sometimes used for estimating the capability of a harvester head to hold stems for good diameter measuring.

A "diameter drop" is defined as a fall in diameter during a certain length of the tree, when the diameter fall is larger than a specified limit, e.g. >12 mm diameter fall in 0,3 m length.

It has been realized by Komatsu (Per Annemalm) that this definition is not enough when developing applications to calculate the frequency of "diameter drops". Komatsu's experience is that different applications calculate "diameter drops" differently. See the following three alternative implementations (figure):



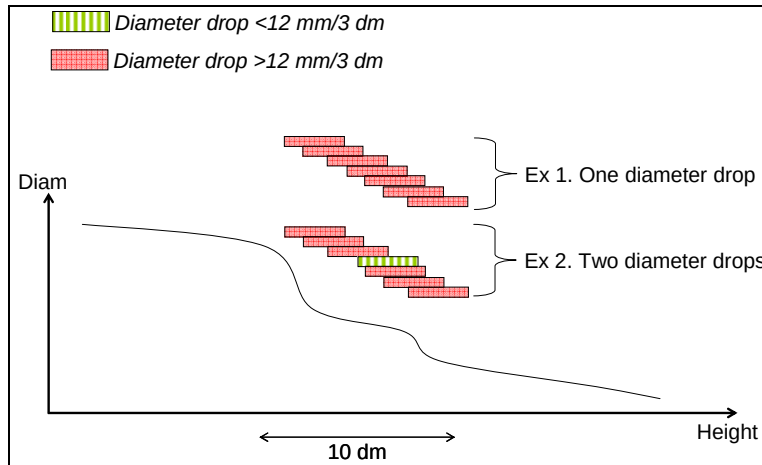
Alternative 1) Count each length interval (3 dm), with no overlapping, as one diameter drop.

Alternative 2) Count each length interval (3 dm) with a distance of 1 dm (overlapping allowed) as one diameter drop

Alternative 3) Count several length intervals (3 dm) located immediately next each other as one diameter drop.

Depending on how we calculate diameter drops we may in other words end up with having 3, 7 or 1 diameter drops in the example above.

The meeting decided to recommend that alternative 3 is to be used for calculating "diameter drops". This means that several length intervals with a large diameter decrease located immediately next each other are to be counted as one diameter drop (example 1). While the same part of a stem will be counted as two diameter drops if one "normal" length interval is located in-between the intervals with large diameter decreases (example 2 in figure below).



§5 Items for discussion and information

A TOOL FOR ANALYZING KTR-FILES

SDC has developed an application for monitoring the measuring systems of individual machines using ktr-files. The work has been carried out within the "Control and calibration project" coordinated by Skogforsk. Reports generated by the application can be reached from ViolWeb.

Today, only files from Timbermatic 300 and Haglöf SkalmanPro 4.x can be used. However, Valmet will also soon be ready to generate the updated version of ktr/stm-files.

The following functions will be available by May:

- Automatic updates of reports with new files sent with SDC's transmission program.
- Calculation of exclusion status due to bad measurement
- Possibility to search with machine number (var3_t2) instead of SDC id
- Handling of revision files (M3 measurement)
- Reports for M3-M2
- Alarm report
- Calculation of volume and reports for volume differences

Still some missing functionality due to missing variables in ktr-files:

- Information about rejected stems
- Date/time and reason for calibration (var41-42, var44-45)
- Bark parameters (var113)

- Coordinates (var520-523)

Routines for reading prl- and pri-files at SDC will be tested during the next weeks. This means that SDC very soon will be able to actively use these types of files.

MOBEEL, A CONCEPT FOR IMPROVING DATA COMMUNICATION WITH FOREST MACHINES

Skogforsk has coordinated a project (Mobeel) where a system using intelligent phones and GPRS was tested. The system will improve the possibility of data communication in areas with poor coverage of mobile phones. A presentation was given by Ingemar Eriksson, Skogforsk.

§6 Other issues

No other issues were discussed

§7 Next meeting

Next meeting will take place on Tuesday October 25th, 2005, at Skogforsk in Uppsala, starting at 10.00 a.m. Proposals for the meeting shall be the secretary by hand preferably not later than September 25th 2004.

§8 End of meeting

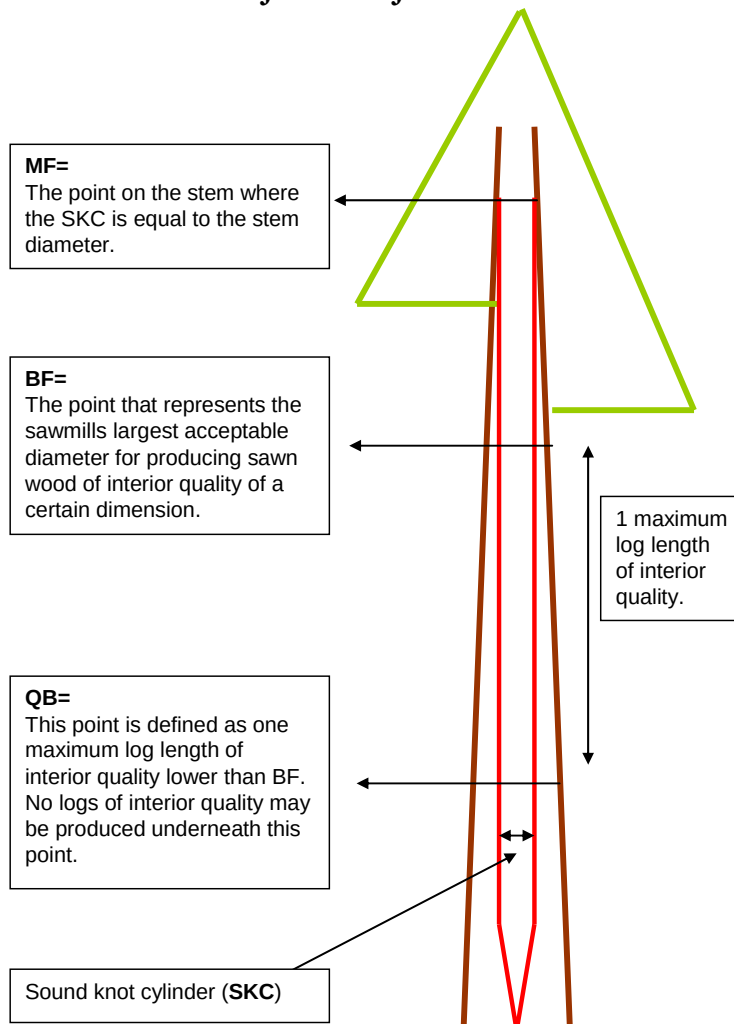
Jan Sondell (chairman) closed the meeting and thanked the group for many years of good cooperation as this was his last meeting as chairman.

Secretary

John Arlinger



PRINCIPALS FOR SOUND KNOT CYLINDER BUCKING OF SPRUCE FROM THE PROJECT "MJØSSKOG 2000"



To determine the point "BF" it is necessary to define the ratio between the size of the sound knot cylinder and the largest acceptable diameter for producing sawn wood of interior quality of a certain dimension.

This ratio is necessary because sawmills are operating in different markets with different specifications to interior quality. Some customers accept dead knots to a certain amount and others don't.

If the ratio is set equal to 1, it means that no dead knots are accepted.

If the ratio is set equal to 1,41, the risk of dead knots is bigger and especially in the corners of the centre block.

The point is that the sawmill must have the possibility to choose in a logic way.

