



Arlinger John

16 June 2021

Minutes StanForD

2021-06-16

Place:	Microsoft Teams (Uppsala), 2021-06-15, 10:00-16:00 CET
Participants:	John Arlinger, Secretary Johan J. Möller, Chairman Jonas Gustafsson, Sveaskog Halvard Olderlund, Komatsu Henrik Persson, Logmax Ian Wilsson, PHD Forest Jeremy Gibson, PHD Forest Jonas Thorsson, Dasa Josh Hildebrand, Tigercat Juha Korhonen, Technion Erik Kindlund, JohnDeere Antti Korkiakoski, JohnDeere Lars Henriksson, Biometria Lars-Erik Andersson, Dasa Heikki Komulainen, Ponsse Mikael Jakas, Logset Mike O'Shea, Coillte Pasi Palonen, Logset Tapio Räsänen, Metsäteho Ronan O'Keefe, Coillte Jean Plamondon, FP Innovation

Decision summary

It was decided to do the following mom-updates:

- Make all down time code elements mandatory and add new “name” attributes.
- Change element name HarvestingHead to Attachment.

- Add new identity elements to code list (CodeListInfo, CodeListVersion, CodeListModificationDate). It was also decided to add these identities also to the mcl-schema.
- Decided re-name UserDefinedCodeList schema to OperationalMonitoringCodeList in order not to mix it up with UserDefinedData, file type to be “mcl” and not “udl”

It is decided with the minutes to do the following mom-updates:

- IndividualMachineWorkTimeKey is added to ShortDownTimes.
- A choice structure is added to the OperatorWorkTimes in order clarify how MachineWorkTimes are to be referenced from OperatorWorkTimes.

It was decided to do the following ogi updates:

- MultiPolygons, MultiLines and MultiPoints should have attribute GISReferenceSystem with unit string. Should be use for EPSG codes.
- Re-modell types for MultiPolygons, MultiLines and MultiPoints so that a basic type does not include Symbol/StyleUserID. This makes it possible to use GeoJson string in situations where styles and symbols are not relevant.
- Descriptions to be updated in ogi-schema and din-schema.
- Alarm coordinates are added to the ogi-schema (decided with the minutes).

It was decided to study possibility of adding “Border polygons” per object and sub-object in the ObjectDefinition. This structure was added to the pre-release schema.

It was decided to continue the discussion at the next meeting regarding the following issues:

- New LimitationCategoryType given that there are some new input.
- Fuel and CO₂ reporting.
- Status on length distribution bucking and MTP.
- Status on DistributionCategory.

Action list (not updated since last meeting):

- The following guidelines should be followed when implementing LongTimberDefinition:

- Must be possible to view and edit LongTimberDefinition in administrative tools.
- Default value equal to DiameterMAXButt in administrative tools
- LongLogButtMAX is never to be included in pin-file if value is 0 (it is optional).
- Value 0 (zero) is to be interpreted as null.
- It is recommended to implement stem codes for both individual trees and groups of trees (so called “sticky registration of stem codes”). Whether the “sticky registration” is trigger by double click or any other operator interaction does not matter.
- Do not mix products and deliveries in forwarder applications.
 - Focus on Deliveries in the UI.
 - Avoid using pin-files since it often creates operator confusion.
- Map interface when creating Locations would be good to avoid incorrect coordinates.
- TextToMachine an urgent variable to be shown when creating new object in harvester and forwarder.
- It is strongly recommended that the control system does not automatically activate a modified pin if it is not active at the present harvesting object
- All randomly selected stems (both rejected and not rejected) must be saved in an hqc-file including a possible reason for rejection. This file should be possible to send directly to the forest company (in Sweden to Biometria).
- Coordinates in production files should always be activated by default in all forest machines (especially important after software updates when coordinate registration is commonly lost).

§1 Opening of meeting and agenda

Chairman Johan J Möller opened the meeting.

No “other issues” were raised.

§2 Presentation of participants

Presentation of meeting participants including a short report on the local weather!

§3 Information about decisions and discussions at previous meetings

- It was decided to publish the new specification for StanForD REST API 1.0.

- It was decided to publishing new yarder and skidder schemas (soi/spr/yoi/ypr) within version 3.6.

DECISIONS MAJOR VERSION 4.0

The following decisions will affect the version 4.0 pre-release schemas:

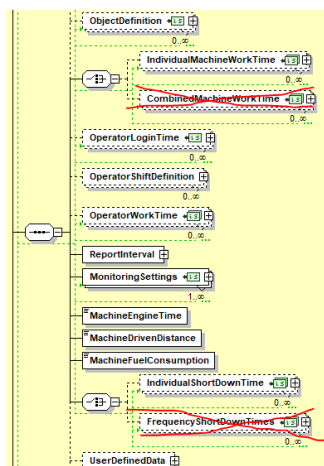
- New simple type to be used for all UserIDs.
- New simple type for LogLengths to include a single fractional digit.
- The xml data type “xsd:unsignedLong” is to be used for all keys (from 0 up to 18446744073709551615).
- Reject the proposal for new Tracking structure and to keep the present layout. The secretary will analyse how to handle Tracking in order to do schema specific adjustments (e.g. fpr vs mom as illustrated in proposal.
- Update the diameter vector.
- Keep StemType structures in pin and spi as it is without any changes.
- Update the StemCode structures for both stem and species group. Also decided that the secretary will clarify rules for handling sticky stem codes.
- Modify the ogi schema including use of a GeoJson string inside element MultiPoint/MultiLine/MultiPolygonGeoJson and to add a new schema called DesignTemplate.
- Exclude combined times and frequency short down times from mom and to develop a new schema for distributing user defined codes for down times and other work.
 - exclude combined times and frequency short down times in mom.
 - develop a new schema for distributing user defined down time codes
 - exclude ShiftKey from the IndividualMachineWorkTime and to discuss how Shift, OperatorWorkTime, Login and MachineWorkTime are related to each other at the next meeting.
- New simple data types for common elements:
 - DiameterType = xsd:positiveInteger
 - VolumeType = nonNegativeDecimal
 - OrderType = xsd:positiveInteger
 - KeyType = xsd:unsignedLong
 - MassType = nonNegativeDecimal
 - LogLengthType = singleDigitNonNegativeDecimal
- Tracking modified so that a message specific Tracking-type is implemented for each type of message.

- StemCode adjusted for registration per stem (in hpr, hqc and bpr). No attribute is included for keeping sticky and non-sticky codes apart.
- Recommendation that a possible “sticky stem code” is not de-activated unless operator selects another sticky stem code or manually de-activates the present sticky stem code. This means that the sticky code is not affected if a “individual stem code” is selected or if a new species group is selected. However, it was decided that “changing Object” must de-activate sticky stem code!
- New elements added to ogi:
 - Extension elements to Feature, FeatureCollection, StyleDefinition, SymbolDefinition.
 - ModificationDate to FeatureCollection, StyleDefinition, SymbolDefinition.
 - FeatureCollectionInfo element to FeatureCollection
 - FeatureInfo element to Feature
 - SymbolUserID element to Warning
- Elements added to mom:
 - OperatorLoginTime is replaced by the OperatorLogInEvent
 - IndividualMachineWorkTimeKey is added to IndividualMachineWorkTime.
- New structure for registering LoadChange added to fpr schema.

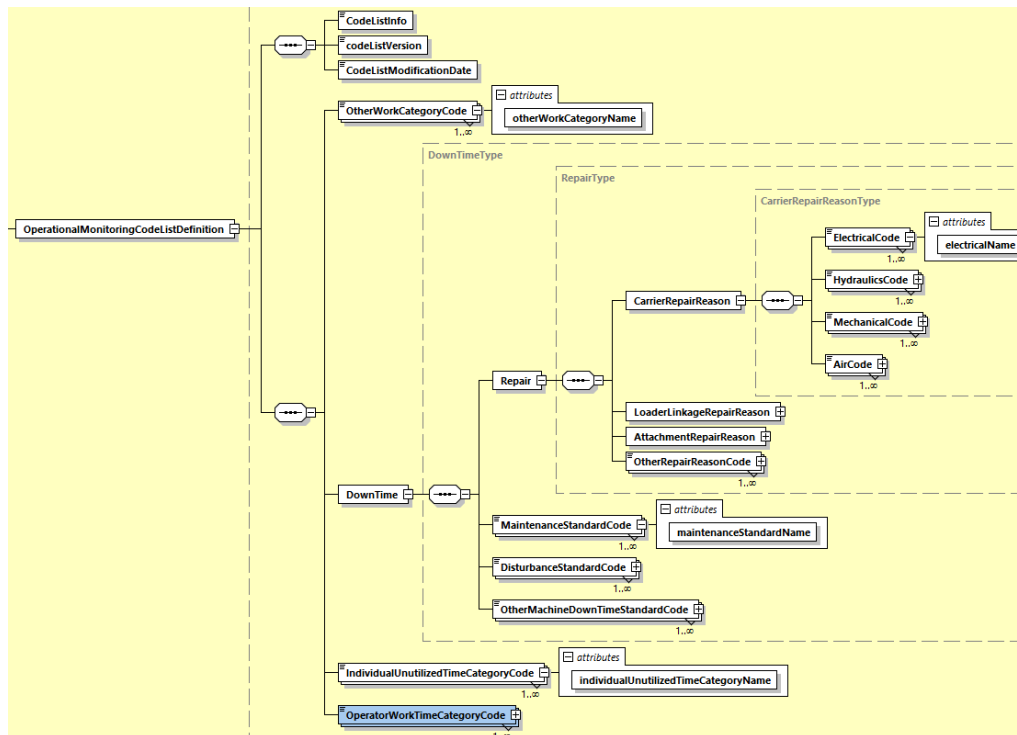
§4 Proposals new major version 4.0

SIGNIFICANT RE-STRUCTURING OF MOM-SCHEMA

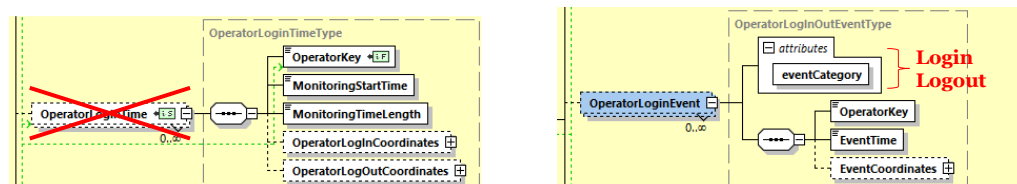
It has been decided (2021-02-07) that CombinedWorkTime and FrequencyShortDownTimes are to be excluded from the mom schema:



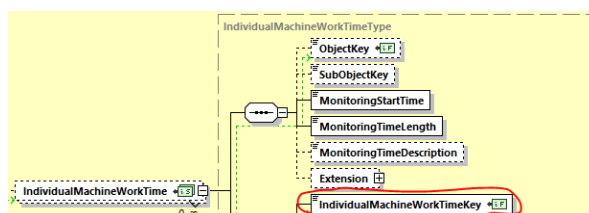
Another improvement is to make it possible to simplify registration of down time reasons. It has been decided to add a new schema (OperationalMonitoringCodeList/mcl) for user defined mom codes as illustrated below. It was decided to update the name of this schema to OperationalMonitoringCodeList at the present meeting. The code list has the same basic structure as is today used in the mom-schema.



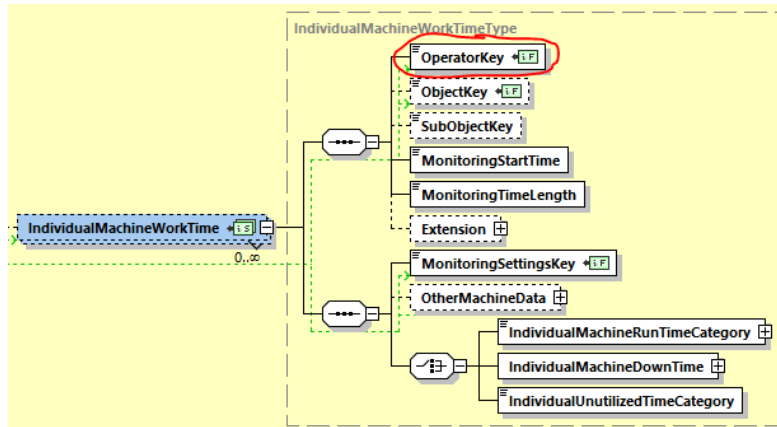
Since there were no objections at the previous meeting it was decided with the previous minutes that the OperatorLoginTime is replaced by the OperatorLogInEvent as illustrated below:



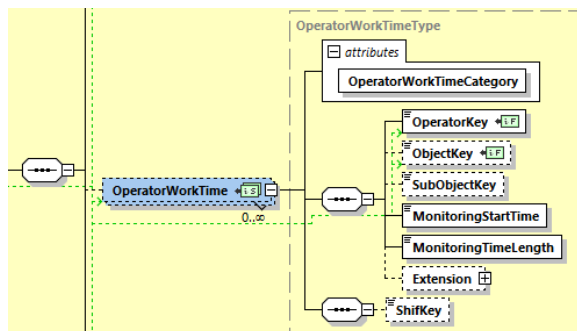
It was also decided with the previous minutes that we add an IndividualMachineWorkTimeKey to IndividualMachineWorkTime as illustrated below:



As a background it should be noted (discussed at last meeting) that the OperatorKey in IndividualMachineWorkTime refers to the operator that registered the time. In some cases it is possible that two different operators are present (e.g. jointly doing maintenance) or no operators are present (repairing done by manufacturer technician).



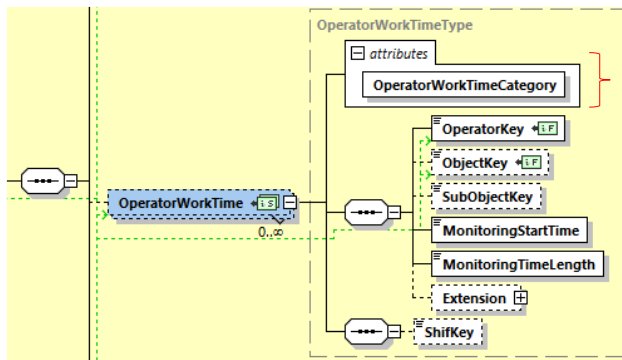
One or several operators can refer to a specific IndividualMachineWorkTime in the present structure for operator work times by registering the value "MachineWorkTime" in OperatorWorkTimeCategory.



The meeting had a long discussion about what type of relationship there should be between OperatorWorkTimes and IndividualMachineWorkTimes.

Today (version 3.6 and below) we have a reference between OperatorWorkTime and IndividualMachineWorkTime using the standardized enumeration value "MachineWorkTime" as illustrated below:

A reference to IndividualMachineWorkTime

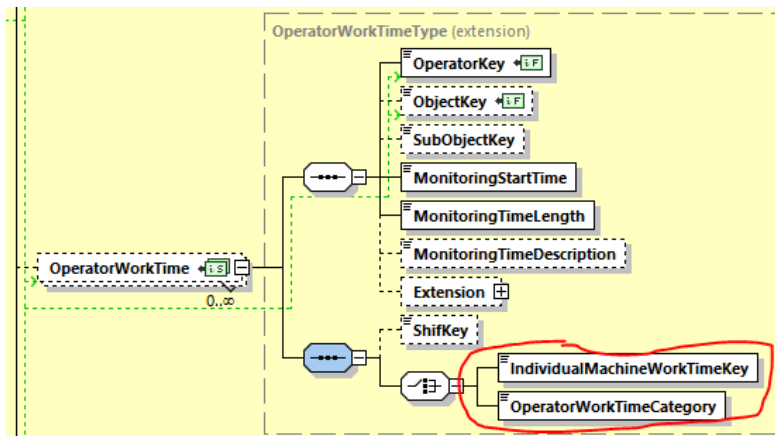


Standardized enumerations:

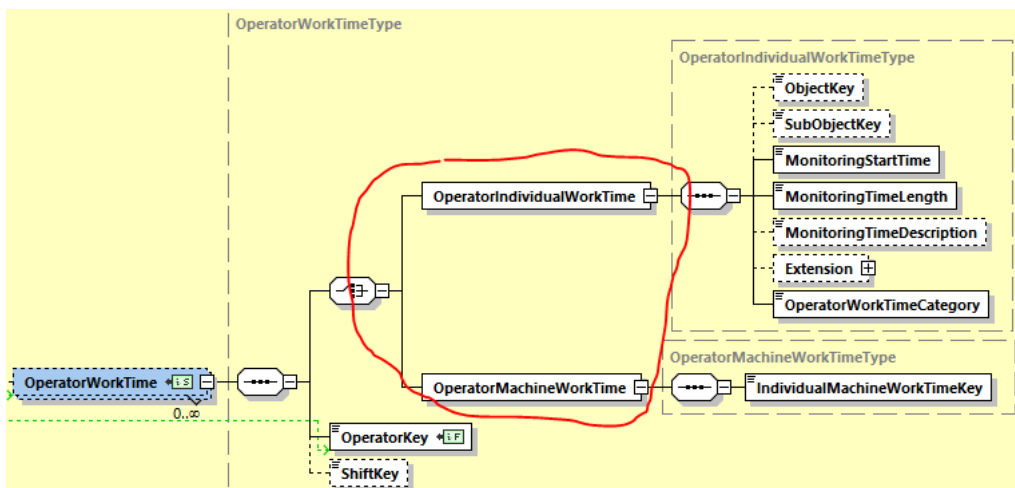
- MachineWorkTime
- Meal break
- Planning outside machine
- Travelling to work outside machine
- Other work outside machine

This reference will not work when implementing the new code list since enumeration value MachineWorkTime may not exist.

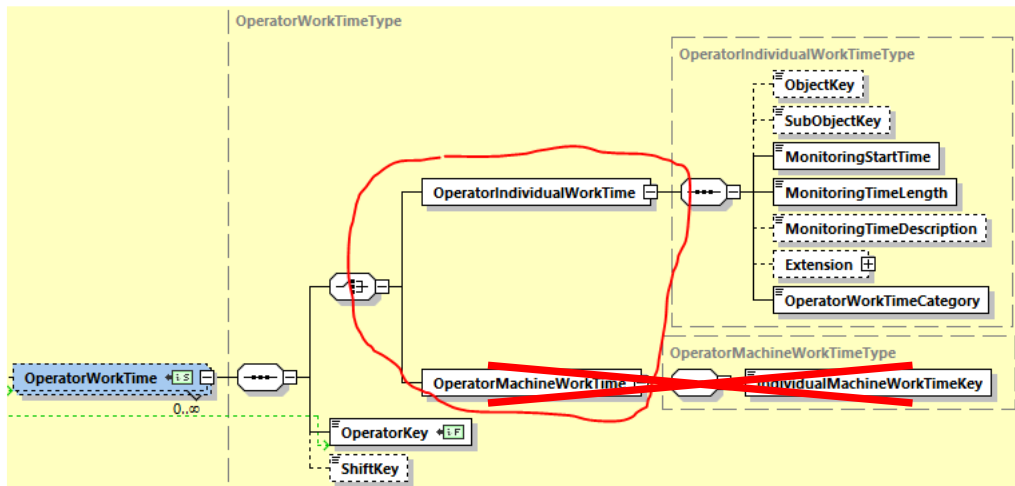
One way of solving this problem is to add IndividualMachineWorkTimeKey to OperatorWorkTime as illustrated below.



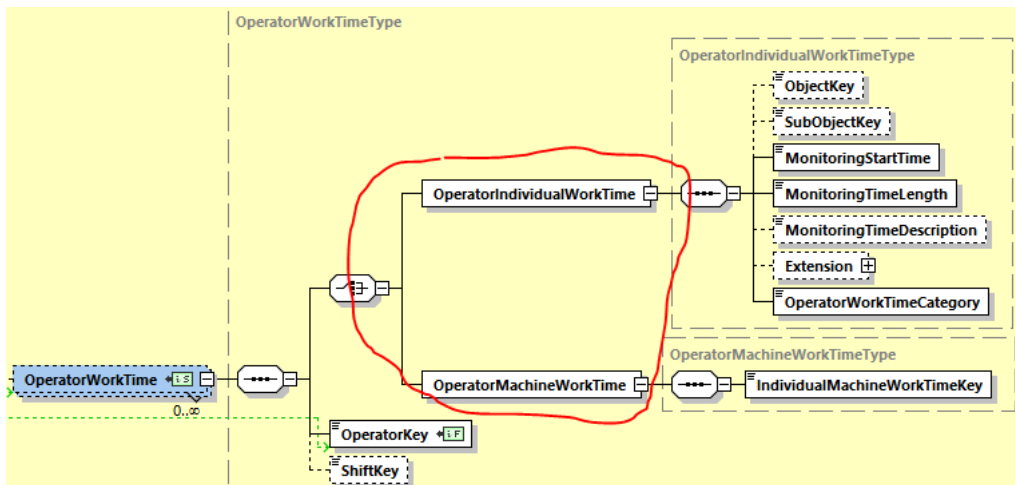
Another solution could be to move the choice upwards as illustrated below:



A third alternative could be to completely delete the reference between OperatorWorkTime and IndividualMachineWorkTime and only use OperatorWorkTimeCategory:



It is decided with the minutes that we start out with the following structure in the next pre-release 4.0 version:



It was suggested by Henrik Persson (2021-06-16) after the meeting that we study the possibility of adding an event describing when mom-application is turned on and off, similar to OperatorLogIn-events. To be discussed at next meeting in September 2021.

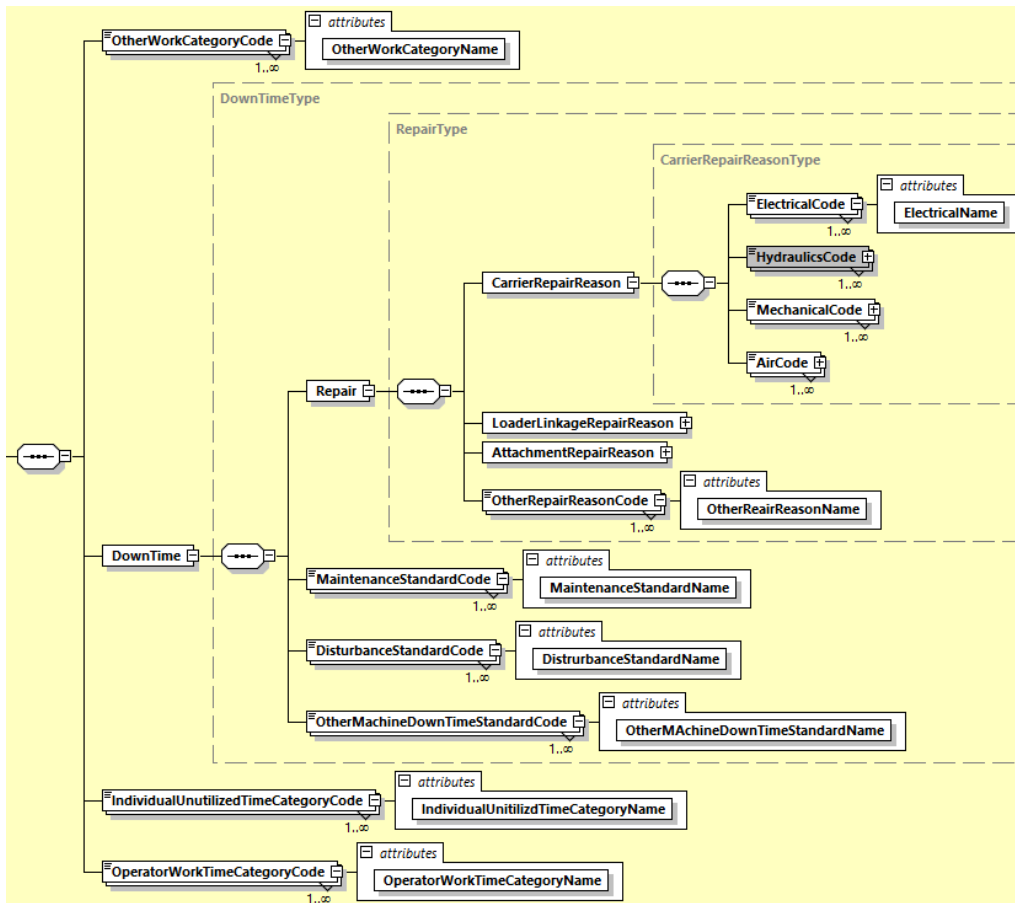
Decisions

It was decided to update the operational monitoring code list as follows:

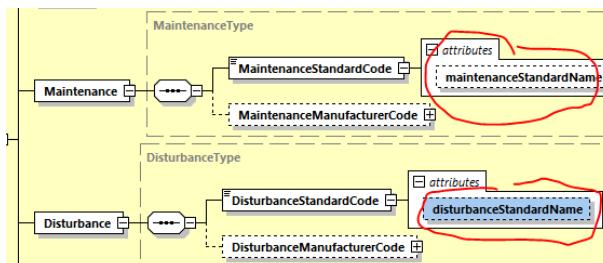
- to make all codes mandatory in OperationalMonitoringCodeList_V4p0.xsd. Add mandatory attribute for the name of the reason ("Name"). Also to be included in mom-file
- To be specified in element descriptions that codes must be unique for a list (e.g. ell OtherWorkCategoryCode elements).
- Change name from "HarvestingHead" to "Attachment" (also in mom)

- Add identity elements (Info/Version/ModificationDate) to the CodeListDefinition. These were previously handled as attributes.
- Rename UserDefinedCodeList to OperationalMonitoringCodeList in order not to mix it up with UserDefinedData, file type to be “mcl” and not “udl”

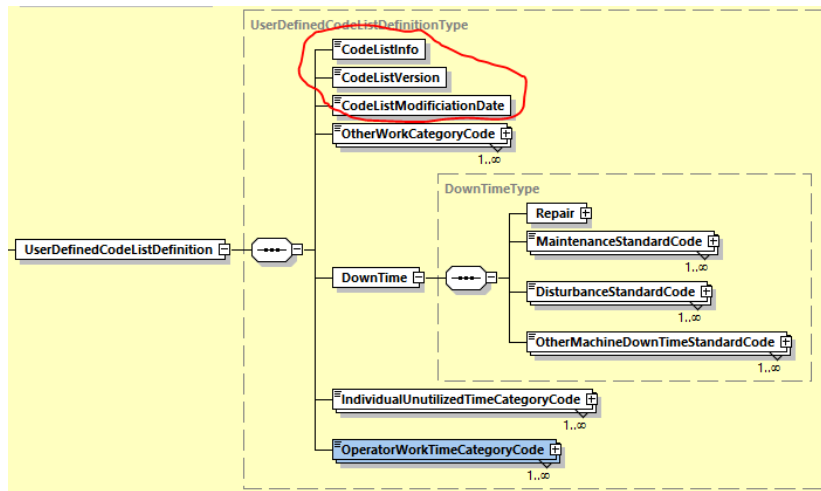
The following figure illustrate the decisions to make all code elements mandatory, to add new “name” attributes and to change element name HarvestingHead to Attachment in code list as illustrated below:



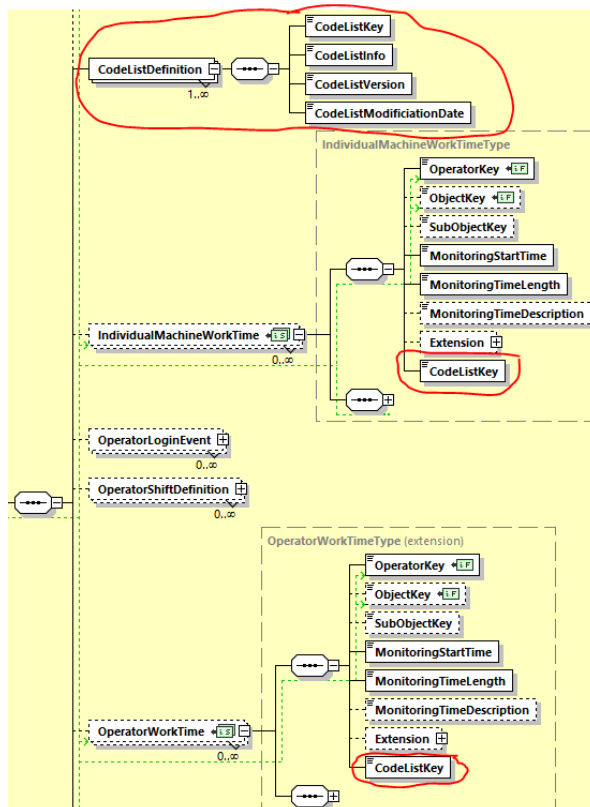
The new “name” attributes in mom are illustrated below:



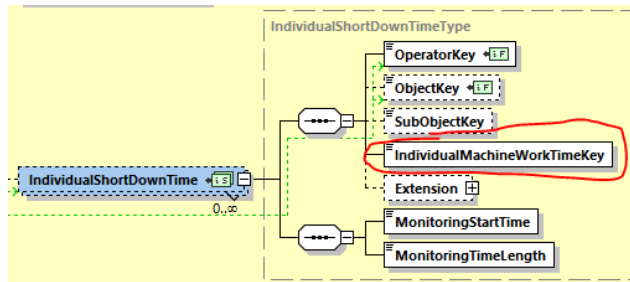
The decision to add identity elements to the code list is illustrated below:



It was also decided to add the relevant code list identities also to the mom-schema (also including CodeListKey in IndividualMachineWorkTime and OperatorWorkTime) in order to make it possible to follow-up what code list has been in use:



It was also decided with the minutes that IndividualMachineWorkTime is added to ShortDownTimes based on a proposal from Heikki Koumolainen, Ponsse:



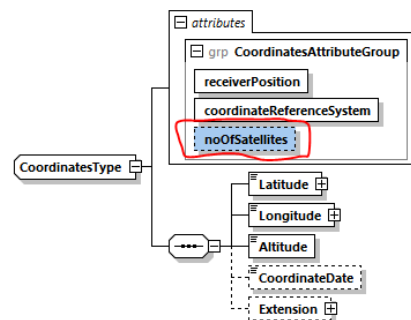
GNSS PRECISION

Patrik Anderchen, Södra (2021-03-18) and Björn Hannrup (2021-06-09).

Quality of coordinates varies significantly depending on a number of different factors such as e.g. hardware, correction and tree canopy. How to analyse and use coordinates depends on the quality of the data, it is thus an advantage to register some quality parameters. Skogforsk is right now studying the possibilities of using available quality parameters.

As a starting point it was suggested that we add a new attribute to CoordinateType (based on the NMEA protocol):

- No of satellites



Attribute name	Data type	Description
NoOfSatellites	Integer	Number of satellites used in the coordinate. From GNSS receiver.

No major objections to the proposal but there were a few questions related to other NMEA precision parameters. It was thus decided to postpone the issue to the next meeting when Björn Hannrup will be present.

BARK FUNCTION

Anders Nylund 2014-04-08.

Exclude country specific names for different bark functions.

Older bark functions excluded.

Postpone, to be dealt with jointly with possible addition of a new bark function in September 2021.

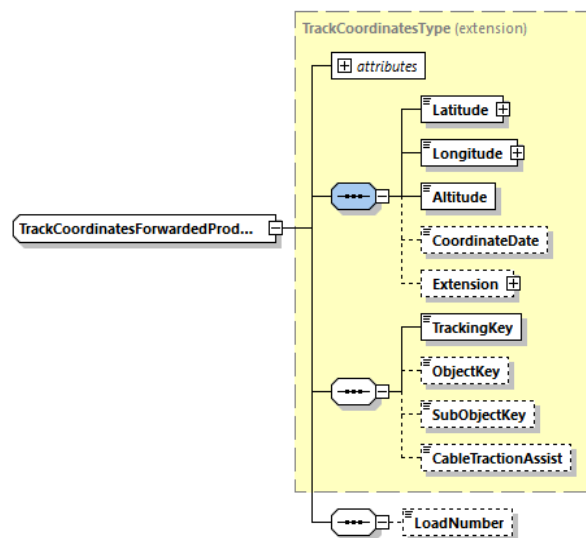
TRACKING

Re-modelling the structure for tracking data has been discussed but it was decided at the previous meeting to keep the basic structure as it is today.

The TrackingType is today located in the common definition. This type is then used e.g. in hpr, fpr, bpr and mom.

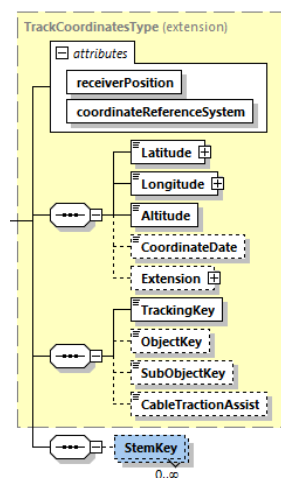
However, we will probably in the future need to use Tracking in different ways in different messages as illustrated below where some elements are relevant only in the mom and other in a possible new scarification message.

It was therefore decided at the previous meeting to modify the Tracking as illustrated below where a Tracking specific for fpr will look like this:

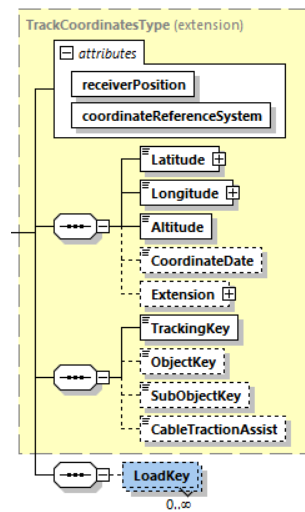


The possibility to add new keys to the tracking structure, as illustrated below, was discussed without making any decisions.

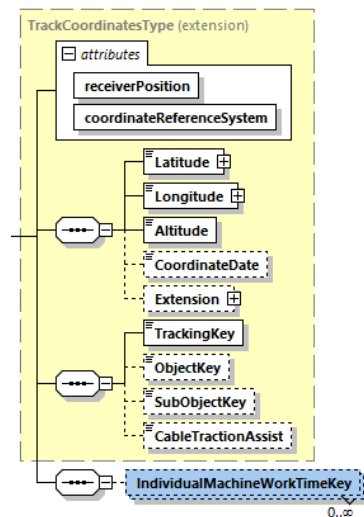
StemKey in hpr tracking:



LoadKey in fpr tracking:

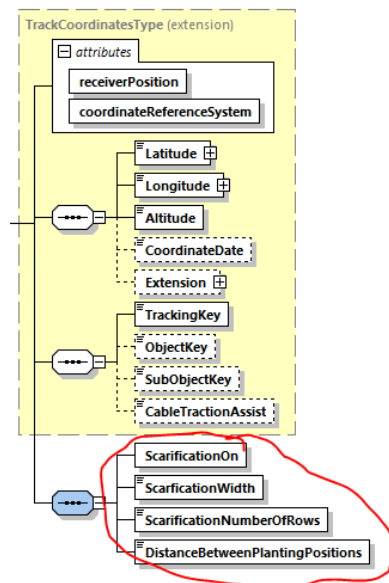


IndividualMachineWorkTime in mom tracking:



The secretary pointed out that several actors have started pushing for new scarification and planting schemas. The secretary is planning to start developing

these types of schemas during the coming year. Below is an illustration of a possible future scarification message based on the tracking structure:



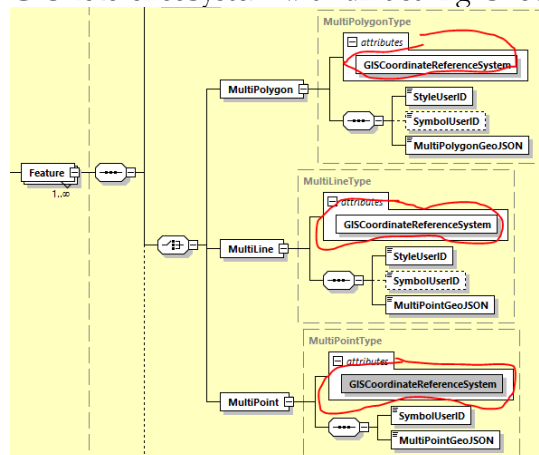
No decisions regarding the tracking structure was made at the meeting.

OGI UPDATES

This issue was not on the original agenda but it was discussed/decided when presenting earlier ogi decisions.

It was decided to do the following updates:

- MultiPolygons, MultiLines and MultiPoints should have attribute GISReferenceSystem with unit string. Should be used for EPSG codes.



- Remodell types for MultiPolygons, MultiLines and MultiPoints so that a basic type does not include Symbol/StyleUserID. This makes it possible to use GeoJson string in situations where styles and symbols are not relevant.

- Descriptions to be updated in ogi-schema:

Name	Description	
FeatureCollectionUserID	Identity per feature collection defined by user of data, normally logging organisation. Useful when sending an updated layer to a machine.	
FeatureCollectionName	Descriptive name of feature collection.	
FeatureCollectionOrder	Order of feature collection as presented in GIS application: For example, 1 is the topmost layer.	
FeatureName	Name of feature.	
FeatureDescription	Text describing feature preproperties if feature, e.g. old mature forest with some broadleaves	
FeatureTreatment	Text describing how feature is to be treated, e.g. cut all small trees, leave oldest trees.	
PhysicallyMarked	Feature physical marked in terrain, eg. painted borders	
Warning	Optional warning (whether machine activities are permitted or not) when passing through/over/into feature.	
WarningDistance	Distance from feature when warning is given to operator, distance in meters.	
WarningDescription	Warning text shown to operator	
SymbolUserID	Identity per Symbol as defined in DIN-file. Set by user of data, normally logging organisation. Do not use a single space or null value. Do not begin or end with a space. Do not include any of the following characters: Double space, Linefeed, carriage return, %, ?, !, gt, :, " (double quote), /, \, , *.	
MultiPolygon	Structure for multipolygon	
GISCoordinateReference-System	Coordinate reference system used for multipolygon/lin/point, codes according to the EPSG database (http://www.epsg.org/). Not used for individual coordinates registered by machine, e.g. per harvested stem or forwarder location.	
StyleUserID	Identity per Style as defined in DIN-file. Set by user of data, normally logging organisation. Do not use a single space or null value. Do not begin or end with a space. Do not include any of the following characters: Double space, Linefeed, carriage return, %, ?, !, gt, :, " (double quote), /, \, , *.	
MultiPolygonGeoJSON	Multi polygon string according to GeoJSON. This example includes required tags: <pre>{ "type": "MultiPolygon", "coordinates": [[[[40.0, 40.0], [20.0, 45.0], [45.0, 30.0], [40.0, 40.0]]], [[[20.0, 35.0], [10.0, 30.0], [10.0, 10.0], [30.0, 5.0], [45.0, 20.0], [20.0, 35.0]], [[30.0, 20.0], [20.0, 15.0], [20.0, 25.0], [30.0, 20.0]]]] }</pre>	

Name	Description	
	}	
MultiLine	Structure for multiline	
MultiLineGeoJSON	This example includes required tags: <pre>{ "type": "MultiLineString", "coordinates": [[[10.0, 10.0], [20.0, 20.0], [10.0, 40.0]], [[40.0, 40.0], [30.0, 30.0], [40.0, 20.0], [30.0, 10.0]]] }</pre>	Update element name
MultiPoint	Structure for multipoint	
MultiPointGeoJSON	Multi point string according to GeoJSON. This example includes required tags: <pre>{ "type": "MultiPoint", "coordinates": [[10, 40], [40, 30], [20, 20], [30, 10]] }</pre>	
BackgroundMap	Structure for background maps, normally e.g. jpg or tif formats	
MapName	Name of background map presented in user interface.	
Order	Order of background maps as presented in GIS application: For example, 1 is the topmost layer. Background maps by default presented behind feature collections.	
MINScale	Min scale per background map. Example, if value is 1500 then min scale for showing present layer is 1:1500.	
MAXScale	Max scale per background map. Example, if value is 10000 then max scale for showing present layer is 1:10 000.	
EmbeddedMap	Background map attachments stored as embedded files.	Use data type EMbeddedType
encodingMethod	The encoding method used to transform compressed binary document to text format. Allowed values: "Base64" and "None"	Use data type EmbeddedType
AttachmentName	The name of the attachment file.	Element rather than attribute
EmbeddedGeoRefMap	Background map attachments stored as embedded files.	
InformationToOperator	Structure for storing directives, including text that describes how the operation is to be carried out.	
WebBrowserFiles	Structure for storing files that can be presented in a web browser, e.g. pdf or html. Typically used in cases where information must be available even if machine is off-line.	
EmbeddedFile	Background map attachments stored as embedded files	
StartFile	Start file to show to operator.	Data type "boolean", make mandatory

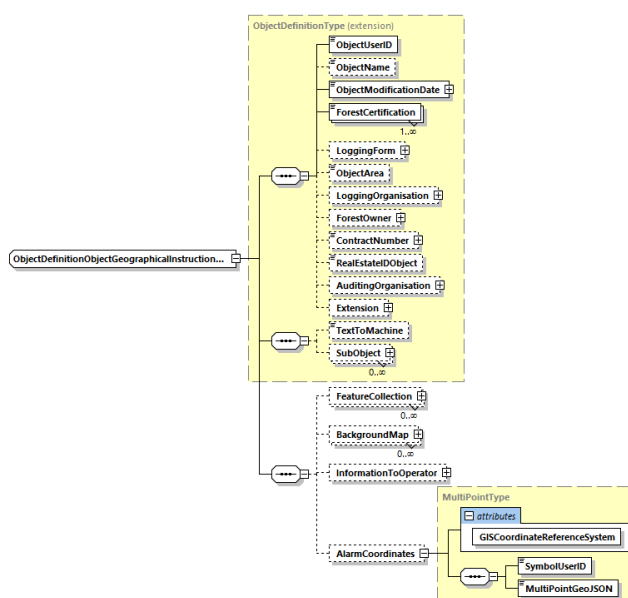
Name	Description	
WebBrowserURL	URL to be presented in web browser component. Only useable when machine is on-line.	

- Descriptions to be updated in din-schema:

Name	Description	
DesignInstructionHeader		
DesignDefinition		
StyleDefinition		
StyleUserID	Identity per Style as defined in DIN-file. Set by user of data, normally logging organisation. Do not use a single space or null value. Do not begin or end with a space. Do not include any of the following characters: Double space, Linefeed, carriage return, %, ?, !, gt, :, " (double quote), /, \, , *.	
Color	Color (RGB) of feature. (Examples: 16711680 = blue, 65280 = green, 255 = red, 0 = black, 16777215 = white)	Data type missing
LineStyle	Line style of feature. Allowed values are: "Solid", "Dash", "Dot", "Dash-Dot", "Double solid" and "HashLine"	Data type missing
LineThickness	Line thickness, no of points, (independently of line style) for feature.	Data type missing
FillStyle	Fill style for feature. Allowed values are: SolidFill, TransparentFill, HorizontalFill, VerticalFill, UpwardDiagonalFill, DownwardDiagonalFill, CrossFill, DiagonalCrossFill, LightGrayFill, GrayFill, DarkGrayFill and HalfTransparentFill	Data type missing
FillOpacity	Fill opacity of feature (0-100%).	Data type missing
TopRendering	Structure for adding colors etc on top of the basic rendering of a geographical feature.	
TopRenderingColor	Color (RGB) of feature. (Examples: 16711680 = blue, 65280 = green, 255 = red, 0 = black, 16777215 = white)	Data type missing
TopRenderingLineStyle	Line style of feature. Allowed values are: "Solid", "Dash", "Dot", "Dash-Dot", "Double solid" and "HashLine"	Data type missing
TopRenderingLineThickness	Line thickness, no of points, (independently of line style) of feature.	Data type missing
TopRenderingFillStyle	Fill style of feature. Allowed values are: SolidFill, TransparentFill, HorizontalFill, VerticalFill, UpwardDiagonalFill, DownwardDiagonalFill, CrossFill, DiagonalCrossFill, LightGrayFill, GrayFill, DarkGrayFill and HalfTransparentFill	Data type missing
TopRenderingFillOpacity	Fill opacity of feature (0-100%).	Data type missing
SymbolDefinition	Structure for embedding symbol files (PNG or SVG)	
SymbolSize	Size of symbol	
EmbeddedSymbol	Symbol attachments stored as embedded files	
pictureFormat	Enumeration values for file formats. Allowed values are: "PNG", "SVG"	

Name	Description	
encodingMethod	The encoding method used to transform compressed binary document to text format. Allowed values: "Base64" and "None"	Use data type EmbeddedType
attachmentName	The name of the attachment file.	Element rather than attribute

- Decided with the minutes that alarm coordinates are added to the ogi-schema:

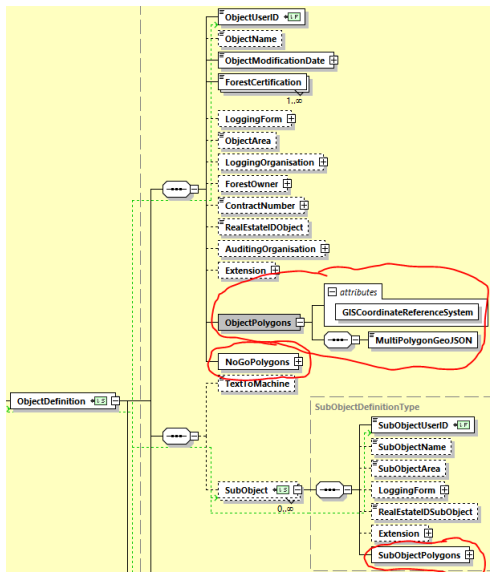


§5 Items for discussion

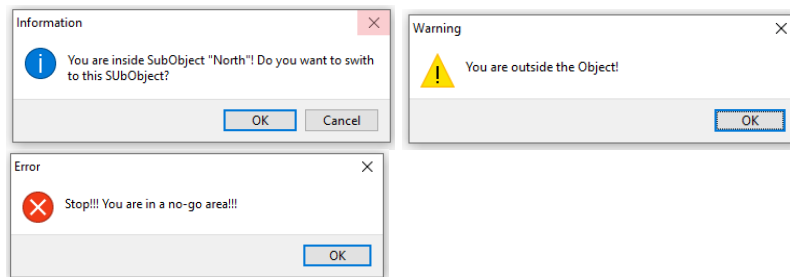
GEOGRAPHICAL DE-LIMITATIONS IN OIN (GEO-FENCING)?

John Arlinger, Skogforsk.

The secretary presented the idea of connecting polygons to Object and SubObject using ObjectUserID and SubObjectUserID in order to open up possibility to automatically switch between different sub-objects in e.g. harvester or feller-buncher. A simple way could be to add a MultiPolygon element under Object and SubObject as well as for “no-go” polygons.



This would make it possible to display messages as illustrated below:

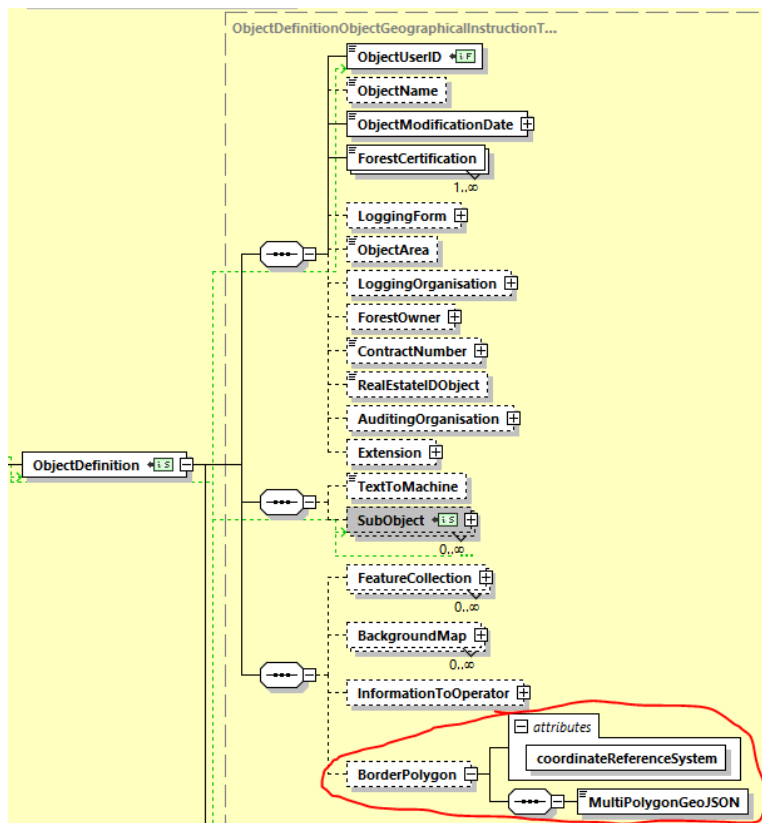


Comments at meeting:

What should be controlled is if the tree position is inside a polygon rather than the harvester position. This will soon be possible with the introduction of better GNSS receivers and boom positioning.

Forwarders frequently move over the “borders” frequently and should do so. This means that there might be plenty of unnecessary warnings.

It was decided to study proposal for “Border polygons” per object and sub-object in the ogi as illustrated below. An update of the SubObject type in ogi would be needed in order to include BorderPolygon also per SubObject.



Observe that a BorderPolygon structure has been added to the pre-release ogi-schema distributed with the minutes.

DIAMETERSECTION

StanForD-meeting 2018-11-20 and Teemu Paldanius, Ponsse, 2018-11-01.

The definition of the DiameterSection is included in the oin sent to the harvester. A number of updates have been decided.

There was also a discussion (2020-12-03) regarding the needs for this type of calculated data since it could very well be calculated using the diameter vector. It was pointed out by the secretary that this type of calculated data would not be added to the standard today but that it is deemed difficult to remove it for historical reasons.

It would be technically quite simple to update the diameter vector to also include a volume for each “length module” as illustrated below using present or new structure:

StemDiameters				
= diameterCategory		Over bark		
<> DiameterMeasured		120		
<> DiameterMeasured		0		
▲ DiameterValue (122)				
	= diameterPosition	= diameterMeasuremen	= volume	Abc Text
1	0	Average	769.8	99
2	10	Average	636.2	90
3	20	Average	608.2	88
4	30	Average	528.1	82

StemDiameters																																									
diameterCategory	Over bark																																								
DiameterMeasuredStartHeight	120																																								
DiameterMeasuredEndHeight	0																																								
DiameterVector																																									
diameterMeasurementCategory	Average																																								
DIA (122)																																									
	<table><tr><th></th><th>POS</th><th>VOL</th><th>Rbc</th><th>Text</th></tr><tr><td>1</td><td>0</td><td>769.8</td><td>99</td><td></td></tr><tr><td>2</td><td>10</td><td>636.2</td><td>90</td><td></td></tr><tr><td>3</td><td>20</td><td>608.2</td><td>88</td><td></td></tr><tr><td>4</td><td>30</td><td>528.1</td><td>82</td><td></td></tr><tr><td>5</td><td>40</td><td>528.1</td><td>82</td><td></td></tr><tr><td>6</td><td>50</td><td>528.1</td><td>82</td><td></td></tr><tr><td>7</td><td>60</td><td>528.1</td><td>82</td><td></td></tr></table>		POS	VOL	Rbc	Text	1	0	769.8	99		2	10	636.2	90		3	20	608.2	88		4	30	528.1	82		5	40	528.1	82		6	50	528.1	82		7	60	528.1	82	
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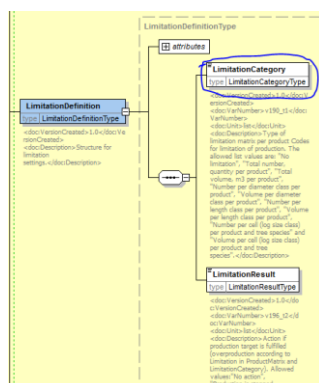
Observe that the last dm-module in the DiameterVector would include volume up to the end of the stem, e.g. the last volume would be based on length 5 cm if last registered diameter is at 2370 cm but the last available measurement is at 2375.

NEW ENUMERATIONS TO LIMITATIONCATEGORYTYPE

Proposal raised by Metsä Group and Stora Enso and prepared by Trimble Forestry (Jyrki Vainio). Discussed at Finnish StanForD meeting 2020-10-29.

Proposal for new type of limitation matrix was discussed. This is done by adding new enumeration values to LimitationCategoryType:

- Relative volume in cell (log class) per total diameter class volume
- Relative number in cell (log class) per total diameter class numbers
- Relative volume in cell (log class) per total product volume
- Relative number in cell (log class) per total product numbers



Action in the bucking system

Intention with the new types is that the quantity of logs to be limited (number or volume of logs). The limitation is to increase as the total quantity of product (or diameter class) increases.

As the total quantity increases, logs that can be cut up to the set limitation percentage according to what has been set in LimitationResult

Example

- Dimensions of log class (cell)
 - length = 310 cm
 - diameter = 150 mm
- LimitationCategoryType = “Percentage of number of logs in cell per diameter class”
- Limitation = 5%

Number of cut logs in diameter class 150 mm	Maximum number of logs allowed to cut in cell (log class 310 cm & 150 mm) according to LimitationCategoryType and Limitation value
20	1
40	2
60	3

Issues to be considered

How does this kind of limitation work in the beginning of the Object? Especially if the quality of the stems is poor. A common technical solution should be specified for this.

Action in the bucking system when a new Object is started or pin is updated? The idea is that the limitation should not be reset when a new object is started with the same pin. How to manage the limitation and distribution matrices of the production over the Objects in two cases?

1. pin is not updated
2. pin is updated

The control system should take into account the previous production after the last update of pin without resetting the limitation matrices when a new object is started.

Machine operators need to understand well how the limitation works in different cases.

It was decided to discuss this issue at the next meeting. It was suggested that a practical test in “the forest” is done by Trimble together with some manufacturer.

Comments at meeting 21-06-15

As far as the secretary understands it the main objective is to minimize the share of manual bucked logs in length classes that has low priority (i.e. lengths that should be avoided).

Traditionally low priority logs often means that:

- The price per m3 is low with the consequence that the optimization will avoid cutting these logs.
- If length distribution is activated the demand matrix usually has a value of 0%
- Either of the following BuckingCriteria values are used:
 - "Forbidden to buck the log even manually“,

- "Only logs bucked manually allowed"

To avoid having large number of low priority logs cut manually it is important to have relevant operator training and feedback regarding proportion of manual cuts. This way the focus will be on the operators with a irregular behaviour.

How to use element LimitationResult together with the present proposal has been discussed. The following two types of enumeration values has been proposed:

- "Production is stopped, forbidden to buck logs, only manually bucked logs allowed"
Comment: With this type of LimitationResult the operator can manually cut as many logs as he/she wants to cut. This means that the main objective cannot be achieved at all.
- "Production is stopped, forbidden to buck logs including manual bucking of logs"
Comment: Cutting "low priority logs" will be impossible when starting a new harvesting object since no or very few logs have been cut if this enumeration value is used.
E.g. at least 50 logs within a diameterclass have to be cut if MAX is 2%.
The maximum limitation will be reached quickly at objects with a large proportion of low quality stems. These are the objects where manually bucking is relevant to use.
The behaviour of the machine will change frequently going between "Allowed" and "Forbidden".
A consequence may be that the operator manually cuts more pulp wood.

The main conclusions from the meeting discussions were that:

- Operator training and feed back is very important. Same problems existed in Sweden but now solved to a large extent due to operator training.
- The proposed solution is complex with uncertain practical consequences. Focus should be on improving the harvester optimization in order to produce a product that is as valuable as possible rather than adjusting the harvester to a simulation tool.
- The meeting suggested that Trimble should do a practical test in the forest together with some machine manufacturer before finalizing the standard solution. That way the new functionality can be tested under practical conditions.
- Skogforsk is more than willing to participate in a physical workshop in Finland where the layout and behavior of Finnish and Swedish systems for bucking simulations can be presented and discussed. Skogforsk would also be happy to present systems for operator feed back and training as well as results from different studies.

FUEL AND CO₂ REPORTING IN HPR AND FPR.

Tapio Räsänen, Metsäteho, 2021-04-16.

There is a growing need in forest industry to report CO₂ emissions of wood supply operations as part of the environmental impacts of the end products

- improvement of environment efficiency
- reporting of emissions per m³ on harvesting object (site level) is required, no need to report on assortment level
- also other operations than harvesting, forwarding and transports must be considered in final analysis
- giving fuel consumption information from contractors to their customers is a sensitive question and does not happen (at least in Finland)

Any discussion around the subject in Swedish industry?

In practice the forest machines may be able to measure and report only the fuel consumption, not emissions (at least in the beginning)

- other emission components should be added as calculated based on emission class of the engine or model of the machine or some other information
- fuel type ?

Aim is that fuel consumption figures would be reported in hpr and fpr files per object and would be linked to other logistics information in forest company systems

Proposal is that the standardization of emission and fuel consumption data is prepared in a StanForD working group

- machine manufacturers, Skogforsk and Metsäteho
- first to look at the technical conditions and reporting possibilities of the machines
- to define common emission measurement and calculation principles and methods
- need for a wider project?

DISTRIBUTION BUCKING AND MULTI TREE PROCESSING

Anders Nylund, Komatsu, 2020-10-02

How to handle MTP-logs when working with distribution bucking? To be used in the algorithm or not?

If we have time the idea is to have a discussion regarding this issue.

Comment from Skogforsk: No need to include MTP-logs in length distribution bucking since there is limited relevance.

Decided to let secretary check with all manufacturers how this issue is handled today. This issue will be discussed at the next meeting.

A questionnaire was distributed to all manufacturers after the meeting. Below are the answers received by 2021-05-04 (so far no answers from JohnDeere and LogSet):

Control system	Is length distribution bucking used on multi-tree-processed (MTP) stems at all?	Are multi-tree-processed (MTP) logs considered when running length distribution? Are they included in the log matrix used for calculating optimal length distribution?
Ponsse Opti	NO - Distribution is not taken in account when calculating optimization in MTH, (pre-defined target length used for MTP). Might affect to single tree processing calculation	YES - logs (from bunch) are registered in distribution follow up matrix. Multi tree processed logs affect STP length optimization.
Technion xLogger	YES – Distribution affects bucking result when multi-tree-processing scaling is active.	NO – MTP logs are not considered and not included in matrix as their number increases
Komatsu MaxiXT	YES – MTP-stems are fully bucked with products on a reference profile so product distribution and limits are in use. It's possible to use different product due to quality if single/multi should differ in distribution.	NO - MultiTree production is not included in distribution and limit data. Distribution and limit are based on single stem data. There is a programmer setting for testing it.
LogMax LogMate	YES – No consideration is paid to whether a stem is MTP or STP when using the distribution logic. Majority of operators use pre-defined target lengths when in MTP.	YES – Logs from MTP handled in the same way as STP.
Dasa Forester	YES, in the same way as STP.	NO, MTP stems are excluded from the log matrix.
JohnDeere Timbermatic		
Logset TOC		

This is not a "super urgent" issue from a Skogforsk perspective since length distribution bucking is of limited interest when doing multi-tree-processing. However it might be a good idea to define a basic recommendation. Based on the answers the most logical recommendation could be that:

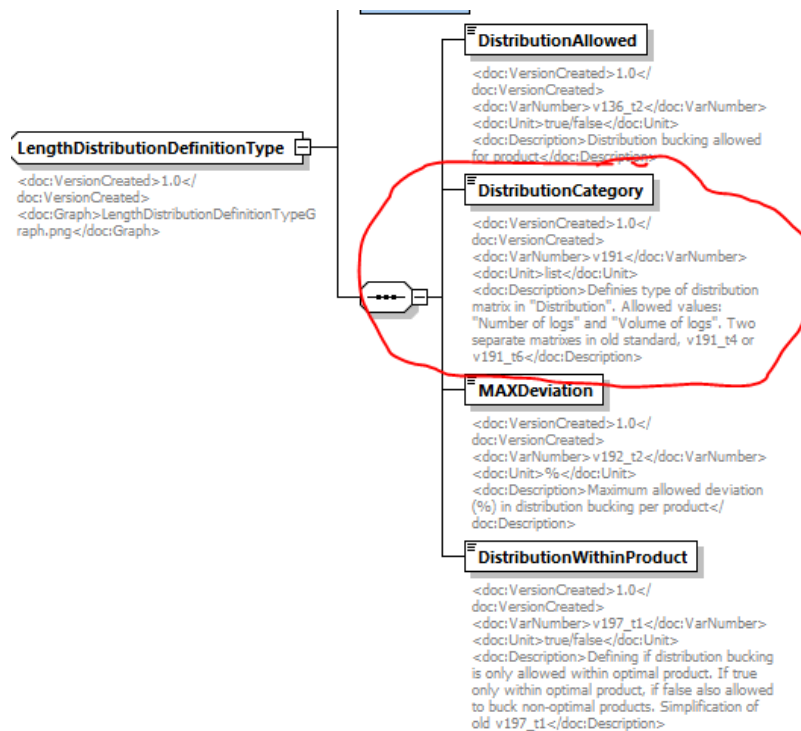
- Length distribution bucking should be used on multi-tree-processed (MTP) stems
- Multi-tree-processed (MTP) logs should be considered when running length distribution. They are not included in the log matrix used for calculating optimal length distribution.

It was decided to send a reminder to JohnDeere and Logset in order to discuss this issue again at next meeting.

DISTRIBUTIONCATEGORY PER PRODUCT

Jonas Gustafsson, 2021-05-27

How is LengthDistributionCategory per product implemented? In old standard one setting for the whole apt-file (var191).



Does your control system allow for using different DistributionCategories for different products?

Control system	DistributionCategory per product
Ponsse	
Technion	YES
Komatsu	YES
LogMax	YES
Dasa	YES
JohnDeere	
Logset	

It was decided to send out a reminder to JohnDeere, Logset and Ponsse before next meeting.

MANUAL MODIFICATION OF LENGTH AND PRODUCT CLASSIFICATION

Issue raised by Henrik Persson, Logmax (2021-06-10)

Henrik has been informed by some Finnish customers that there are Finnish requirements (regulations) that all control systems must make it possible for operator to:

- Manually change the product (ProductKey) of a log after cutting of a log is completed.
- Manually change the log length based on a manual measurement or visual estimation.

Henriks question is if this an official requirement? What are the effects on volume and diameters if log length is changed? Should we make LogMeasurement repeatable and use logMeasurementCategory "Operator"?

There is no such a legal requirements according to Timo Melkas, Metsäteho. Regarding log length it is actually the opposite, it is not allowed to change the log length.

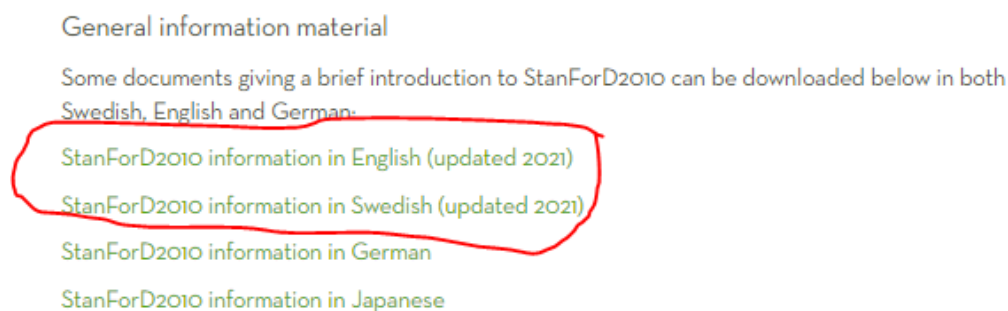
When checking with the other meeting participants it turned out that all manufacturers allow for changing of product until the tree has been completely processed (e.g. "tilt-up" or "knives open"). Only Komatsu have some type of functionality for modifying log lengths.

Henrik Persson may contact Timo Melkas to discuss the issue of modifying log lengths if his Finnish customer persist in I requiring that functionality.

§6 StanForD2010 projects / implementations

NEW STANFORD INFORMATION MATERIAL

The secretary has recently updated the information material available at Skogforsk.se/Stanford :



The major improvements to the English and Swedish versions are that all new members are presented and that tree length machines are now included.

POSSIBLE FORWARDER TEST IN SWEDEN (SVEASKOG AND SKOGFORSK)

Johan Möller presented an idea to arrange a forwarder test in Sweden during late spring 2021. The test will be carried out together with Sveaskog.

The idea is to run the test including the following parts:

1. New object using manual registration of unloaded volume
 - Start with complete Envelope include pre-defined locations.
 - Open and activate updated Delivery (fdi).
2. New object using manual registration of unloaded volume
 - New Delivery (fdi) added
 - Start with new foi without any correctly defined locations
 - Open and activate updated foi (additional Delivery).

- Manually create locations with correct coordinates.
 - Take an updated foi (new delivery added) into use.
3. New object using registration of unloaded mass with scale and testing scale control (fqc) if scale measurements are available
 - Start with new foi using SenderXC
 4. New object using automatic registration of unloaded volume based on hpr-data (if GIS-functionality is available)
 - Start with new foi
 - Control if volume is included in mom
 5. Other tests
 - Control conversion between mass and volume.
 - Check if tracking is included
 - Evaluate GUI for delivery vs product
 - GIS-application (hpr-data presented independently of manufacturer brand)
 - Correct identities in fpr and mom.
 - How is the delivery library working?
 - Registration of negative volumes possible?
 - Simplicity when starting an object with a new foi.
 - Other functionalities that the manufacturer wants to be tested/shown.

§7 Other issues

No other issues.

§8 Next meeting

StanForD meeting 2021-09-15, Teams (10:00-16:00 CET)

StanForD meeting 2021-11-30—12-01, Vantaa or Teams (12:00-14:00 EET)

Possible REST API meeting 2021-08-25, Teams, (13:00-16:00 CET). Experiences from work with version 1.0 and needs for a data-API.

By default, all financially contributing members will receive an Outlook invitation to all meetings in advance.

§9 End of meeting

The chairman thanked everyone for attending the meeting.