Title	**Demonstrate knowledge of analysis techniques and conduct a time study and a delay time study in a forestry operation**		
Level	**5**	**Credits**	**8**

Purpose	People credited with this unit standard are able to: demonstrate knowledge of analysis techniques used in forestry operations; prepare and conduct a time study; interpret and report time study results; prepare and conduct a delay time study; interpret and report a delay time study; and evaluate activity sampling data, for a forestry production process.

Classification	Forestry > Forest Operations Management

Available grade	Achieved

Guidance Information

1 References
British Standard 3138:1992 *Glossary of terms used in management services*, available at http://www.bsigroup.com/en/Standards-and-Publications.
Colley, M. *Forestry handbook / New Zealand Institute of Forestry Inc.* (4th ed). (2005). Christchurch: New Zealand Institute of Forestry Inc.
Future Forests Research. *Business Management for Logging* (2nd edition) (2009) available at https://fgr.nz/documents/business-management-logging-2nd-addition-2009/.
Kanawaty, G. (ed). *Introduction to Work Study.* (4th ed). (1992). Geneva: International Labour office, available from EBSCO NZ Ltd, Private Bag 99914, Newmarket, Auckland 1149, or email: essnz@ebsco.com.

2 Definitions
Method study is the systematic recording and critical examination of existing and proposed ways of doing work as a means of developing and applying easier and more effective methods and reducing costs.
Work measurement is the application of techniques designed to establish the work content of a specified task, and the time required for a qualified worker to carry out that work at a defined level of performance.
Work study includes method study and work measurement.

3 All activities and performance criteria must be carried out in accordance with the reference texts.

Outcome and performance criteria

Outcome 1

Performance criteria

1.1 The relationship between productivity and work study is described.

1.2 The eight-step approach to work study is described.

Range select, record, examine, develop, evaluate, define, install, maintain.

1.3 The critical nature of human factors in the application of work study is described.

1.4 The importance of predetermining the cost benefits and limits of individual method studies is explained.

1.5 Techniques for work measurement are described, and their application is explained.

Range measuring techniques – time study, activity sampling, predetermined motion time systems, estimating.

1.6 Terms used in time study are explained.

Range work cycles, elements, observed time, BS100 rating, qualified worker, basic time, frequency, delay time allowances, standard time.

1.7 For a given forestry operation process, the relevant process analysis tools are identified, and steps used to make improvements are explained.

Outcome 2

Prepare and conduct a time study in a forestry operation.

Performance criteria

2.1 The forestry operation process is broken into appropriate work elements.

2.2 Elements are categorised into time types.

Range time types – productive work elements, delay due to work process, mechanical delay, delay due to relaxation, delay due to personal reasons, breakdown, scheduled delay.

2.3 Time types are distinguished for the worker and the machine.

2.4 The time study sheet is prepared, and time study data are collected.

Outcome 3

Interpret time study results in a forestry operation.

Performance criteria

3.1 Raw time study data are analysed for outliers.

3.2 Raw time study data are transferred to the calculation sheets, and calculations are completed.

Range calculations – average element time, average performance rating, basic element time at standard performance, frequency of occurrence, delay allowances, standard time per element with given delay time allowance, number of cycles used for evaluation, confidence limits for average element time.

3.3 Evaluate the confidence level for the average cycle time results and make recommendations to improve the confidence level.

Outcome 4

Prepare and conduct a delay time study in a forestry operation.

Performance criteria

4.1 The operation is reviewed to identify a constraint that would benefit from a delay time study.

4.2 Timeframes for a delay time study are determined in relation to the purpose of the study and the process being evaluated.

4.3 A plan and worksheet are developed to record people, materials, machines and manufacturing resources, and activities to be recorded.

4.4 Delay time study data are collected.

Outcome 5

Interpret and report a delay time study in a forestry operation.

Performance criteria

5.1 Categories of delay time are identified from the delay time study.

5.2 The proportions of time relative to the identified categories of delay time are calculated and recorded.

5.3 Total delay time allowance is determined from the categories of delay time.

5.4 Analysis identifies and prioritises areas for improvement.

Range a minimum of two areas are to be identified.

Outcome 6

Evaluate activity sampling data for a forestry production process.

Performance criteria

6.1 The number of observations required for a pre-determined accuracy of results is calculated for given data.

6.2 The different time types for activity samples are identified and the proportion of different time types is calculated for given data.

6.3 The confidence levels of the results of the different time type proportions are evaluated, and recommendations to improve the levels of confidence are made.

Planned review date	31 December 2028

Status information and last date for assessment for superseded versions

Process	Version	Date	Last Date for Assessment
Registration	1	16 October 2009	31 December 2017
Review	2	10 December 2015	N/A
Review	3	25 June 2020	N/A
Rollover	4	26 April 2024	N/A

Consent and Moderation Requirements (CMR) reference	0173

This CMR can be accessed at http://www.nzqa.govt.nz/framework/search/index.do.

Comments on this unit standard

Please contact Muka Tangata - People, Food and Fibre Workforce Development Council qualifications@mukatangata.nz if you wish to suggest changes to the content of this unit standard.