



TOPIC 4

STOPWATCH TIME STUDY

Outline

TOPIC 4 : STOPWATCH TIME STUDY

4.1 Equipment and forms

4.2 Time study procedure

4.2.1 Preparation

4.2.2 Data collection

4.2.3 Calculations

Learning Outcome

Upon successful completion of this topic, the student will be able to:

Perform:

- ☑ Time study using stopwatch
- ☑ Calculate cycle time
- ☑ Analyse the time study



TOPIC 4.1 : Equipment and Forms

POWERING AMBITIONS

Time Study Equipments

The following equipment is needed for time study:

- ✓ *Timing device*
- ✓ *Time study observation sheet*
- ✓ *Time study observation board*

Other equipments (pencil, eraser, device like tachometer etc.)

Time Study Equipments



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Timing Devices

- The stop watch is the most widely used timing device used for time study
- Although electronic timer is also sometimes used
- Electronic timer can measure time accurately to the third decimal of a second and can keep a large volume of time data in memory

Timing element

Cumulative Timing

- In this method stop watch runs continuously through out the study.
- Watch is started at first elements of work cycle to be timed and not stopped until whole study is completed
- At the end each element watch reading is recorded.
- Time for each individual element is calculated later by successive subtractions.
- This procedure gives the total time during which job done is recorded in the study

Timing element

Fly back timing

- In this method hands of the watch are return to zero at the end of each element and are allowed to start immediately for next elements.
- Time of each element is obtained directly.
- Time on and time off (study stated/ ended) are also mentioned.
- These are called check times and difference elapsed time
- Sum of all elemental times, ineffective time and check time is called recorded time.

Time Study Observation Sheet

- It is printed form with spaces provided for noting down the necessary information about the operation being studied:
 - Name of operation
 - Drawing number
 - Name of the worker
 - Name of time study person
 - Date and place of study

Time Study Observation Sheet

- Spaces are also provided in the form for writing detailed description of the process (element wise):
 - Recorded time or stopwatch reading s for each element of the process
 - Performance rating (s) of operator
 - Computation

Time Study Board

- It is a light weight board used for holding the observation sheet and stopwatch in position
- It is of size slightly larger than that of observation sheet
- Generally, the watch is mounted near the upper right-hand corner of the board
- The board has a clamp to hold the observation sheet

Time Study Board





TOPIC 4.2 : Time Study Procedure

Time Study Procedure

Step 1 : Define objective of the study. This involves statement of the use of the result, the precision desired, and the required level of confidence in the estimated time standards

Step 2 : Verify that the standard method and conditions exist for the operation and the operation is properly trained.

If need is felt for method study or further training of operator, the same may be completed before starting the time study

Time Study Procedure

- Step 3 : Select operator to be studied if there are more than one operator doing the same task
- Step 4 : Record information about the standard method, operation, operator, product, equipment, and conditions on the Time Study observation sheet
- Step 5 : Divide the operation into reasonably small elements, and record them on the Time Study observation sheet

Time Study Procedure

Step 6 : Time the operator for each of the elements. Record the data for a few number of cycles on the Time Study observation sheet.

To estimate the total number of observations to be taken

Step 7 : Collect and record the data for required number of cycles by timing and rating the operator

Time Study Procedure

Step 8 : Calculated the representative watch time for each element of operation. Multiply it by rating factor to get normal time

Normal time = Observed time x Rating factor

Calculate the normal time for the whole operation by adding the normal time of its various elements.

Time Study Procedure

- Step 9 : Determine allowances for fatigue and various allowances.
- Step 10: Determine standard time of operation.

$$\text{Standard time} = \text{Normal time} \times (1 + \text{allowances}\%)$$