

Title : Workstudy

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Lecture No : 36

Micro-motion Study

➤ *Micro-motion/Therbligs*

✓ *Technique of recording and analyzing the timing of basic elements of an operation*

✓ *Developing best possible pattern of movement; operator performing @ minimum effort and fatigue, for repeated operations*

✓ *Consists of taking motion pictures of the operation with a clock in the picture (or with a video camera running at a known speed)*

Micro-motion Study

➤ *Micro-motion/Therbligs*

✓ *The speed of the camera used ranges from 960 to 1000 frames per minute. But faster cameras may be used to study very fast hand motions or complex operations.*

✓ *Micromotion study should be used when it is economical to do so (short cycle highly repetitive operations, large volume production or operation performed by a large number of workers)*

Micro-motion Study

➤ *Therbligs*

| | |
|---|---|
|  Search |  Use |
|  Find |  Disassemble |
|  Select |  Inspect |
|  Grasp |  Preposition |
|  Hold |  Release Load |
|  Transport Loaded |  Unavoidable Delay |
|  Transport Empty |  Avoidable Delay |
|  Position |  Plan |
|  Assemble |  Rest |

Micro-motion Study

➤ *Therbligs*

- *Search (SH) – attempt to find an object using eyes or hand*
- *Find (F) – mental reaction at end of search*
- *Select (ST) – choose among several objects in a group*
- *Grasp (G) – grasp an object*
- *Hold (H) – hold an object*
- *Transport loaded (TL) – move an object with hand and arm*
- *Transport empty (TE) – reach for an object*
- *Position (P) – position object in defined location*
- *Assemble (A) – join two parts*
- *Use (U) – manipulate a tool*
- *Disassemble (DA) – separate multiple parts that were previously joined*
- *Inspect (I) – determine quality of object*
- *Pre-position (PP) – position object for next operation*
- *Release load (RL) – release control of an object*
- *Unavoidable delay (UD) – waiting due to factors beyond worker control*
- *Avoidable delay (AD) – worker waiting*
- *Plan (PN) – decide on an action*
- *Rest (R) – resting to overcome fatigue*

Micro-motion Study

➤ *Micro-motion study involves the following steps:*

1) Filming the operation to study

2) Analysis of the data from the films

*3) Making recording of the data
(using SIMO chart)*

Micro-motion Study

➤ *SIMO chart format:*
(*Simultaneous Motion cycle chart*)

| Operation : | | Film No. : | | | | | |
|-----------------------------|------------------------------|-------------------|-------------|----------------------|-------------|-------------------|-------------------------------|
| Part drawing No. : | | Chart No. : | | | | | |
| Method : | | Present/Proposed | | Date : | | Charted by: | |
| Operation No. : | | | | | | | |
| <i>Wink counter Reading</i> | <i>Left hand description</i> | <i>Therbligs</i> | <i>Time</i> | <i>Time in 200/m</i> | <i>Time</i> | <i>Therbligs</i> | <i>Right hand description</i> |
| | | | | | | | |

Micro-motion Study

- *Provides a permanent record of motion study on films.*
- *A large number of operators can see the procedure at any time even after the completion of motion study work.*
- *Films can easily reveal the difference between the present and the proposed technique.*
- *Films can be demonstrated to large work force at any desired speed.*
- *It provides very accurate time for each operation or motion in comparison to stop watch time study.*

Micro-motion Study

- *It helps in making detailed and accurate analysis of the prevailing technique.*
- *To study the activities of the machine and the operator.*
- *To impart training to the workers or operators regarding motion; economy so that unnecessary movement by the workers may be avoided.*
- *To study the relationship between the activities of operator and the machine.*
- *To obtain motion time data for developing synthetic time standards for various elements.*

Questions

- Explain the use of therblings in Industrial Engineering.
- What is micro motion study? How it applicable in any organization?