

# **P-PR-011:**

## **Work Standard for Man-hour Control**

Approved by:	Confirmed by:	Prepared by:
P. Bautista	L. Tan	J. Garcia
PE Manager	PE SPV	PE Engineer

Rev. 1.02

**PRODUCTION DEPARTMENT**

- ① Purpose of “**Work Standard for Man-hour control**”
- ② Definition of Terms
- ③ Management of Man Hours
- ④ Definition of Standard Man Hours
- ⑤ Composition of Man Hours
- ⑥ Definition of Man Hour related terms
- ⑦ Management Indexes
- ⑧ Utilizing and Reporting the Process Management Indexes

# ① Purpose of “Work Standard for Man-hour control”

## Purpose

- ✓ To clarify the **relationship** between **actual man-hours** and **standard man-hours** in manufacturing departments and thereby **enable smooth work to control man-hours**.



## ② Definition of Terms

### Standard Time

- The time required for an adequately skilled operator competent for an operation to perform that operation at a normal rate in **predetermined manner** under specified working conditions and under the supervision of a qualified person.
- Standard time is also referred to as “**ST**”.

### SAP

- An integrated management **software application** including a **production management system**.

### Cost Center

- An organizational **unit** for which the **cost is calculated** and managed by the SAP

### Work Area

- An organizational **unit on the SAP** where products are **assembled and processes**.

## ② Definition of Terms

### Direct Department

- A cost center where standard man-hours are spent

### Indirect Department

- A cost center that is not a direct department

### FOB (Free On Board) price

- Product selling price (product purchase price for BIL) for products sold to BIL by the manufacturing plant.
- FOB is calculated for each product 11-digit code based on BIL's calculation logic for product purchase prices including part costs, estimation criteria, and other base unit (forming and machining costs, internal treatment costs, ST, intermediate material costs, etc.).

## ③ Management of Man Hours

At BIUS, BIUK, BISK and Mie Brother, contents of this section shall be separately coordinated with the governing department at BIL.

### **3.1 Scope of Man Hour Management**

All cost centers constituting the manufacturing department are subject to man-hour management, as a rule, and indirect departments belonging to the Manufacturing shall also be included in the scope of man-hour management.

Example:

**(1) Kariya Manufacturing Group:** The man-hour management is performed from this group excluding the indirect personnel (inspection and warehousing).

**(2) When the manufacturing department includes resin forming work:** The man-hour management is performed from the manufacturing department excluding the personnel and man-hours at the molding cost center, as well as the equipment operation rate at the molding cost center.

## ③ Management of Man Hours

### 3.2 Classification of the Personnel

The personnel at the manufacturing department shall be classified according to the tasks in which they are involved, regardless of their titles and duties. Supervisors and substitutes shall be regarded as direct personnel if involved in direct operations.

#### **(1) Direct Personnel**

Performs product assembly, functional inspection or part processing, “direct work” for which the ST has been determined.

#### **(2) Quasi-direct personnel**

- Acting Personnel - Act as substitutes for repairmen or absent direct personnel.
- Serving Personnel
  - : Carry part & materials from a warehouse to a direct work area.
  - : Transfer kit parts.
  - : Carry modules, units, and goods in process.

### ③ Management of Man Hours

- Team leaders and assistant team leaders
  - : Team leaders and assistant, superior and assistant superior team leaders.
  - : Serving team leaders are also included
- Equipment Maintenance Personnel
  - Belongs to the Manufacturing and maintain the equipment.
- Other personnel working in the direct work area as a recorder.

#### (3) Indirect Personnel

- Trainees
  - : Receives education
  - : Direct and quasi-direct personnel being trained on operations.
- Waiting Personnel
  - : Idle direct personnel due to production model change.
  - : Direct personnel who are pregnant and cannot be involved in direct operations.



## ③ Management of Man Hours

: Direct personnel who are acting as substitutes for the retired personnel or become idle due to production quantity variations.

- Clerks and engineers

: Clerical or technical work at an office.

: General affairs personnel

- Chiefs and staffers

- Section managers and assistant section managers (excluding temporarily transferred ones)

### 3.3 Determination of the ST

Shall be determined for each model to be produced at the production site according to P-PR-004 "Standard for Determining Standard Times for Assembly Processes."

ST shall be:

(1) determined by agreement between the general manager of the department in charge of man-hour management at BIL or the person assigned by the relevant manager, and the relevant manager at the production site.

### ③ Management of Man Hours

- (2) registered as a basic unit on the SAP and used to manage man-hours and quote FOB prices, and
- (3) used for a year after **determined during regular review**, as a rule.

**The ST must be changed in the middle of a term when changed for the following reasons:**

- (a) BIL's instructions to:
  - add or delete an inspection process to maintain the quality level, or increase or decrease assembling man-hours to reflect a design change
- (b) A change regarding whether to make or buy a unit
- (c) A reduction of man-hours as a result of investment on the automation **led by direction** from BIL.

## ③ Management of Man Hours

### 3.4 Entering man hour management data

(1) Enter data for each work area every day.

(2) Data to be entered

(a) Production model

: Enter a 9-digit or 11-digit part or product code.

(b) Production quantity

: Complete the final process in the work area and enter the number of products handed over to the subsequent process.

(c) Working time

: The sum of attending hours of all employees and dispatched operators in the work area.

d) Number of persons involved

: The number of all employees and dispatched operators attending to the work area.

(e) Line suspension time

- The time for which the line in the work area is suspended.
- The total time spent for reworking in the work area.

### ③ Management of Man Hours

#### (f) Supporting Time

Sum of working hours of the direct, quasi direct and indirect personnel exchanged beyond the work area according to the workload.

Includes:

- mutual supports with direct departments in another work area,
- supports for indirect departments outside the work area,
- supports by indirect departments in the work area (those for indirect departments in the work area shall be included in lost man-hours, not in the supporting time),
- supports by external services and part time operators, and
- supports for or by other companies and business trips and travels required for tasks related with the production.

## ④ Definition of Standard Man Hours

Is defined as the sum of man hours mentioned in (1), (2), and (3), the latter of which shall be adjusted at the end of each month.

(1)  $\Sigma$  (ST x number of products for each production model)

Sum of STs specified for each production model and multiplied by the respective number of products.

(2) Increase or decrease in stocktaking man-hours

Is calculated by deducting the stocktaking man hours at the beginning of a term from that at the end of that term.

Note: Stocktaking man-hours =  $\Sigma$  (stocktaking quantity x ST x progress number for each production model)  
 where,  $0 < \text{Progress number} < 1$

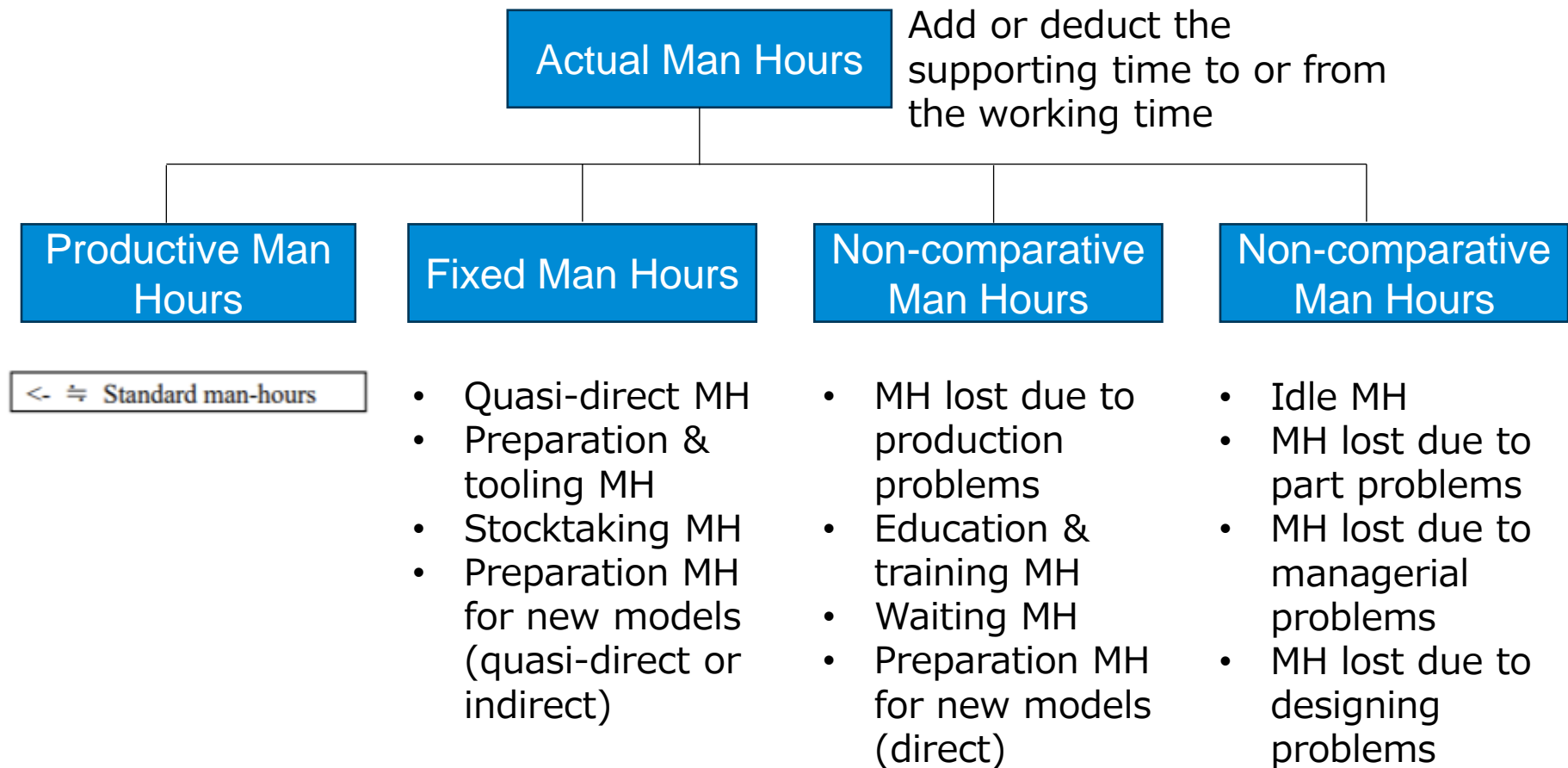
(3) Man-hours deducted from or added to the standard man-hours (at the end of each month)

Man-hours other than (1) and (2) shall be deducted or added as necessary.

The man-hours of (2) and (3) shall be deducted from or added to (1) at the end of each month if determined necessary by the man-hour managing department.

If man-hours of (2) and (3) are much shorter than those of (1), which is often the case at overseas factories, those of (1) may be directly used as standard man-hours.

## ⑤ Composition of Man Hours



### Lost Man Hour

Man Hours lost due to production, part, managerial or designing problems

## ⑥ Definition of Man Hour related terms

### ❖ Actual Man Hours

Sum of working and supporting hours of all direct, quasi-direct and indirect personnel at cost centers constituting the manufacturing department.

### ❖ Productive Man Hours

Man-hours spent by the direct personnel to manufacture a product or part.

### ❖ Fixed Man Hours

Man-hours not directly proportional to the production quantity but almost constantly required.

→ **Quasi-Direct Man Hours:** Sum of working hours of the quasi-direct personnel and those of the indirect personnel excluding education and waiting hours

## ⑥ Definition of Man Hour related terms

- **Preparation and Tooling Man Hours:** Sum of preparation and tooling hours required at the start of work or for lot changes and hours spent to put the work area back into order at completion of work or at the end of each lot.
- **Stocktaking Man Hours:** Sum of man-hours required for stocktaking products and preparation hours spent on the stocktaking and previous days.
- **Preparation man-hours for new models (quasi-direct and indirect):** Sum of man-hours spent by the quasi-direct and indirect personnel to release new models after the start of concurrent engineering at the factory until delivery approval is obtained at the delivery approval meeting.



## ⑥ Definition of Man Hour related terms

### ❖ Non-Comparative Man Hours

Man-hours lost due to a problem attributable to the manufacturing department and man-hours not related with productive activities but required for production.

→ **Man-hours lost due to production problems:** Sum of line suspension hours during production resulting from managerial or operational problems attributable to the manufacturing department.

→ **Education and Training Man Hours:** Sum of education and training hours required for the direct, quasi-direct and indirect personnel to learn skills and techniques & improve their motivation to work.

→ **Waiting Man Hours:** Sum of working times of the waiting personnel.

→ **Preparation Man Hours for New Models (Direct):** The sum of man hours spent by the direct personnel to release new models after the start of concurrent engineering at the factory until delivery approval is obtained at the delivery approval meeting.

## ⑥ Definition of Man Hour related terms

### ❖ Non-Productive Man Hours

Man-hours not directly related with the production or lost due to a problem attributable to a party other than the manufacturing department.

→ **Idle Man Hours**: Sum of Man Hours determined necessary for welfare or occupational management by the company or responsible person and those required for factory relocations planned by the company.

→ **Man Hours lost due to part problems**: Sum of man-hours spent by the manufacturing department to solve part quality problems attributable to a part supplier or another factor.

→ **Man Hours lost due to managerial problems**: Sum of man-hours spent by the designing department to solve problems attributable to the managing department or any of the Group member companies (including BIL).

→ **Man Hours lost due to designing problems**: Sum of man-hours lost by the manufacturing department to solve problems attributable to the development and designing department (including BIL).

## ⑦ Management Indexes

### ❖ Total efficiency

2 indexes: Total efficiency (A) & total efficiency excluding preparation man hours for new models (B)

$$\begin{aligned} \text{Total efficiency (A)} &= \frac{\text{Standard man-hours}}{\text{Actual man-hours}} \times 100 (\%) \\ \text{Total} &= \frac{\text{Standard man-}}{\text{Actual man-hours - preparation man-hours for new models (quasi-direct and indirect) - Preparation man-hours for new models (direct)}} \times 100 (\%) \end{aligned}$$

### ❖ Production efficiency

2 indexes: Production efficiency (indirect) & production efficiency (direct) excluding working hours of the indirect personnel.

$$\begin{aligned} \text{Production efficiency (indirect)} &= \frac{\text{Standard man-hours}}{\text{Actual man-hours - non-productive man-hours}} \times 100 (\%) \\ \text{Production efficiency (direct)} &= \frac{\text{Standard man-hours}}{\text{Actual man-hours - non-productive man-hours - sum of working hours of indirect personnel}} \times 100 (\%) \end{aligned}$$

## ⑦ Management Indexes

### ❖ Direct efficiency

Index representing the working pace or density of the direct personnel at the manufacturing department and used to determine the validity of ST.

$$\text{Direct efficiency} = \frac{\text{Standard man-hours}}{\text{Actual man-hours}} \times 100 (\%)$$

### ❖ Quality loss rate

Index representing the ratio of lost man-hours to actual man-hours at the manufacturing department.

$$\text{Quality loss rate} = \frac{\text{Lost man-hours}}{\text{Actual man-hours}} \times 100 (\%)$$

The **FOB efficiency** is not a process management index but used to calculate the product selling prices.

$$\text{FOB efficiency} = \frac{\text{Standard man-hours}}{\text{Actual man-hours} - \text{lost man-hours} - \text{preparation man-hours for new models}} \times 100 (\%)$$

# ⑦ Management Indexes

## 7.1 Meanings and examples of use of management indexes

Management index		Meaning	Example of use
Total efficiency	Total efficiency (A)	Represents the productivity at the manufacturing department as a whole, including losses not attributable to the manufacturing department (factory).	The general directors administrating the factory and the head of the factory are responsible for those indexes.
	Total efficiency (B)	Represents the productivity (except for new models) at the manufacturing department as a whole, including losses not attributable to the manufacturing department (factory).	
Production efficiency	Production efficiency (indirect)	<b>Represents productivity</b> including losses caused by the indirect personnel and production management and managed by the manufacturing department.	The section managers and general directors administrating the manufacturing department are responsible for this index.
	Production efficiency (direct)	Represents the productivity at the production site including the quasi-direct personnel.	The staff and assistant section managers administrating the production site are responsible for this index.
Direct efficiency		Represents the productivity of direct operations for assembly of products (the production line).	The staff administrating the production line and team leaders in each process are responsible for this index.

## ⑦ Management Indexes

### 7.3 Meanings and examples of use of management indexes

- ❖ **Rate of quasi-direct man hours:** Ratio of working hours of the quasi-direct personnel to standard man hours. It represents the productivity of the quasi-direct personnel.

$$\text{Rate of quasi-direct man-hours} = \frac{\text{Quasi-direct man-hours}}{\text{Standard man-hours}} \times 100 (\%)$$

- ❖ **Total loss rate:** Ratio of lost man hours to standard man hours

$$\text{Total loss rate} = \frac{\text{Man-hours lost due to managerial production problems} + \text{non-productive man-hours}}{\text{Standard man-hours}} \times 100 (\%)$$

# ⑧ Utilizing and Reporting the Process Management Indexes

## 8.1 Annual plan and approximate personnel plan

### Must be observed to make a personnel plan:

- 1) Calculate standard man-hours from the STs for the relevant product and parts and the planned production quantity.
- (2) Calculate necessary man-hours based on calculated management indexes to attain productivity improvement targets.
- (3) Establish a staffing plan based on necessary man-hours.

## 8.2 Reporting man hours at the factory

The responsible person shall:

- Explain the monthly productivity to the manager in charge of manufacturing at the location using calculated man-hours and management indexes.
- Report monthly results, targets and differences from results in the previous month and the manager in charge of manufacturing at the location shall instruct additional improvements and review the improvement plan as necessary.

# ⑧ Utilizing and Reporting the Process Management Indexes

## **8.3 Reporting to BIL**

The manager in charge of manufacturing at the location shall:

→ Have man-hour management data in each month confirmed by the fifth operating day in the next month and report it to the general manager of the responsible department at BIL.

→ Notify the responsible department at BIL when changing the scope of man-hour management or any management index.



**brother**  
at your side