

Logo

Name of Institution

# **Standardize and sustain 3S**

## **NTQF Level II**

# Learning Guide #1

**Unit of Competence:**    **Standardize and sustain 3S**  
**Module Title:**            **Standardizing and sustaining 3S**  
**LG Code:**                  **---2 M 02 L01- 03**  
**TTLM Code:**              **TTLM 0715v1**

## **L0 1: Prepare for work**

Learning Guide for Standardize and Sustain 3S Level II Version: 1    Revision: 0	Date: July 2015	Page 1 of 64
	Author EKl/MoE – TVET Outcome Based Training Core Process	

This learning guide is developed to provide you the necessary information regarding the following content coverage and topics –

- Job requirements
- OHS requirements
- Tools and Equipment Preparation for 3S
- 3S Implementation

This guide will also assist you to attain the learning outcome stated in the cover page. Specifically, upon completion of this Learning Guide, you will be able to –

- Use work instruction, work manual and job requirements.
- Use OHS requirements (Safety policies /Legislation/ regulations/codes of practice, Safe operating procedures, Emergency procedures, Personal protective equipment).
- Prepare tools and equipment for sorting, set in order and shining activities.
- Check if 3S is implemented.

**Learning Instructions:**

1. Read the specific objectives of this Learning Guide.
2. Follow the instructions described in number 3 to 15.
3. Read the information written in the “Information Sheets 1”. Try to understand what are being discussed. Ask your trainer for assistance if you have hard time understanding them.
4. Accomplish the “Self-check 1” in page 07.
5. Ask from your trainer the key to correction (key answers) or you can request your trainer to correct your work. (You are to get the key answer only after you finished answering the Self-check 1).
6. If you earned a satisfactory evaluation proceed to “Information Sheet 2”. However, if your rating is unsatisfactory, see your trainer for further instructions or go back to Learning Activity #1.
7. Submit your accomplished Self-check. This will form part of your training portfolio.
8. Read the information written in the “Information Sheet 2”. Try to understand what are being discussed. Ask your trainer for assistance if you have hard time understanding them.
9. Accomplish the “Self-check 2” in page 15.
10. Ask from your trainer the key to correction (key answers) or you can request your trainer to correct your work. (You are to get the key answer only after you finished answering the Self-check 2).

11. Read the information written in the “Information Sheets 3. Try to understand what are being discussed. Ask you trainer for assistance if you have hard time understanding them.
12. Accomplish the “Self-check 3” in page 21.
13. Ask from your trainer the key to correction (key answers) or you can request your trainer to correct your work. (You are to get the key answer only after you finished answering the Self-check 3).
14. Read the information written in the “Information Sheets 4. Try to understand what are being discussed. Ask you trainer for assistance if you have hard time understanding them.
15. Accomplish the “Self-check 4” in page 54.
16. Ask from your trainer the key to correction (key answers) or you can request your trainer to correct your work. (You are to get the key answer only after you finished answering the Self-check 3).
17. If you earned a satisfactory evaluation proceed to “Operation Sheet 1” in page 58. However, if your rating is unsatisfactory, see your trainer for further instructions or go back to Learning Activity #1.
18. Do the “LAP test” in page 63 (if you are ready). Request your trainer to evaluate your performance and outputs. Your trainer will give you feedback and the evaluation will be either satisfactory or unsatisfactory. If unsatisfactory, your trainer shall advice you on additional work. But if satisfactory you can proceed to Learning Guide #8.

Information Sheet-1	Job Requirements
---------------------	------------------

## Job Requirements

A Job can be defined as:

- A piece of work, especially a specific task done as part of the routine of one's occupation or for an agreed price.
- A post of employment; full-time or part-time position
- Anything a person is expected or obliged to do; duty; responsibility
- An affair, matter, occurrence, or state of affairs.
- The material, project, assignment, etc., being worked upon.
- The process or requirements, details, etc., of working.
- The execution or performance of a task.

The requirements for a job vary according to the nature of the job itself. However, a certain work ethic must be cultivated to succeed in any job and this is fundamental to an individual's sense of himself as a worker, as part of production relations and a fundamental economic being. The basic requirements for a job remain the same no matter what the job is, where it is located or what professional and educational qualifications are required for it. These are as follows:

**Discipline:** Nothing is possible without discipline. Any job requires a fundamental core of discipline from the worker or the employee and this is a quality which is independent of age, post, stature, job and so on. Discipline is absolutely indispensable and provides the impetus for work that can be strenuous, repetitive, boring and even unsatisfactory at times.

**Enthusiasm:** Enthusiasm for work is also a pre-requisite for any job. An innate love for the job, which in modern parlance is known as job satisfaction, is a core requirement for any job. The drive to succeed, to innovate, to do well and to make one's profession into one's livelihood is a critical drive which needs to be present in the employee or cultivated as soon as possible. No job, however perfectly carried out, can evoke the feeling of satisfaction of a job well done without the instinct for success.

**Qualifications:** This is a more material, tactile need for a job which can be conveyed through degrees and certificates. However education is not limited to what is taught in colleges or vocational training courses. It is the burning desire to learn more, to reach the depths of knowledge about a particular field of interest, to complete the job and learn from it that marks the true enthusiast and the truly learned.

**Soft Skills:** Soft skills include those skills which ensure that a job is executed well, and the employee can carry himself in the proper manner too. For example, good and smooth communication, computer skills, proficiency in language if needed, presentable appearance, the ability to manage crises are all soft skills which are fundamentally important in any job and which must be cultivated consciously.

Learning Guide for Standardize and Sustain 3S Level II Version: 1      Revision: 0	Date: July 2015	Page 4 of 64
	Author EKI/MoE – TVET Outcome Based Training Core Process	

Thus, the requirements of a job, though specific to it, cover also a general spectrum. These make for better employees and better individuals.

## 1. Work Instruction

### Information about the work

- Describe what workers need to be able to do on the job
  - Work functions
  - Key activities of each work function
  - Performance indicators
- Describe what task to be done or work roles in a certain occupation

Work instruction is a description of the specific tasks and activities within an organization. A work instruction in a business will generally outline all of the different jobs needed for the operation of the firm in great detail and is a key element to running a business smoothly.

In other words it is a document containing detailed instructions that specify exactly what steps to follow to carry out an activity. It contains much more detail than a Procedure and is only created if very detailed instructions are needed. For example, describing precisely how a Request for Change record is created in the Change Management software support tool.

### Procedures vs. Work Instructions

Many people confuse “procedures” with “work instructions”. In fact, most people write work instructions and call them procedures. Knowing the differences of procedures vs work instructions can help you understand the documentation process much better and, therefore, procedure documentation.

Procedures describe a process, while a work instruction describes how to perform the conversion itself. Process descriptions include details about the inputs, what conversion takes place (of inputs into outputs), the outputs, and the feedback necessary to ensure consistent results. The PDCA process approach (Plan, Do, Check, Act) is used to capture the relevant information.

Questions that need to be answered in a procedure include:

- Where do the inputs come from (suppliers)?
- Where do the outputs go (customers)?
- Who performs what action when (responsibilities)?
- How do you know when you have done it right (effectiveness criteria)?
- What feedback should be captured (metrics)?
- How do we communicate results (charts, graphs and reports)?
- What laws (regulations) or standards apply (e.g., ISO 9001, 8th EU Directive, IFRS, Sarbanes-Oxley)?

Learning Guide for Standardize and Sustain 3S Level II Version: 1      Revision: 0	Date: July 2015	Page 5 of 64
	Author EKI/MoE – TVET Outcome Based Training Core Process	

### Job Specification

A statement of employee/workers characteristics and qualifications required for satisfactory performance of defined duties and tasks comprising a specific job or function.

### Specification Sample

Technical parameters	Gigabyte 3D Rocket II (GH-PCU23-VE)
Heatsink and fan dimensions (L x W x H)	112mm x 112mm x 160mm 92mm x 92mm x 25mm
Heatsink material	aluminum plates on a copper base and four copper heatpipes 6mm in diameter
Fan rotation speed	~1500-3000rpm
Airflow	no data
Noise level	16.0 ~ 33.5 dBA
Nominal voltage	~12V
Fan MTBF	50,000h
Maximum power consumption	~4.6W
Fan bearings	2 frictionless bearings
Full weight	640g
Supported CPU sockets	Socket 478, LGA 775, Socket AM2/754/939/940
Additional	Additional fan in the lower part of the cooler Gigabyte thermal grease Replaceable fluorescent rings
Price, USD	\$60

<b>Work Manual Self-Check 1</b>	<b>Written Test</b>
---------------------------------	---------------------

**Directions:** Answer all the questions listed below. Use the Answer sheet provided in the next page:

1. What is job (1 point)
2. What is a job requirement? (2 points)
3. List the requirements of job. (5 points)
4. What is work? (2 points)
5. Describe work instruction by your own words. (5 points)
6. Describe the difference between procedure and work instruction? (5 points)
7. Define job specification? (2 points)
8. Prepare specification samples (10 points)

**Note: Satisfactory rating - 18points                      Unsatisfactory - below 18 points**  
 You can ask you trainer for the copy of the correct answers.

Learning Guide for Standardize and Sustain 3S Level II Version: 1      Revision: 0	Date: July 2015	Page 7 of 64
	Author EKII/MoE – TVET Outcome Based Training Core Process	

## Answer Sheet

Score = \_\_\_\_\_

Rating: \_\_\_\_\_

Name: \_\_\_\_\_

Date: \_\_\_\_\_

### Short Answer Questions

1. \_\_\_\_\_

\_\_\_\_\_

2. \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

3. \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

4. \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

5. \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

6. \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

7. \_\_\_\_\_

\_\_\_\_\_



8. \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

## **OHS Requirements**

OHS requirements are legislation/regulations/codes of practice and enterprise safety policies and procedures. This may include protective clothing and equipment, use of tooling and equipment, workplace environment and safety, handling of material, use of firefighting equipment, enterprise first aid, hazard control and hazardous materials and substances.

Personal protective equipment include those prescribed under legislation/regulations/codes of practice and workplace policies and practices. Safe operating procedures include the conduct of operational risk assessment and treatments associated with workplace organization. Emergency procedures include emergency shutdown and stopping of equipment, extinguishing fires, enterprise first aid requirements and site evacuation.

Occupational safety and health (OSH) also commonly referred to as occupational health and safety (OHS) or workplace health and safety (WHS) is an area concerned with the safety, health and welfare of people engaged in work or employment. The goals of occupational safety and health programs include fostering a safe and healthy work environment. OSH may also protect co-workers, family members, employers, customers, and many others who might be affected by the workplace environment. In the United States the term occupational health and safety is referred to as occupational health and occupational and non-occupational safety and includes safety for activities outside work.

Occupational safety and health can be important for moral, legal, and financial reasons. In common-law jurisdictions, employers have a common law duty (reflecting an underlying moral obligation) to take reasonable care for the safety of their employees. Statute law may build upon this to impose additional general duties, introduce specific duties and create government bodies with powers to regulate workplace safety issues: details of this will vary from jurisdiction to jurisdiction. Good OSH practices can also reduce employee injury and illness related costs, including medical care, sick leave and disability benefit costs.

As defined by the World Health Organization (WHO) "occupational health deals with all aspects of health and safety in the workplace and has a strong focus on primary prevention of hazards." Health has been defined as "a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity. Occupational health is a multidisciplinary field of healthcare concerned with enabling an individual to undertake their occupation, in the way that causes least harm to their health. It contrasts, for example, with the promotion of health and safety at work, which is concerned with preventing harm from any incidental hazards, arising in the workplace.

Since 1950, the International Labour Organization (ILO) and the World Health Organization (WHO) have shared a common definition of occupational health. It was

adopted by the Joint ILO/WHO Committee on Occupational Health at its first session in 1950 and revised at its twelfth session in 1995. The definition reads: "The main focus in occupational health is on three different objectives: (i) the maintenance and promotion of workers' health and working capacity; (ii) the improvement of working environment and work to become conducive to safety and health and (iii) development of work organizations and working cultures in a direction which supports health and safety at work and in doing so also promotes a positive social climate and smooth operation and may enhance productivity of the undertakings. The concept of working culture is intended in this context to mean a reflection of the essential value systems adopted by the undertaking concerned. Such a culture is reflected in practice in the managerial systems, personnel policy, principles for participation, training policies and quality management of the undertaking."

Joint ILO/WHO Committee on Occupational Health: those in the field of occupational health come from a wide range of disciplines and professions including medicine, psychology, epidemiology, physiotherapy and rehabilitation, occupational, occupational medicine, human factors and ergonomics, and many others. Professionals advise on a broad range of occupational health matters. These include how to avoid particular pre-existing conditions causing a problem in the occupation, correct posture for the work, frequency of rest breaks, preventative action that can be undertaken, and so forth.

"Occupational health should aim at: the promotion and maintenance of the highest degree of physical, mental and social well-being of workers in all occupations; the prevention amongst workers of departures from health caused by their working conditions; the protection of workers in their employment from risks resulting from factors adverse to health; the placing and maintenance of the worker in an occupational environment adapted to his physiological and psychological capabilities; and, to summarize, the adaptation of work to man and of each man to his job.

## History



Harry McShane, age 16, 1908. Pulled into machinery in a factory in Cincinnati and had his arm ripped off at the shoulder and his leg broken without any compensation.

The research and regulation of occupational safety and health are a relatively recent phenomenon. As labor movements arose in response to worker concerns in the wake of the industrial revolution, worker's health entered consideration as a labor-related issue.

Learning Guide for Standardize and Sustain 3S Level II Version: 1      Revision: 0	Date: July 2015	Page 11 of 64
	Author EKI/MoE – TVET Outcome Based Training Core Process	

In 1833, HM Factory Inspectorate was formed in the United Kingdom with a remit to inspect factories and ensure the prevention of injury to child textile workers. In 1840 a Royal Commission published its findings on the state of conditions for the workers of the mining industry that documented the appallingly dangerous environment that they had to work in and the high frequency of accidents. The commission sparked public outrage which resulted in the Mines Act of 1842. The act set up an inspectorate for mines and collieries which resulted in many prosecutions and safety improvements, and by 1850, inspectors were able to enter and inspect premises at their discretion.

Otto von Bismarck inaugurated the first social insurance legislation in 1883 and the first worker's compensation law in 1884 – the first of their kind in the Western world. Similar acts followed in other countries, partly in response to labor unrest.

## Workplace hazards

Although work provides many economic and other benefits, a wide array of workplace hazards also present risks to the health and safety of people at work. These include "chemicals, biological agents, physical factors, adverse ergonomic conditions, allergens, a complex network of safety risks," and a broad range of psychosocial risk factors.

## Physical and mechanical hazards



At-risk workers without appropriate safety equipment

Physical hazards are a common source of injuries in many industries. They are perhaps unavoidable in certain industries, such as construction and mining, but over time people have developed safety methods and procedures to manage the risks of physical danger in the workplace. Employment of children may pose special problems. Falls are a common cause of occupational injuries and fatalities, especially in construction, extraction, transportation, healthcare, and building cleaning and maintenance.

An engineering workshop specializing in the fabrication and welding of components has to follow the Personal Protective Equipment (PPE) at work regulations 1992. It is an employer's/workers duty to provide 'all equipment (including clothing affording protection against the weather) which is intended to be worn or held by a person at work which protects him against one or more risks to his health and safety'. In a fabrication and welding workshop an employer would be required to provide face and eye protection, safety footwear, overalls and other necessary PPE.

Machines are commonplace in many industries, including manufacturing, mining, construction and agriculture, and can be dangerous to workers. Many machines involve

Learning Guide for Standardize and Sustain 3S Level II Version: 1      Revision: 0	Date: July 2015	Page 12 of 64
	Author EKI/MoE – TVET Outcome Based Training Core Process	

moving parts, sharp edges, hot surfaces and other hazards with the potential to crush, burn, cut, shear, stab or otherwise strike or wound workers if used unsafely. Various safety measures exist to minimize these hazards, including lockout-tag out procedures for machine maintenance and roll over protection systems for vehicles.

According to the United States Bureau of Labor Statistics, machine-related injuries were responsible for 64,170 cases that required days away from work in 2008. More than a quarter of these cases required more than 31 days spent away from work. That same year, machines were the primary or secondary source of over 600 work-related fatalities. Machines are also often involved indirectly in worker deaths and injuries, such as in cases in which a worker slips and falls, possibly upon a sharp or pointed object.

The transportation sector bears many risks for the health of commercial drivers, too, for example from vibration, long periods of sitting, work stress and exhaustion. These problems occur in Europe but in other parts of the world the situation is even worse. More drivers die in accidents due to security defects in vehicles. Long waiting times at borders cause that drivers are away from home and family much longer and even increase the risk of HIV infections.

Confined spaces also present a work hazard. The National Institute of Occupational Safety and Health defines "confined space" as having limited openings for entry and exit and unfavorable natural ventilation, and which is not intended for continuous employee occupancy. Spaces of this kind can include storage tanks, ship compartments, sewers, and pipelines. Confined spaces can pose a hazard not just to workers, but also to people who try to rescue them.

Noise also presents a fairly common workplace hazard: occupational hearing loss is the most common work-related injury in the United States, with 22 million workers exposed to hazardous noise levels at work and an estimated \$242 million spent annually on worker's compensation for hearing loss disability. Noise is not the only source of occupational hearing loss; exposure to chemicals such as aromatic solvents and metals including lead, arsenic, and mercury can also cause hearing loss.

Temperature extremes can also pose a danger to workers. Heat stress can cause heat stroke, exhaustion, cramps, and rashes. Heat can also fog up safety glasses or cause sweaty palms or dizziness, all of which increase the risk of other injuries. Workers near hot surfaces or steam also are at risk for burns. Dehydration may also result from overexposure to heat. Cold stress also poses a danger to many workers. Over-exposure to cold conditions or extreme cold can lead to hypothermia, frostbite, trench foot, or chilblains.

Electricity poses a danger to many workers. Electrical injuries can be divided into four types: fatal electrocution, electric shock, burns, and falls caused by contact with electric energy.

Vibrating machinery, lighting, and air pressure (high or low) can also cause work-related illness and injury. Asphyxiation is another potential work hazard in certain situations. Musculoskeletal are avoided by the employment of good ergonomic design and the

Learning Guide for Standardize and Sustain 3S Level II Version: 1      Revision: 0	Date: July 2015	Page 13 of 64
	Author EKI/MoE – TVET Outcome Based Training Core Process	

reduction of repeated strenuous movements or lifts. Ionizing (alpha, beta, gamma, X, neutron), and non-ionizing radiation (microwave, intense IR, RF, UV, laser at visible and non-visible wavelengths), can also be a potent hazard

In Victoria, workplace health and safety is governed by a system of laws, regulations and compliance codes which set out the responsibilities of employers and workers to ensure that safety is maintained at work.

### **The Act**

The *Occupational Health and Safety Act 2004* (the Act) is the cornerstone of legislative and administrative measures to improve occupational health and safety in Victoria.

The Act sets out the key principles, duties and rights in relation to occupational health and safety. The general nature of the duties imposed by the Act means that they cover a very wide variety of circumstances, do not readily date and provide considerable flexibility for a duty holder to determine what needs to be done to comply.

### **The Regulations**

The *Occupational Health and Safety Regulations 2007* are made under the Act. They specify the ways duties imposed by the Act must be performed, or prescribe procedural or administrative matters to support the Act, such as requiring licenses for specific activities, keeping records, or notifying certain matters.

### **Guidance**

Effective OHS regulation requires that Work Safe provides clear, accessible advice and guidance about what constitutes compliance with the Act and Regulations. This can be achieved through Compliance Codes, Work Safe Positions and non-statutory guidance ("the OHS compliance framework"). For a detailed explanation of the OHS compliance framework, see the Victorian Occupational Health and Safety Compliance Framework Handbook.

### **Policy**

Not every term in the legislation is defined or explained in detail. Also, sometimes new circumstances arise (like increases in non-standard forms of employment, such as casual, labour hire and contract work, or completely new industries with new technologies which produce new hazards and risks) which could potentially impact on the reach of the law, or its effective administration by Work Safe. Therefore, from time to time Work Safe must make decisions about how it will interpret something that is referred to in legislation, or act on a particular issue, to ensure clarity. In these circumstances, Work Safe will develop a policy. A policy is a statement of what Work Safe understands something to mean, or what Work Safe will do in certain circumstances.

Learning Guide for Standardize and Sustain 3S Level II Version: 1      Revision: 0	Date: July 2015	Page 14 of 64
	Author EKI/MoE – TVET Outcome Based Training Core Process	

<b>Work Manual Self- Check 2</b>	<b>Written Test</b>
--------------------------------------	---------------------

**Directions:** Answer all the questions listed below. Use the Answer sheet provided in the next page:

1. What is OHS represents for (2 point)
2. What is OSH represents for? (1 point)
3. What is WHS represents for. (1 point)
4. What are the goals of OHS? (2 points)
5. List some examples of OHS requirements in your work areas. (10 points)

**Note: Satisfactory rating – 09 points                      Unsatisfactory - below 09 points**  
You can ask you trainer for the copy of the correct answers.

Learning Guide for Standardize and Sustain 3S Level II Version: 1      Revision: 0	Date: July 2015	Page 15 of 64
	Author EKI/MoE – TVET Outcome Based Training Core Process	

## Answer Sheet

Score = \_\_\_\_\_

Rating: \_\_\_\_\_

Name: \_\_\_\_\_

Date: \_\_\_\_\_

### Short Answer Questions

1. \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_

2. \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_

3. \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_

4. \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_

5. \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_



## Tools and Equipment used to implement 3S

You are required to prepare and use tools and equipment to implement sort, set in order and shine activities in to your work station. The following are some tools and equipment that help you in the implementation of 3S.



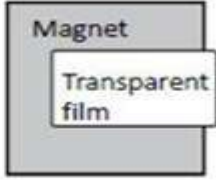
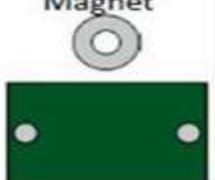




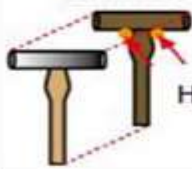

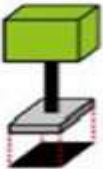
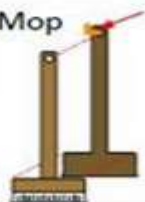




### Tools and materials used to implement Sort activity

Tools and materials are required to implement sort, set in order and shine activities in work stations. The following are some tools and materials used to implement the first pillar of 5S-Sort.

- red tags
- hook
- shelves
- sponge
- pencil
- formats (for recording necessary and unnecessary items, plans etc...)
- sticker
- nails
- chip wood
- broom
- shadow board/ tools board

### Tools and materials used to implement set in order

The following are some tools and materials used to implement the second pillar of 5S-Set in order.

Labels	   
Signs	   
Figures	     
Partition lines	 

### Tools and materials used to implement shine

The following are some tools and materials used to implement the third pillar of 5S-Shine.

- sponges
- brooms
- brushes
- spades
- vacuum cleaners
- waste baskets
- dust bins
- gloves
- dust masks
- detergents
- containers
- oils
- bolts
- screws
- boots shoes
- Etc...





<b>Self-Check 3</b>	<b>Written Test</b>
---------------------	---------------------

**Instructions:** Perform the following tasks. Write your answers in the answer sheet provided:

1. List at least 10 tools and materials used to implement Sort. (10 points)
2. List at least eight tools and materials used to implement Set in order. (8 points)
3. List at least eight tools and materials used to implement Shine. (8 points)

**Note: Satisfactory rating - 08 points                      Unsatisfactory - below 08 points**  
 You can ask your trainer for the copy of the correct answers.

## Answer Sheet

Score = \_\_\_\_\_

Rating: \_\_\_\_\_

Name: \_\_\_\_\_

Date: \_\_\_\_\_

1. \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

2. \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

3. \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

## SORT

### Overview of red tagging

The Red-Tag Strategy is a simple method for identifying potentially unneeded items in the factory or workshop, evaluating their usefulness and dealing with them appropriately. Red-tagging means putting red tags on items in the factory or workshop that need to be evaluated as being necessary or unnecessary. A Red tag is a red colored tag used to identify items no longer needed in a particular work area. The red tags catch people's attention because red is a colour that stands out. An item with a red tag is asking three questions:

- Is this item needed?
- If it is needed, is it needed in this quantity?
- If it is needed, does it need to be located here?

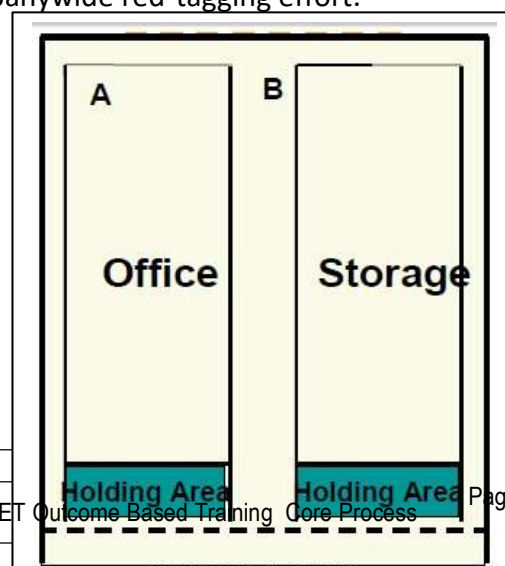
Once these items are identified, they can be held in a “Red Tag Holding Area” for a period of time to see whether they are needed, disposed of, relocated, or left exactly where they are.

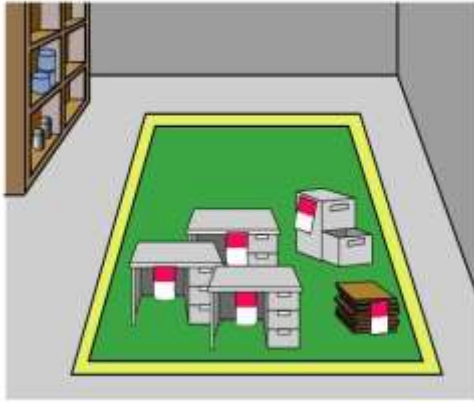
### Red-tag Holding areas

In order to implement the red-tag strategy effectively, a red-tag holding area must be created. A red-tag holding area is an area set aside for use in storing red-tagged items that need further evaluation. Red-tagging is helpful when the need or frequency of need for that item is unknown. When an item is set aside in a red-tag holding area and watched for an agreed-upon period of time people tend to be more ready to let it go when that time is over.

There are two red-tag holding areas: local and central holding areas. Local red-tag holding area is used to manage the flow of red-tagged items with in a local department or production area. Central red-tag holding area is used to manage the flow of items that cannot or should not be disposed of by individual departments or production area. Usually central red-tag holding area is used by an organization that is launching a companywide red-tagging effort.

Red-tag Holding Area





### Steps/procedures in Red tagging

The red-tagging process in a department or work area can be broken down into seven steps.

- Step 1: Launch the red-tag project.
- Step 2: Identify the red-tag targets.
- Step 3: Set red-tag criteria.
- Step 4: Make red tags.
- Step 5: Attach red tags.
- Step 6: Evaluate red-tagged items.
- Step 7: Document the results of red-tagging.

#### Step 1: Launch the red-tag project

Red-tag campaigns are started and coordinated by the upper-level management of a company. Even when a red-tag campaign is companywide, local campaigns need to be organized in each department or production area. This involves

- Organizing a team
- Organizing supplies
- Organizing a time or schedule to perform red-tagging
- Deciding a local-tag holding area
- Planning for disposal of red-tagged items

People from outside a department can be valuable members on a red-tagging team since they tend to see the area with a fresh eye. Hence, it is helpful to partner with other departments or production areas in creating red-tagging teams.

#### Step 2: Identify red-tag targets

There are two red-tag targets:

- a) Items: in the manufacturing area items like inventory (warehouse and in-process inventory), equipment, and space are targets for red tags. Warehouse inventory include material, parts, products etc.
- b) Areas: It is better to define a smaller area and evaluate it well than to define a larger area and not be able to evaluate it fully in available time.

Learning Guide for Standardize and Sustain 3S Level II Version: 1      Revision: 0	Date: July 2015	Page 24 of 64
	Author EKI/MoE – TVET Outcome Based Training Core Process	



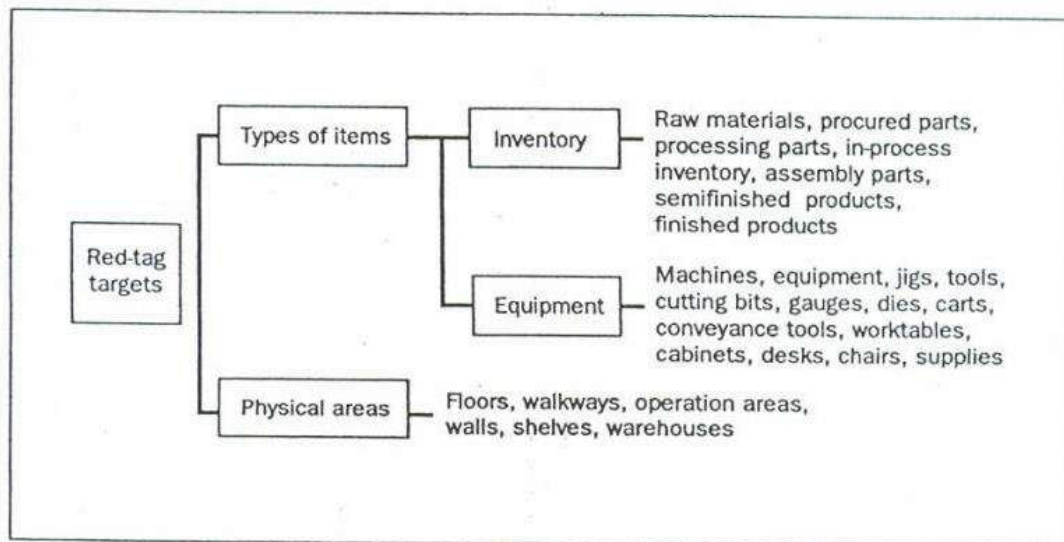


Figure 3-1. Identifying Red-Tag Targets

### Step 3: Set red-tag criteria

As already mentioned, the most difficult thing about red-tagging is differentiating what is needed from what is not. This issue can be managed by establishing clear-cut criteria for what is needed in particular area and what is not. The most common criterion is the next month's production schedule.

- Items needed for that schedule are kept in that location.
- Items not needed for the schedule can be disposed of or stored in a separate location.

Three main factors determine whether an item is necessary or not. These factors are:

- The usefulness of the item to perform the work at hand. If the item isn't needed it should be disposed of.
- The frequency with which the item is needed. If it is needed infrequently it can be stored away from the work area.
- The quantity of the item needed to perform this work. If it is needed in limited quantity the excess can be disposed or stored away from the work area.

Each company must establish its own red-tagging criteria and each department may customize this standard to meet its local needs.

### Step 4: Make red-tags

Each company has specific needs for documenting and reporting the movement, use, and value of materials, equipment, tools, inventory and products. The company's red tags should be designed to support this documentation process.

Various types of information on a red tag may include:

- Category: provides a general idea of the type of item (e.g., a warehouse item or machine). Categories include raw materials, in-process inventory, products, equipment, jigs, tools and dies.
- Item name and manufacturing number.
- Quantity: indicates the number of items included under this red tag.
- Reason: describes why a red tag has been attached to this item.

Learning Guide for Standardize and Sustain 3S Level II Version: 1      Revision: 0	Date: July 2015	Page 25 of 64
	Author EKI/MoE – TVET Outcome Based Training Core Process	

- Division: includes the name of the division responsible for managing the red-tagged item.
- Value: includes the value of the red-tagged item.
- Date: includes the red-tagging date.

# Red Tag

## Item Information

Date: \_\_\_\_\_ Tagged By: \_\_\_\_\_  
Item Name: \_\_\_\_\_  
Location: \_\_\_\_\_

## Category

- |   |  |
|---|--|
| <input type="checkbox"/> Equipment            | <input type="checkbox"/> Raw Materials   |
| <input type="checkbox"/> Tools & Jigs         | <input type="checkbox"/> Work-in-Process |
| <input type="checkbox"/> Finished Goods       | <input type="checkbox"/> Other           |
| <input type="checkbox"/> Gauges & Instruments |  |
| <input type="checkbox"/> Consumables          |  |
| <input type="checkbox"/> Machine Parts        |  |

## Reason for Red Tag

- |                                       |   |
|---------------------------------------|---|
| <input type="checkbox"/> Not Required | <input type="checkbox"/> Obsolete       |
| <input type="checkbox"/> Defect       | <input type="checkbox"/> Unknown object |
| <input type="checkbox"/> Scrap        |   |

## Suggested Action Required

- |                                    |
|------------------------------------|
| <input type="checkbox"/> Return to |
| <input type="checkbox"/> Scrap     |
| <input type="checkbox"/> Relocate  |
| <input type="checkbox"/> Sell      |

## Comments

---

---

---

---

---

---

Log No. \_\_\_\_\_

RED TAG				
Category	1. Raw material      5. Machine and other equipment 2. In-process stock      6. Dies and jigs ③ Semi-finished goods      7. Tools and supplies 4. Products      8. Other			
Item name:	Door			
Manufacturing No.:	PX-180X			
Quantity:	2 Units	Value:	\$	(total)

Red Tag		No.
Name of applicant:	Date	
Name of item:	Quantity:	
Part No.:		
Location:		
<b>Classification</b> <input type="checkbox"/> 1. Material <input type="checkbox"/> 2. Part <input type="checkbox"/> 3. Inventory in-process <input type="checkbox"/> 4. Product <input type="checkbox"/> 5. Equipment/facilities <input type="checkbox"/> 6. Cutting tool <input type="checkbox"/> 7. Jig <input type="checkbox"/> 8. Fixing <input type="checkbox"/> 9. Others		
<b>A: Reason for item of 1 to 4</b> <input type="checkbox"/> a. Miscalculation/mistakes in sales/production plan <input type="checkbox"/> b. Order cancellation <input type="checkbox"/> c. Design/specification change <input type="checkbox"/> d. Design error <input type="checkbox"/> e. Order error <input type="checkbox"/> f. Receipt error (Insufficient inspection) <input type="checkbox"/> g. Machining error <input type="checkbox"/> h. Assembly error <input type="checkbox"/> i. Obsolescence, Long time storage <input type="checkbox"/> j. Others		
<b>B: Reason for item of 5 to 9</b> <input type="checkbox"/> k. Ageing <input type="checkbox"/> l. Out of order <input type="checkbox"/> m. No longer applicable <input type="checkbox"/> n. Others		



RED TAG	
Date Issued:	Red Tag File No.:
Issued By:	Department/Division/Section:
<b>Category: (Check appropriate box)</b> <input type="checkbox"/> 1. Equipment or Machine <input type="checkbox"/> 6. Other (Please describe below) <input type="checkbox"/> 2. Die, Fixture, Tool, Gage <input type="checkbox"/> 7. Furniture <input type="checkbox"/> 3. Manufacturing Instructions <input type="checkbox"/> 8. Other (Please describe below) <input type="checkbox"/> 4. Non-permanent Material (Transfer, rework, etc.) <input type="checkbox"/> 5. Obsolete Material (excess in process, obsolete, holdout, etc.)	
Take Action:	
Manufacturing No.	Red Tag No.:
Quantity	Unit of Measure
Reason: (Check appropriate box)	
<input type="checkbox"/> 1. Not Used Ever <input type="checkbox"/> 6. Stored in Obsolete Material <input type="checkbox"/> 2. Broken/Over (overload) <input type="checkbox"/> 3. Used Long After (obsolete) <input type="checkbox"/> 4. Defective or Damaged <input type="checkbox"/> 7. Excess Inventory <input type="checkbox"/> 5. Stored in Excess Storage Area	
<b>Desired Action: (Check appropriate box)</b> <input type="checkbox"/> 1. Dispose <input type="checkbox"/> 6. Repair or Recondition <input type="checkbox"/> 2. Return to Stock <input type="checkbox"/> 7. Repair/Replace and Adjust <input type="checkbox"/> 3. Return to Stock - Storage Area <input type="checkbox"/> 8. Repair/Replace and Adjust <input type="checkbox"/> 4. Move to Excess Storage Area	
Take Tag Off This Area Log in Book    Print for Area Manager/Inspector/Dept.	
Authorised By:	Area Manager/Inspector/Dept.
BERNCO SIGNATURE™ DIV. CATALOG NO. 51882	

RED TAG
NAME:
Item:
Date:
ACTION REQUIRED:

The material used for red tags can be red paper, thick red tape, or others. Red tags can be laminated with plastic or another material to protect them during repeated use.

### Step 5: Attach the red tags

The best way to carry out red-tagging is to do the whole target area quickly, if possible, in one or two days. In fact, many companies choose to red-tag their entire factory during a one or two day period. Red-tagging should be a short and powerful event. You should red-tag all items you question, without evaluating what to do with them.

### Step 6: Evaluate the red-tagged items

In this step, the red-tag criteria established in step 3 are used to evaluate what to do with red-tagged items. Options include:

- Keep the item where it is.
- Move the item to a new location in the work area.
- Store the item away from the work area.
- Hold the item in the local red-tag holding area for evaluation.
- Dispose of the item.

Disposal methods include:

- Throw it away.
- Sell it.
- Return it to the vendor.
- Lend it out.
- Distribute it to a different part of the company.
- Send it to the central red-tag holding area.

The next table shows disposal methods.

Treatment	Description
Throw it away	Dispose of as scrap or incinerate items that are useless or unneeded for any purpose.
Sell	Sell off to other companies items that are useless or unneeded for any purpose.
Return	Return items to the supply company.
Lend out	Lend items to other sections of the company that can use them on a temporary basis.
Distribute	Distribute items to another part of the company on a permanent basis.
Central red-tag area	Send items to the central red-tag holding area for redistribution, storage, or disposal.

Evaluation format for red-tag items (sample)

Evaluation Form of Red Tag Items							Date of issue: Issued by: 5S promotion office		Remarks
Stage: Seiri		Unused Period (month)	Red tag strategy		Sorter		Unnecessary item list		
Object	Type		Required	Not required	First	Second	Required	Not required	
Material	Main	12	<input type="radio"/>		Leader	Manager	<input type="radio"/>		
	Supplement	6	<input type="radio"/>		Leader	Manager	<input type="radio"/>		
	Broken	1		<input type="radio"/>				Dispose	
Parts	Common Use	6	<input type="radio"/>		Leader	Manager	<input type="radio"/>		
	Exclusive use	3	<input type="radio"/>		Leader	Manager	<input type="radio"/>		
Inventory in-process		2	<input type="radio"/>		Leader	Manager	<input type="radio"/>		
Product		3	<input type="radio"/>		Manager	General manager	<input type="radio"/>		
Facility		6	<input type="radio"/>		Manager	General manager	<input type="radio"/>		
Die		6	<input type="radio"/>		Manager	General manager	<input type="radio"/>		
Jig		6	<input type="radio"/>		Leader	General manager	<input type="radio"/>		
Cutting tool		6	<input type="radio"/>		Leader	Manager	<input type="radio"/>		
Tool		3	<input type="radio"/>		Leader	Head of Section	<input type="radio"/>		
Measuring instrument		6	<input type="radio"/>		Leader	Head of Section	<input type="radio"/>		
Carrying equipment		2	<input type="radio"/>		Leader	Head of Section	<input type="radio"/>		

How to evaluate:  
Evaluate items based on unused period of them.

How to prepare the form

- 5S committee set the standard by main unneeded item
- Explain contents of this form to each promotion block.
- Compile the form to help Seiri activity such as requirement of red tag and record on unnecessary item list

Ideally, unnecessary equipment should be removed from areas where daily production activities take place. However, large equipment and equipment or machine attached to the floor may be expensive to move. It is sometimes better to leave this equipment where it is unless it interferes with daily production activities or prevents workshop improvements. Label this unneeded and difficult to move equipment with a “freeze” red tag, which indicates that its use has been “frozen,” but that it will remain in place for the time being.

### Step 7: Document the results of red-tagging

Each company or organization needs to create its own system for logging and tracking necessary information as red-tagging takes place. The documentation system may involve a written logbook in each department and in the central red tag holding area. Or it may involve entering data from the red-tags into a computer system. Whatever the system, documenting results is an important part of the red-tagging process. It allows the company to measure the improvement and savings produced as a result of the red-tagging effort. As it is indicated in step 4, the red-tags should be designed to support the documentation process.

Determine in advance approximately how many red-tags each workplace should use. An average of four red-tags per employee should be used. This means a workshop with 30 employees should need about 120 red tags. In addition when you find a shelf full of items which are difficult to decide, we don't have to be tempted to attach one red-tag for the whole shelf. Because this can lead to confusion when we want to dispose of these items in the shelf. Therefore, avoid this temptation and attach individual tags to individual items.

When red-tagging is completed the factory or workshop is usually dotted with empty spaces – a sign of real progress. Then the layout of equipments and worktables can be changed to occupy the free space. Companies or organizations who think they need to build a new factory for a production of new products/ services should first apply the sort activity or the red-tag strategy so that they could get plenty of free space.

# Red Tagged Items

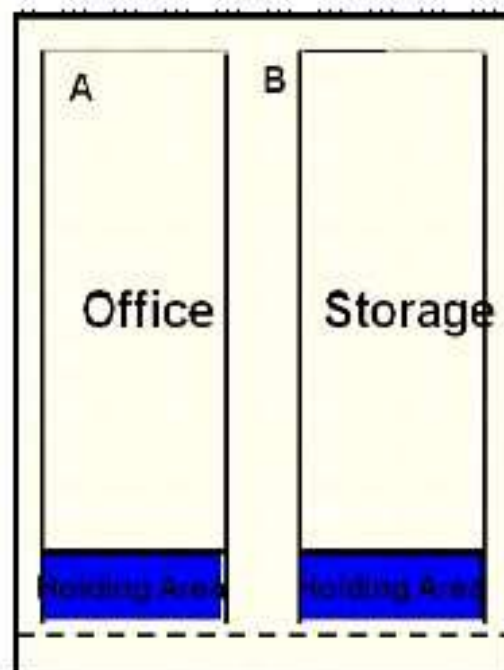






## Temporary Storage Area (Holding Area)

Disposal of Unnecessary Items



## SET IN ORDER

There are some principles for deciding best locations for tools and equipments. Jigs, tools and dies differ from materials, equipments, machinery and parts in that they must be put back after each use. Some of the principles for jigs, tools and dies also apply to parts, equipments, and machinery. These are:

- Locate items in the workplace according to their frequency of use. Place frequently used items near the place of use. Store infrequently used items away from the place of use.
- Store items together if they are used together, and store them in sequence in which they are used.

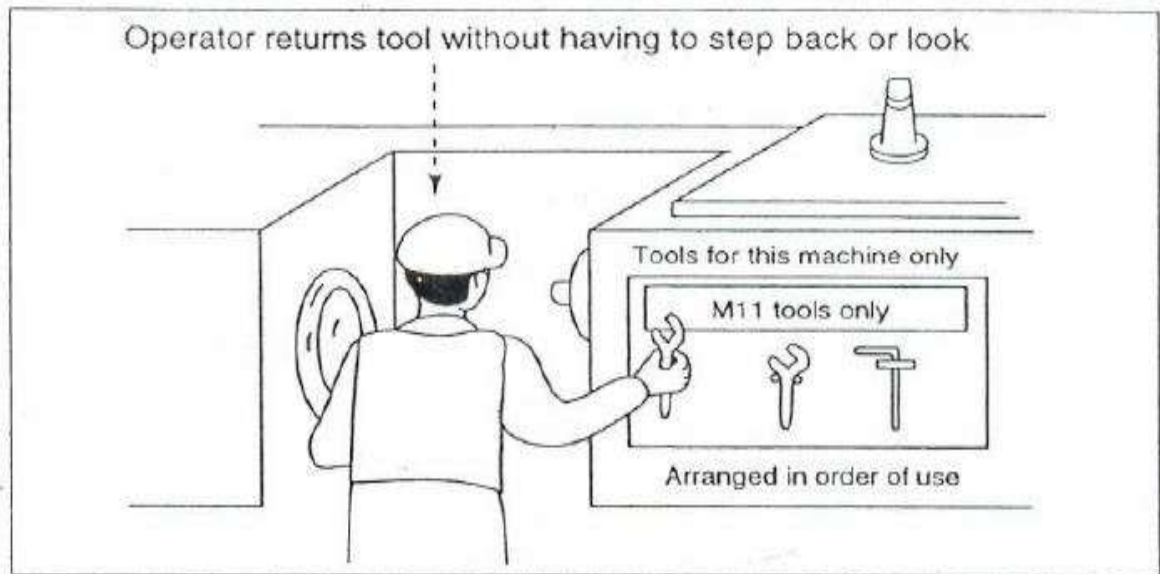


Fig. Tools kept at hand and stored in the order used.

- Device a “just let go” arrangement for tools. This approach involves suspending tools from a retractable cord just within reach so that they will automatically go back in to their correct storage position when released.
- Make storage places larger than the items stored there so that they are physically easy to remove and put back.
- Eliminate the variety of jigs, tools and dies needed by creating a few jigs, tools and dies that serve multiple functions.
- Store tools according to function or product. Function-based storage means storing tools together when they have similar functions. This works best for job-shop production. Product-based storage means storing tools together when they are used on the same product. This works best for repetitive production.

There are principles helpful in deciding the best locations for parts, equipments, and machinery, as well as tools by removing motion wastes. Motion wastes are unnecessary movements created when people move their trunks, feet, arms, and hands more than needed to perform a given operation. These wastes lead to waste of time, energy and effort. These motion wastes can be minimized by locating parts, equipments, and machinery in the best locations possible. More

important than removing motion wastes is asking why it occurs. By asking 'why' we can find the methods of manufacturing that work and approach the zero-waste mark. Eliminating the unnecessary motions from existing operations is called *Motion improvement*. And finding ways to eliminate the whole operations to remove the wastes is called *Radical improvement*.

The principles that are helpful to eliminate or reduce motions that operators make are:

- Principle 1: Start and end each motion with both hands moving at once.
- Principle 2: Both arms should move symmetrically and in opposite directions.
- Principle 3: Keep trunk motions to a minimum.
- Principle 4: Use gravity instead of muscle.
- Principle 5: Avoid zigzagging motions and sudden changes in direction.
- Principle 6: Move with a steady rhythm.
- Principle 7: Maintain a comfortable posture with comfortable motions.
- Principle 8: Use the feet to operate on and off switches for machines where practical.
- Principle 9: Keep materials and tools close and in front.

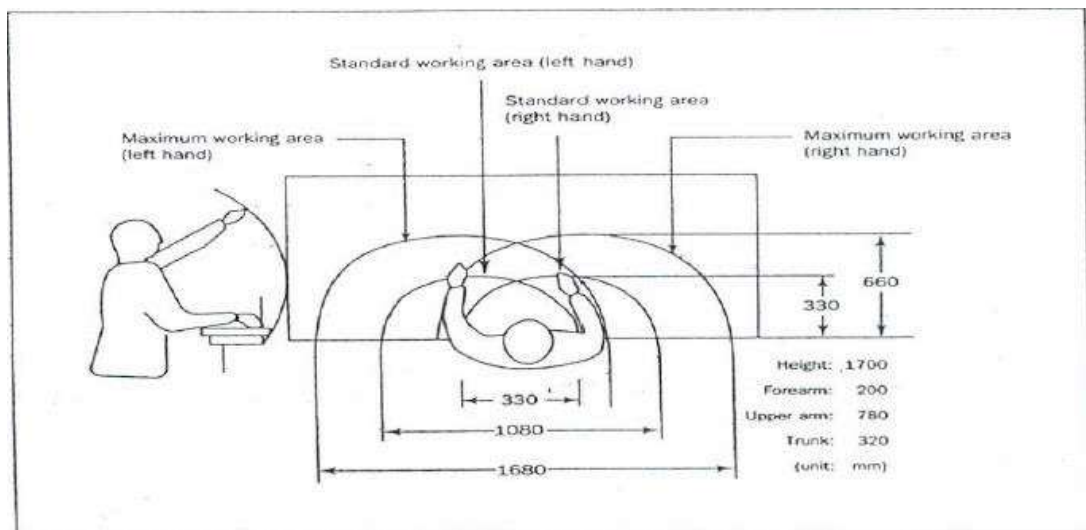


Fig. Guidelines for locating parts, equipments, and machinery to maximize motion efficiency.

- Principle 10: Arrange materials and tools in the order of their use.
- Principle 11: Use inexpensive methods for feeding in and sending out materials.
- Principle 12: Stand at a proper height for the work to be done.
- Principle 13: Make materials and parts easy to pick up.
- Principle 14: Make handles and grips in efficient, easy-to-use shapes and positions.

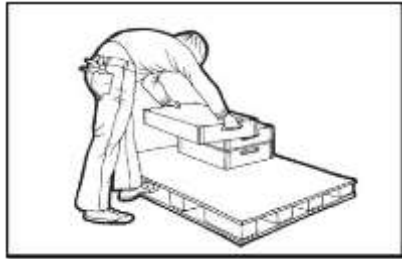


Fig. Motion wastes

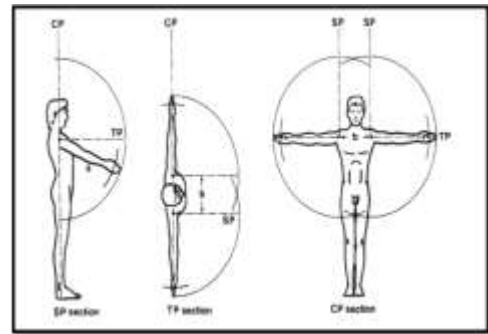
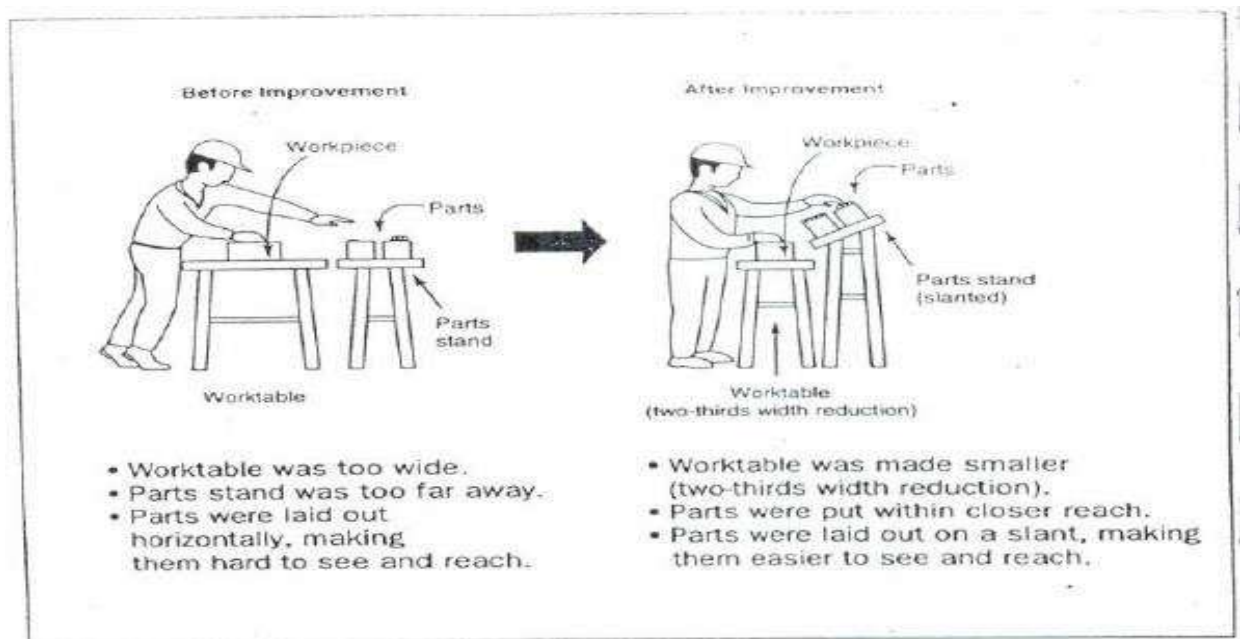


Fig. No waste of motion

### Example of eliminating motion wastes

#### Improving the retrieval of parts

The figure below shows an improvement in picking up parts in an assembly work. Before improvement, the worktable was so large that the assembly worker had to stretch to pick up parts. Also, the parts boxes were laid flat at table level, making it difficult to reach inside them. After improvement, the decreased width of the worktable enabled the assembly worker to reach the parts without stretching his arm too far. Also the parts boxes set on an inclined surface to make their contents more accessible.

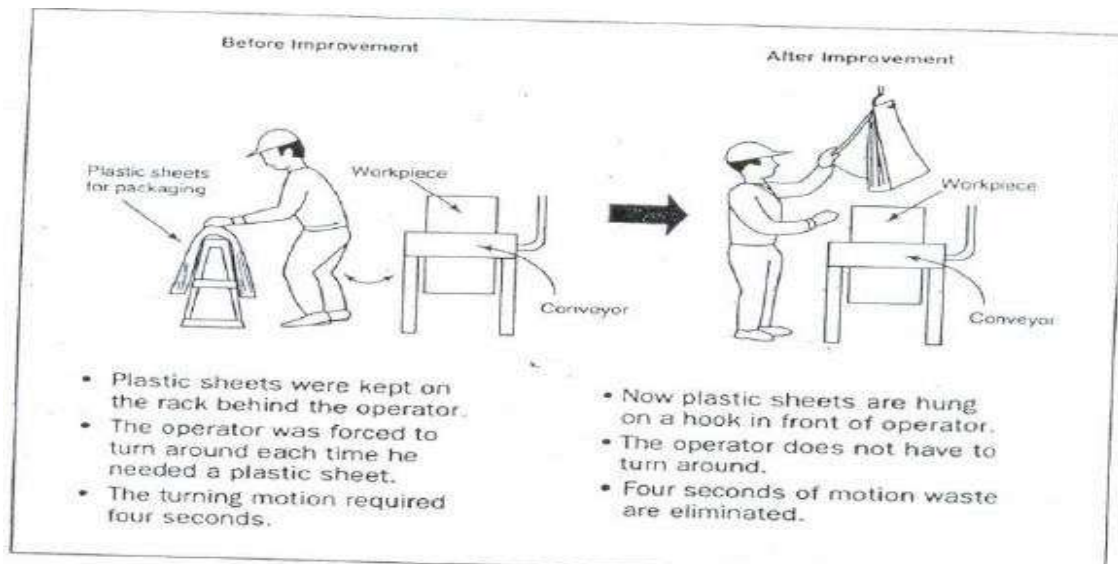


Improvements in picking up parts

#### Improving the layout of parts

The following figure shows an improvement in how plastic packaging sheets are used. The sheets are moved from a rack behind the operator to a hook in front of the operator and above the production line. This improvement eliminates four seconds of motion waste from each unit of packing work.





Improvement in parts layout

### Evaluating current locations and deciding best locations

The 5S Map is a tool that can be used to evaluate current locations of parts, jigs, tools, dies, equipment, and machinery, and to decide best locations. 5S Map involves creating two maps 'before map' and 'after map'. The 'before map' shows the layout of the workplace before implementing set in order. The 'after map' shows the workplace after implementing set in order. The 5S Map can be used to evaluate the locations in a small or large workplaces, like in a single workstations, on a production line, or in a department.

#### The steps of using the 5S Map:

1. Make a floor plan or area diagram of the workplace you wish to study. Show the location of specific parts, inventory, tools, jigs, dies, equipment and machinery.
2. Draw arrows on the plan showing the work flow between items in the workplace. There should be at least one arrow for every operation performed. Draw the arrows in the order that the operations are performed, and number them as you go.

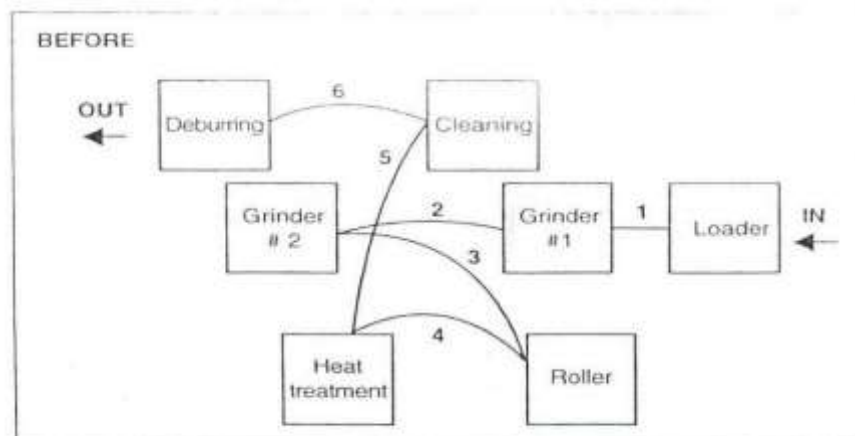


Figure 4.8. 5S Map of Old Layout in Machining Operations.  
Fig. 5S Map of old layout in machining operations ('before map')

3. Look carefully at the resulting “spaghetti diagram”. Can you see places where there is congestion in the work flow? Can you see ways to eliminate waste?
4. Make a new 5S Map to experiment with a better layout for this work place. Again, draw and number arrows to show the flow of operations performed.
5. Analyze the efficiency of the new layout (the after map), based on the principles explained in the above.
6. Continue to experiment with possible layouts (after maps) using the 5S Map until you find one which you think will work well.

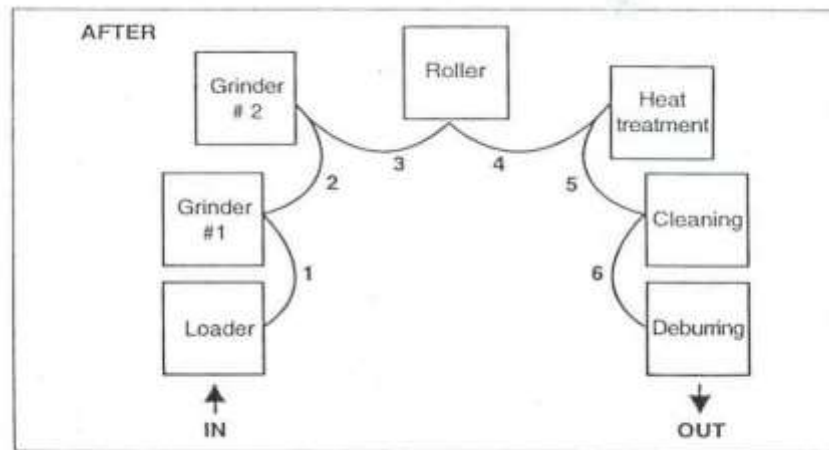


Figure 4.9. 5S Map of New Layout in Machining Operations

7. Implement this new layout in the work place by moving parts, tools, jigs, dies, equipment, and machinery to their new locations.
8. Continue to evaluate and improve the layout in the workplace.

### 1.1 Set in order strategies

Once best locations have been decided, it is necessary to mark these locations so that everyone knows what goes where, and how many of each item belongs in each location. There are several strategies for marking or showing what, where and how many.

#### 1.1.1 Motion Economy strategy

Following the principles explained in the above, we can remove motion waste from existing operation. By using human body appropriately, by organizing the workplace and by redesigning of tools and equipments, we can minimize motion waste.

#### 1.1.2 Visual control Strategy

A visual control is any communication device used in the work environment that tells us at a glance how work should be done. There are several strategies for setting in order items so that to easily identify what, where and how many (visual control). These visual control strategies are discussed in the next contents.

##### 1.1.2.1 Signboard strategy

The signboard strategy uses signboards to identify what, where, and how many. The three main types of signboards are:

Learning Guide for Standardize and Sustain 3S Level II Version: 1      Revision: 0	Date: July 2015	Page 39 of 64
	Author EKI/MoE – TVET Outcome Based Training Core Process	

- Location indicators that show where items go.
- Item indicators that show what specific items go in those places.
- Amount indicators that show how many of these items belong there.

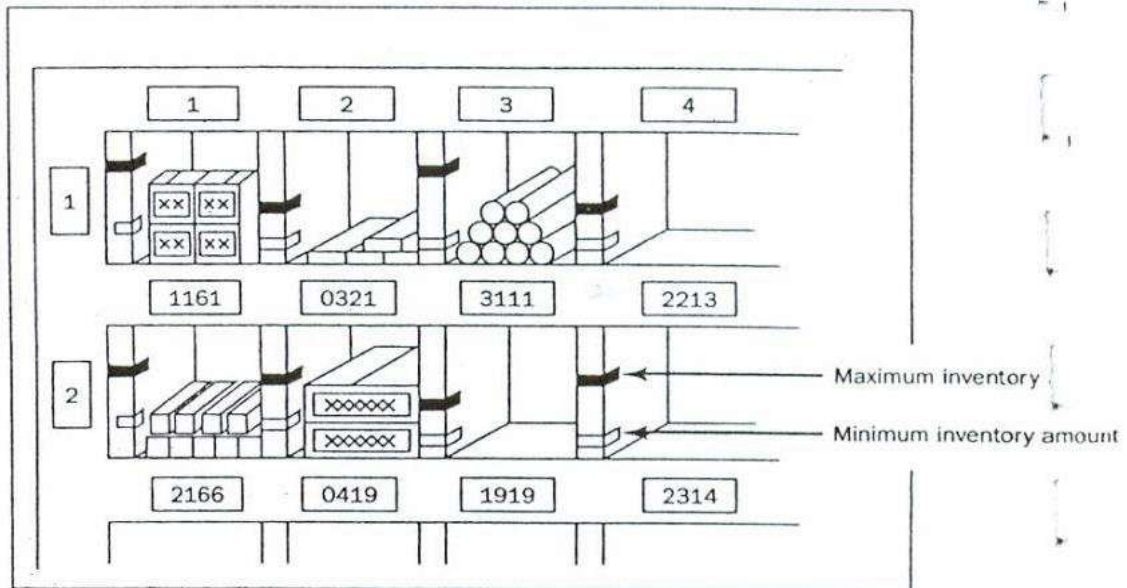


Figure 4-10. Amount Indicators Fig. Amount indicators

Signboards are often used to identify:

- Names of work areas
- Inventory locations
- Equipment storage locations
- Standard procedures
- Machine layout

For example, in order to identify inventory stored on shelves in a warehouse, a whole system of signboards may be used. Every section of shelving may have a signboard identifying the section. Within that section, vertical and horizontal addresses on shelves can be identified with additional signboard. Each item stored on the shelf may also have a signboard showing the “return address” for that item. The “return address” allows the item to be put back in the proper location once it has been removed.



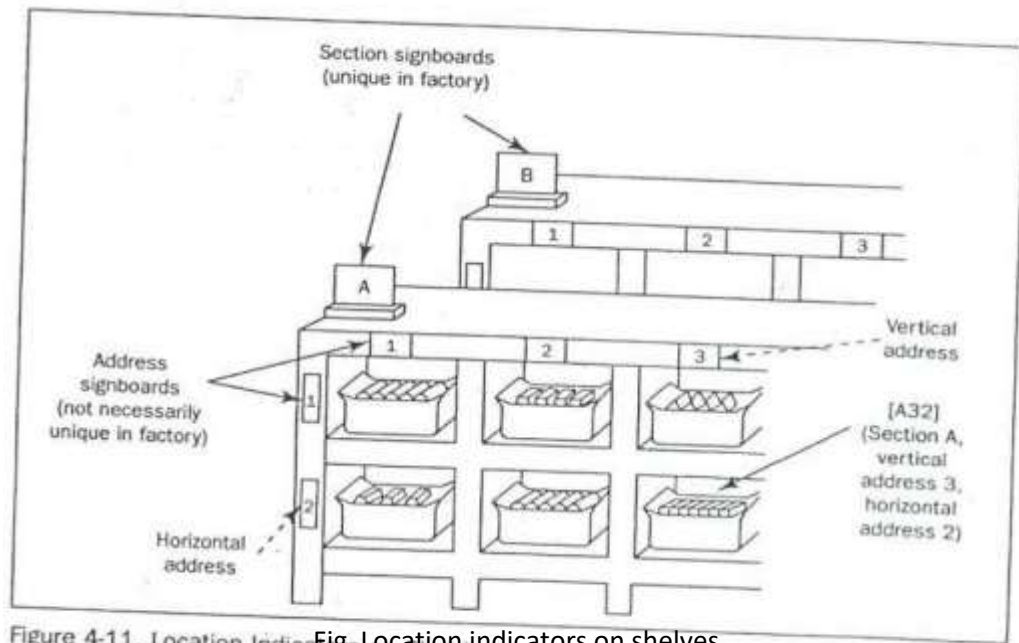


Figure 4-11. Location Indicators on shelving

The 'after 5S Map' discussed before is a kind of signboard. It shows the location of parts, tools, jigs, dies, equipment, and machinery in a given work area after set in order is implemented. When posted in the work place, it is useful in communicating the standard for where items are located.

#### 1.1.2.2 Painting strategy

The painting strategy is a method for identifying locations on floors and walkways. It is called the Painting strategy because paint is the material generally used. But also plastic tape, cut in to any length, can be used. Plastic tape, although more expensive, shows up just as clearly as paint and can be removed if the layout is changed.

The painting strategy is used to divide the factory's or workshop's walking areas (walkways) from the working areas (operation areas). When putting lines to divide walkways from operation areas, the following factors should be considered:

- U-shaped cell designs are generally efficient than straight production lines.
- In-process inventory should be positioned carefully for best production flow.
- Floors should be levelled or repaired before we put lines.
- Walkways should be wide enough to avoid twists and turns and for safety and a smooth flow of goods.
- The dividing lines should be between 2 and 4 inches in width.
- Paint colors should be standardized. For example
  - operation areas are painted by green;
  - walkways are fluorescent orange or red;
  - Lines that divide the walkways from operation areas are yellow in color.

Dividing lines can be used to show:

- Cart storage locations,
- aisle directions,
- door range, to show which way a door swings open,
- for worktables,

Learning Guide for Standardize and Sustain 3S Level II Version: 1      Revision: 0	Date: July 2015	Page 41 of 64
	Author EKI/MoE – TVET Outcome Based Training Core Process	

- tiger marks, to show areas where inventory and equipment should not be placed, or to show hazardous areas.

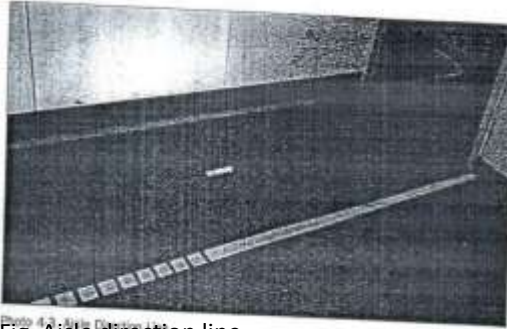


Photo 4-3 Aisle direction line

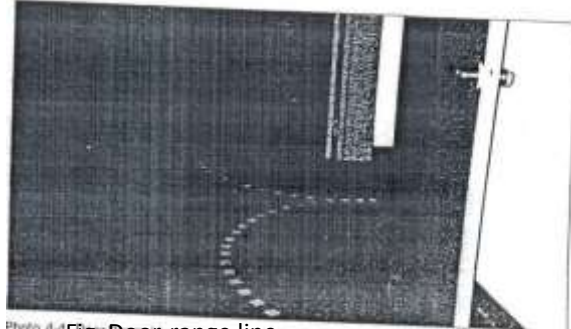


Photo 4-4 Door-range line



### 1.1.2.3 Color-code strategy

Color-coding is used to show clearly which parts, tools, jigs and dies are to be used for which purpose. For example, if certain parts are to be used to make a particular product, they can all be color-coded with the same color and even stored in a location that is painted with that color. Similarly, as shown the picture in below, if different types of lubricants are to be used on different parts of a machine, the supply containers, oil cans, and machine parts can be color-coded to show what is used where.

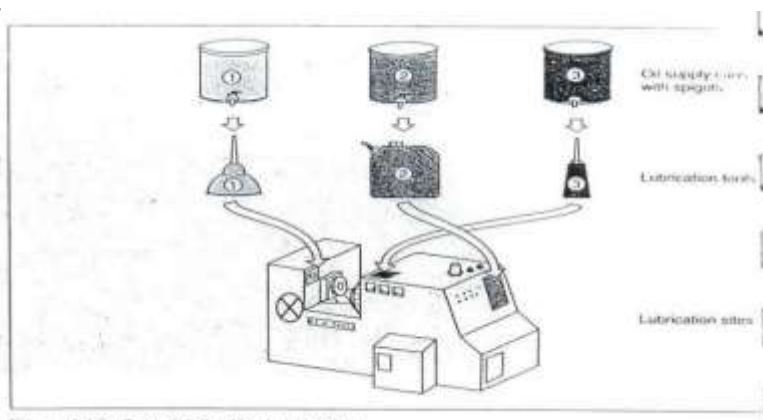
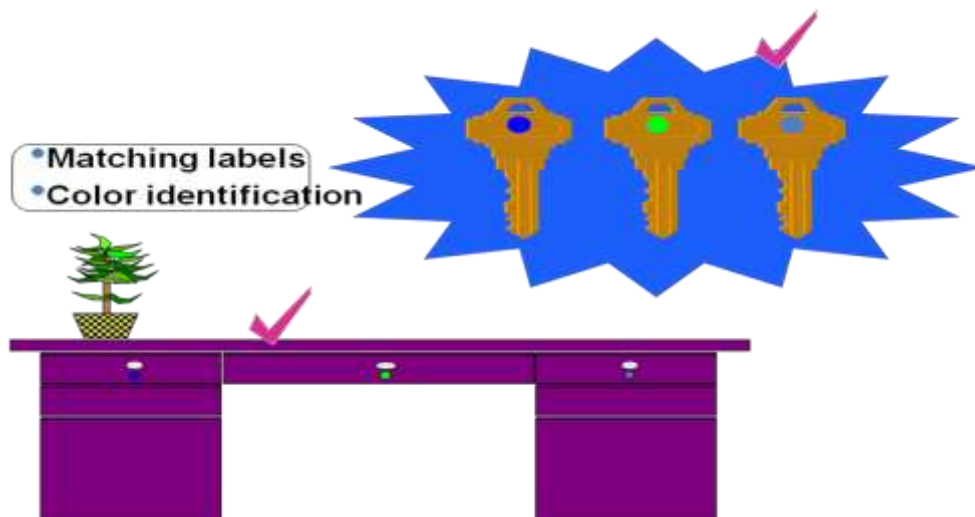
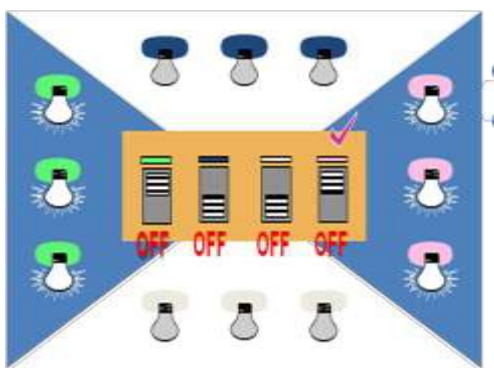


Figure 4-12. Color-Coding for Lubrication

Fig. Color-coding for lubrication



#### 1.1.2.4 Outlining strategy

Outlining is used to show which jigs and tools are stored where. Outlining simply means drawing outlines of jigs and tools in their proper storage positions. When you want to return a tool, the outline provides an additional indication of where it belongs.

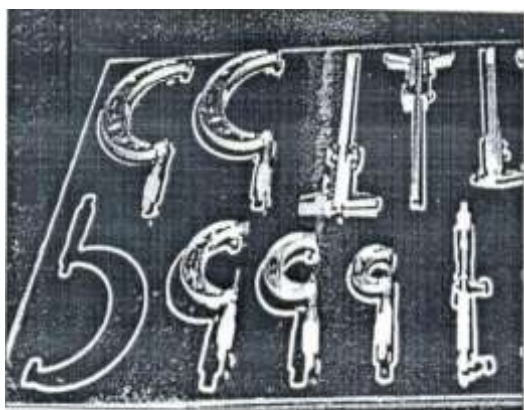


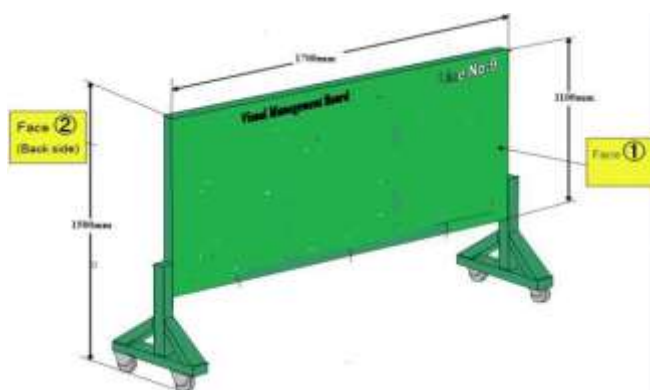
Photo 4-5. Example: Outlining of tools to show their locations



Fig. Outlining of tools to show their locations



### 1.1.2.5 Visual Management Board (Kaizen board) Strategy





# Set In Order Samples

## Set In Order-Shadow Board



**BEFORE**



**AFTER**



**BEFORE**



**AFTER**









# SHINE

Shine activities should be taught as a set of steps and rules that employees learn to maintain with discipline.

## Step 1: Determine shine target areas

Shine target areas are grouped in to three categories: warehouse item, equipments and space. *Warehouse items* include raw materials, procured subcontracted parts, parts made in-house, and assembly components, semifinished and finished products. *Equipment* includes machines, welding tools, cutting tools, conveyance tools, general tools, measuring instruments, dies, wheels and casters, worktables, cabinets, desks, chairs and spare equipment. *Space* refers to floors, work areas, walkways, walls, pillars, ceilings, windows, shelves, closets, rooms and lights.

## Step 2: Determine Shine Assignments

Workplace cleanliness is the responsibility of everyone who works there. Each employee should be assigned specific area to clean. To do this two methods can be used:

- A 5S Assignment Map – shows all the target areas for shine activity and who is responsible for cleaning them. By marking on 5S Map, the shine assignments can be shown.
- A 5S schedule – shows in detail who is responsible for cleaning which areas on which days and times of the day. Then this schedule should be posted in the work area.

Example 1:

General Cleaning Assignment Sheet						
Activity area		Target place/object	Group	Leader	Tools	Required number of workers
Zone A	Machining-- Group A area	Lathe	Manufacturing	A	Detergent	25
		Press machine			Waste cloth	
		Floor			Scraper	
	Machining-- Group B area	Resting-place			Broom	
		Pathway			mop	
	Machining-- Group C area					
Zone B	Purchasing area					
	Material area					
Zone C	Painting area					
	Processed products discharge area					

Example 2:

Regular Cleaning Assignment Sheet												
Worksite			Group				5S promoter					
No.	Day	Target place/object	Person in charge						Frequency	Time	Start	Tool
			A	B	C	D	E	F				
1	Mon											
2												
3												
4	Tue											
5												
6												
7	Wed											
8												
9												
10	Thu											
11												
12												
13	Fri											
14												
15												

### Step 3: Determine shine methods

Shine activities should be a natural part of the daily work. Shine activities and inspection should be done before a shift starts, during work time and at the end of the shift.

Determining shine methods include:

- *Choosing targets and tools* – define what will be cleaned in each area and what supplies and equipments will be used.
- *Performing the five-minute shine* – cleaning should be practiced daily and should not require a lot of time.
- *Creating standards for shine procedures* – people need to know what procedures to follow in order to use their time efficiently. Otherwise, they are likely to spend most of their time getting ready to clean.

### Step 4: prepare tools

The cleaning tools should be placed properly or set in order where they are easy to find, use and return.

### Step 5: Start to shine

When implementing the shine procedures, consider the following suggestions:

- Be sure to sweep dirt from floor cracks, wall corners, and around pillars.
- Wipe off dust and dirt from walls, windows, and doors.
- Be thorough about cleaning dirt, scraps, oil, dust, rust, cutting shavings, sand, paint, and other foreign matter from all surfaces.
- Use cleaning detergents when sweeping is not enough to remove dirt.

## 1.2 Inspection

As discussed earlier, it is natural to do a certain amount of inspection while implementing shine activities. Once daily cleaning and periodic major cleanups become a habit, we can start incorporating systematic inspection procedures in to the shine procedures. Even when equipment in the workplace appears to function normally, it may be developing many problems. Always when machines or other equipment begin to show sign of minor, sporadic malfunctions, the operators

not the maintenance people notice it first. Therefore, it is important to consider the operators information about the equipment.

The following types of equipment problems frequently exist in factories:

1. Oil leaks from the equipment on to the floor.
2. Machines are so dirty that operators avoid touching them.
3. Gauge displays and other indicators are too dirty to be read.
4. Nuts and bolts are either loose or missing.
5. Motors overheat.
6. Sparks flare from power cords.
7. V-belts are loose or broken.
8. Some machines make strange noises.

Daily cleaning or inspection can help to find these problems and solve them.



Before Shine



After Shine

### 1.2.1 Inspection steps

The steps of inspection and shine procedures are parallel. But the steps of inspection give greater emphasis on the maintenance of machines and equipment. These steps are:

#### **Step 1: Determine inspection targets**

The targets for inspection are similar to the targets of shine activities. These include machines, equipments, jigs, dies, cutting tools and measuring instruments.

#### **Step 2: Assign inspection activities**

In principle, the people who carry out inspection on a particular machine should be the same people who operate the machine. But most often one person can operate several machines at a time (as in multi-process handling). In this case, it is good to involve line supervisors and group leaders in the inspection duties. Once inspection activities are assigned, they have to be written up on a large signboard for the workshop or on small signboards that are attached to each target machine.

### Step 3: Determine inspection methods

First all of the items to be inspected should be listed then an inspection checklist should be prepared based on the listed inspection items. The following shows an example of an inspection checklist.

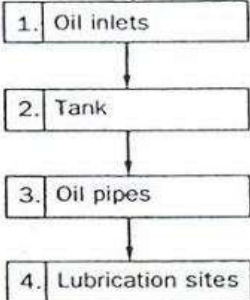
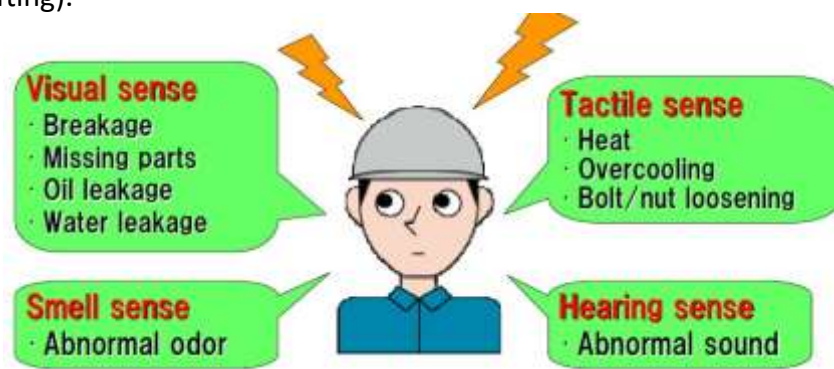
Mechanism	No.	Point	Main Response			
			Clean	Lubricate	Replace	Restore
Lubrication system 	26.	Is there any dirt or dust in the oil inlets?	<input type="radio"/>			
	27.	Do the oil level indicators show adequate levels?		<input type="radio"/>		
	28.	Can the oil level indicators be clearly seen?	<input type="radio"/>			
	29.	Are there any cracks in the oil tank?	<input type="radio"/>			<input type="radio"/>
	30.	Is the bottom of the oil tank dirty?	<input type="radio"/>			<input type="radio"/>
	31.	Is the oil in the tank dirty?			<input type="radio"/>	<input type="radio"/>
	32.	Is there any oil leakage from the tank or pipe joints?			<input type="radio"/>	<input type="radio"/>
	33.	Are oil levels adequate?		<input type="radio"/>		
	34.	Is the correct type of oil being used?			<input type="radio"/>	<input type="radio"/>
	35.	Is there any clogging in the oil pipes?			<input type="radio"/>	<input type="radio"/>
	36.	Is there any dust or dirt at lubrication sites?	<input type="radio"/>			
	37.	Are the lubrication tools dirty?	<input type="radio"/>			

Table 5.1 Sample of inspection checklist

### Step 4: Implement inspection

When implementing inspection, use all your senses to detect abnormalities. Inspection is not simply a visual activity. There are some ways to detect abnormalities. These are:

- Look closely at how the machine works and watch for slight defects (e.g. oil leakage, debris scattering, deformation, wear, warping, mold, missing items, lopsidedness, inclinations, color changes).
- Listen closely for changes in the sounds the machine makes while operating (e.g. sporadic sounds, odd sounds).
- Use your nose to detect burning smells or other unusual odours (e.g. burning rubber)
- Touch the machine where it is safe during operation and during downtime to detect deviations from normal conditions (e.g. strange vibrations, wobbling, looseness, excessive heat, shifting).



### Step 5: Correct equipment problems

All equipment abnormalities or slight defects should be fixed or improved. There are two approaches to do these:

**Instant Maintenance:** whenever possible, an operator should immediately fix or improve a problem he or she discovers during inspection. But the operators should know what level of maintenance work they can handle by themselves and immediately.

**Requested Maintenance:** In some cases, a defect or problem may be difficult for the operator to hand alone and immediately. In this situation, the operator should attach a maintenance card to the site of the problem in order to make it visible. He or she can also issue a maintenance kanban to request help from the maintenance department. It is also good to log requested maintenance on to a checklist of needed maintenance activities. Once a requested maintenance is taken care and its result confirmed, the activity should be checked off in the 'confirmation' column of the checklist. The maintenance card should then be retrieved from the machine where it is attached.

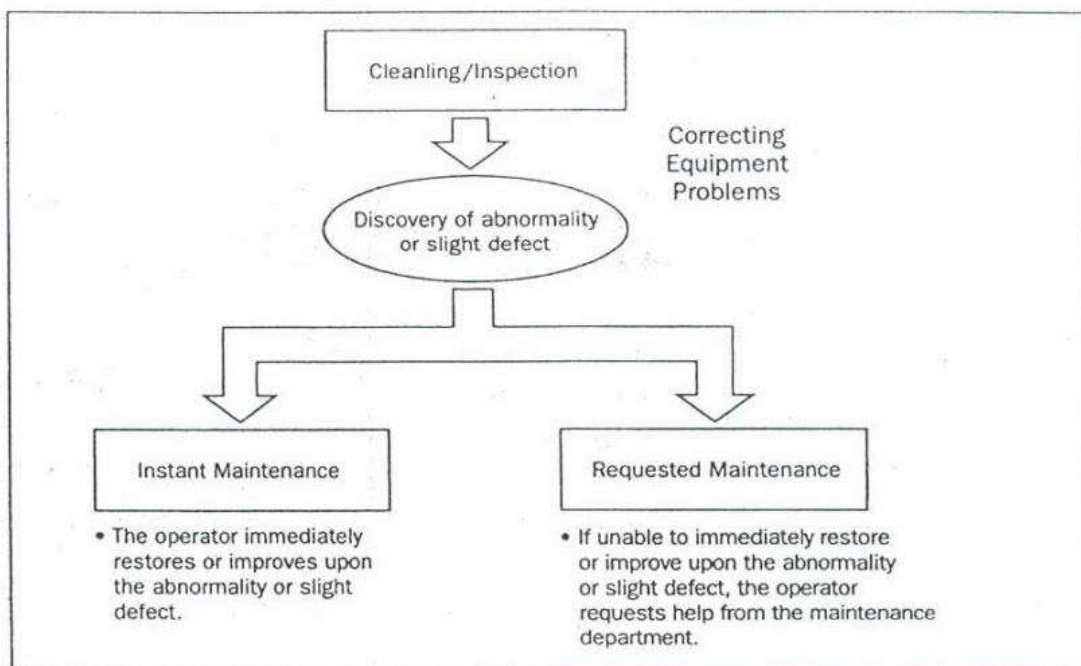


Figure 16. Two approaches for solving equipment problems

<b>Work Manual Self-Check 3</b>	<b>Written Test</b>
---------------------------------	---------------------

**Directions:** Answer all the questions listed below. Use the Answer sheet provided in the next page:

4. Describe 3S (1 point)
5. What is red tagging? (1 point)
6. Describe red tag holding area. (1 point)
7. List steps in red tagging? (7 points)
8. Describe steps to set in order. (5 points)
9. What is motion economy? (5 points)
10. List principles that helps to reduce motion (7 points)
11. List steps to shine activities. (5 points)
12. List types of problems frequently exist in factories. (4 points)
13. Describe shine targets. (5)
14. Describe steps in cleaning/inspection. (4 points)

**Note: Satisfactory rating – 27 points                      Unsatisfactory - below 27 points**  
 You can ask you trainer for the copy of the correct answers.

Learning Guide for Standardize and Sustain 3S Level II Version: 1      Revision: 0	Date: July 2015	Page 54 of 64
	Author EKI/MoE – TVET Outcome Based Training Core Process	

## Answer Sheet

Score = \_\_\_\_\_

Rating: \_\_\_\_\_

Name: \_\_\_\_\_

Date: \_\_\_\_\_

## Short Answer Questions

1. \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

2. \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

3. \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

4. \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

5. \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

6. \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

7. \_\_\_\_\_

\_\_\_\_\_



8. \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_
9. \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_
10. \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_
11. \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

## Sequence of 3S

### 1. Sort

#### 1.1 Plan and procedures for sort activity

Sort activity plan sheet (sample)

Preparation date: Year      Month      Day  
Prepared by 5S Committee

Area : M-1

Basic Plan		Sort Activity																																												
		1st month										2nd month																																		
Activity		18	19	20	21	22	23	24	25	26	27	28	29	30	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
Determining activity area	Plan																																													
	Result																																													
Preparing documentations	Plan																																													
	Result																																													
Deciding where to put unnecessary things	Plan																																													
	Result																																													
Holding a briefing session	Plan																																													
	Result																																													
Red tagging	Plan																																													
	Result																																													
Filling out documentations	Plan																																													
	Result																																													
Quantification	Plan																																													
	Result																																													
General cleaning	Plan																																													
	Result																																													

## 1.1 Implementation



## 2. Set in order

### 2.1 Plan and procedures for set in order

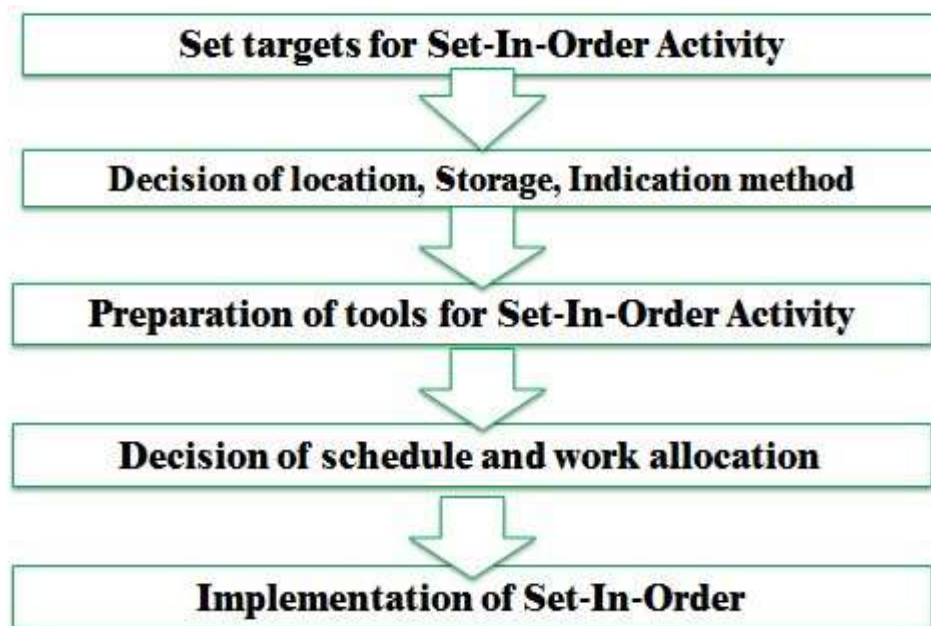
Area: M-1

Date of issue:  
Issued by: 5S Committee

Basic plan		Seiton																														
		3rd month																														
Activity items		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
Preparing tools	Plan																															
	Result																															
Determining storage positions/methods	Plan																															
	Result																															
Determining indication methods	Plan																															
	Result																															
Setting temporary signboards	Plan																															
	Result																															
Signboard operation	Plan																															
	Result																															

Set in order activity plan sheet (sample)

### 2.2 Implementation stage



### 3. Shine

#### 3.1 Plan

Area : M-1

Preparation date: Year

Month

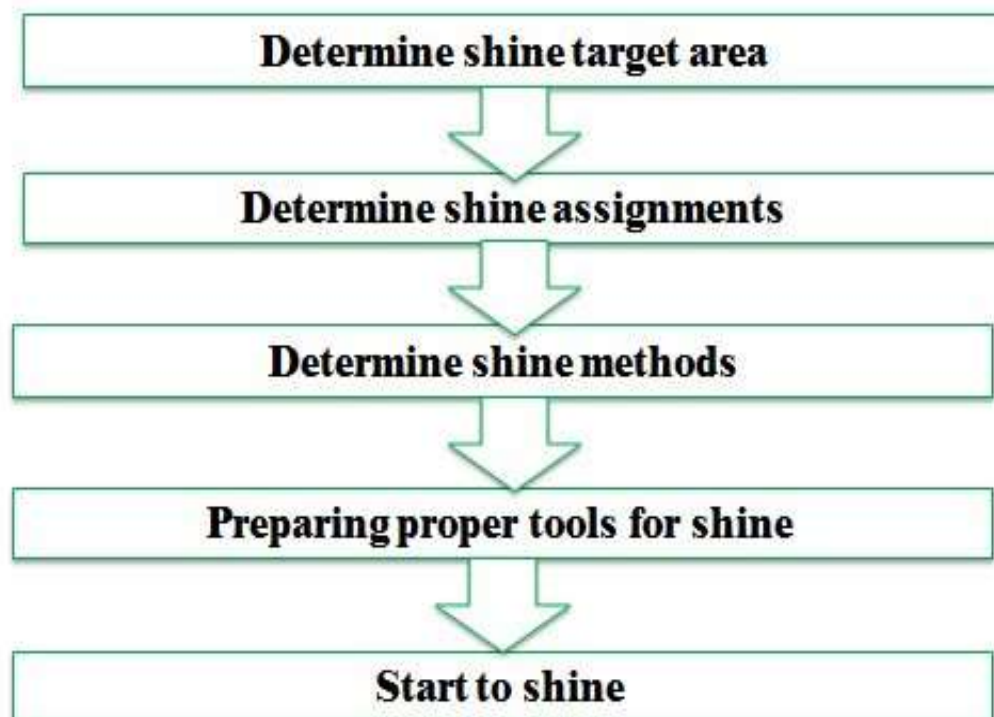
Day

Prepared by 5S Committee

Basic Plan		Seisou Activity																														
		5th month																														
Activity		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
Preparing necessary tools	Plan																															
	Result																															
Determining activity area	Plan																															
	Result																															
Designing procedures for the Seisou Activity	Plan																															
	Result																															
General cleaning	Plan																															
	Result																															
Working out the problems revealed through the general cleaning	Plan																															
	Result																															

Shine activity plan sheet (sample)

## 3.2 Implementation



<b>LAP Test</b>	<b>Practical Demonstration</b>
-----------------	--------------------------------

Name: \_\_\_\_\_ Date: \_\_\_\_\_

Time started: \_\_\_\_\_ Time finished: \_\_\_\_\_

**Instructions:** Given necessary templates, workshop, tools and materials you are required to perform the following tasks within ----- hours.

Task 1: identify and prepare tools and techniques to the sort activities.

Task 2: identify and prepare tools and techniques to the set in order activities.

Task 3: identify and prepare tools and techniques to the shine activities.

Task 4: using the identified, prepared and given tools and techniques perform 3S to your/ the given work area.

- identify the:

- person -in-charge
- technology workshop
- work station

- consider the:

- OHS procedures
- workplace procedures and standards (work area)
- frequency of maintenance activities

## List of Reference Materials

- 5S for operators (1995)
- Journals/publications/magazines
- Reference Book
- Job specifications
- Safety Manual and Guide
- Learning Guide #1