Furniture Making

NTQF Level- I

Learning Guide #5

Unit of Competence: Apply 3S

Module Title: Applying 3S

LG Code: IND-FMK1 - M01 LO 5-01

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LO 5: Perform Shine activities

Instruction Sheet	Learning Guide #1

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

- The third pillar of 5S – Shine

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 –

- Prepare plan for implementing shine activities.
- Prepare and use necessary tools and equipment for shine activities.
- Implement shine activity according to the prepared procedure.
- Report performance results using appropriate formats.
- Conduct regular shinning activities.

Learning Instructions:

1. Read the specific objectives of this Learning Guide.
2. Follow the instructions described in number 3 to 8.
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 11.
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 "Operation Sheet 1" in page 14; However, if your rating is unsatisfactory, see your trainer for further instructions or go back to Information sheet 1.
7. Read the "Operation Sheet 1" and try to understand the procedures discussed.
8. Do the "LAP test" in page 16 (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 have completed Learning guides prepared for Level I.

Information Sheet-1	The third pillar of 3S – Shine

1. Explanation of the third pillar Shine

1.1 Definition of Shine

The third pillar of 5S is shine. Shine means sweeping floors, wiping off machinery and generally making sure that everything in the factory stays clean. In a manufacturing company, shine is closely related to the ability to produce quality products. Shine also includes saving labor by finding ways to prevent dirt, dust, and debris from piling up in the workshop. Shine should be integrated in to daily maintenance tasks to combine cleaning checkpoints with maintenance checkpoints.

Fig. Workers shinning machines.

Fig. Workers shinning the floor

Cleaning is so important because when we clean an area, we are also doing some inspection or checking of machinery, equipment, and work conditions. An operator cleaning a machine can find many mal-functions. When a machine is covered with oil, soot, and dust, it is difficult to identify any problems that may be developing. While cleaning the machine, however, one can easily spot oil leakage, a crack developing on the cover, or loose nuts and bolts. Once these problems are recognized, they are easily fixed.

It is said that most machines breakdowns begin with vibration (due to loose nuts and bolts), with introduction of foreign particles such as dust (due to the crack on the cover, for instance), or with inadequate oiling and greasing. For this reason shine is useful to make discoveries while cleaning machines. Hence, shine means cleaning the workplace's floors, equipment and facilities, provide inspection at the same time, and ensure that they are in good operating condition.

1.2 Benefits of shine

One of the more obvious purposes of shine is to turn the workplace in to clean, bright place where everyone will enjoy working. Another key purpose is to keep everything in top condition so that when someone needs to use something, it is ready to be used. Companies or organizations should avoid the tradition of annual at the end of the year or on spring cleanings. Instead, cleaning should become a deeply ingrained part of daily work habits, so that tools, equipment, and work areas will be ready for use all the time.

Fig. Workers cleaning machines

Cleanliness for factories and offices is a lot like bathing for human beings. It relieves stress and strain, removes sweat and dirt, and prepares the body and mind for the next day. Cleanliness is important for physical and mental health. Just as you would not bath only once a year, performing shine procedures in a factory should not be an annual activity. Cleaning should be done on daily basis.

Fig. Shine activities relieves stress and strain

Shine activities can play an important part in bringing work efficiency and safety. Cleanliness is also linked with the morale of employees and their awareness of improvements. Factories or workshops that do not implement the shine pillar suffer the following types of problems:

1. Poor morale and inefficiency at work. This could be due to dirty windows that can pass only little light.
2. Unable to see or find defects in dark and messy workplaces.
3. Slipping and injuries can be created due to puddles of oil and water on the floor.
4. Frequent breakdown of machines due to insufficient check-ups and maintenances which in turn leads to late deliveries.
5. Low and unsafe operating machines due to insufficient checkups and maintenance which in turn leads to hazard and accidents.
6. Defects will result due to shaving cuts getting mixed in to production or assembly processes.
7. Shaving cuts can get in to people's eyes and create injuries.
8. Low morale due to filthy work environments.

2. Implementing the third pillar - Shine

2.1 Plan and procedures for shine activities

Shine activities should be taught as a set of steps and rules that employees learn to maintain with discipline. The following sample format can be used to prepare a plan for implementing shine activities.

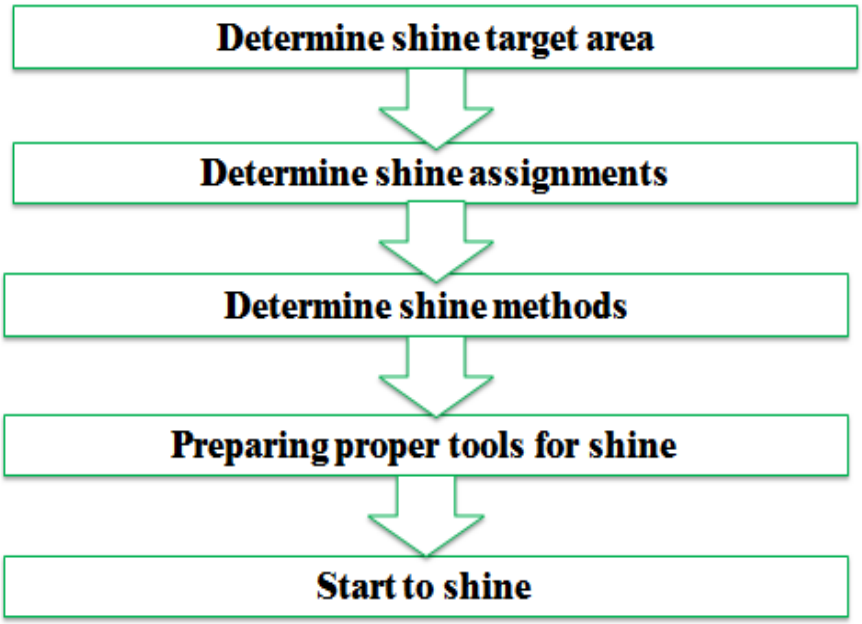
Shine activity plan sheet (sample)

Preparation date: Year Month Day

Area : M-1 Prepared by 5S Committee

Basic Plan / Activity		Seisou Activity – 5th month: 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	

Procedures for Set in order



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

Date of cleaning: Year Month

Activity area		Target place/object	Group	Leader	Tools	Required number of workers
Zone A	Machining-- Group A area Machining-- Group B area Machining-- Group C area	Lathe Press machine Floor Resting-place Pathway	Manufacturing	A	Detergent Waste cloth Scraper Broom mop	25
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 A	B	C	D	E	F	Frequency	Time	Start	Tool
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.

2.2 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

2.2.1 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.

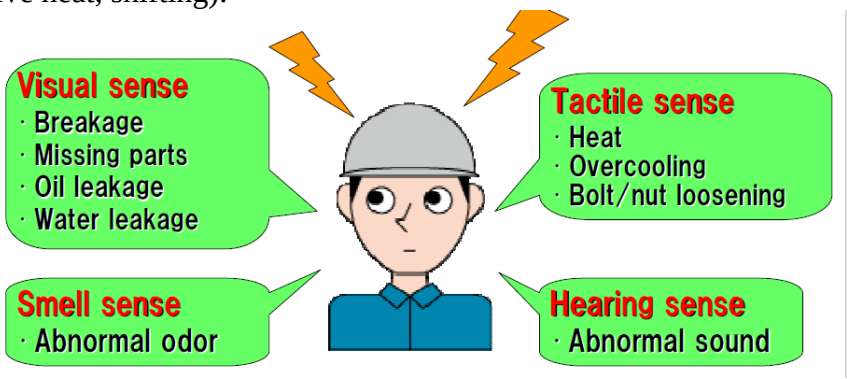
Mechanism	No.	Point	Main Response			
			Clean	Lubricate	Replace	Restore
Lubrication system 1. Oil inlets 2. Tank 3. Oil pipes 4. Lubrication sites	26.	Is there any dirt or dust in the oil inlets?	○			
	27.	Do the oil level indicators show adequate levels?		○		
	28.	Can the oil level indicators be clearly seen?	○			
	29.	Are there any cracks in the oil tank?				○
	30.	Is the bottom of the oil tank dirty?	○			
	31.	Is the oil in the tank dirty?			○	
	32.	Is there any oil leakage from the tank or pipe joints?			○	○
	33.	Are oil levels adequate?		○		
	34.	Is the correct type of oil being used?			○	
	35.	Is there any clogging in the oil pipes?			○	○
	36.	Is there any dust or dirt at lubrication sites?	○			
	37.	Are the lubrication tools dirty?	○			

Table: 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.

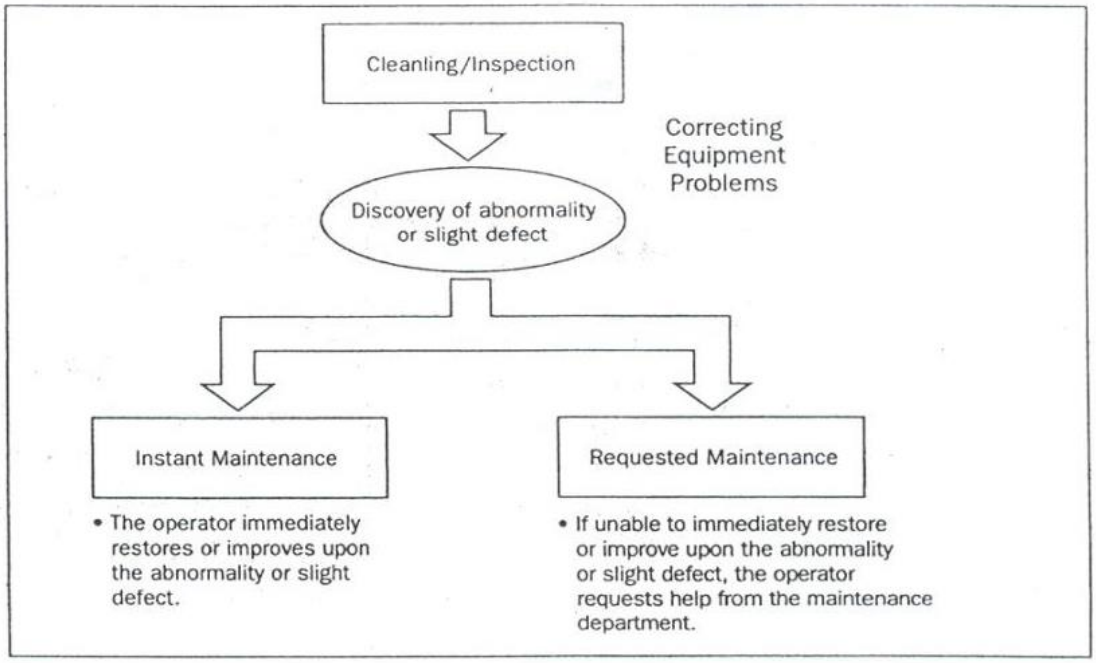


Fig. Two approaches for solving equipment problems

Self-Check 1	Written Test

Instructions: Answer all the questions listed below. Illustrations may be necessary to aid some explanations/answers. Write your answers in the sheet provided in the next page.

1. Give definition of the third pillar shine. (2 points)
2. What problems occur in a workshop if shine is not implemented? (8 points)
3. What are the steps/procedures for implementing shine? (5 points)
4. What are the two methods used to assign shine activities to employees? (2 points)
5. What are the most frequent problems of equipments/machines? (4 points)
6. List the steps of inspection. (5 points)
7. How do you detect abnormalities in a workplace or machine? (4 points)

Note: **Satisfactory rating - 7 points** **Unsatisfactory - below 6 points**
You can ask you teacher for the copy of the correct answers.

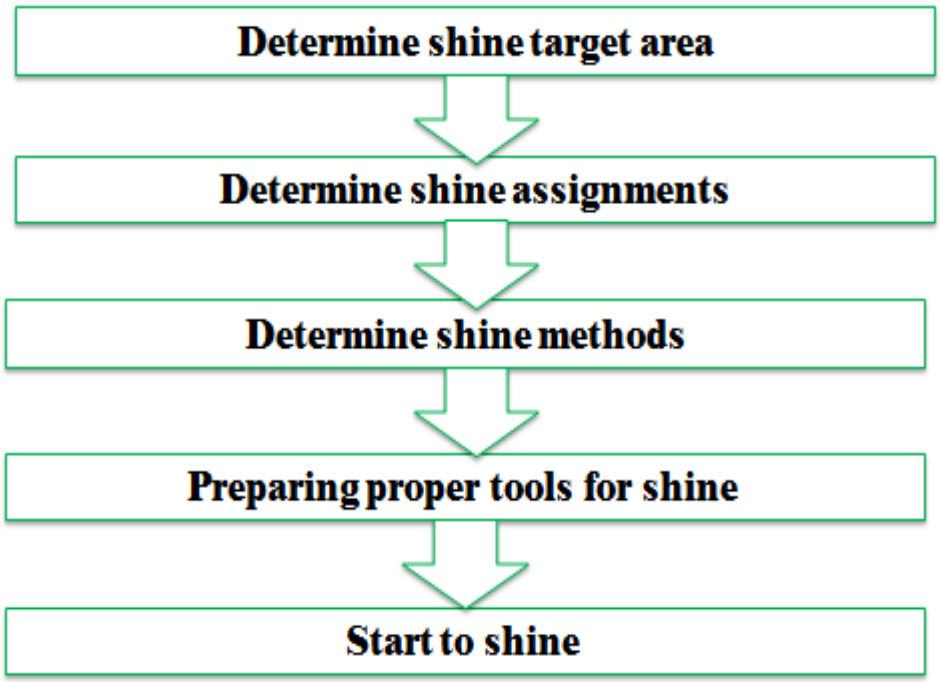
Answer Sheet

Score = _____

Rating: _____

Operation Sheet 1	Implementing shine activity

1) Procedures for implementing Shine



2) Prepare plan for shine

Sample plan for shine

Preparation date: Year Month Day

Area : M-1

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																														

Sample format for general cleaning assignment

General Cleaning Assignment Sheet

Date of cleaning: Year Month

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	
	Machining-- Group B area	Floor			Scraper	
		Resting-place			Broom	
		Pathway			mop	
	Machining-- Group C area					
Zone B	Purchasing area					
	Material area					
Zone C	Painting area					
	Processed products discharge area					

Sample format for regular cleaning assignment

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												

3) Steps in inspection

Step 1: Determine inspection targets
Step 2: Assign inspection activities
Step 3: Determine inspection methods
Step 4: Implement inspection
Step 5: Correct equipment problems

LAP Test	Practical Demonstration

Name: _____ Date: _____

Time started: _____ Time finished: _____

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

Task 1: Using the given template, prepare a plan for shine activity in your workshop.

Task 2: Following the shine procedures, perform shine activity in the assigned workshop.

Task 3: Following the steps for inspection, perform inspection of equipments, tools and machines in your workshop.

List of Reference Materials

1) 5S for operators (1995)
2) Ethiopia Kaizen Manual (2011)
3) Journals/publications/magazine