Meat and Meat Product Processing

Level-III

Module Title: - Operating Slicing and Packaging Machinery

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Contents

LG #31	LO #1-Set up equipment for operation

Instruction sheet

- This learning guide is developed to provide you the necessary information regarding the following content coverage and topics:
- Machine set up of packaging component.
- Conforming and loading consumable material and items.
- Identifying cleaning and maintenance requirements.
- Fitting and adjusting Machine components and related attachment.
- Carrying out Pre-start checks.
- Using Personal Protective Equipment (PPE)

This guide will also assist you to attain the learning outcomes stated in the cover page. Specifically, upon completion of this learning guide, you will be able to:

- Set up machine packaging component.
- Conform and load consumable material and items.
- Identify clean and maintenance requirements.
- Fit and adjust Machine components and related attachment.
- Carry out Pre-start checks.
- Use personal protective equipment (PPE)

Learning Instructions:

1. Read the specific objectives of this Learning Guide.
2. Follow the instructions described below.
3. Read the information written in the information Sheets
4. Accomplish the Self-checks
5. Perform Operation Sheets
6. Do the “LAP test”

Information Sheet 1- Machine set up of packaging component.

1.1 Introduction

Packaging machinery is used throughout all packaging operations, involving primary packages to distribution packs. This includes many packaging processes: fabrication, cleaning, filling, sealing, combining, labeling, overwrapping, palletizing.

1.2 Setting up the machine:

Before choosing the site for the machine, please consider that you will also need room for packaged and non-packaged products apart from the space needed for the machine itself. Keep in mind that the machine must not be set up upon uneven ground. Especially with vacuum packaging models, the weight of the pump might then cause warping of the machine. Then the lid will not fit correctly. Before starting to work, check the oil view glass on the pump, if there is a sufficient quantity of oil in the pump. Never use oil other than recommended by the producer. Never exceed maximum quantity of oil indicated, when adding or changing oil. Verify weekly. Normal ambient temperature for the vacuum pump is between 10 to 70oc.For temperature below 10oc; it is recommended to use synthetic oil. Please consult factory and pump manufacturer manual for more information or when ambient temperature are outside normal limits.

Some packaging operations cannot be accomplished without packaging equipment. For example many packages include heat seals to prepare or seal a package. With many industries, the effectiveness of the heat seal is critical to product safety so the heat sealing operation must closely controlled with documented Verification and validation protocols. Food, drug, and medical regulations require consistent seals on packages.

1.3 Types of vacuum packaging

1.3.1. Single vacuum chamber machines

Figure 1 single vacuum chamber

Single chamber sealers require the entire product to be placed within the machine. Like external sealers, a plastic bag is typically used for packaging. Once the product is placed in the machine, the lid is closed and air is removed. Then, there is a heat seal inside the chamber that will seal the bag, after sealing the bag the chamber is refilled with air by the automatic opening of a vent to the outside. This oncoming pressure squeezes all remaining air in the bag. The lid is then opened and the product removed. Chamber sealers are typically used for low-to-medium-volume packaging. This style of vacuum machine is also capable of sealing liquids due to equal pressure in the chamber and the bag eliminating the risk of the liquid being sucked out of the open edge of the bag.

1.3.2. Double vacuum chamber machines

Figure 2 double vacuum chamber

1.3.3. Double chamber vacuum packaging machine

Double chamber sealers require the entire product to be placed in a plastic bag within the machine. Once the product is placed in the machine on the seal bar, the lid is closed and air is removed. Then a seal bar inside the chamber seals the product in the bag, after sealing the bag the chamber is refilled with air by the automatic opening of a vent to the outside. This oncoming pressure squeezes all remaining air in the bag. The lid is then opened and the product removed. Double chamber sealers are typically used for medium-volume packaging, and also have the capability to vacuum seal liquids. The lid generally swings from one side to another, increasing production speed over a single chamber model. Double chamber vacuum packaging machines generally have either spring-weighted lids or fully automatic lids.

Double chamber vacuum packaging machines are commonly used for:

- Fresh meat
- Processed meat
- Cheese (hard and soft)
- Candy and chocolate

1.3.4. Rotary belt type vacuum sealer (rolling vacuum sealer)

Rotary belt type vacuum packaging machine or vacuum sealer features the same function as the double chamber vacuum packaging machine as a 'vacuum bag sealer'. But the rotary belt vacuum packaging machine is more convenient, as the belt rotates automatically while the bags are placed to the sealing bar and vacuum sealing process

completed. The vacuumed and sealed bags are automatically unloaded, which obviously is more convenient. The packaging plate of the machine is adjustable to 4 degrees, which allows the vacuum packaging of food with soup and liquid.

Rotary belt type packaging machines are commonly used for:

- Fresh meat
- Processed meat
- Seafood
- Pickles
- Cheese (hard and soft)
- Candy and chocolate

Any other packs that needs vacuum sealing, and the size of the pack is not too big.

1.3.5. Automatic belt vacuum chamber machines

Figure 3 Automatic belt vacuum chamber machines

Automatic Belt Vacuum Chamber Machine. Automatic belt vacuum chamber machines offer vastly increased speed and automation and accommodate large products. Automatic belt chamber sealers require the entire product to be placed in a plastic bag or flow wrapped pouch within the machine. The product travels on the conveyor belt, it is automatically positioned in the machine on the seal bar, the lid is closed and air is removed. Then a seal bar inside the chamber seals the product in the bag. After sealing the bag, the chamber is refilled with air by the automatic opening of a vent to the outside. This oncoming pressure squeezes all remaining air in the bag. The lid is then opened and the product removed. Automatic belt vacuum chamber machines are typically used for high-speed packaging of large items, and also have the capability to

vacuum seal liquids. The lid generally travels straight up and down. Automatic belt vacuum chamber packaging machines are commonly used for:

- Fresh meat (large portions)
- Processed meat
- Large sausage logs
- Cheese (hard and soft)

1.3.6. Thermoforming vacuum packaging machines

Figure 4 Thermoforming vacuum packaging machines

Thermoform packaging machines are used in larger production facilities for vacuum packaging products. Vacuum Packaging in large production facilities can be done with thermoforming machines. These are Form-Fill-Seal style machines that form the package from rolls of packaging film (webbing). Products are loaded into the thermoformed pockets, the top web is laid and sealed under a vacuum, producing vacuum packaged products. Thermoforming can greatly increase packaging production speed. Thermoformed plastics can be customized for size, color, clarity, and shape to fit products perfectly, creating a consistent appearance. One of the most commonly used thermoformed plastics is PET, known for a high-strength barrier resistant to outside tampering and an ease of molding into designated designs and shapes.

Some common uses for Thermoforming in vacuum packaging include:

- Fresh and marinated meat
- Sausage
- Cheese
- Candy / chocolate
- Grain
- Grab-and-go snacks (beef jerky, snack sticks)
- Pharmaceutical and medical products.

1.4 Choosing packaging machinery

Choosing packaging machinery includes an assessment of technical capabilities, labor requirements, worker safety, maintainability, serviceability, reliability, ability to integrate into the packaging line, capital cost, floor space, flexibility (change-over, materials, multiple products, etc.), energy requirements, quality of outgoing packages, qualifications (for food, pharmaceuticals, etc.), throughput, efficiency, productivity, ergonomics, return on investment, etc.

- Packaging machinery can be:
- Purchased as standard, off-the-shelf equipment
- Purchased custom-made or custom-tailored to specific operations
- Purchased refurbished and upgraded
- Manufactured or modified by in-house engineers and maintenance staff

Figure 5 double chamber vacuum packer

1.4.1 Double chamber vacuum packer

Machinery must be compatible with the expected operating conditions. For example, cold temperature operations require special considerations. Some industries must perform periodic wash downs of all equipment. This high pressure chemical washing puts special demands on machinery and control systems. Condensation within closed portions of machinery can also be problematic. Machinery needs to keep control of the product being packaged. For example, powders need to be stable, liquids cannot slosh out etc. Some manufacturers decide not to do their own packaging but to employ contract packagers to perform all or some operations. Capital, labor, and other costs are outsourced.

1.4.2 Function

Packaging is necessary to protect products, and is now done mainly through the use of packaging machinery. Machinery plays increasingly important roles such as: Improve labor productivity. Sliding blister sealing machine packaging machinery is much faster than manual packaging. One good example of this is the candy packing machine. Here, hundreds to thousands of candies can be wrapped in minutes. Ensure packaging quality. Mechanical packaging is particularly important for exported goods to achieve consistent packaging.

Handle specialized requirements, such as vacuum packaging, inflatable packaging, skin packaging and pressure filling. Reduce labor and improve working conditions for bulky/heavy products. Protect workers from health effects brought by dust, toxic/hazardous products and prevent environmental contamination. Reduce packaging costs and save storage costs for loose products, such as meat, tobacco, silk, linen, etc., by simply using compression packaging. Reliably ensure product hygiene by eliminating hand contact with food and medicines.

Self-check 1	Written test

Name…… ID…… Date…….

Directions: Answer all the questions listed below. Examples may be necessary to aid some explanations/answers.

Test I: Choose the best answer (4 point)

1._____used throughout all packaging operations, involving primary packages to distribution packs.

A.Packaging machinery

B.Double vacuum chamber machine

C.Rotary belt type vacuum sealer

D.thermo forming vacuum packaging machines

E.all

2. From the given choose which one is importance of vacuum packaging.

A.fabrication

B. Cleaning

C.filling

D.sealing,

E.ALL

Test II: Short Answer Questions

3. List types vacuum packaging machine?(5 point)

You can ask you teacher for the copy of the correct answers.

Note: **Satisfactory rating - 10 points** **Unsatisfactory - below 10 points**

Information Sheet 2- Conforming and loading consumable material and items.

2.1. Conforming and loading consumable material and items.

Raw materials, intermediate components and consumables are costs that are directly attributable to the production of a good or a service, thus including everything that is used to manufacture the final product or service. In most situations the raw materials and consumables items are variable costs, meaning that these items will vary along with the volume of production. It is common for a company to hold an inventory or stock of its consumptions.

2.2. Raw Materials and intermediate components

Raw material is also called direct material. In a short definition, the raw materials are the inputs (commodities, parts or substances) that are used in the manufacturing, transformation or assembly process of a product. Examples of raw materials:

- Metal
- Minerals
- Plastic
- Chemicals
- Meat

None processed food

More often than not, the inputs that a factory receives have gone through some sort of previous processing. These are intermediate components: The parts that are used in the production of a machine have gone through some sort of previous processing.

The seats, the speedometers, the glasses, the lights and many other parts have been manufactured by the suppliers.

2.3. Consumables

Consumables are supplies that are used in the production process, such: As machine meat in a factory. Printing ink in a printing company. Printing ink can also be stated as a raw material if it can be precisely measured the amount that is consumed per

impression or work – be aware that ink or toners for office use in non-graphic companies should be deemed as an office material in operating expenses.

The mains difference between raw materials and consumables is that become components or are transformed to give ways to the final product or service, whilst the consumables are needed for productions but are not incorporated in the product or service. It is usually difficult to assign how much (quantity) of a given consumable is used in the manufacturing of one product.

2.3.1 Raw materials and consumables in services

Although it is usually not commonly accounted as such, there are certain consumptions of raw materials or consumables that are needed in services. Take the following example.

2.3.2 2.3.2 Goods to be sold

Goods to be sold are items that the company acquires to be resold in the exact same condition in which they are bought. Retail stores buy manufactured products that are then resold to the final consumer. Goods to be sold are “consumed” in the sense that they are necessary for the retail activity, but are not transformed or manufactured.

Self-check 2	Written test

Name…… ID…… Date…….

Directions: Answer all the questions listed below. Examples may be necessary to aid some explanations/answers.

Test I: Choose the best answer (4 point)

1._____ is costs that are directly attributable to the production of a good or a service, thus including everything that is used to manufacture the final product or service.(5points)

A. Raw materials

B. intermediate components

C. consumables

D. All

Test II: Short Answer Questions

2.Write the difference between raw material and consumer? (5 point)

You can ask you teacher for the copy of the correct answers.

Note: **Satisfactory rating - 10 points** **Unsatisfactory - below 10 points**

3.1. Cleaning equipment

any of a large class of implements used for **cleaning**. **Cleaning** device, **cleaning** implement. Broom - a **cleaning** implement for sweeping; bundle of straws or twigs attached to a long handle.

Figure 6 vacuum packaging machine or vacuum sealing

Vacuum sealing is an easy process that extends the shelf life of food by removing any air surrounding the food. When the air is eliminated, heat is then used to seal the vacuum pack bag so that the food products inside remain fresh for a longer period. This allows for the shelf life of certain food products to be extended, which in turn minimizes kitchen wastage.

There are many different types of vacuum packers which come from various different manufacturers. For example, our range of top quality vacuum packers can be explored here. Each vacuum packaging machine will have specific cleaning instructions and requirements as per the manufacturer. These, along with tips below, will ensure the best maintenance and cleanliness of your vacuum packer.

3.1.1. Clean Your Vacuum Packer Regularly

Vacuum sealers are generally used to seal fresh and raw food products, and as such, they are highly susceptible to contamination and require regular cleaning. Once you have used your vacuum cleaner it is essential to clean it well. This will prevent any dust, bacteria, and/or other unwanted elements from spreading throughout your appliance. Ideally, you should clean your vacuum packer after every use to prevent this from happening.

3.1.2. Don't Use Harsh Chemicals to Clean Your Vacuum Packer

Harsh chemicals should be voided when cleaning your appliance. Vacuum packers are generally used to seal food products so avoiding chemicals is crucial. Harsh cleaning products contain toxic chemicals that can be a health hazard. You want to avoid any chance that your food products will come into contact with dangerous chemicals. Using mild soaps instead will reduce the risk of any health problems and/or chemical damage to the sealer itself.

3.1.3. Don't Use Wet Cloths When Cleaning Your Vacuum Packer

It is important to remember to not use a wet cloth when cleaning your vacuum packer, but rather a damp one. If the cloth is wet you run the risk of water dripping into the electrical components of the appliance. So instead, always use a lightly damp cloth to wipe down the machine to prevent electrical shock or damage to your vacuum packer. It is important to also always unplug your vacuum packer before starting any cleaning processes.

3.1.4. Remove Any Soap Residue from Your Vacuum Packer

Any evidence of soap residue on your appliance should be removed immediately. Not removing any cleaning residue could result in a build-up of bacteria which can cause health issues. This is because if soap residue is not properly rinsed away it attracts dirt and dust to the machine. To ensure your vacuum packer is rinsed efficiently, it is advised to give it a second wipe down with a dry cloth. Properly drying your vacuum packer will lower the risk of damage to the machine and any health hazards in using it.

Air and oxygen have a massive impact on the preservation of food products and by keeping your food products airtight you will reap many benefits. As such, vacuum

packers are incredibly useful kitchen gadgets and a worthwhile investment that provides many, various benefits. Therefore, you want your machine to remain in its best condition for as long as possible.

Following these easy maintenance tips will help you to effectively and safely clean your vacuum packer and reduce any risk of bacterial infections, damage, and/or electrical shocks. It is important to always take into consideration the hygiene level of your vacuum packer as it is exposed to fresh and raw food items that could carry airborne bacteria that can affect the condition of your vacuum packer machine as well as your health. Once your vacuum sealer is properly cleaned and dried, it is important to then store it in a safe and dry area where it will be protected from any unwanted elements.

3.2. Cleaning Equipment Use

Careful selection and maintenance of cleaning equipment will help minimize the risk of cross-contamination from the equipment itself but the action of cleaning can increase the risk of cross-contamination, i.e., through generation and spread of aerosols and particles (including allergens and foreign bodies), and consequently this must also be considered and controlled.

3.2.1. Cleaning Equipment: Preparation for First Use

Most cleaning equipment is not decontaminated before it is sent to the user, consequently it may be contaminated with microorganisms, chemical residues, allergens, and foreign bodies. All cleaning equipment should be decontaminated, as appropriate to its future use, before use, and have any removable labels removed.

3.2.2. Spread of Contamination by Cleaning Equipment

We have already detailed how cleaning equipment can be a source of contamination and how this can subsequently lead to contamination spread. This section provides further details of how cleaning equipment and the action of cleaning itself can cause the spread of contamination, and how this can be minimized. Research conducted by Campden BRI (Holah et al., 1990) has shown that the act of cleaning can increase the microbial level in the air (Table 41.2). Movement of these microorganisms by air can lead to subsequent spread of contamination to other parts of the production area and

surfaces within it. Studies conducted at Campden BRI, reported in Holah (2014), recorded the dispersal of particles and droplets generated by a range of wet and dry cleaning techniques.

The results show that, for dry cleaning, the use of vacuum-cleaning systems is the most effective at removing dry soils and preventing or minimizing the spread of contamination. However, it is important that the vacuums are fitted with appropriate bag and exhaust filters, that prevent the contamination re-entering the environment via the exhaust, and that these are regularly cleaned and changed to ensure their effectiveness.

3.3. Spread of Contamination by Hygiene Staff

Cleaning is only effective if it is conducted by properly trained, experienced, and conscientious hygiene staff. Selection of these staff is as important as selection of the cleaning equipment and they should be assigned to the tasks for which they are qualified. Each should have an awareness of the hazards and risks associated with their cleaning tasks, allergen, microbial, and/or foreign body control, of how their cleaning activities can impact on the spread of contamination and how poor cleaning can lead to serious consequences.

They should also be aware of how they themselves can cause the spread of contamination and the precaution they should take to minimize this. For example: Contamination transfer by hands—wash and dry hands/change gloves between tasks. Use of different hygiene staff for different areas—high/low risk, allergen/non allergen Hygiene staff training (keep records). Contamination transfer by clothing—use separate color-coded clothing, disposable aprons, change between tasks. Contamination transfer by footwear—keep captive to high-risk areas, clean and disinfect regularly.

Self-check 3	Written test

Name…… ID…… Date…….

Directions: Answer all the questions listed below. Examples may be necessary to aid some explanations/answers.

Test I: Choose the best answer (4 point)

1._____ any of a large class of implements used for cleaning.

A. Raw materials

B. intermediate components

C. consumables

D. All

2._____ an easy process that extends the shelf life of food by removing any air surrounding the food.

A, vacuum packaging

B. vacuum sealing

C. a$b

You can ask you teacher for the copy of the correct answers

4.1. Fitting and adjusting Machine components and related attachment

The vacuum cylinders always generate sufficient pressure. When sealing very thick vacuum bags, a top / bottom welding facility is fitted as an optional extra. This device applies the heat from both sides of the bag. Compressed-air support is also often used in such cases. For this purpose, a connection nozzle can be connected to the back of the machine (for 10-mm hose diameters) for a maximum 1.5 bar compressed-air supply.

- Vacuum packaging involves removal of air from within the pack and maintaining an oxygen-deficient environment around the product by sealing the product in a flexible film of low oxygen permeability. This technique is used for improving the shelf life of primal and sub primal meat cuts, boneless meat, and also for processed meat products like sausages, patties, nuggets, etc. Significant improvement in shelf life of moist-cooked nuggets, dry-cooked patties, and deep-fat fried croquettes up to 40, 60, and 80 days, respectively, has been reported at refrigerated storage under vacuum packaging condition (Naveena et al., 2014). During vacuum packaging air is evacuated either by nozzle vacuuming or by chamber vacuuming from package and same atmosphere is maintained till heat sealing (Brody, 1989; Davies, 1995), while doing so pressure difference exists between the package exterior and interior causing collapse in packages.
- Check that equipment is plugged in correctly. For example you should never use double adapters to plug in multiple devices. If more than one device needs to be connected to power you would always use a power board.
- Ensure that the electrical cords are in good condition and not frayed or broken
- Ensure that equipment is properly ventilated. Most machines can get very hot and need to have a proper airflow around them to avoid damage.
- start equipment in accordance with the organizations or manufacture's guidelines.
- Use safety guards or safety clothing (if applicable). Some equipment can have areas that can cause injury such as cutting blades and overheated areas. They will

generally have safety guards or may require safety clothing (such as eye or ear protection) to be worn.

- Log on and off equipment (where applicable) in accordance with the organizations producers. This is to ensure security of the information contained in computers or other equipment that contains confidential information.
- Never try to repair a computer or clear paper jams in a photocopier while the machine is still turned on. This could result in injuries such as electrocution if the machinery is faulty
- Turn off all equipment when it is not in use. This prevents machines from overheating and perhaps causing damage, and saves on cost.
- Using business equipment is an unsafe manner is a hazard, not only to your own health and safety, but also to those around you, and possibly even the premises.

Figure 7 Adjusting machine

Please note:

- For machines without a gas flushing device set the gas value to 0.
- The control is a time-driven control system.

1) ON pushbutton	:	Switch on
2) OFF pushbutton	:	Switch off
3) DAL pushbutton	:	Continuous operation
4) VAC pushbutton	:	Vacuum
5) GAS pushbutton	:	Gas filling
6) C° pushbutton	:	Sealing temperature
7) " + " symbol	:	Pushbutton to increase value
8) " - " symbol	:	Pushbutton to decrease value
9) STOP pushbutton	:	Quick-Stop for packaging liquids (see 3.3.)
10) Display	:	Display field for displaying the set values
11) Vacuum meter	:	Vacuum display

Self-check 4	Written test

Name…… ID…… Date…….

Directions: Answer all the questions listed below. Examples may be necessary to aid some explanations/answers.

Test I: write the best answer (4 point)

1. How do you describe fitting and adjusting of machine component of vacuum packaging machine?

2. List control boards of vacuum packaging machine?

Information Sheet 5- Carrying out Pre-start checks.

5.1 carrying out Pre-start checks

Pre start checks are pretty much exactly what they sound like, they are checks made to something - most often a piece of plant, equipment or machinery - prior to that thing being started or used; or checks made prior to doing something specific - like a days work or specific hazardous activity.

Pre starts often involve routine inspections conducted by the machine or equipment operator. Because of this, pre starts often take the form of a pre start checklist or Pre start checks are most common in heavy industries like construction, oil and gas, mining and manufacturing. They are also an everyday occurrence across all walks of life, with people performing basic and intuitive checks before they perform many activities and tasks.

5.2 Why are pre start checks important?

After you have answered your initial question of what is a pre start check - the natural next questions is often well then why are they important? The most obvious reason for why they are important is for human safety. Heavy machinery or equipment which malfunctions is not just a project or financial risk, it can result in serious injury or death to people. Pre starts are one of the most relied upon and basic safety steps for almost any company who engages with dangerous equipment or activities. Pre starts protect the operator as well as other people on site, on the factory floor etc.

The less known and less focused on benefit of pre start checks are the financial gains which companies and projects get from doing good pre starts regularly. Pre starts enable companies to catch small/minor issues before they snowball into bigger issues. Catching minor issues which take minutes or hours to repair also minimizes the chance of large scale repairs and downtime, which has a very real cost in terms or production and productivity. Pre starts are crucial for safety and an important part of good asset and equipment management.

5.3 How to streamline and improve safety compliance for your pre starts

Most companies think about safety and pre starts with good intentions, and most don't need to ask what a pre start check is because they fully understand the need to have and maintain good pre start practices. But companies, operators and workers get busy - and the admin burden and time it takes to conduct them compound to create an environment whereby pre starts can get overlooked of forgotten. Because of these factors, and because of the increasing importance of workplace safety, many companies have turned to software and dedicated pre start apps for help. These systems enable companies to streamline how they manage pre starts from start to finish - increasing the likelihood of them getting done properly and improving the quality and security of pre start record keeping. The most important benefit of these digital tools is that they improve access to the procedures and documents behind pre starts.

In the past, a machine operator may have a stack of pre start forms sitting in their piece of plant or in the office, or they may only have a word doc which they fill out after the days work or during lunch. But when it's on a tablet or mobile, it's always available and it's always the latest version. On the administration side, the machine operator would have had to scan or upload the completed pre start and then email or share it with the office when using paper or PDF. As you can imagine, this resulted in a high percentage of pre starts going missing or being illegible, which can be extremely costly in the event of an accident or audit. With new systems, as soon as an operator completes their pre start check it is synced to a central document management system. Here, a safety manager or administrator can quickly see and find any record.

Pre starts are a necessary part of managing assets, people and industrial projects - and you can make sure that they get the attention and care they deserve using a smarter template or solution. While you cam here to answer your question, what is a pre start? You are leaving with more context and some templates which can help you implement and maintain the type of pre start program which is guaranteed to reduce incidents and major events. Prestart checks must be made to ensure equipment is not damaged on start up and also to prevent possible injury to personnel during start up, the operational status of safety systems must be checked.

Self-check 5	Written test

Name…… ID…… Date…….

Directions: Answer all the questions listed below. Examples may be necessary to aid some explanations/answers.

Test I: Choose the best answer (4 point)

1____ are pretty much exactly what they sound like, they are checks made to something - most often a piece of plant, equipment or machinery

A. Pre start checks B. check list C. Personal protective equipment

2. From the given choose which one is not importance of pre start checks.

A. Workers safety

B. Working/fitted probably

C.Electrical equipment safety

D .all

Information Sheet 6- Using Personal Protective Equipment (PPE)

6.1 Introduction

Personal protective equipment, commonly referred to as "PPE", is equipment worn to minimize exposure to hazards that cause serious workplace injuries and illnesses. These injuries and illnesses may result from contact with chemical, radiological, physical, electrical, mechanical, or other workplace hazards. Personal protective equipment may include items such as gloves, safety glasses and shoes, earplugs or muffs, hard hats, respirators, or coveralls, vests and full body suits. Insure that all signs and caution labels are in good condition and visible.

6.2 Personal Protective Equipment

In addition to being aware of the mechanical hazards in the kitchen, it is important that you use the correct protective clothing and equipment. Wearing personal protective equipment (PPE) can prevent accidents from happening. As a worker, you are responsible for the following: Making sure your uniform is well fitted. Keeping all uniforms clean and in good condition, not frayed or badly worn. Making sure sleeves are kept buttoned at the wrist, cuffs on overalls and trousers are be eliminated, and trouser legs are long enough to hang outside boots. Wearing specific personal safety equipment such as goggles, hearing protection, gloves, and aprons when required. To ensure that you are protecting yourself, your personal protective equipment (PPE) list should include the following items.

A. Clothing

This includes well-fitted pants and jackets with all buttons fastened. Sleeves should be close fitting because sleeves that are loose and flowing are potential fire hazards when working over open gas burners. Health regulations require that all food handlers wear hair nets or use other approved methods for keeping hair under control. Aprons should be made of non-combustible and flame-resistant materials that do not melt under heat.

B. Footwear

The OHS Regulation requires that approved footwear must be worn by employees in all industrial occupations. Ensure your footwear is sturdy and provides enough back support to not cause future back problems. Footwear suitable for commercial foodservice establishments must have a non-slip sole and a closed toe and closed back. Your footwear should be sturdy and comfortable, and if the environment you work requires steeled toes, such footwear should be worn. High leather tops on shoes are a good idea as they will protect your feet from hot grease or liquids.

C.Hand protection

The most common type of gloves used in food service establishments are natural rubber latex gloves, synthetic rubber gloves, and vinyl gloves. As it is impossible to distinguish between natural and synthetic rubber gloves simply by looking at them, you should read the label on the box to determine what they are made of. Some people may have an allergic reaction (known as dermatitis) or a more serious reaction known as anaphylaxis to the natural latex glove, and for this reason natural latex gloves are not recommended for use when preparing food. Mesh gloves should be used when cleaning the meat slicer. Thick plastic, gloves should be used when handling cleaning products.

D.Eye protection

Eye protection in the form of safety goggles or masks should be worn whenever there is a chance of eye injury. Particles flying through the air can easily land in your eye and possibly do permanent damage. Eye protection is important, for example, when working with the band saw cutting through bone or when working with corrosive cleansers that could splash into your face.

E. Hearing protection

Approved hearing protection must be worn when high-level noise conditions exist. These conditions are not common in commercial kitchens but may be present in food manufacturing operations.

F. Respirators

Respirators should be used to protect yourself from inhaling harmful fumes or vapours such as those that often come from concentrated kitchen cleaning liquids. The respirator unit should be properly fitted to provide the best protection. Check the components to ensure they are not broken, cracked, or torn and that they do not have holes. Replace faulty components before use. Each unit will have a filter that should be checked regularly and replaced before the expiration date.

All personal protective equipment should be safely designed and constructed, and should be maintained in a clean and reliable fashion. It should fit comfortably, encouraging worker use. If the personal protective equipment does not fit properly, it can make the difference between being safely covered or dangerously exposed. When engineering, work practice, and administrative controls are not feasible or do not provide sufficient protection, employers must provide personal protective equipment to their workers and ensure its proper use. Employers are also required to train each worker required to use personal protective equipment to know:

- What kind is necessary
- How to properly put it on, adjust, wear and take it off
- The limitations of the equipment
- Proper care, maintenance, useful life, and disposal of the equipment
- If PPE is to be used, a PPE program should be implemented. This program should address the hazards present; the selection, maintenance, and use of PPE; the training of employees; and monitoring of the program to ensure its ongoing effectiveness.

There are many serious safety and health hazards in the meat packing industry. These hazards include exposure to high noise levels, dangerous equipment, slippery floors, musculoskeletal disorders, and hazardous chemicals (including ammonia that is used as a refrigerant). Musculoskeletal disorders comprise a large part of these serious injuries and continue to be common among meat packing workers. In addition, meat packing workers can be exposed to biological hazards associated with handling live

animals or exposures to feces and blood which can increase their risk for many diseases.

6.3 Common hazard control measures include:

Implementing an effective hearing conservation program, Implementing design and maintenance of electrical systems and an effective lockout/tag out program to prevent injury from accidental start-up of machinery during maintenance activities, Providing required personal protective equipment (PPE), Guarding dangerous equipment, Following OSHA's process safety management standard to protect workers from accidental leaks of ammonia, Incorporating engineering controls, such as improving sanitation and ventilation measures, to protect workers from chemical and biological hazards. Maintaining walking/working surfaces to prevent slips, trips and falls, Implementing OSHA's Hazard Communication Standard requirements and ensuring workers are not exposed to unsafe levels of hazardous chemicals, Following OSHA standards that require that exit doors are not blocked and not locked while employees are in the building. Employees must be able to open an exit route door from the inside at all times without keys, tools or special knowledge.

That requires that toilet facilities must be made readily available and that employees are able to use toilet facilities when needed. Insurance policies — regularly review and update your business insurance, especially when your business grows or changes.
Equipment must not be used. Immediately report any suspect machine.

Self-check 6	Written test

Name…… ID…… Date…….

Directions: Answer all the questions listed below. Examples may be necessary to aid some explanations/answers.

Test I: Choose the best answer (4 point)

1____ is equipment worn to minimize exposure to hazards that cause serious workplace injuries and illnesses.

A.Accident B. Damage C. Personal protective equipment

2.From the given choose which one is personal protective equipment.

A.Safety goggles B. Safety shoes C. Clothes D. Gloves

E. Ear protection F. All

You can ask you teacher for the copy of the correct answers.

Note: **Satisfactory rating - 10 points** **Unsatisfactory - below 10 points**

Operation sheet 1- Identifying cleaning and maintenance requirements

1.1 Cleaning and sanitizing

- Dismantle or open the equipment.
- Disconnect lines or open cut-outs to avoid washing debris .
- Remove waste with brush, shovel, broom, or other appropriate tool.
- Rinse surfaces to be cleaned with water to remove food residues.
- Clean surfaces with hot water with an added detergent
- Pressure or brushes, to remove tenacious deposits.
- flushing with hot water to remove detergent residues
- Rinse with cold water to cool equipment below 27 °C (80 °F).
- Allow equipment to drain and air dry.
- Do not depend on high-pressure steam to sterilize equipment;
- Sanitize equipment by rinsing, or spraying with a 100–200 ppm chlorine solution.
- Avoid contamination of equipment by spatter from floors
- Keep hoses used for rinsing equipment off the floor.
- Backwash and regularly sanitise water filters and water softeners.
- Eliminate dead ends in water pipes, brine, and syrup pipes
- Eliminate dead ends in flumes, sharp curves, bad solder, and welded joints.
- Provide in-plant chlorination and maintain a chlorine residual of 1 ppm in the plant water supply.
- Eliminate scale from the surfaces of pipeline blanchers.
- Rinsing boxes and bins with a chlorinated final rinse is recommended.
- Clean and sanitize corn huskers and cutters daily.
- Replace wooden husker and cutter bins with metal ones
- Keep cooling tanks clean and chlorinate cooling tanks or canals.
- During a breakdown, rinse off equipment and cool below 32 °C (90 °F) to arrest bacterial growth.
- Short-period shutdowns and similar equipment running and cool down to below 32 °C (90 °F).

Operation sheet 2- Fitting and adjusting Machine components and related attachment

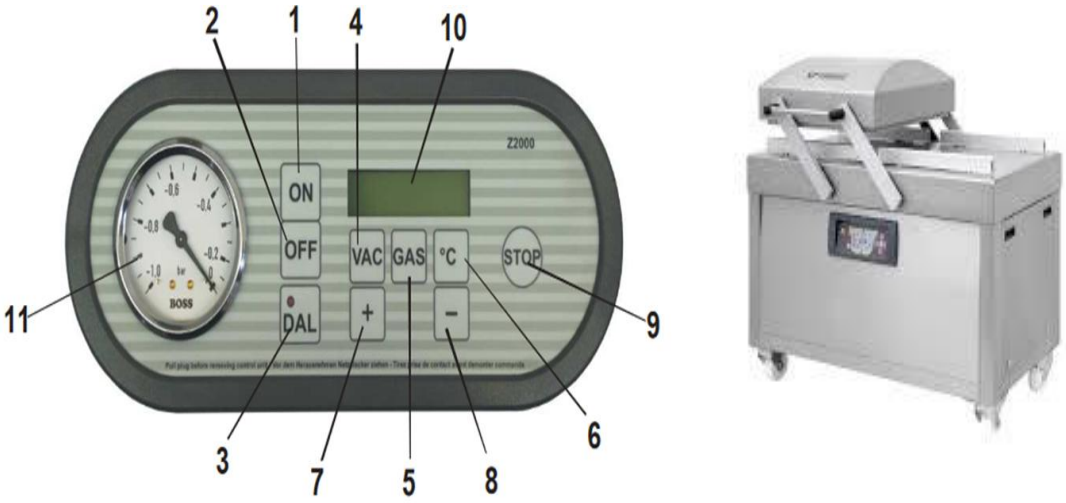


Figure 10 vacuum packaging machine

Adjustment of the Control Z 1000 / Z 2000

a) Switch ON

With the lid open, switch the machine on by pressing the ON push button 1).You can see the set values in the display field 10).

b) Vacuum value

Press the VAC pushbutton 4) and use pushbuttons 7) and 8) to set the required vacuum value (e.g. 25 seconds).Press the VAC pushbutton again to confirm the set value.

c) Gas filling

For machines without a gas flushing device (or for machines with a gas flushing device but where it is not to be used for a specific product) the gas value must be set to 0.To set the duration of the gas filling process, press the GAS pushbutton 5) and use pushbuttons 7) and 8) to set the required gas value (e.g. 5 seconds).Press the GAS pushbutton again to confirm the set value. The gas flushing device is an optional extra and must be ordered separately if required!

d) Sealing time

Press die C°push button 6) and use pushbuttons 7) and 8) to set the required sealing time (e.g. 1.5 seconds).

E) STOP pushbutton

By pressing the STOP pushbutton 9) you can prematurely interrupt the vacuum process and the vacuum bag is sealed immediately. When packaging liquids, this can prevent the leakage of liquid from the vacuum bag .The machine should have reached at least 40 % vacuum before you press the STOP pushbutton. You can see the current level of vacuum on the vacuum meter 11).

f) Continuous operation

When you press the DAL pushbutton 3) the pump runs continuously. Before starting work, run the machine approx. 1-2 minutes, and before an oil change 5-10 minutes, to warm it up. This warm-up should be carried out with the chamber lid closed.

g) Switching OFF The machine is switched off over the OFF pushbutton 2).

LAP TEST	Performance Test

Name……. ID……..

Date…….

Time started: _____ Time finished: _____

Instructions: Given necessary templates, tools and materials you are required to perform the following tasks within 1 hour. The project is expected from each student to do it.

Task-1 perform the cleaning and maintenance requirement

Task-2 perform the vacuum packaging machine component.

LG #2	LO #2-Operate slicing and packaging machinery

Instruction sheet

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

- Starting process and operating slicing and packaging machinery
- Monitoring equipment
- Identifying variation in equipment operation and reporting maintenance requirements
- Taking remedial action faults in process or product
- Meeting workplace housekeeping standards
- Meeting daily production schedule
- Maintaining workplace records

This guide will also assist you to attain the learning outcomes stated in the cover page. Specifically, upon completion of this learning guide, you will be able to:

- Start process and operating slicing and packaging machinery
- Monitor equipment
- Identify variation in equipment operation and reporting maintenance requirements
- Take remedial action faults in process or product
- Meet workplace housekeeping standards
- Meet daily production schedule
- Maintain workplace records

Learning Instructions:
1 .Read the specific objectives of this Learning Guide. 2. Follow the instructions described below. 3.Read the information written in the information Sheets 4.Accomplish the Self-checks 5.Perform Operation Sheets 6.Do the “LAP test”

Information Sheet1 - Starting process and operating slicing and packaging machinery.

1.1. Working principles

A vacuum packaging cycle is made of 3 stages. First the vacuum is made; the air is completely taken out of the chamber and from bag containing the product. Then it is possible to inject neutral gas from the nozzles, if the product is delicate. Finally, a mechanism pushes the sealing bar to the rubber support to seal the bag. To obtain nice packages, the products and the bags have to be of proportional sizes. The bag's opening should never exceed 50 cm (2") past the seal bars. The product should be centered in height in relation to the seal bar by adjusting the spacers provided. To obtain a good seal, make sure that no residue of fat is left between the bag's inner sides where sealing is done.

Self-check 1	Written test

Name…… ID…… Date…….

Directions: Answer all the questions listed below. Examples may be necessary to aid some explanations/answers.

Test I: write the best answer (4 point)

1. _____ First the vacuum is made; the air is completely taken out of the chamber and from bag containing the product.

A.vacuum packaging cycle B. vacuum packing working principle c A and B

Information Sheet 2 - Monitoring equipment

2.1 Introduction

Vacuum packaging is an efficient way to extend the shelf life of food products and to protect both food and non-food and non-food products against external elements. The cycle has 4 steps. During the first phase, the air is extracted from the product, the bag and the chamber. Up until the pre-set time or vacuum percentage has been reached or the boiling point has been detected in the case of liquid products, Vacuum packaging loads food into the packaging bag, draws out the air in the packaging bag, reaches a predetermined vacuum degree, and finishes the sealing process. Vacuum inflatable packaging loads food into a packaging bag, draws out air in the packaging bag to reach a predetermined vacuum degree, then fills nitrogen or other mixed gas, and then completes the sealing process.

2.2 Function and principle of vacuum packaging machine

The main function of vacuum packaging is to remove oxygen in order to prevent food spoilage. Its principle is also relatively simple. Because food mildew spoilage is mainly caused by the activities of microorganisms, and most microorganisms (such as mold and yeast) need oxygen for their survival, vacuum packaging uses this principle to pump oxygen out of the packaging bag and food cells, thus causing the micro-objects to lose their " living environment". Experiments show that when the oxygen concentration in the packaging bag is less than or equal to 1 %, the growth and reproduction speed of microorganisms will drop sharply. When the oxygen concentration is less than or equal to 0.5 %, most microorganisms will be inhibited and will stop reproducing. (Note: vacuum packaging cannot inhibit the spoilage and discoloration of food caused by anaerobic bacteria reproduction and enzyme reaction. Therefore, it must be combined with other auxiliary methods, such as refrigeration, quick freezing, dehydration, high temperature sterilization, irradiation sterilization, microwave sterilization, salt pickling, etc.

In addition to inhibiting the growth and reproduction of microorganisms, vacuum de oxygenation has another important function to prevent food oxidation. Due to the large amount of unsaturated fatty acids contained in oil and fat foods, they are oxidized by the action of oxygen, which makes the food taste and deteriorate. In addition, oxidation also

causes the loss of vitamin a and c, and the unstable substances in food pigments are oxidized, making the color dark. Therefore, de oxygenation can effectively prevent food deterioration and maintain its color, aroma, taste and nutritional value.

The main function of vacuum inflatable packaging is not only to remove oxygen and ensure quality, but also to resist pressure, block gas and keep fresh. It can effectively keep the original color, fragrance, taste, shape and nutritional value of food for a long time. In addition, there are many foods that are not suitable for vacuum packaging but must be vacuum filled. For example, crispy and fragile foods, easily caking foods, easily deformable oil-removing foods, foods with sharp edges or high hardness that can puncture packaging bags, etc. After the food is vacuum - inflated, the inflation pressure in the packaging bag is greater than the atmospheric pressure outside the packaging bag, which can effectively prevent the food from being crushed and deformed under pressure and does not affect the appearance of the packaging bag and the printing decoration.

The vacuum inflatable package is filled with nitrogen, carbon dioxide, oxygen single gas or mixed gas of two or three gases after vacuum. Its nitrogen is inert gas and plays a filling role, keeping the inside of the bag at a positive pressure to prevent air outside the bag from entering the bag, thus playing a protective role for food. Its carbon dioxide can be dissolved in various fats or water, leading to carbonic acid with weak acidity, and has the activity of inhibiting microorganisms such as mold and putrefactive bacteria.

Self-check 2	Written test

Name…… ID…… Date…….

Directions: Answer all the questions listed below. Examples may be necessary to aid some explanations/answers.

Test I: Choose the best answer (4 point)

1____ is cause of food spoilage in correct vacuum packaging machine.

A.microorganisms

B.cells

C. monitor d.all

2_____ is main function of vacuum inflatable packaging

A, To remove oxygen

B. To resist pressure

C. blocks gas and keep fresh

C. Personal protective equipment

d. all

f. none

Information Sheet 3- Identifying variation in equipment operation and reporting maintenance requirements

3.1 Introduction

Effective O&M is one of the most cost-effective methods for ensuring reliability, safety, and energy efficiency. Inadequate maintenance of energy-using systems is a major cause of energy waste in both the Federal Government and the private sector. Energy losses from steam, water and air leaks, un insulated lines, maladjusted or inoperable controls, and other losses from poor maintenance are often considerable. Good maintenance practices can generate substantial energy savings and should be considered a resource. Moreover, improvements to facility maintenance programs can often be accomplished immediately and at a relatively low cost.

Managing the operation and maintenance of equipment is fundamental to all owners and users of industrial assets. Process complexities and different methods of achieving the same outcomes have resulted in a large number of equipment types and models. From testing and installation of equipment, to operating periods, in-situ modifications, maintenance and overall life cycle management, EEMUA offers know-how for optimal operation and maintenance. It has particular expertise in pressure vessels, rotating machinery, piping systems, pressure relief systems and specialized equipment for dealing with hydrofluoric acid. In addition to these strengths, EEMUA membership also offers members the opportunity to collaborate with other member companies on key topics relevant to equipment operation and maintenance.

3.2 Reporting Maintenance

By using an outline, this document explains how you report maintenance jobs that are performed on positions and equipment. This includes reporting operations, approving operations and closing work order operations and work orders.

- **Results**
- **Outcome**

You have optimized production availability and minimized downtime. The work order is closed and the equipment is either back in production, or being maintained according to

the maintenance intervals. For scheduled services, the next service is generated. Actual costs can be generated. Required additional work orders are created. The warranty record is updated.

- **Uses**

Additional work that is either manually entered or automatically created as an alarm or a disturbance can be planned and performed. Updated maintenance statistics enable you to follow-up on your maintenance. The next scheduled service is available for work.

Self-check 3	Written test

Name…… ID…… Date…….

Directions: Answer all the questions listed below. Examples may be necessary to aid some explanations/answers.

Test I: Choose the best answer (4 point)

1.____ one of the most cost-effective methods for ensuring reliability, safety, and energy efficiency

A.operation and maintenance

B. Reporting maintenance

C. Effective maintenance

D. All

Information Sheet 4- Taking remedial action faults in process or product

4.1 Introduction

A remedial action is a change made to a nonconforming product or service to address the deficiency. This also can refer to restoration of a landscape from industrial activity. Rework and repair are generally the remedial actions taken on products, while services usually require additional services to be performed to ensure satisfaction. In some settings, corrective action is used as an encompassing term that includes remedial actions, corrective actions and preventive actions.

'Remedial Action' is a term referring to actions taken by businesses to counteract deficiencies or undesirable characteristics in their products. In this way it is distinct from 'Corrective Action', which aims to change the processes that led to these deficiencies, and 'Preventive Action', which aims to strengthen weak management systems not yet responsible for any deficiency. Supplier Corrective Action Request (SCAR) is a systematic approach to request investigation of a problem that already happened and request root cause analysis and resolution from supplier to prevent recurrence.

4.2 SCAR Key Elements SCAR

Step 1: Problem Verification

Step 2: Containment Action

Step 3: Failure Analysis Step

Step 4: Root Cause Step

Step 5:Corrective Action Step

Step 7: Effectiveness Verification

Step 6: Preventive Action

Step 1: Problem Verification

Problem verification is the first step of problem investigation. There are 3 main activities:

a) Verify the problem

b) Collect information

c) Describe the problem: To describe the problem specifically, (5W2H) terms (who, what, where, when, why, how, and how many) would help.

Step 2: Containment Action

Containment action is to limit a problem extent while continue normal operation until the root cause is defined and permanent corrective action is implemented The containment area should cover

a. Production

b. finished goods

c. Customer (Key sight)

d, Incoming material

e. Warehouse Storage

Step 3: Failure Analysis

Failure analysis (FA) is the process of collecting and analyzing data to determine the cause of a failure. Failure Analysis can be carry out by various methods including visual inspection, electrical testing and physical testing.

Step 4: Root Cause

Root cause identification is the most important step. The problem will be solved only if the corrective action implemented is addressing the real root cause accurately. Root Cause Analysis (RCA) is a systematic approach to identify the actual root causes of a problem.

Step 5: Corrective Action

Corrective action (CA) is to remove the root cause and prevent a problem from ever happening again. The corrective action should correspond to the root cause identified earlier in order to eliminate the real root cause and prevent recurrence of the problem.

Method such as brainstorming is recommended as it can help to select appropriate corrective action for identified root.

Step 6: Preventive Action

Preventive Action are proactive and focused on a potential problem in the future. Corrective actions are only a temporary solution that keeps the system running, but a permanent solution is needed to avoid similar problems from occurring into the system again.

Self-check 4	Written test

Name…… ID…… Date…….

Directions: Answer all the questions listed below. Examples may be necessary to aid some explanations/answers.

Test I: Choose the best answer (4 point)

1.____ it includes keeping work areas neat and orderly, maintaining halls and floors free of slip and trip hazards, and removing of waste

A. remedial action B. preventive action C. A&b

Information Sheet 5- Meeting workplace housekeeping standards

5.1 introduction

Housekeeping is not just cleanliness. It includes keeping work areas neat and orderly, maintaining halls and floors free of slip and trip hazards, and removing of waste materials (e.g., paper, cardboard) and other fire hazards from work areas Good housekeeping is also a basic part of incident and fire prevention.

5.2 What is the purpose of workplace housekeeping?

- Poor housekeeping can be a cause of incidents, such as:
- Tripping over loose objects on floors, stairs and platforms
- Being hit by falling objects
- Slipping on greasy, wet or dirty surfaces
- Striking against projecting, poorly stacked items or misplaced material
- Cutting, puncturing, or tearing the skin of hands or other parts of the body on projecting nails, wire or steel strapping

To avoid these hazards, a workplace must "maintain" order throughout a workday. Although this effort requires a great deal of management and planning, the benefits are many.

5.3 What are some benefits of good housekeeping practices?

- Effective housekeeping results in:
- Reduced handling to ease the flow of materials
- Fewer tripping and slipping incidents in clutter-free and spill-free work areas
- Decreased fire hazards
- Lower worker exposures to hazardous products (e.g. Dusts, vapours)
- Better control of tools and materials, including inventory and supplies
- More efficient equipment cleanup and maintenance
- Better hygienic conditions leading to improved health
- More effective use of space
- Reduced property damage by improving preventive maintenance

- Less janitorial work
- Improved morale
- Improved productivity (tools and materials will be easy to find)

5.4 How to plan a good housekeeping program?

A good housekeeping program plans and manages the orderly storage and movement of materials from point of entry to exit. It includes a material flow plan to ensure minimal handling. The plan also makes sure that work areas are not used as storage areas by having workers move materials to and from work areas as needed. Part of the plan could include investing in extra bins and more frequent disposal.

The costs of this investment could be offset by the elimination of repeated handling of the same material and more effective use of the workers' time. Often, ineffective or insufficient storage planning results in materials being handled many times and being stored in hazardous ways. Knowing the workplace layout and the movement of materials throughout it will help when planning work procedures. Worker training is an essential part of any good housekeeping program. Workers need to know how to work safely with the products they use. They also need to know how to protect other workers such as by posting signs (e.g., "Wet - Slippery Floor") and reporting any unusual conditions.

Housekeeping order is "maintained" not "achieved." Cleaning and organization must be done regularly, not just at the end of the shift. Integrating housekeeping into jobs can help ensure this is done. A good housekeeping program identifies and assigns responsibilities for the following:

- Clean up during the shift
- Day-to-day cleanup
- Waste disposal
- Removal of unused materials
- Inspection to ensure cleanup is complete
- Do not forget out-of-the-way places such as shelves, basements, sheds, and boiler rooms that would otherwise be overlooked.

The final step to any housekeeping program is inspection. It is the only way to check for deficiencies in the program so that changes can be made. Examples of checklists include inspecting offices and manufacturing facilities.

5.5 What are the elements of an effective housekeeping program?

A.Maintenance

The maintenance of buildings and equipment may be the most important element of good housekeeping. Maintenance involves keeping buildings, equipment and machinery in safe, efficient working order and in good repair. It includes maintaining sanitary facilities and regularly painting and cleaning walls. Broken windows, damaged doors, defective plumbing and broken floor surfaces can make a workplace look neglected; these conditions can cause incidents and affect work practices. So it is important to replace or fix broken or damaged items as quickly as possible. A good maintenance program provides for the inspection, maintenance, upkeep and repair of tools, equipment, machines and processes.

B.Dust and Dirt Removal

Enclosures and exhaust ventilation systems may fail to collect dust, dirt and chips adequately. Vacuum cleaners are suitable for removing light dust and dirt that is not otherwise hazardous. Industrial models have special fittings for cleaning walls, ceilings, ledges, machinery, and other hard-to-reach places where dust and dirt may accumulate. Special-purpose vacuums are useful for removing hazardous products. For example, vacuum cleaners fitted with HEPA (high efficiency particulate air) filters may be used to capture fine particles of asbestos or fibre glass.

Dampening (wetting) floors or using sweeping compounds before sweeping reduces the amount of airborne dust. The dust and grime that collect in places like shelves, piping, conduits, light fixtures, reflectors, windows, cupboards and lockers may require manual cleaning. Compressed air should not be used for removing dust, dirt or chips from equipment or work surfaces.

C. Employee Facilities

Employee facilities need to be adequate, clean and well maintained. Lockers may be necessary for storing employees' personal belongings. Washroom facilities require cleaning once or more each shift. They also need to have a good supply of soap, towels plus disinfectants, if needed. If workers are using hazardous products, employee facilities should provide special precautions as needed such as showers, washing facilities and change rooms. Some facilities may require two locker rooms with showers between. Using such double locker rooms allows workers to shower off workplace contaminants and reduces the chance of contaminating their "street clothes" by keeping their work clothes separated from the clothing that they wear home. Smoking, eating or drinking in the work area should be prohibited where hazardous products are handled. The eating area should be separate from the work area and should be cleaned properly each shift.

D. Surfaces

Floors: Poor floor conditions are a leading cause of incidents so cleaning up spilled oil and other liquids at once is important. Allowing chips, shavings and dust to accumulate can also cause incidents. Trapping chips, shavings and dust before they reach the floor or cleaning them up regularly can prevent their accumulation. Areas that cannot be cleaned continuously, such as entrance ways, should have anti-slip flooring. Keeping floors in good order also means replacing any worn, ripped, or damaged flooring that poses a tripping hazard.

Walls: Light-coloured walls reflect light while dirty or dark-coloured walls absorb light. Contrasting colours warn of physical hazards and mark obstructions such as pillars. Paint can highlight railings, guards and other safety equipment, but should never be used as a substitute for guarding. The program should outline the regulations and standards for colours.

F.Maintain Light Fixtures

Dirty light fixtures reduce essential light levels. Clean light fixtures can improve lighting efficiency significantly.

G. Aisles and Stairways

Aisles should be wide enough to accommodate people and vehicles comfortably and safely. Aisle space allows for the movement of people, products and materials. Warning signs and mirrors can improve sight-lines in blind corners. Arranging aisles properly encourages people to use them so that they do not take shortcuts through hazardous areas. Keeping aisles and stairways clear is important. They should not be used for temporary "overflow" or "bottleneck" storage. Stairways and aisles also require adequate lighting.

H. Spill Control

The best way to control spills is to stop them before they happen. Regularly cleaning and maintaining machines and equipment is one way. Another is to use drip pans and guards where possible spills might occur. When spills do occur, it is important to clean them up immediately. Absorbent materials are useful for wiping up greasy, oily or other liquid spills. Used absorbents must be disposed of properly and safely.

5.6 Tools and Equipment

Tool housekeeping is very important, whether in the tool room, on the rack, in the yard, or on the bench. Tools require suitable fixtures with marked locations to provide an orderly arrangement. Returning tools promptly after use reduces the chance of it being misplaced or lost. Workers should regularly inspect, clean and repair all tools and take any damaged or worn tools out of service.

A.Waste Disposal

The regular collection, grading and sorting of scrap contribute to good housekeeping practices. It also makes it possible to separate materials that can be recycled from those going to waste disposal facilities.

Allowing material to build up on the floor wastes time and energy since additional time is required for cleaning it up. Placing scrap containers near where the waste is produced encourages orderly waste disposal and makes collection easier. All waste receptacles should be clearly labeled (e.g., recyclable glass, plastic, scrap metal, etc.).

B. Storage

Good organization of stored materials is essential for overcoming material storage problems whether on a temporary or permanent basis. There will also be fewer strain injuries if the amount of handling is reduced, especially if less manual material handling is required. The location of the stockpiles should not interfere with work but they should still be readily available when required. Stored materials should allow at least one meter (or about three feet) of clear space under sprinkler heads.

Stacking cartons and drums on a firm foundation and cross tying them, where necessary, reduces the chance of their movement. Stored materials should not obstruct aisles, stairs, exits, fire equipment, emergency eyewash fountains, emergency showers, or first aid stations. All storage areas should be clearly marked. Flammable, combustible, toxic and other hazardous materials should be stored in approved containers in designated areas that are appropriate for the different hazards that they pose. Storage of materials should meet all requirements specified in the fire codes and the regulations of environmental and occupational health and safety agencies in your jurisdiction.

Self-check 5	Written test

Name…… ID…… Date…….

Directions: Answer all the questions listed below. Examples may be necessary to aid some explanations/answers.

Test I: Choose the best answer (4 point)

1.____ it includes keeping work areas neat and orderly, maintaining halls and floors free of slip and trip hazards, and removing of waste

A. Housekeeping B. Maintenance C. Spill Control D.All

Information Sheet 6- Meeting daily production schedule.

6.1 Meeting daily production schedule.

The Daily Production Meeting (DPM) is a 15-30 minute get-together of key/appropriate people to assess measure, communicate and plan production schedules. The objectives of the meeting are to:

- Assess rate and schedule performance from the previous day
- Confirm the schedule for the current day
- Set the schedule for the next day or two
- Discuss, report, and resolve production and customer issues

Customer Request this is the date that the customer asked for the shipment to be made. As unrealistic as it may be, it is what the customer wants. It never changes unless initialed by the customer.

6.2. Original Promise

this is the due date that the company gave to the customer at the time of order entry. It never changes unless repromised based on a customer request.

6.3. Current Promise

this is the “system positioner” due date and is the current best estimate of what is going to happen. This is the due date that MUST be kept valid daily. It is NEVER past due. You can’t ship something yesterday. The same logic holds true for schedule (work order) dates. However quite often only two dates are used:

A. Original Schedule – this is the due date that the schedule was originally given at the time the schedule was first established.

B. Current Schedule – this is the “system positioner” due date and is the current best estimate of what is going to happen. This is the due date that MUST be kept valid daily. It is NEVER past due. You can’t produce something yesterday.

Date validity is a wonderful practice to have. Valid dates basically enable the business system to provide valid information. Customer, production, and supplier information can be used straight from the business system. The DPM is a wonderful forum for

maintaining date validity and is a key tool for the DPM. Performance Measures, Posting, and Visualization Performance measures are used to drive improvement, not to punish people. In the DPM, the players must be encouraged and expected to know their performance, and praised for knowing what it is! In the DPM, the two most critical performance measures are:

- Schedule performance. This is the percentage of schedules completed vs. The total schedules. Often in a lean environment, it is done by cell or line.
- Run Rate performance. This is the percentage of output completed vs.

Other performance measures that could be included are quality, safety, and cost. There are a variety of ways to do these which will not be detailed here. In the meeting, each person who has schedule accountability must come to the meeting prepared with their performance numbers for the day. The results are typically posted on a whiteboard day by day. Each person, in turn, gets the maker in their hand, goes to the board, and writes the numbers. After all, it's their number. Why should anyone else do it? In addition, the daily numbers are recorded on a spreadsheet and graphed for display and distribution. The daily numbers are summarized in monthly totals. It is critical to post performance. It is critical that the people accountable for performance do the posting. It is a way to ensure understanding, ownership, and improvement. It's that simple.

Four absolute keys for a successful DPM:

i. The company president, general manager, and/or VP of manufacturing must want this done and be willing to get involved. He/she must show up at the meeting to make sure that everyone knows that a high performance DPM is not optional.

ii. Show up. That's right Show up on time. If the meeting is to start at 4:00, then all players should be at the meeting ready to go at precisely 4:00. Not a minute later.

III. C. Be prepared. Based on each player's particular role, all information must be known before the meeting. Rate and schedule performance, material issues, customer issues, production issues should all be researched, data collected, and facts gathered before the meeting.

IV. D. Information format. This sounds too simple, but it is critical. The schedule used as the basic input to the meeting must be in the fit-for-use condition

described. During the presentation, specific formats for the daily schedule and customer open order reports will be presented. Output of the DPM

Four outputs of the daily production meeting as follows:

i. Update any and all dates to ensure date validity as follows: any schedules that were missed that day

A. Any customer shipments that were missed that day

B. Any future schedules or customer shipments that require a date change

ii. Review performance to ensure the team understands if operations are getting better or worse and to know what to work on for improvement. Again, the key performance measures are:

A Schedule performance.

B. Run Rate performance.

iii. Update the schedule for the next few days. Make sure the schedule is valid in terms of customer needs, material supportability, capacity supportability, and tooling supportability.

iv. Record any action items that need attention. Make sure there are specific action items, who are going to do them, and when they are going to be done. Usually, the action plan is listed on a white board.

Now, let's think about why you have the meeting in the first place. It's a crutch. Most shops have the production meetings mainly because nobody uses their system correctly, and possesses the discipline to enforce standards that the company should be operating with. The information in the system is lacking in some way; the dates entered are padded because sales and the customer service reps have been burned by production so they don't trust that it will go out on time, or maybe there are challenges along the way with getting the art approved or all the inventory delivered – but the ship date never moves. The need for the production meeting is apparent, as your staff isn't doing their jobs correctly and each day the schedule has to be filtered down to what you can actually accomplish.

Everyone has to agree that you want to move in another direction and agree to work towards that goal. Below are some challenges that should get you thinking: Whatever system you use, everyone has to do their part correctly. All departments have to use the system and mark their part of the work complete each and every time. Staff members agree to put all notes in the system, and not handwrite anything on the work orders.

Ship dates and In-Hands dates must be the real ones. This is a cardinal rule that can't be broken. If you are padding dates, you are forcing the "we have more time" thought around the order. It becomes a moving target, and the information is unreliable. Once in a while that client's order uses a real date, when normally it would be padded, nobody will trust that it's accurate and when push comes to shove, this is the order that gets bumped.

Based on your staff's skill level and equipment, you need to calculate how much time is needed for each step of the process along the way and then set some rules to work by. For example, art will need to be approved two working days before production is to start. This gives the art staff time to separate the file so the screen room has time to burn the screens. The goal should be that the screens are ready for use one business day before the job is to start printing. The goal of production is to work towards finishing printing one business day before the posted ship date.

You should know your daily capacity in production based on real numbers. Use your production logs, and average out how many impressions or jobs can be printed on each press on a normal shift. If your customer service or sales team books jobs that exceed those numbers you should start talking about overtime, moving some jobs around, adding another shift, or contracting the work. It's crucial that your front office is trained to understand the production schedule, and comprehend the impact on crowding the schedule and agreeing to challenges. Your production schedule should be available for all to see. Whether it's in your computer system, on your server, or just a whiteboard on the wall of the shop; it's mandatory that everyone is trained to review the schedule constantly and make adjustments to their department based on the ebb and flow of the

work coming in. Each department has to support each other and get their tasks completed – the earlier the better.

There's one thing that's certain, and that you are always going to have crucial "have to go" jobs every day. These could be for an important client, maybe they are already late, or you just want them to go early to impress a new customer. Regardless, you need a way to earmark them so everyone knows to "work on this first". These are the first jobs you pull to the press in the morning (or if you are like our shop, we like to start them the day before), so you are assured they will go out on time. Some shops use brightly colored stickers, different colored paper, or job jackets for the work orders. We add a "$" to the front of our customers PO numbers so we can simply run a report each day on what is the crucial "can't fail" jobs. This is reviewed by each department constantly and everyone gets to work to make it happen.

People have to pay attention. Any challenges to the timing of the schedule have to be handled and decisions made. Everyone should be trained to review their chunk of the schedule three or four times a day and really dig into what's coming up tomorrow or the next day. Your staff may also need to get up out of their chairs or pick up the phone and talk to other departments to resolve challenges. The longer your company waits to tackle a potential problem, the larger it will grow as it nears the deadline. You want to be in the "Hey, I just noticed this" stage not in the "Oh no! What are we going to do?" Stage.

The more you standardize your company's policies and procedures, the better chance you will have of weaning off the production meeting need. It's the system, discipline, and training that you have to have to support the idea of not having a production meeting.

Self-check 6	Written test

Name…… ID…… Date…….

Directions: Answer all the questions listed below. Examples may be necessary to aid some explanations/answers.

Test I: Choose the best answer (4 point)

1.____ a 15-30 minute get-together of key/appropriate people to assess measure, communicate and plan production schedules

A. The Daily Production Meeting (DPM) B. Maintenance C. Spill Control D.All

Information Sheet 7- Maintaining workplace records

7.1 Introduction

Records are'information created, received, and maintained as evidence and information by an organization or person, in pursuance of legal obligations or in the transaction of business'

7.2 Basic record keeping requirements

Setting up the right record keeping system for your business will help you work efficiently, meet legal requirements and strengthen customer and staff relationships. There are certain record keeping requirements for businesses in Queensland, and there may be specific laws and requirements related to your industry sector. It's a good idea to protect yourself by seeking expert advice before setting up a record keeping system for your business.

Laws that apply to your business will determine how long you need to keep records for. If you use an electronic record keeping system, you must also be able to produce a hard copy of a record if the Australian Taxation Office (ATO) or Australian Securities and Investments Commission (ASIC) request it.

For financial reporting, ASIC's Regulatory index - financial reporting breaks reporting requirements down by business type. Personal financial records must be kept for 5 years, whereas the following records must be kept for 7 years:

- Financial records for your company
- Most employee records
- All records of fringe benefits and capital gains.

7.3 Basic records

To meet basic legal requirements, you must keep the following:

- A cash book or financial accounting program — that records cash receipts and cash payments
- Bank accounts — cheque books, deposit books and bank statements

- Employment records — hours of work, overtime, remuneration or other benefits, leave, superannuation benefits, termination of employment, type of employment, personal details of workers, employee personal contact and employment details
- Occupational training records — for both you and employees to comply with work, health and safety laws including evacuation and emergency training attendance
- Sales records — invoice books, receipt books, cash register tapes, credit card documentation, credit notes for goods returned and a record of goods used by the business owner personally
- Proof of purchases — cheque butts (larger purchases), petty cash system (smaller cash purchases), receipts, credit card statements, invoices, any other documents relating to purchases including copies of agreements or leases
- Work, health and safety (WHS) records — workplace incidents, risk register and management plan, names of key WHS people (e.g. WHS representative, Trained Safety Advisor (TSA), first aid attendant), chemical storage records, first aid incident register, workplace assessments, Material Safety Data Sheets (MSDS).

It is a good idea to keep personal and business records separate, to simplify business reporting and tax returns. For example, using a dedicated business credit and debit card for business expenses will make it easy to separate business and personal expenses.

7.4 End of financial year records

To meet legal requirements, maximize your tax return or minimise your tax bill at the end of the financial year, keep the following records:

- Details of stock on hand — at the beginning and end of the financial year
- A list of debtors and creditors — for the entire financial year.
- Agreements — sales and purchase contracts, loan agreements, rental agreements, lease agreements, franchise agreements, sale and lease back agreements, trading agreements with suppliers, legal documentation
- Other documents — deposits with utilities, contracts with phone companies, your business name registration certificate, capital gains records.

7.5 Best practice and record keeping

Depending on your industry, keeping the following records may be a legal requirement, but it is best practice to keep them for 5-7 years:

- Employee accreditation certificates and licenses — copies of permits, registrations and licenses employees need to do their jobs
- Employee resumes and job applications
- Performance reviews — including assessments of staff performance and agreements between you and your employees
- Position statements and job advertisements
- Customer records — personal details, products purchased and product enquiries that are useful for finding new customers
- Customer complaints — details of complaints about products, service, staff or anything else, and steps taken to resolve them
- Details of any disputes with other businesses — including how you went about resolving disputes
- Quotes given and won — specifics of jobs and time spent on them to help with future quoting
- Details of advertising campaigns and success — to make it easier to repeat advertisements and plan future advertising campaigns
- Insurance policies — regularly review and update your business insurance, especially when your business grows or changes.

Self-check 7	Written test

Name…… ID…… Date…….

Directions: Answer all the questions listed below. Examples may be necessary to aid some explanations/answers.

Test I: Choose the best answer (4 point)

1.____ is 'information created, received, and maintained as evidence and information by an organization or person.

A. records B. report c. Sales records d. Agreements

Operation sheet 1- Starting process and operating slicing and packaging machinery.

i. Use key "POWER" to power ON / OFF the vacuum packaging machine.
ii. Unit is energize; the identification of the last executed program is displayed on LCD screen.
iii. Use the "ESC" key to change over from the programs menu to the functions menu and from the functions menu to the programs menu.
iv. In functions menu, use key "SELECT" to select a function and key "ENTER" to accede and executed the selection.
v. In programs menu, use key "SELECT" to select a program and key "ENTER" to accede and modify the selection.
vi. In programs submenu, use key "ENTER" to pass over the parameters and point to the following one
vii. A return to programs menu is performed automatically following the last parameter acquisition.
viii. In program submenu, use key "ESC" to get back to the programs menu.
ix. Strike any key to clear the error messages which may be displayed on
x. When executing the "create a program" function, the program submenu is acceded, starting with the identification.
xi. The machine is switched off over the OFF pushbutton 2).

Operation sheet 2- Monitoring equipment

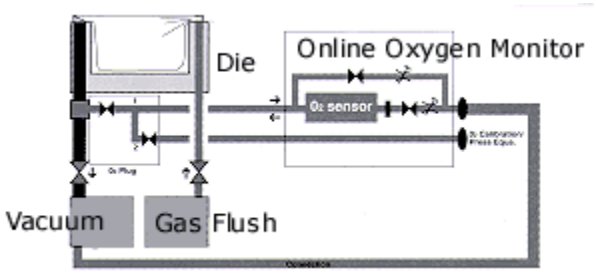
2.1. Monitoring equipment

On-line Oxygen Monitor for Vacuum Packaging Machines

The PBI 9100 is an on-line oxygen monitor designed for integration into a vacuum packaging machine to monitor the residual oxygen in the die just before the package is sealed

Related products
Oxygen and CO2 headspace analyzers
On-line Oxygen and CO2 monitor for flow packers

Oxygen monitor for vacuum packaging - principle The 9100 analyzer is an on-line oxygen monitor for use with vacuum packaging systems. The instrument works by drawing a sample of gas from the die during the vacuum (die evacuation) and gassing cycles (gas flushing). This sample is analyzed very quickly immediately after the package is sealed. The instrument uses the packaging machines vacuum system to draw a sample from the die. The 9100 takes two signal inputs from the packaging machine, the first from the vacuum valve and the second from the gassing valve. With this information the instrument's microprocessor coordinates a sampling sequence controlling the flow of sample gas to the oxygen sensor by means of a series of solenoid valves which are a part of the 9100 system. The speed and sensitivity of the oxygen sensor used in the



9100 system means that the instrument effectively performs real time residual oxygen analysis of every package run on the machine. This information helps the packer to optimize the machine throughput, maintaining the vacuum levels and gas consumption at correct (and therefore economical) settings.

Oxygen monitor for vacuum packaging - operation

The 9100 is made up of two modules a sensor module which is mounted close to the packaging machine die and a monitor module which contains the display and control panel. The instrument is set up and operated by means of the 5 touch key pads on the control panel. These five keys give the operator access to a series of menus for setting up the product alarms, setting up external signals for a printer or analog output and reviewing diagnostic information. Once the setup has been initialized the instrument can be operated with minimal training with couple of key strokes.

Operation sheet 3- Identifying variation in equipment operation and reporting maintenance requirements

3.1. Maintenance procedures that should be considered when preparing the planned maintenance program include:

I. Carry out repairs needed when plant or equipment breaks down;

II. The breakdowns, the life expectancy of parts, bearings, etc., the tasks to be carried out.

III. Check the condition throughout the plant of equipment, its running hours, readings of different responses (e.g. Vibration, temperatures, current, etc.);

IV. Monitor the operating cycle and, where appropriate, seasonal shutdowns of plant, equipment (e.g. Production process, 24-hour duty, etc.).

LAP TEST	Performance Test

Name……. ID……..

Date…….

Time started: _____ Time finished: _____

Instructions: Given necessary templates, tools and materials you are required to perform the following tasks within 30 minute. The project is expected from each student to do it.

Task-1 operates the vacuum packaging.

Task-2 perform monitor of oxygen in vacuum packaging

Task-3 perform report maintenance

LG #3	LO #3-Ensure safe operation of process

Instruction sheet

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

- Identifying potential dangers from hazards
- Checking and adjusting Equipment performance
- Using Clear and accurate oral communication
- Encouraging and supporting team members
- Working and following Safe working practices

This guide will also assist you to attain the learning outcomes stated in the cover page. Specifically, upon completion of this learning guide, you will be able to:

- Identify potential dangers from hazards
- Check and adjust equipment performance
- Use Clear and accurate oral communication
- Encourage and supporting team members
- Work and follow safe working practices

Learning Instructions:

1. Read the specific objectives of this Learning Guide.
2. Follow the instructions described below.
3. Read the information written in the “Information Sheets”. Try to understand what are being discussed. Ask your trainer for assistance if you have hard time understanding them.
4. Accomplish the “Self-checks” which are placed following all information sheets.
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-checks).
6. If you earned a satisfactory evaluation proceed to “Operation sheets
7. Perform “the Learning activity performance test” which is placed following “Operation sheets” ,

8	If your performance is satisfactory proceed to the next learning guide,
9	If your performance is unsatisfactory, see your trainer for further instructions or go back to “Operation sheets”.

Information Sheet 1- Identifying potential dangers from hazards.

1.1 Identifying potential dangers from hazards.

Hazard is the potential for harm or an adverse effect (for example, to people as health effects, to organizations as property or equipment losses, or to the environment). Sometimes the resulting harm is referred to as the hazard instead of the actual source of the hazard. Hazard warning signs. Your machine is fitted with the following hazard warning sign: The sign is located at the back of the machine or is placed directly on the electrical control cabinet of the machine. If any of the signs is damaged or is missing on the machine, it must be replaced immediately. Please contact us if you require any replacement signs and we will be happy to provide them.

1.2 Emissions and disposal

Provided that the machine is working properly, the workplace-related noise emission value is less than 70 db (A).Please carry out the oil change and oil filter change as specified. "Regular maintenance tasks").Failure to comply may result in the output of noxious oil fumes. If the machine is not supplied and erected by one of our agencies but supplied by a forwarding agent, please dispose of the packaging at local collection point .Used oil and oil filters should also be disposed of at a local collection point. When you no longer have any use for your old machine you can return it to us free of charge and we will dispose of it for you.

The words ‘risk’ and ‘hazard’ are often used interchangeably. However, if you are responsible for managing the health and safety in your workplace, it’s important that you understand the difference between them. The rest of this article focuses on hazards, including where they might be found in different workplaces. We also provide you with a range of further resources to make your risk assessment process as smooth as possible.

Self-check 1	Written test

Name…… ID…… Date…….

Directions: Answer all the questions listed below. Examples may be necessary to aid some explanations/answers.

Test I: Choose the best answer (4 point)

1.____ **is the potential** for harm or an adverse effect (for example, to people as health effects, to organizations as property or equipment losses, or to the environment

A. hazard B. emission c. disposal d. all

Information Sheet 2- checking and adjusting Equipment performance

2.1 checking and adjusting Equipment performance

Equipment performance is defined as a measure of total equipment performance. That is, the degree to which the equipment is doing what it is supposed to do (Williamson, 2006). It is a three-part analysis tool for equipment performance based on its availability, performance, and the quality rate of the output. It is used to identify for equipment the related losses for the purpose of improving total asset Performance and reliability. It categorizes major losses or reasons for poor Performance and therefore provides the basis for setting improvement priorities and beginning of root cause analysis. It can point to hidden capacity in a manufacturing process and lead to balanced flow. OEE is used to track and trace improvements or decline in equipment effectiveness over a period of time OEE measurement tool was developed from the TPM concept launched by Nakajima (1988).

The goal of TPM is to achieve zero break down and zero defects related to equipment. The consequence of reducing breakdowns and defects is improvement on production rate, reduction in costs, reduction in Inventory and eventually, increase in labour productivity.

The TPM concept puts much attention to production equipment since they have a high influence on quality, productivity, cost, inventory, safety and health, and production output. OEE is defined as a measure of total equipment performance. That is, the degree to which the equipment is doing what it is supposed to do (Williamson,2006). It is a three-part analysis tool for equipment performance based on its availability, performance, and the quality rate of the output. It is used to identify for equipment the related losses for the purpose of improving total asset Performance and reliability. It categorizes major losses or reasons for poor Performance and therefore provides the basis for setting improvement priorities and beginning of root cause analysis. It can point to hidden capacity in a manufacturing process and lead to balanced flow.

OEE is used to track and trace improvements or decline in equipment effectiveness over a period of time Confusion exist as to whether OEE indeed measures effectiveness (as depicted by its name) or it is an efficiency measure. In literature (US department of Energy, 1995), effectiveness is defined as a process characteristic that indicates the degree to which the process output conforms to the requirements.

The OEE tool is designed to identify losses that reduce the equipment effectiveness. These losses are activities that absorb resources but create no Value. According to Jonsson and Lesshammar (1999), the losses are due to manufacturing disturbances that are either chronic or sporadic. It is a bottom-up approach where an integrated workforce strives to achieve overall equipment effectiveness by eliminating six big losses (Nakajima, 1988). The six big losses are given below with some examples from a palletizing plant in a brewery as analyses by Pintelon et al (2000).

Downtime losses

I. Breakdown losses categorized as time losses and quantity losses caused by equipment failure or breakdown. For example, a breakdown of Palletizing plant motor in a brewery leads to downtime and thus production loss.

II. Set-up and adjustment losses occur when production is changing over from requirement of one item to another. In brewery plant, this type of loss is encountered during set-ups between different products, testing during start-ups and fine-tuning of machines and instruments.

Speed losses

I. Idling and minor stoppage losses occur when production is interrupted by temporary malfunction or when machine is idling. For example dirty photocells on palletizing machines cause minor stoppages. Though they are quickly fixed, much capacity is lost due to their frequency.

II. Reduced speed losses refer to the difference between equipment design speed and actual operating speed. In a palletizing plant, use of un adapted pallets cause longer processing time for the same number of package leading to speed losses.

Quality Losses

I. Quality defects and rework are losses in quality caused by malfunctioning Production equipment. For example, some pallet types get stuck in between depalletizer and unpacker and are damaged.

II. Reduced yield during start-up are yield losses that occur from machine Start-up to stabilization. For example in the brewery, poor preparation for morning shift by night shift leads to problems with the filling taps and thus leads to reduced yields. The six big losses are measured by OEE, which is a function of availability (A),
Performance (P) and Quality rate (Q). Therefore:

O E E = A * P * Q

Where,

Operating Time (hrs)

Availability Rate (A) = x 100

Loading time (hrs)

Operating Time = Loading Time - Downtime

Theoretical Cycle time (hrs)*Actual Output (Units)

Performance Efficiency (P) =Operating Time (hrs)

(Total Production - Defect Amount)

Quality Rate (Q) = x 100

Total Production (Units)

The perspectives integrated in the OEE tool are the maintenance effectiveness, Production efficiency and quality efficiency.

2.2 Evolution Of OEE

Though the OEE tool has become increasingly popular and has been widely Used as a quantitative tool essential for measurement of productivity, it is only limited to productivity behavior of individual equipment (Huang et al, 2003). Scott and Pisa (1998) have pointed out that the gains in OEE, while important and ongoing, are insufficient because no machine is isolated. They points out that manufacturing process is a complex web of interactions among process tools, materials, machines, people, departments, companies and processes.

However, too often these inter-dependent activities are viewed in isolation and there is lack of coordination in deploying available factory resources (people, Information materials and tools) to manage work efficiently.

This insufficiency of OEE tool has led to modification and enlargement of original OEE tool to fit a broader perspective as deemed important in the manufacturing systems. With the modification of OEE, different terminologies has also come up in literature and in practice, coupled with their modified Formulations. Some of the modified formulations are limited to effectiveness at Equipment level (e.g. PEE and TEEP) while others have been extended to Factory level effectiveness (e.g. OFE, OTE, OPE and OAE).

2.3 Total Equipment Effectiveness Performance (TEEP)

Total Equipment Effectiveness Performance (TEEP), proposed by Invancic (1998), is very similar to OEE. The main difference lies in the inclusion of planned downtime in total planned time horizon. In order to show clearly how Maintenance contributes to the bottom line productivity of the plant, a clear distinction is made between planned downtime and unplanned downtime.

Minimizing unplanned shutdown, sometimes called technical downtime, is a common goal in maintenance. Unplanned downtime is a function of the number of breakdowns within a specified time period and related measures such as mean time between failures (MTBF) and mean time to repair (MTTR) (al2000). MTBF and MTTR are claimed to be measures of equipment achievement and are related to objectives such as functional performance and Process capability (Wilson, 1999).

Thorough analysis of these two elements enables the maintenance function to improve equipment availability by either increasing the mean time between Failure (MTBF) or reducing the mean time to repair (MTTR). The other elements Included in the TEEP measure are the speed losses and quality rate, which are also in OEE. The TEEP is calculated by dividing the valuable operating time (VOT) with the total available time (TT) . The constituent Elements (losses) in TEEP are analyzed and measured. It is also applicable to a processing plant or a flow shop where the production process can be treated like a single production entity.

2.4 Production Equipment Effectiveness (PEE)

Production equipment effectiveness (PEE), formulated by Raouf (1994), is similar to OEE. The main difference with OEE is the allocation of weights to the various items in the overall effectiveness. It assumes that quality has different weight from performance and different availability contrary to the basic assumption in OEE that the three elements have the same weight. It also makes a distinction between two different types of production operations namely:

i. Discrete-type production operations and
ii. Continuous process operation.

For discrete-type production operation, PEE is calculated as follows:

PEE = (Aκ1) (Eκ2) (Qκ3)

Where, A = Availability

E = Performance Efficiency

Q = Quality efficiency

The availability rate considers the planned or scheduled downtime and is similar to the planning rate in TEEP. The attainment rate considers the unscheduled down time and is similar to availability in TEEP.

The other additional factors Included are the product support efficiency and operating utility, which considers the transaction losses and no demand time respectively. It is assumed that there Is no setup time needed for the continuous process operation and therefore, Setup time loss has not been included in the PEE diagram.

2.5 Overall Factory Effectiveness (OFE)

The overall factory effectiveness (OFE) was developed to measure the factory level effectiveness, where several production steps or machines are installed to form a production process. While OEE is about achieving excellence in Individual equipment, OFE is about the relationships among different machines and processes. As noted by Scott and Pisa (1998), OFE seeks to integrate the many activities and information systems that production process entails. OFE is therefore a term about combining activities, relationships between different machines and processes, integrating

information, decisions, and actions across many independent systems and subsystems (Oechsner et al, 2003).

Among the Issues that OFE seeks to accomplish is; to synchronize the production schedule with planned downtime, setup time and qualification time through tighter Connectivity to enterprise planning systems and infinite capacity schedule; Optimize the sequence of orders, works or jobs; ensure a balanced line and Smooth flow of work by integrating micro-scheduling with overall plant Scheduling (Williamson, 2006).

Another approach proposed by Huang et al (2003) considers simulation analysis as the most reliable method in studying the dynamic performance of systems. It defines an OFE metric; overall throughput Effectiveness (OTE), developed on the basis of OEE metrics analysis, for Complex connected manufacturing systems. These metrics are integrated with Simulation analysis for manufacturing productivity improvement.
Number of good parts produced (P)
OEE =Theoretical number of parts produced in total time (P)
Where,
Pth = Theoretical production rate (Rth)
* Total available time (TT) By extending the expression of unit-based OEE to factory level, the overall Through put effectiveness (OTE) during period TT is defined as;
Adjustment of guide arm

Both length of the guide arm and position on the guide arm axis have to be adjusted. Each of these should be adjusted separately. Fix the lower axis in a central position (centered in the holes) then adjust guide arm length until cover sit correctly on the right side. Move cover to the left side and check if cover sits correctly, if not move lower axis position and change length.

The machines must only be operated by fully trained and authorized persons. Before you begin working with the machine, check the lid and the glass panes for damage and cracks. If you find any signs of damage you must not use the machine. If you are working with gas, you must ensure that you only work with pure oxygen (O^2) or with a gas mixture that contains more than21 % oxygen, and your machine must be fitted with

a special pump. If the machine is fitted with a standard pump, you must not use pure oxygen ora gas mixture with such a high percent of oxygen! Danger of explosion!

Always ensure that fingers, hands and other parts of the human body are kept clear when closing the machine lids to prevent the risk of entrapment between the lid and the chamber. It is also essential to ensure that there are no other persons in the danger zone. Danger of entrapment! If working at high speed (or in the event of an operating error) the welding bar can get very hot. Do not touch the welding bar .Danger of burns! Ensure that the specified oil changes and oil filter changes are carried out regularly. Failure to comply may result in the output of noxious oil fumes. Sensitive products: Before packing products, make sure that the product cannot be damaged by the high pressure generated by the vacuuming process. Otherwise, a machine with a gas flushing device must be used. If you are working with gas, you must ensure that there is always a residual vacuum of 20 % / 0.2 bar.

As soon as you remove the gassing nozzles from the machine, you must close the holes/drillings with the enclosed silicone caps because of reasons of hygiene! Some machine types can be opened up and folded out once the rear panel has been unscrewed. The whole of the folded-out machine must be securely placed on a stable table! If you have run the machine to warm it up prior to changing the oil, avoid contact with the hot oil. Risk of burning! Safety instructions for faults and repairs Repair tasks should only be carried out by fully qualified engineers. Please contact us directly or one of our agencies.Always disconnects the machine from the mains before carrying out repair task.

Self-check 2	Written test

Name…… ID…… Date…….

Directions: Answer all the questions listed below. Examples may be necessary to aid some explanations/answers.

Test I: Choose the best answer (4 point)

1.____ is defined as a measure of total equipment performance.

A. equipment performance

B Equipment maintenance

C. equipment cleaning

Information Sheet 3 - Using Clear and accurate oral communication

3.1 - Using Clear and accurate oral communication

Oral communication is the exchange of information and ideas through spoken word. It can be directly in person in a face-to-face interaction or through an electronic device such as a phone or radio. The most effective way for businesses to transmit information verbally is through oral communication such as a staff meeting.

3.2 The importance of oral communication

Oral communication is important for learning and understanding those in your environment. It is a fundamental aspect of learning a language and helps solve problems, quickly exchange information, and convey emotion in a conversation. Listening and speaking skills are used personally and professionally, on a daily basis.

- **The 5 elements of oral communication**

A. Sender. The sender is the person who initiates communication to the receiver.

B. Medium. The medium is the format in which the message is being sent. For example a voicemail, a face-to-face conversation or a presentation.

C. Channel. The channel is the platform in which the message is delivered. For example, a podcast, a telephone or a meeting.

D. Receiver. The receiver listens and decodes the message sent by the sender. The receiver then generates feedback for the sender in response to the message.

E. Feedback. This final stage is the reaction of the receiver, such as oral or written communication, No response from the receiver is also a type of feedback. This completes the entire oral communication cycle.

3.3 Types of oral communication

A. One-on-one conversations. Conversations between two friends, employee and manager weekly meet-up.

B. Meetings. Decision-making meeting, information-sharing meeting.

C. Group discussions. Book club gathering, small group project.

D. Speeches. Political debate, motivational speech.

E. Presentations. Teaching students in a classroom, instructional presentation.

The ability to communicate effectively in speech and in writing is one of the most valuable professional skills. Sending messages and information so they are understood as intended and produce the desired effect demands certain technical competencies and interpersonal capabilities. Fortunately, these can be learned and honed through practice.

Communicating effectively relies on credibility. Mistakes in grammar and spelling, incompleteness, and errors in logic can have a negative impact on the audience's perception of the sender's credibility. As a result, the communicator's ability to persuade or otherwise influence the recipient is diminished. Effective ways to learn precise, professional oral and written communication skills include:
Having others, such as a supervisor, provide feedback on strengths and weaknesses as a communicator.

3.4 Communicating in the Workplace

When sending a message, communicators must think of the target audience, being sure to use terms and phrases that readers or listeners will understand. For example, texts or e-mails should avoid using abbreviations that the receiver may not recognize. To respect others' time, communication should aim for brevity and concision without sacrificing clarity and completeness. Using e-mail effectively poses particular challenges. Often, messages are poorly structured, missing specific subject lines, slow in getting to the point, or too long to warrant being read in their entirety.

It can be challenging to strike the right tone or avoid the wrong one in electronic communication. The absence of non-verbal cues, such as tone of voice or body language, means that written communication can be more easily misinterpreted and even cause offense. Consequently, important communications may warrant review by someone who can assess the tone and content and provide feedback.

3.5 Communicate, every day, every way

Good communication is at the heart of great teamwork. Great teams communicate well and often, their members are happy to share ideas, brainstorm together, ask for feedback, and be contradicted. This doesn't mean team members always agree, but they're able to communicate through their differences to settle on a sound solution and continue moving forwards as a team. So, how to enable good communication? Be clear: Set the tone for communication among the team. When is it acceptable to close your office door? Is it okay to contact someone after hours? How often should the whole team get together? This outline will help to keep everyone on the same page and communication flowing.

Listen: Communication is as much about listening as it is about speaking. Make sure you're listening to fellow team members and actually considering their thoughts before offering your own solutions and input.

Method: There are so many ways to reach each other in the modern age. Try to use the most suitable tool to communicate for your specific needs, whether that's email, a chat tool, phone call, or face to face. We've got an article that'll help you decide which communication tool is best for what.

Touch base: Encourage informal meetings, information sharing, and huddles between team members. People shouldn't have to wait for a weekly catch-up meeting to get together. Collaborative team members are comfortable communicating as and when they need to.

Collaboration tools: These enable workers to connect across the world, or across the office, in a group or one-to-one conversation. They also make progress on group projects at the times that are most convenient for them.

3.6 Learning Objectives

Explain active and reflective listening as techniques for improving the effectiveness of oral communication. Communication is an activity that involves a both sender and an

audience, or receiver. While the sender must focus on making sure the message is clear, the receiver has to show that the message is received and understood.

Active listening is a process of attending carefully to what is being said and how the speaker says it.

Reflective listening focuses on personal elements of communication rather than the abstract ideas. It deals with the emotional content of communication.

Interpretation: An act of explaining what is obscure.

Active listening: The process of attending carefully to what a speaker is saying, involving such techniques as accurately paraphrasing the speaker's remarks.

Receiver: A person who receives a signal.

Effective oral communication is the responsibility of both the sender and the recipient. While the sender must focus on making sure the message is clear, the receiver has to show that the message is received and understood. For the sender, content, channel choice, and understanding of the audience matter most. For the recipient, listening skills are paramount. Listening is an interaction between speaker and listener. The listener's use of active and reflective listening skills can help improve communication effectiveness.

3.5.1 Active Listening

Active listening is a process of attending carefully to what is being said. It also involves the listener observing the speaker's behavior and body language. One way to demonstrate this attention is for the listener to show understanding by paraphrasing what the speaker has said. Paraphrasing can confirm the accuracy of the listener's interpretation or identify the need for clarification. Conversely, when individuals show disinterest or distraction when someone is speaking, it reveals an absence of listening that can frustrate, annoy, and even anger the speaker.

3.5.2 Reflective Listening

Reflective listening focuses on personal elements of the communication rather than the abstract ideas. Reflective listening should be feeling-oriented and responsive. The listener should show empathy and concern for the person communicating. A good reflective listener concentrates on the discussion at hand while allowing the speaker to lead the communication. Verbal response is essential for reflective listening. Listeners should make statements that paraphrase what is said, clarify what appears to be implicit, and reflect the emotion or feeling they sense from the speaker. Being able to understand and articulate the meaning behind the words helps receivers better interpret the information and messages they hear.

Oral and written communications contain nonverbal elements that can reinforce or contradict what is being expressed verbally. Nonverbal communication represents two-thirds of all communication. For this reason, learning to identify and read nonverbal cues is an important communication skill. Nonverbal communication can enhance a spoken message through gestures, eye contact, and posture.

Non verbal: Of communication: a form other than written or spoken words, like gestures, facial expressions, or body language. Nonverbal communication is the process of

sending and receiving wordless (mostly visual) messages between people. Oral and written communication has nonverbal elements that can reinforce or contradict what is being expressed verbally. Messages can be communicated through gestures and touch, by body language or posture, or by facial expression and eye contact. Speech also contains nonverbal elements, known as paralanguage, that include voice quality, rate, pitch, volume, and speaking style, as well prosodic features such as rhythm, intonation, and stress.

Self-check 3	Written test

Name…… ID…… Date…….

Directions: Answer all the questions listed below. Examples may be necessary to aid some explanations/answers.

Test I: Choose the best answer (4 point)

1.____ is the person who initiates communication to the receiver.

A. sender B. Medium C.Channel D. receiver F. all

Information Sheet4 - Encouraging and supporting team members.

4.1 Encouraging and supporting team members.

A support team member is responsible for assisting and connecting with the whole department group in meeting the company's goals and exceeding performance expectations.

A support team member needs to have a strong organization and time-management skills to support daily operations and do extra tasks as needed. Building an effective support team in your small business involves ensuring that all team members have the skills and knowledge to perform effectively. By establishing clear policies and procedures and documenting common troubleshooting techniques, you can maximize productivity and consistency that ultimately leads to increased customer satisfaction. Maintain a reasonable workload and workflow, set appropriate expectations, ensure knowledge transfer and hire the best personnel to get optimal results.

4.2 Effective Support Team should have:

A. Workflow

Analyze your call logs to identify the busiest times of day. Ensure you have the right level of staffing during these times. Make sure you clearly define your support types, resources knowledge in your products and services and procedures for handling support tickets. Assign a dispatcher to route calls to the appropriate personnel or use service automation tools and help desk software. Make clear status updates so you know what calls are new, open, on hold and closed. Having an effective workflow enables your team to provide efficient service.

B. Expectations

To build an effective support team, run team-building exercises and conduct regular team meetings to establish a common sense of purpose. Each team member should commit to achieving the company’s goals and objectives for support, such as increased customer satisfaction. Team members must value opinions of others and freely share information and resources to ensure knowledge gets transferred from one support agent

to another. By keeping the team focused on solving problems for customers, you minimize interpersonal issues that drain a team's energy and cohesion. Encourage creativity and innovation to generate solutions to complex customer support problems. Develop a climate of trust between team members by handling conflicts as they arise, not letting them fester.

C. Knowledge

Review and analyze call logs to identify common problems. Create scripts and troubleshooting techniques for handling those problems. To create an effective support team process, accept customer input from multiple sources, such as email, websites, telephone calls, system-generated alerts or written correspondence. Establish procedures for handling the initiation of each incident, and provide easy access to existing service tickets and status updates for your customers and support team alike. Maintain a closed-loop process by continuously updating the status and providing feedback to customers on a regular basis.

D. Development

Ensure that team members get the training and development they need to succeed on the job. This includes maintaining certifications. Schedule regular workshops and seminars to give your support team the latest information on products and services. Provide a list of resources and self-paced training alternatives to keep them up to date.

4.3Team member responsibilities:

Participating in meetings and voicing concerns as well as suggestions for improvement. Answering or escalating concerns and queries from clients or other stakeholders. Completing a range of administrative tasks. Maintaining a high level of professionalism while representing the company.

Self-check 4	Written test

Name…… ID…… Date…….

Directions: Answer all the questions listed below. Examples may be necessary to aid some explanations/answers.

Test I: Choose the best answer (4 point)

1.____ is Responsible for assisting and connecting with the whole department group in meeting the company's goals and exceeding performance expectations.

A. team member B. team support Developer D. communication F. all

Operation sheet 1 - Working and following Safe working

1.1. Steps to developing safe systems of work.

Step 1: Task assessment

To determine where safe systems of work need to be developed, you should start by assessing your organization's operations. A safe system of work should be based on a thorough assessment of the task the system is to cover, so it's important that all aspects of a particular task/job are examined and put into writing to make sure that no elements of the task are overlooked.

Make a note of: What is used (plant and equipment, substances, machinery, electrical sources); Potential error sources (possible human error, short cuts, equipment failure); Where the task is carried out (the working environment and its protection needs); and How the task is carried out (procedures, task frequency, training needs). This assessment should be done by supervisory staff with input from workers with detailed knowledge of the activity. That way, the system of work produced is effective and practical as well as safe, and any assumptions that supervisors might have about methods of work don't differ from reality. Not only that, but consulting with workers who are exposed to risks (either directly or indirectly) is also a legal requirement. Workers may also be in the best position to help with preparing a safe system of work.

Step 2: Hazard identification and risk assessment

The law requires employers to conduct a 'suitable and sufficient' assessment of all risks that employees and others may be exposed to, so once you have produced a detailed overview of the task, the next step is to conduct a risk assessment. This involves listing the task's elements, and for each element:

Identifying possible causes of harm; Evaluating the likelihood of that harm occurring given the safeguards you have in place; and Putting in place further safeguarding measures where necessary to reduce the risk to as low a level as reasonably practicable.

The exact method of analysis you adopt depends on the nature of the task/job or operation.

If what is being considered involves high loss potential, then formal hazard analysis techniques such as a hazard and operability (HAZOP) study, fault tree analysis (FTA) or failure modes and effects analysis should be considered. If the potential loss is lower, a simpler approach such as job safety analysis (JSA) may be used.

Step 3: Defining safe methods

If you can't eliminate hazards and risks remain, then procedures to ensure a safe method of work must be worked out.

LAP TEST	Performance Test

Name……. ID……..

Date…….

Time started: _____ Time finished: _____I

instructions: Given necessary templates, tools and materials you are required to perform the following tasks within 30 minute. The project is expected from each student to do it.

Task-1 Perform safe system of work.

LG #4	LO #4- Shut down the process

Instruction sheet

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

- Identifying shut-down procedure
- Shut downing process
- Reporting faults and variances outside area of responsibility.

This guide will also assist you to attain the learning outcomes stated in the cover page. Specifically, upon completion of this learning guide, you will be able to:

- Identifying shut-down procedure
- Shut downing process
- Reporting faults and variances outside area of responsibility.

Learning Instructions:

1. Read the specific objectives of this Learning Guide.
2. Follow the instructions described below.
3. Read the information written in the “Information Sheets”. Try to understand what are being discussed. Ask your trainer for assistance if you have hard time understanding them.
4. Accomplish the “Self-checks” which are placed following all information sheets.
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-checks).
6. If you earned a satisfactory evaluation proceed to “Operation sheets
7. Perform “the Learning activity performance test” which is placed following “Operation sheets” ,
8. If your performance is satisfactory proceed to the next learning guide,
9. If your performance is unsatisfactory, see your trainer for further instructions or go back to “Operation sheets”.

Information Sheet 1- Identifying shut-down procedure

1.1 Identifying shut-down procedure

Normal shutdown includes steps to render the systems safe, such as removal of hazardous process materials and inert (asphyxiating) gases. The systems might be cleaned as part of the shutdown; cleaning is often a process unto itself requiring its own set of startup, operation, and shutdown procedures.

1.2 Look for more ways to improve and simplify

Outages are excellent opportunities to look for areas that can be improved by new or updated technology. Measurements can be taken, and new equipment considered for the next shutdown. These improvements can include:

- Adding different seal types
- Adding new bearing isolators to prevent lubricant leakage or contamination
- Updating bushings and packing types for improved sealing and shaft protection.

Self-check 1	Written test

Name…… ID…… Date…….

Directions: Answer all the questions listed below. Examples may be necessary to aid some explanations/answers.

Test I: Choose the best answer (4 point)

1. ___ steps to render the systems safe, such as removal of hazardous process materials and inert (asphyxiating) gases A.shut down procedure B shut down step C shut down application D, A and B

Information Sheet2 - Shut downing process

2.1 Introduction

Process shutdown (PSD) is defined as the automatic isolation and the activation of all part of a process. During a PSD the process remains pressurized. Basically PSD consist of field mounted sensors. Valves and trip relays, a system logic unit for processing of incoming signals, alarm.

2.2. Types of shutdown

An equipment item is normally shut down manually when it is no longer required for duty or during inspection or maintenance. A shutdown can also occur in an emergency when:

- An emergency shutdown button is pressed atrip is activated by an automatic shutdown system.
- When an item of equipment is to be manually shut down, the type of shutdown must be selected which will cause:
- Minimum disruption to production minimum risk of damage to equipment.

The type of shutdown selected could be:

A.Item shutdown

B.Maintenance shutdown

C.Unit shutdown

D.Operations or total shutdown

E. Emergency shutdown.

2.3.1Item shutdown

An item shutdown will shut down only the equipment item, without shutting down the entire process or plant. In some cases, two equipment items are connected in parallel to prevent the need for a process shutdown: If one of the equipment items is on duty while the other is on standby, one of the equipment items can be isolated and shut down without effecting production

If both equipment items are on duty, isolating and shutting down one equipment item will reduce but not stop production.

2.3.2 Maintenance shutdown

Maintenance shutdown will consist of shutting down, then fully isolating, draining and purging an equipment item to make it safe for maintenance work.

2.3.2 Unit shutdown

unit shutdown will shut down only the process unit in a plant, but will not shutdown the entire plant. Many units will feed to storage tanks so that downstream processes can take their feed from the storage and continue to operate when another unit is offline.

2.3.3 Total shutdown

An emergency shutdown due to fire, major spills or gas release, will shut down an equipment item as quickly as possible, then depressurize and drain equipment and lines to leave them in the safest possible condition. Emergency shutdowns can create extra wear and tear on machinery, as the shutdown time is shorter than for a normal shutdown.

Self-check 2	Written test

Name…… ID…… Date…….

Directions: Answer all the questions listed below. Examples may be necessary to aid some explanations/answers.

Test I: Choose the best answer (4 point)

1.____ defined as the automatic isolation and the activation of all part of a process.

A. process shut down

B. item shut down

C. System shut down D. all

2. List types of shut down?

Information Sheet3- Reporting faults and variances outside area of responsibility.

3.1 Responsibility Reports

Responsibility accounting provides reports to different levels of management. The amount of detail varies depending on the manager's level in the organization. A performance report to a department manager of a retail store would include actual and budgeted dollar amounts of all revenue and expense items under that supervisor's control. The report issued to the store manager would show only totals from all the department supervisors' performance reports and any additional items under the store manager's control, such as the store's administrative expenses. The report to the company's president includes summary totals of all the stores' performance levels plus any additional items under the president's control. In effect, the president's report should include all revenue and expense items in summary form because the president is responsible for controlling the profitability of the entire company.

Management by exception is the principle that upper level management does not need to examine operating details at lower levels unless there appears to be a problem. As businesses become increasingly complex, accountants have found it necessary to filter and condense accounting data so that these data may be analyzed quickly. Most executives do not have time to study detailed accounting reports and search for problem areas. Reporting only summary totals highlights any areas needing attention and makes the most efficient use of the executive's time.

The condensation of data in successive levels of management reports is justified on the basis that the appropriate manager will take the necessary corrective action. Thus, specific performance details need not be reported to superiors. For example, if sales personnel costs have been excessively high in a particular department, that departmental manager should find and correct the cause of the problem. When the store manager questions the unfavorable budget variance of the department, the departmental supervisor can inform the store manager that corrective action was taken. Hence, it is not necessary to report to any higher authority that a particular department within one of the stores is not operating satisfactorily because the matter has already

been resolved. Alternatively, if a manager's entire store has been performing poorly, summary totals reported to the vice president of operations discloses this situation, and an investigation of the store manager's problems may be indicated.

Self-check 3	Written test

Name…… ID…… Date…….

Directions: Answer all the questions listed below. Examples may be necessary to aid some explanations/answers.

Test I: Choose the best answer (4 point)

1.____ principle that upper level management does not need to examine operating details at lower levels unless there appears to be a problem.

A. responsibility report B.faults C.execeptional reports D.All

Operation Sheet 1- Identifying shut-down procedure

1.1 Identifying shut-down procedure

Step 1: A comprehensive list

A checklist with every piece of equipment involved in the outage should be available for review. Every stakeholder should examine this list to ensure nothing is missing. Examples of assets for most plant checklists include:

1. Agitators
2. Airlocks
3. Conveyors
4. Doors
5. Dust baggers.
6. Gearboxes
7. Man ways
8. Mixers
9. Motors
10. Piping
11. Pumps
12. Valves.

This checklist should be periodically updated to add equipment installed since the last shutdown. It should also note:

Equipment difficult to take offline in the past bad actor assets since the last outage Special equipment such as cranes or generators needed to complete the required work. This information should be included in the job plan for each equipment type.

Step 2: Have it in inventory

Ensure that all replacement parts, accessories and rebuilt equipment are in stock before the shutdown. The last thing any team needs is to have staff on hand to conduct maintenance, replacements and new installations only to be held up waiting for rebuilt equipment to return from a shop.

The team should encounter no surprises. Inventory should be up to date well before the outage date. Environmental controls are part of this inventory, including pressure gauges, temperature sensors and flush line components. Sealing equipment, such as packing, process seals, oil seals, new lubricants and lantern rings should be in stock and prepared for installation.

Step 3: Safety first

Safety should be the top priority during any outage. Before beginning work, all lock out/tag out (LOTO) procedures should be followed and personnel must wear all required personal protective equipment (PPE) . Because equipment is shut down, personnel may have a false sense of security. However, PPE is still required, especially for situations in which machinery or piping may retain hazardous, hot or corrosive liquids. Team leaders should review task and safety requirements with personnel participating in the work, including temporary staff onsite who may not be as familiar with this location's LOTO and PPE rules. A zero-tolerance LOTO and PPE policy should be enforced.

Step 4: Within current specifications

Double check that all equipment (new and rebuilt) is within current operating parameter specifications. When assets were specified, they met the requirements of the process at that time. Condition changes, such as fluid temperature, flow requirement or process fluid ph must be considered. Different parts or different equipment may need to be used. For example, water flow from when a pump was specified was 100 gallons per minute. During operation and plant growth, the requirement at shutdown is 500 gallons per minute. Perhaps a larger pump should be installed. An outage is an ideal time to make this type of replacement.

Step 5: Inspect before installation

Personnel should inspect all equipment before anything is installed; look for wear or damage. Installing new components into a worn piece of equipment is almost always counterproductive. Demise of the new components begins immediately. Examples of this include: Packing installed in a pump with a worn shaft or sleeve or a damaged stuffing box wall will immediately begin to wear. With extreme damage, successful installation may not be possible.

Installing a new mechanical seal into a system with a failing bearing or bearing isolator means the mechanical seal's life will be shortened. Installing a new impeller on a worn shaft or with improper clearances because of casing wear or damage will result in poor operation and incorrect flow.

Step 6: Precise installation

While this step seems obvious, improper installation happens all the time. Reliability begins with the asset selection and correct installation. If installed imprecisely, failure begins at startup. Installation issues include: Mis alignment Soft foot — A soft foot exists when not all a machine's feet sit flat on the supporting base, so that tightening the foot bolts distorts the machine case. This can make a machine difficult to align and a distorted case can result in poor overall machine performance.

- Improperly set packing
- Bearings installed with a hammer or without being properly heated
- Incorrect tightening of bolts or other fasteners
- Installing the wrong component
- Using the wrong lubricant

Properly following job plans help prevent premature failure because of installation problems. An example of ways to properly install components is to use tools to install compression packing. Using tools and carefully following the correct job plan steps every time results in precise installation and provides the longest life for each component or asset.

Step 7: Inspection before restart

The plant team should give everything one more look before restarting the plant or process. Even when every step is taken and every job plan is followed, stuff happens. A motor is bumped during work on another piece of equipment, causing misalignment.

LAP TEST	Performance Test

Name……. ID……..

Date…….

Time started: _____ Time finished: _____

Instructions: Given necessary templates, tools and materials you are required to perform the following tasks within 30 minute. The project is expected from each student to do it.

Task-1 perform shut down of vacuum packaging.

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LO1: answer

Self check one:1.A 2.E

Self check two: 1.d

2. Consumable are supplies that are used in the production process and raw materials are inputs that are used in the production process

Self check three: 1.D 2.C

Self check 4:

Please note:

- For machines without a gas flushing device set the gas value to 0.
- The control is a time-driven control system.

1) ON pushbutton	:	Switch on
2) OFF pushbutton	:	Switch off
3) DAL pushbutton	:	Continuous operation
4) VAC pushbutton	:	Vacuum
5) GAS pushbutton	:	Gas filling
6) C° pushbutton	:	Sealing temperature
7) " + " symbol	:	Pushbutton to increase value
8) " - " symbol	:	Pushbutton to decrease value
9) STOP pushbutton	:	Quick-Stop for packaging liquids (see 3.3.)
10) Display	:	Display field for displaying the set values
11) Vacuum meter	:	Vacuum display

Self check 5:1.A 2.D

Self check6.1.C 2.F

LO2 answer:

Self check 1:1 C 2.A

Self check 2:1.A 2.D

Self check 3:1.A

Self chek4:1.A

Self check 5:1.A

Self check 6:1.A

Self-check 7:1.A

LO3 answer

Self-check 1:1 .A

Self-check 2:1.A

Self-check 3:1.A

Self chek4:1.A

LO4 answer

Self-check 1:1 .D

Self-check 2:1.A

2. A.Item shutdown

Maintenance shutdown

C.Unit shutdown

D.Operations or total shutdown

E.Emergency shutdown

Self-check 3:1.A