## (ANIMAL PRODUCTION)

### NTQF Level - II

# Learning Guide #-13

**Unit of Competence: -** Assisting Basic Husbandry Practice of Ruminants

**Module Title: -** Assisting Basic Husbandry Practice of Ruminants

**LG Code:** AGR APR2 M04 LO3-LG-13

**TTLM Code:** AGR APR2 M04 TTLM 0919-v1

## LO 3: Handle and clean materials and Equipment

| Instruction Sheet | Learning Guide #-13 |
|---|---|

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

3.1. Handling waste materials

3.2. Handling and transporting materials, tools and equipments.

3.3. Reporting problems or difficulties

3.4. Cleaning, maintaining and storing materials, tools and equipment's

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

- Handle waste materials
- Handle and transport materials, tools and equipments.
- Report problems or difficulties
- Clean, maintain and store materials, tools and equipment's

**Learning Instructions:**

1. Read the specific objectives of this Learning Guide.
2. Follow the instructions described below 3 to 7.
3. Read the information written in the information "Sheet 1, Sheet 2, Sheet 3 and Sheet 4".
4. Accomplish the "Self-check 1, Self-check t 2, Self-check 3 and Self-check 4" **in page 5, 7, 10 and 19** respectively.
5. If you earned a satisfactory evaluation from the "Self-check" proceed to "Operation Sheet 1, and Operation Sheet 2" **in page -21.**
6. Do the "LAP test" **in page – 22** (if you are ready).
7. Then proceed to the next learning guide.

| Information Sheet # 1 | Handling waste materials |
|---|---|

## 1. Definitions of terms

***Waste*** is described as “any gas, liquid, solid or energy, or a combination of them that is not considered a resource and is surplus to, or unwanted from, any industrial, commercial, domestic or other activity, whether or not of value.”

***Animal Wastes*** refers to waste of a biological nature, which has the potential to cause harm by acting as an infectious agent, while undergoing decomposition. To prevent this occurring, Animal wastes are treated (i.e. by rendering or using incineration).

***Animal carcasses*** refers to the carcasses of domestic and laboratory animals including parts thereof that are not classified as Clinical and Related (Path) waste or Cytotoxic Drugs, waste containing radiation material and Related waste.

***Carcass Limbs*** Any limb which has been removed from the carcass.

***Animal litter and foodstuffs*** refers to left over or contaminated foodstuffs, sawdust from cages and all animal litter.

***Faeces*** any faeces accumulated or faecal specimens used for testing.

***Clinical Waste*** refers to any samples (e.g. Tissue, venom, blood, serum and swabs) that have been in contact with or used in experiments with a pathological substance and includes pathological waste.

***Infectious Agent*** Means an organism, including a micro-organism or worm that causes disease or another adverse health impact in humans.

Waste materials May include, but not limited to:

- Broken rearing and farm items
- Plant debris
- Plastic, metal and paper-based materials
- Returned to manufacturer
- Dung and urine
- Spoiled milk

## 2. Objectives of Handling waste

• Ensure that the Animal Wastes generated are disposed of in an environmentally sound manner

• Protect human health and the environment from the effects of potentially harmful wastes; and

• Comply with legal requirements for treatment and disposal of Animal Waste.

## 3. Collection of waste for disposal

- Where possible, Animal waste shall be placed in a green receptacle/bin with a light green lid with no splits or cracks and a fixed lid;
- The receptacle/bins will be marked as Animal waste;
- The receptacle/bins will not exceed 40kg in weight; and Please place in Clinical and Related Waste or other appropriate waste bins.

**N.B.** Please exclude the following non-compatible wastes from the Animal Waste bins:

- ✓ Sharps
- ✓ Disposable gloves
- ✓ Any types of plastic (e.g. plastic bags, plastic containers)
- ✓ Paper toweling
- ✓ Paper that is contaminated (e.g. blood and serum).

## 4. Storage of waste

Animal carcasses and parts thereof must be kept refrigerated (e.g. dedicated area within a cold room) as required until the time of removal from site. Animal litter, foodstuffs and faeces must be stored in a cool environment.

The waste shall be stored:

- in a weather protected, well ventilated area;
- in a secured area and not readily accessible by the general public; and
- In such a manner as to present no threat to health, safety and the environment.

⇨ If possible and safe, stored until the School or Centre has a bin full.

⇨ If not able to comply with the above requirements, disposed of as quickly as possible.

**5. Transporters of Animal Waste**

- ✓ Animal Waste will be collected and transported by:
- ✓ A licensed contractor for the handling of this type of waste; or
- ✓ A person or company who can demonstrate suitable knowledge and equipment to handle such waste.
- ✓ Transportation shall be in accordance with the Transport Operations

**6. Disposal and Treatment**

- ⇨ Only suitably licensed or approved facilities shall be used to treat this waste for disposal including rendering and composting.
- ⇨ These facilities are licensed to only accept wastes that are non infected or uncontaminated.

**Spills**

- ♣ Every generator, transporter or handler of Animal Wastes shall hold equipment, and have staff who are trained to carry out clean up of spills of this waste. This will include all measures for containing, removing and disinfecting a spill area.
- ♣ Any material generated by responding to a spill should be handled as animal waste unless it is excluded, by its nature, by any part of this procedure.

| **Self-Check # 1** | **Written Test** |
|---|---|

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

1. Define waste? (2pts)
2. What is the objective of waste handling? (2pts)
3. What will occur if waste is not properly handled? (3pts)

***Note:*** **Satisfactory rating - 5 points** **Unsatisfactory - below 5 points**

**Answer Sheet**

Score = _____

Rating: _____

Name: _____ Date: _____

**Short Answer Questions**

1._____

_____

2._____

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3._____

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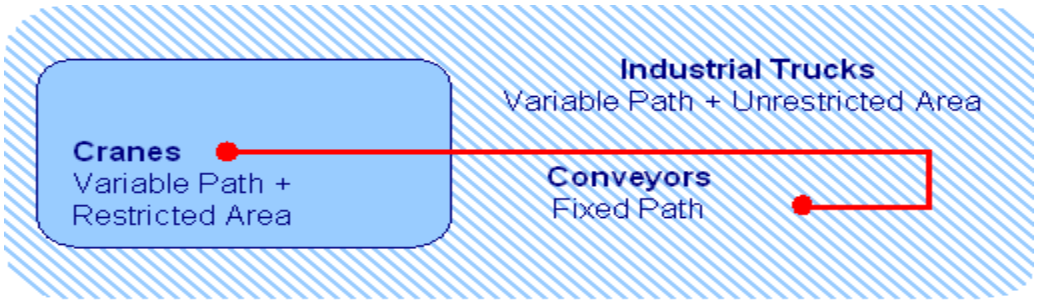
| **Information Sheet # 2** | **Handling and transporting materials, tools and equipments.** |
|---|---|

Transporting equipment is used to move material from one location to another (e.g., between workplaces, between a loading dock and a storage area, etc.) within a facility or at a site.




The major subcategories of transport equipment are:

A. ***Conveyors.*** Equipment used to move materials over a fixed path between specific points.

B. ***Cranes.*** Equipment used to move materials over variable paths within a restricted area.

C. ***Industrial Trucks.*** Equipment used to move materials over variable paths, with no restrictions on the area covered by the movement (i.e., unrestricted area).

D. ***No Equipment.*** Material can also be transported manually using no equipment.

"Materials handling include all movements of materials in a manufacturing situation. It is an art and science involving the moving, packing and storing of substances in any form." — American Society of Mechanical Engineers

"Material handling involves the movements of materials, manually or mechanically, in batches or one item at a time within the plant. The movement may be horizontal, vertical or the combination of horizontal and vertical".

The overall objectives of materials handling is to reduce production cost. This general objective can be sub-divided into more specific goals, such as:

- ✓ To lowers unit materials handling cost
- ✓ To reduce manufacturing cycle time
- ✓ To provide better control of the flow of materials
- ✓ To provide better working conditions
- ✓ To provide contribution for better quality by avoiding damages to products
- ✓ To increase storage capacity through better utilization of storage areas
- ✓ To provide higher productivity at lower manufacturing costs
- ✓ To improve customer service

| Self-Check # 2 | Written Test |
|---|---|

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

1. What is material handling?

2. Discus the objective of material handling?

3. Elaborate damages causing by poor transporting and handling techniques and give your solution

***Note:*** **Satisfactory rating - 5 points** **Unsatisfactory - below 5 points**

**Answer Sheet**

Score = _____

Rating: _____

Name: _____ Date: _____

**Short Answer Questions**

1._____

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2._____

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3._____

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| **Information Sheet # 3** | **Reporting problems or difficulties** |
|---|---|

A report is a document that presents information in an organized format for a specific audience and purpose. Although summaries of reports may be delivered orally, complete reports are almost always in the form of written documents.

In modern business scenario, reports play a major role in the progress of business. Reports are the backbone to the thinking process of the establishment and they are responsible, to a great extent, in evolving an efficient or inefficient work environment.

The significance of the reports includes:

- Reports present adequate information on various aspects of the business.
- All the skills and the knowledge of the professionals are communicated through reports.

- Reports help the top line in decision making.
- A rule and balanced report also helps in problem solving.
- Reports communicate the planning, policies and other matters regarding an organization to the masses. News reports play the role of ombudsman and levy checks and balances on the establishment.

**What is reporting?**

Reporting is providing information about serious wrongdoing that you have become aware of at your workplace/ place of study. Reporting is about notifying concerning what you believe to be the discovery of breaches of laws and regulations, breaches of ethical norms or serious conditions which might harm individuals, the university, cooperative partners, or society as a whole.

Employees have the right and, in some cases, duty to report wrongdoing at the institution, such as when there is a danger posed to life and health.

Examples of situations where employees need to speak out:

- Defects or shortcomings which could lead to a danger posed to life or health
- Breaches of professional and research-oriented ethical guidelines
- When fellow students or colleagues are bullied, harassed (including sexual harassment) or discriminated against in connection with their work at workplace
- Drug use or other forms of problematic addiction
- Environmental crime
- Activities which could damage property or infrastructure

Reporting regarding conditions which are only of internal or personal interest, for example internal personal conflicts in which the employee can be considered to be a part of the conflict, shall be dealt with in accordance with workplace guidelines for managing conflict.

Any difficulties or problems should be report for the concerned body or supervisor with format given by the organization. Report can be regular or scheduled (like annual

report, have year report, quarter year report, monthly report, weakly and daily report) and emergency report (report where emergency or uncertainty occur).

| Self-Check # 3 | Written Test |
|---|---|

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

1. What is report? (2pts)

2. Mention the significance of the reports? (2pts)

***Note:*** **Satisfactory rating - 3 points** **Unsatisfactory - below 3 points**

**Answer Sheet**

Score = _____

Rating: _____

Name: _____ Date: _____

**Short Answer Questions**

1._____

_____

2._____

_____

| Information Sheet # 4 | Cleaning, maintaining and storing materials, tools and equipment's |
|---|---|

## 4.1. Cleaning of materials, tools and equipment's

Cleaning is the process of removing unwanted substances, such as dirt, infectious agents, and other impurities, from an object or environment. Cleaning occurs in many different contexts, and uses many different methods. Several occupations are devoted to cleaning.

### *Methods of cleaning materials, tools and equipments*

Cleaning is broadly achieved through mechanical action and/or solvent action; many methods rely on both processes.

- ***Washing***, usually done with water and often some kind of soap or detergent
  - *Pressure washing*, using a high-pressure stream of water
- ***Abrasive blasting,*** typically used to remove bulk material from a surface, may be used to remove contaminants as well
- ***Acoustic cleaning,*** the use of sound waves to shake particulates loose from surfaces
  - *Ultrasonic cleaning*, using ultrasound, usually from 20–400 kHz
  - *Megasonic cleaning,* a gentler mechanism than ultrasonic cleaning, used in wafer, medical implant, and industrial part cleaning
- ***Carbon dioxide cleaning,*** a family of methods for parts cleaning and sterilization using carbon dioxide in its various phases
- ***Dry cleaning*** of clothing and textiles, using a chemical solvent other than water
- ***Flame cleaning*** of structural steel with an oxyacetylene flame
- ***Green cleaning,*** using environmentally friendly methods and products
- ***Plasma cleaning,*** using energetic plasma or dielectric barrier discharge plasma created from various gases
- ***Sputter cleaning,*** performed in a vacuum by using physical sputtering of the surface

- ***Steam cleaning,*** in both domestic and industrial contexts
- ***Thermal cleaning,*** in industrial settings, involving pyrolysis and oxidation
- ***Wet cleaning,*** methods of professional laundering that avoid the use of chemical solvents

Fig1. Cleaning methods

**Cleaning agents** are substances (usually liquids, powders, sprays, or granules) used to remove dirt, including dust, stains, bad smells, and clutter on surfaces. Purposes of cleaning agents include health, beauty, removing offensive odor, and avoiding the spread of dirt and contaminants to oneself and others. Some cleaning agents can kill bacteria (e.g. door handle bacteria, as well as bacteria on worktops and other metallic surfaces) and clean at the same time. Others, called degreasers, contain organic solvents to help dissolve oils and fats.

Different cleaning agents are used depending on the item to be cleaned, the cleaning method and the type of soiling found on the item. There are four main types of cleaning agents used in commercial kitchens:

1. Detergents
2. Degreasers
3. Abrasives
4. Acids

***Detergents***

Detergents are the most common type of cleaning agent and are used in home and commercial kitchens. They work by breaking up dirt or soil, making it easy to wash it away. The detergents used in commercial kitchens are usually synthetic detergents made from petroleum products and may be in the form of powder, liquid, gel or crystals.

***Degreasers***

Degreasers are sometimes known as solvent cleaners and are used to remove grease from surfaces such as oven tops, counters and grill backsplashes. Methylated spirits or white spirit were commonly used as degreasers in the past. Most food businesses now try to use non-toxic, non-fuming degreasers in their operations to prevent chemical contamination.

***Abrasives***

Abrasives are substances or chemicals that depend on rubbing or scrubbing action to clean dirt from hard surfaces. In commercial kitchens, abrasives are usually used to clean floors, pots and pans. Abrasives should be used with care as they may scratch certain types of materials used for kitchen equipment such as plastic or stainless steel.

***Acids***

Acid cleaners are the most powerful type of cleaning agent and should be used with care. If they are not diluted correctly acid cleaners can be very poisonous and corrosive. Acid cleaners are generally used to remove mineral deposits and are useful for descaling dishwashers or removing rust from restroom facilities.

Always follow cleaning with sanitizing:

Cleaning is only the first step to a germ-free kitchen. Cleaning is done using detergent, but it doesn't kill bacteria or other microorganisms that can cause food poisoning. To kill bacteria and ensure a clean workplace, you must follow cleaning with sanitizing. Effective cleaning and sanitizing also helps to:

- ✓ prevent pests from entering your business
- ✓ prevent cross-contamination

- ✓ prevent allergic reactions caused by cross-contamination

### 4.2. Maintaining materials, tools and equipment's

The technical meaning of maintenance involves functional checks, servicing, repairing or replacing of necessary devices, equipment, machinery, building infrastructure, and supporting utilities in industrial, business, governmental, and residential installations. Over time, this has come to include multiple wordings that describe various cost-effective practices to keep equipment operational; these activities take place either before or after a failure.

- Any activity—such as tests, measurements, replacements, adjustments, and repairs—intended to retain or restore a functional unit in or to a specified state in which the unit can perform its required functions.
- All action taken to retain material in a serviceable condition or to restore it to serviceability. It includes inspections, testing, servicing, classification as to serviceability, repair, rebuilding and reclamation.
- All supply and repair action taken to keep a force in condition to carry out its mission.
- The routine recurring work required to keep a facility (plant, building, structure, ground facility, utility system, or other real property) in such condition that it may be continuously used, at its original or designed capacity and efficiency for its intended purpose.

Maintenance is strictly connected to the utilization stage of the product or technical system, in which the concept of maintainability must be included. In this scenario, maintainability is considered as the ability of an item, under stated conditions of use, to be retained in or restored to a state in which it can perform its required functions, using prescribed procedures and resources.

**Types of maintenance**

The basic types of maintenance include:

- Preventive maintenance (PM)

- Corrective maintenance where equipment is repaired or replaced after wear, malfunction or break down.
- Predictive maintenance, which uses sensor data to monitor a system, then continuously evaluates it against historical trends to predict failure before it occurs.
- Reinforcement

**1. Preventive maintenance**

***Preventive maintenance** (PM)* is "a routine for periodically inspecting" with the goal of "noticing small problems and fixing them before major ones develop." Ideally, "nothing breaks down."

The main goal behind PM is for the equipment to make it from one planned service to the next planned service without any failures caused by fatigue, neglect, or normal wear (preventable items), which Planned Maintenance and Condition Based Maintenance help to achieve by replacing worn components before they actually fail. Maintenance activities include partial or complete overhauls at specified periods, oil changes, lubrication, minor adjustments, and so on. In addition, workers can record equipment deterioration so they know to replace or repair worn parts before they cause system failure.

**Main objective of PM are:**

1. Enhance capital equipment productive life.
2. Reduce critical equipment breakdown.
3. Minimize production loss due to equipment failures.

Other terms and abbreviations related to PM are:

- scheduled maintenance
- planned maintenance, which may include scheduled downtime for equipment replacement
- planned preventive maintenance (PPM) is another name for PM
- Breakdown maintenance: fixing things only when they break. This is also known as "a reactive maintenance strategy “and may involve "consequential damage."

***Planned maintenance***

Planned preventive maintenance (PPM), more commonly referred to as simply ***planned maintenance*** *(**PM**) or* ***scheduled maintenance***, is any variety of scheduled maintenance to an object or item of equipment. Specifically, planned maintenance is a scheduled service visit carried out by a competent and suitable agent, to ensure that an item of equipment is operating correctly and to therefore avoid any unscheduled breakdown and downtime.

The key factor as to when and why this work is being done is timing, and involve a service, resource or facility being unavailable. Planned maintenance is preplanned, and can be date-based, based on equipment running hours, or on distance travelled.

***Predictive replacement***

***Predictive replacement*** is the replacement of an item that is still functioning properly. Usually it's a tax-benefit based replacement policy whereby expensive equipment or batches of individually inexpensive supply items are removed and donated on a predicted/fixed shelf life schedule. These items are given to tax-exempt institutions.

***Condition-based maintenance***

Condition-based maintenance (CBM), shortly described, is maintenance when need arises. CBM maintenance is performed after one or more indicators show that equipment is going to fail or that equipment performance is deteriorating.

***Advantages and disadvantages of CBM***

CBM has some advantages over planned maintenance:

- Improved system reliability
- Decreased maintenance costs
- Decreased number of maintenance operations causes a reduction of human error influences

Its disadvantages are:

- ✓ High installation costs, for minor equipment items often more than the value of the equipment
- ✓ Unpredictable maintenance periods cause costs to be divided unequally
- ✓ Increased number of parts (the CBM installation itself) that need maintenance and checking

**2. Corrective maintenance**

Corrective maintenance is a type of maintenance used for equipment after equipment break down or malfunction is often most expensive – not only can worn equipment damage other parts and cause multiple damage, but consequential repair and replacement costs and loss of revenues due to down time during overhaul can be significant. Rebuilding and resurfacing of equipment and infrastructure damaged by erosion and corrosion as part of corrective or preventive maintenance program involves conventional processes such as welding and metal flame spraying.

***3. Predictive maintenance***

This maintenance strategy uses sensors to monitor key parameters within a machine or system, and uses this data in conjunction with analyzed historical trends to continuously evaluate the system health and predict a breakdown before it happens. This strategy allows maintenance to be performed more efficiently, since more up-to-date data is obtained about how close the product is to failure.

**4.3. Storing materials, tools and equipment's**

Safe storage of materials and equipment is essential for many businesses, such as construction job sites, laboratories, and other locations that handle chemicals, flammable gases and other hazardous materials. Storage methods and procedures are regulated for many such items; when in doubt it is always best to be cautious to prevent accidents. Locking storage cabinets and restricting access to storage areas will prevent unauthorized handling of stored items and minimize the possibility of theft.

### *General Plan*

Create a plan for storing all equipment and materials at your site. Assign a specific location to each item or type of item and label the space accordingly. Make certain that work areas and walkways are kept clear of all stored items. Use tape or paint to identify such areas on the floor of a large area, such as a manufacturing facility. In an office, laboratory or similar smaller setting, use cabinets with doors that close securely. Always leave at least 1.5 feet between the top of stored items and fire sprinklers, if present. Make sure that all stacks are solid and secure them whenever possible.

### *Flammable Materials*

Materials that are highly flammable require special handling. Gases such as propane and butane must be kept in pressure-safe containers with appropriate labels. Flammable gases are to be kept in a separate, well-ventilated area. According to the Occupational Safety and Health Association, flammable liquids such as gasoline and kerosene must be stored in approved containers located away from other flammable materials. These can be stored only in a specially constructed room that is able to contain a fire for one to two hours. Keep flammable materials 50 feet away from sources of heat or flame.

### *Chemicals and Other Hazardous Materials*

All chemicals, including cleaning materials, should be kept in their original containers or in properly labeled containers of an appropriate type. Every workplace that uses chemicals of any type should have a book containing all material data safety sheets, and the book must be kept where it is easily accessible. Chemicals must be stored where there is no public access and where tipping or breaking can’t happen, such as secure shelves inside a locked cupboard. The cupboard must be labeled with the type of materials it contains.

***Machinery and Equipment***

Machinery such as forklifts such must be kept in a safe location where it is protected from unauthorized access, weather and accidental damage. It must be kept away from driveways, walkways and other areas where access is required. All equipment should be turned off when not in use. If there is a chance of oil, hydraulic fluid or other liquids leaking from the vehicle while it is stored, use a drip pan underneath it to catch any spills. Check the area frequently for such leaks and clean them up immediately if any are found, as these represent significant fall hazards for employees.

***Remember:*** always after work was accomplish clean, maintain and store on their original place of materials tools and equipment.

| **Self-Check # 4** | **Written Test** |
|---|---|

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

1. What is cleaning? (2pts)
2. Discus about methods of cleaning? (2pts)
3. Discus about methods of material maintenance? (3pts)

***Note:*** **Satisfactory rating - 3 points** **Unsatisfactory - below 3 points**

**Answer Sheet**

Score = _____

Rating: _____

Name: _____ Date: _____

**Short Answer Questions**

1._____

_____

2._____

_____

| Operation Sheet # 1 | dispose waste material |
|---|---|

**Procedures for disposal of waste materials**

Step1. Put on appropriate PPE

Step2. Prepare waste disposal materials tools and equipment

Step3. Identify disposable materials with returning material

Step4. Collect waste materials properly

Step5. Dispose waste on designated waste disposal area.

| Operation Sheet # 2 | Cleaning materials, tools and equipment’s |
|---|---|

**Procedures for Cleaning materials, tools and equipment’s**

Step1. Put on appropriate PPE

Step2. Prepare cleaning materials

Step3. Wash the equipments by water

Step4. Apply suitable detergents for the type of waste present on the equipments

Step5. Rinse the equipments

Step6. Dry the cleaned equipments by towel or heat

Step7. Return or store the equipments on their original place.

| LAP Test | Practical Demonstration |
|---|---|

Name: _____ Date: _____

Time started: _____ Time finished: _____

**Instructions:** Given necessary templates, tools and materials you are required to perform the following tasks within -1:20- hour.

Task1. Dispose waste material properly

Task2. Clean materials, tools and equipment's

Task3. Maintain materials, tools and equipment's

Task4. Store materials, tools and equipment's

Task5. Prepare report for your work

## List of reference materials


1. Dairy Farmers Training Manual, Ministry of Livestock Development, Nairobi, Kenya 2012.
2. Pashu sakhi Handbook http://vikaspedia.in/agriculture/livestock/general-management-practices-of-livestock/feed-and-water-for-ruminants
3. https://bizfluent.com/how-7576502-store-equipment-materials-safely.html
4. https://en.wikipedia.org/wiki/Maintenance_(technical)
5. https://www.uia.no/en/about-uia/speak-up/hvordan-varsle/what-is-reporting