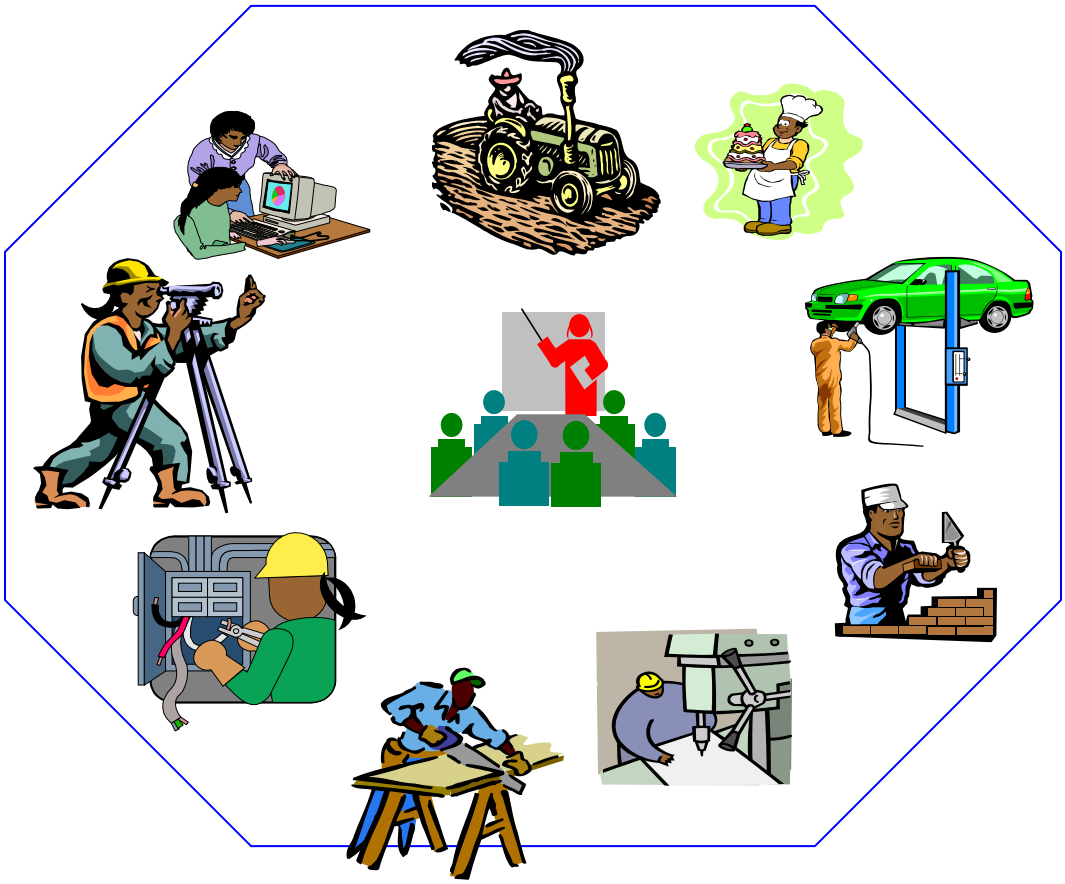
Intermediate Communication and Multimedia Equipment Servicing Level III

Based on May, 2011 V2 OS and Dec, 2020 V1 Curriculum



Module Title: Assembling and Erecting Antenna and Signal Distribution Equipment

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Bishoftu, Ethiopia

L #64	2. LO #1- Prepare to install and set up reception antennae and signal distribution systems

Instruction sheet

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

- Identifying, obtaining and understand OHS procedures
- Following established OHS for risk control
- Reporting and advising safety hazards.
- Obtaining the nature and location of the work from work supervisor
- Seeing and coordinating advice from the work supervisor
- Establishing sources of materials for the work
- Obtaining and checking tools, equipment and testing devices

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, obtaining and understand OHS procedures
- Follow established OHS for risk control
- Report and advice safety hazards.
- Obtain the nature and location of the work from work supervisor
- See and coordinate advice from the work supervisor
- Establish sources of materials for the work
- Obtain and check tools, equipment and testing devices

Learning Instructions:

Read the specific objectives of this Learning Guide.
Follow the instructions described below.

1. 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.
2. Accomplish the “Self-checks” which are placed following all information sheets.
3. 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).
4. If you earned a satisfactory evaluation proceed to “Operation sheets
5. Perform “the Learning activity performance test” which is placed following “Operation sheets” ,
6. If your performance is satisfactory proceed to the next learning guide,
7. If your performance is unsatisfactory, see your trainer for further instructions or go back to “Operation sheets”.

Information Sheet 1: Identifying, obtaining and understand OHS procedures

1.1. Identifying, obtaining and understand OHS procedures

Workplace safety can only be achieved if ongoing attention is paid to it. A vital element of an effective approach to workplace safety is the need to identify and report workplace hazards and risks on a day to day basis. You cannot „do" workplace safety at the start of the year and believe it is „done" for the entire 12 months. A hazard is a situation in the workplace that has the potential to harm the health and safety of people or to damage plant and equipment.

- **Coordinating scheduled hazard identification activities**

The goal of any workplace health and safety strategy is to eliminate or reduce, as far as practicable, all workplace risks. This can be achieved by setting standards in accordance with applicable and current OHS legislation, implementing measures to meet those standards, monitoring the measures, and having an OHS management program of regular health and safety review and improvement.

This program should address risk/hazard management. This known as the three-stage process of:

- ✓ Identifying hazards in the workplace
- ✓ Assessing the risks to health and safety which those hazards create
- ✓ Implementing suitable measures to control the risks.

The stages of hazard management range from identifying potential hazards at the planning and purchasing stages, to implementing programs which address specific hazards, and consulting with workers.

All these phases should be covered by venue-specific workplace policies and procedures tailor-made to reflect the requirements of individual businesses and individual work practices.

- **Hazard Identification**

Hazard identification is the process used to identify all possible situations where people may be exposed to injury, illness or disease. It is the process used to identify all the possible situations in the workplace where people may be exposed to injury, illness or disease.

- **Ways to identify hazards**

Hazards can be identified in a number of ways:

- ✓ Consulting with HSRs
- ✓ Consulting with employees
- ✓ Undertaking workplace inspections
- ✓ Examining workplace records of incidents and dangerous occurrences or near misses
- ✓ Keeping up to date with safety-related matters and issues.

The most effective methods of identifying hazards use a combination of these ways.

- **Timely identification of hazards**

Management must ensure their actions enable appropriate and timely identification of hazards.

A *systematic* approach using the above techniques is recommended and attention should be paid to specific occasions when hazards may be introduced into the workplace. The most common times when hazards may be introduced are when changes to the workplace are implemented.

Examples of these instances include:

- Before premises or work stations are used for the first time and after they have been used for a while
- Before, during and after installation of plant and equipment
- Before, during and after alterations to plant, machinery or equipment
- Before, during and after alterations to layout of the workplace
- Before and after changes to existing work practices are introduced
- When any new information becomes available relating to relevant workplace health and safety risks
- After any near miss situation has occurred
- When any workplace accident, actual injury or event takes place
- In keeping with workplace schedules for regular workplace checks and hazard inspections – for example, every month, every quarter.
- Factors to consider when developing inspection protocols

When developing inspection systems it is important to establish:

- The emphasis and scope of the inspections – what will be inspected and which areas will be inspected
- How they are to be conducted. A walk around" the workplace is an essential element of any inspection system
- How often they are to be carried out. Regular inspections are critical: once every month is best but inspections should occur at least every three months
- Who will be involved in the inspections? Workers should be involved together with the HSR and a management-level representative
- Who is responsible for ensuring suggested improvements are taken into account?
- This will normally be management or the owner
- What checks should be carried out to ensure corrective action has been taken once a problem has been identified, analyzed and has had suitable control procedures developed for it? It is also important to check the implementation of risk controls has not, itself, introduced a new risk into the workplace
- How they are to be documented. Inspections should use a dedicated inspection checklist to record findings of the inspection.

The main reasons for doing workplace OHS inspections are to identify the health and safety hazards in the workplace that exist or have emerged over time.

During inspections, health and safety issues can often be identified and resolved before any harmful event takes place.

Inspections can also help to identify whether measures are in place to ensure the workplace complies with all relevant health and safety requirements (legislation and business policies). When deciding which aspects of the workplace are priority areas for routine inspection, it is important to consider:

- The existing and potential health and safety hazards within each workplace. Common sense is a good indicator, as is input from workers and analysis of workplace accident registers.
- The types of processes, operations and occupations present in the workplace. Historically certain tasks carry with them greater risks. For example, the risks in a kitchen are more numerous and potentially dangerous than those involved in an office environment.

- Any OHS requirements relating to particular hazards, occupations, industrial processes and operations which apply to individual workplaces. Most OHS authorities have lists to assist in this regard detailing historical risks and what can be done to prevent or control them.
- Any new processes or arrangements which have been introduced. The introduction of anything new (process, product, equipment) has the potential to create a new or different risk or hazard. Remember the introduction of risk control measures may sometimes introduce a new/different hazard or risk.
- Equipment, substances or situations causing injury or disease in the past using anecdotal staff evidence and accident/near miss registers as the basis for identifying these.
- The need to follow up and monitor any changes suggested or implemented during previous inspections – to ensure they are effective and are being implemented.

Check list

Where areas for routine inspections have been established (such as the areas/departments which are the basis of DWGs) simple checklists which can be systematically completed during inspections should be prepared to facilitate and record findings. These will help save time and ensure a thorough inspection is carried out which is consistent every time it is undertaken.

In practice, these checklists form the basis of a comprehensive review of workplace practices on a regular basis (every month or three months).

Checklists will vary according to the workplace environment.

The types of hazards present will determine the areas covered in the checklist. Some areas to consider and develop checklists for are:

- ✓ Manual handling hazards addressing any activities where there is a need to push, pull, carry, manipulate, carry, lift, or use anything.
- ✓ Housekeeping practices relating to issues such as (but not restricted to) use of chemicals, bed making, cleaning of items (such as baths and toilets) and the vast variety of manual handling activities

- ✓ General tidiness of the workplace with attention to items being stowed in walkways, rubbish in the workplace, arrangement of items, storing of cartons and equipment
- ✓ Machinery with attention focused on correct operation, presence of all required safety guards and cut-off switches, noise levels and stability of items
- ✓ Chemical hazards addressing issues such as fumes, gases, storage, labeling, handling, Material Safety Data Sheets, personal protective clothing and equipment
- ✓ Electrical safety ensuring electrical items have been tested, tagged and are safe to use
- ✓ Office safety relating to the layout of offices, furniture used, use of equipment (especially computers and related equipment), and lighting as well as personal practices of office staff when engaged in office work
- ✓ Fire safety addressing firefighting equipment, access and exits, alarm systems, instructions for employees and presence of suitable EMPs
- ✓ First aid provisions. Verify all the necessary items are present in workplace first aid kits, that the kits are located where they should be and all the facilities in any First Aid rooms are present and in working condition. This check should also verify any workplace first aid providers have current first aid qualifications, updated as required so they maintain currency and required skill and knowledge levels
- ✓ Registers. Ensure they are located where required and are being completed as necessary.

Because each workplace is different, it is important to develop checklists which match the actual design and processes of the workplace, and the products and services each area/DWG is involved in providing.

Tailoring inspection checklists to suit the workplace will ensure all existing and potential health and safety problems can be identified.

Codes of Practice/Compliance Codes may contain checklists which can be used (or modified) to help identify particular hazards and hazard areas.

Working closely with staff on a day to day basis

Previous notes have stressed the need for a collaborative and consultative approach towards workplace safety.

A key to this approach is the ongoing identification of workplace hazards before they result in accident or injury.

Effective hazard identification requires application of all the techniques identified above (regular workplace inspections using checklists to record and document what is found) as well as close contact with staff and the operation of the business on a day by day basis.

This close contact is necessary so:

- Employees understand safety is an ongoing concern for management and demonstrating management are actually involved and „walking the talk
- Management can identify and address hazards at the earliest opportunity to prevent a potential risk becoming a workplace accident causing actual injury
- Staffs are reminded that they have an ongoing role in workplace safety and are able to contribute to workplace safety on an ongoing basis, and have an obligation to do so.

Examples of hazards which may need to be addressed

Traditionally, hazards have been able to be classified as one of the following:

- Hazards in the physical environment
- Hazards associated with plant and equipment
- Hazards associated with work practices and procedures
- Hazards associated with security issues
- It is possible your workplace has additional hazards. Check with your supervisor to determine what applies where you work.

Hazards in the physical environment

Responsible management should target attention to areas and issues associated with:

- The physical working space staffs are required to operate within. This is to identify physical placement of items posing a risk, ensure freedom from physical hazards, and ensure conditions are not cramped or overcrowded and function to facilitate the work to be done.

- Lighting. To ensure appropriate lighting, check that lights are operating correctly (no flickering fluorescents, no blown globes) and there is freedom from shadows and an absence of glare (especially for office workers)
- Hot and cold environments such as severe temperatures (and excess times at these temperatures) for those involved in hot kitchen work and/or loading deliveries into (or cleaning of) walk-in cool rooms and freezers.
- Exposure to the elements. This is a concern where there are staff workings outdoors around pools or as grounds staff. Issues may include protection against sun, wind and rain and the use of required personal protective clothing and equipment.
- Prevailing noise levels. This can be a special concern for those working in entertainment areas where there is amplified music, or who need to operate noisy equipment for extended periods.
- Electrical items. Ensure they are safe by having them checked and approved as safe. They should be used with a Residual Current Device (RCD) and staff operating them as required in accordance with establishment-based safe working procedures and manufacturer's instructions
- Flooring. Hazards in this regard can include frayed carpet causing a tripping hazard, wet floors due to work processes or spills, as well as uneven surfaces. The presence of steps and stairs should also be addressed
- Equipment designed to assist with manual handling. All workplaces should use manual handling and lifting aids to reduce the possibility of injury to workers.
- Options include:
    - ✓ Trolleys
    - ✓ Forklifts
    - ✓ Pallet movers
- Pests. These are a special concern for food safety. Pests can turn customers away, can cause food waste, and mice and rats have been known to cause fires when they chew through electrical wiring
- Crowds. During busy times management has an obligation to the public to protect them against injury when they are on the premises

- Large crowds provide the potential for injury and management have to prepare plans and provide staff to control these situations (restricting access to certain areas, restricting access to the premises, eliminating bottlenecks, providing security staff to monitor and control areas).

Hazards with plant and equipment

Efforts to identify hazards in relation to machinery, tools, appliances and equipment should focus on:

- Ensuring regular service and maintenance is provided for all plant and equipment, items and utensils in accordance with manufacturer's instructions and to address malfunctions
- Ensuring staff receive adequate training in the use of all plant and equipment, items and utensils they are required to use.
- Ensuring electrical tests and checks are performed at least every 12 months to ensure the electrical safety of equipment and appliances, power points and switches.
- Ensuring staff are adhering to standard safe work practice when using electrical equipment/appliances such as:
    - ✓ Not operating electrical equipment while standing in water
    - ✓ Not using electrical equipment with wet hands
    - ✓ Not using appliances that are untagged as being tested and safe for use
    - ✓ Not using faulty appliances or items tagged as being "Out Of Operation/Service Unsafe For Use"
    - ✓ Not using electrical appliances for work they were not intended for
- Ensuring all malfunctioning tools and equipment are reported using verbal reporting mechanism or completing a workplace-based „Maintenance Request" form, and taking the faulty item out of service and tagging it as Out of Service.
- Ensuring only enterprise tools and equipment are to be used for undertaking work at the workplace. This means staff cannot bring in and use their own electrical tools and equipment.
- Ensuring all operational manuals, manufacturer's instructions and trouble-shooting guides are available to all users.

Hazards with working practices

Attention should be paid to the following as they commonly raise workplace hazards in one form or another:

- Opening and closing procedures (procedures used by a business or department at the beginning and end of a day or shift. Special attention must be paid at closing times to ensure all doors and windows are locked and no unauthorized persons are left on the premises.
- Safety and security procedures. There is a need for management to ensure they have established and implemented plans (EMPs) to address security issues identified as being likely for their business such as:
  - ✓ Theft and Robbery
  - ✓ Irrational or angry customers
  - ✓ Bomb threats
- Standard Operating Procedures for all work-related tasks to ensure they remain applicable given any changes in levels of trade, materials, equipment used, and/or techniques required.
- Roistering of staff. You need to ensure there are enough suitably trained, qualified and experienced staff is roistered on duty and that the changing nature of the workplace is reflected in the rosters being prepared.
- Length of time spent on certain tasks. Where there is a possibility of repetitive strain injury (RSI), other injury or boredom management need to rotate staff through different jobs (and/or provide appropriate extra breaks) to avoid inherent problems and injuries.

Note

Many of the issues raised above should be covered in the EMPs for the venue.

In addition, specifics to follow in responding to several of the emergency situations identified above are presented in the unit „Plan and conduct an evacuation of premises".

Coordinating risk assessments

While staff are encouraged to participate in workplace safety processes (consultation, collaboration and participative arrangements), they generally have no legal obligation to do anything unless specified by legislation. The legal obligation for workplace safety always rests with management and owners.

It is the managers and owners who must drive the entire workplace OHS process, preferably supported by staff.

Once the hazards have been identified, they should be listed for a risk assessment to be carried out in consultation with the relevant HSR and employees.

The purpose of risk assessment is to determine whether there is any likelihood of injury, illness or disease associated with each of the potentially hazardous situations identified in the hazard identification process by considering:

- Whether any person (workers and/or members of the public/visitors) would be exposed to the identified situations under all possible scenarios (such as, for example, during installation, commissioning, erection, operation, inspection, maintenance, repair, service and cleaning of plant, equipment or areas)
- The existing measures in place to protect the health and safety of people who may be exposed to the identified risk or hazard
- How adequate the existing measures are for protecting the health and safety of people who may be exposed.

If the likelihood anyone will be exposed to a situation under all possible scenarios is „nil", then there is no risk and no additional risk control measures are required.

The adequacy of existing control measures should be considered if there is the potential someone may be exposed to a particular situation.

Note: Existing control measures should not be regarded as adequate simply because an incident has not occurred.

This particularly applies where the existing control measures are only *administrative* controls (such as training, safety procedures, safety signs, supervision) or personal protective equipment and clothing (such as safety gloves, safety glasses, protective clothing, and respirators).

These types of control rely heavily on human behavior doing the right thing. The downfall of this approach is that any deviation in behavior (employees not following the safety procedures because some person or situation is distracting them or staff failing to wear protective clothing) could cause injury, illness or disease.

Remember, the thrust of workplace safety is for „safe place as opposed to safe person".

After the list of hazards has been finalized, documented and agreed on (by workers and management), a judgment needs to be made about the seriousness of each hazard and which one/s require the most urgent attention:

- Take a close look at each item on your „hazard identification" list and consider "What is the possible outcome if things go wrong?" Are you talking about cuts, scratches and bruises or is there the potential for someone to be seriously injured or even killed?
- Is the hazard an everyday task or something coming up only now and again giving you more time to find a solution?
- Are there things you can do right now as a short-term fix while you work out a better, more permanent solution?
- Never wait for all risks to be assessed before you start fixing things – make a start and begin by addressing at least one identified risk or threat

Once you have worked out which hazards have the greatest potential to cause injury or disease, or are a risk to public safety, they should be marked as your high-priority hazards. The other hazards should be ranked in priority order

The hazard list must be reviewed regularly to ensure every aspect of the workplace is monitored and any new hazards are immediately identified. Remember, workplace safety is a dynamic concept. You assess risks so you can make sure you control them effectively. The risk from a hazard is a combination of the chance of an incident occurring (that is, "Very likely", „likely", unlikely" or „very unlikely"), what could go wrong and how badly someone could be hurt.

Occupational health and safety management systems risk assessment as critical to prioritizing risk control measures and use the following formula to determine risk level:

Risk level = Consequence x Exposure x Probability where**:**

- Consequence is „the outcome severity (injury/illness) of the scenario"
- Exposure is „frequency and duration of exposure of persons to the chosen hazard"
- Probability is the „likelihood or chance that the chosen sequence and consequence will occur".

Issues to examine

To assess a risk then, you must examine all of the factors affecting the risk.

Assessment should occur in a „public" forum such as an OHS meeting where staff (impacted by the risk being discussed), HSRs and management all attend to consider the issue with a view to properly analyzing it so an effective and practicable control solution can be identified.

You need to look at:

- The number of people exposed to the risk
- Who these people are: the different types of people who are exposed and their special needs. They could be, for example, new workers, casual employees (who usually have different OHS needs to permanent staff because they often do not receive „standard" OHS training and are often not present to attend standard staff meetings and briefings), visitors, contractors, members of the public, disabled workers and customers
- How near these people is to the risk
- How often they are exposed
- How long they are exposed for
- The combination of hazards they are exposed to
- How serious the resulting harm could be
- How easily someone could be hurt
- What the law says about risk control
- How common it is for the hazard to cause problems in other workplaces • Any factors that could increase the likelihood of illness and injury
- The work processes involved. This requires you to know the practices, procedures and protocols for performing the particular task under consideration
- How well your current precautions work. Has the hazard already caused any problems?

Reviewing risk assessments

The workplace is a dynamic environment and there is a need to review all the risk assessments you conduct „on a regular basis" (monthly or at least every three months). You will notice the Risk Assessment Worksheet presented below contains a space for the „Date" in order to facilitate this review activity. Additionally, risks must be reviewed

when any significant change in the workplace takes place impacting on the risk (once again the HSR and other workers should be involved).

These changes may be required:

- Alerts or notifications from OHS authorities in relation to a practice, product, procedure, technique, and/or items of equipment
- Changes to internal operating procedures
- Introduction of new or more equipment
- Change in staffing – new staff, reduced staffing levels
- Modification to the work environment such as changes to job allocation, work station layout, relocation of items of equipment, different environmental conditions, a change in patron profile
- Based on concerns, feedback and/or complaints from workers, customers or management.

Reporting hazards

Where workplace hazards are identified they must be immediately reported to the appropriate person such as a supervisor or HSR.

A verbal report is usually the best option as it is quick and allows the other person to ask questions to clarify and better understand the issue.

- ✓ A written form such as a „ Hazard notification‟ or „Hazard report‟ may also be required.

Implementation of safety regulations

When workplace risks and hazards have been identified and analyzed, suitable risk controls must be implemented. This Section discusses the use of risk control in the workplace to protect the safety of workers and others.

Controlling risk is the third step in risk management. The first step was hazard identification and the second step was risk assessment and analysis.

Implementing risk control methods means putting in place the risk control options deemed most appropriate and effective for the identified hazard. Where a manager or supervisor is unable to implement identified risk control methods these situations must immediately be reported to the „appropriate person‟ (owner, more senior manager) for their attention and action.

When hazards have been identified, and the risks to health and safety assessed, the risks need to be controlled. Risk control is a requirement as part of the employer's duty to provide and maintain so far as is practicable a working environment which is safe and without risks to health for employees and the public.

Risk control means taking action to eliminate or reduce the likelihood of exposure to a hazard that may result in injury or disease.

The Hierarchy of Control is a list of control measures in descending order of effectiveness that may be applied to specific risks only after an assessment and analysis has been made of all possible risk controls.

This highlights the need for time, planning and consultation throughout the entire process.

Note: while it is preferable that hazards and risks are subject to planned and comprehensive procedure if there is an immediate risk to health and safety, you must make sure the activity in question is ceased until measures are taken to remove the immediate risk. In most cases, effective control of a risk requires **a combination** of the following controls to be applied. In addition, remember it is vital to make sure the introduction of a control measure does not create another, new or different risk. Some control options are better than others. Again, „safe place" options are better than „safe person" options.

It is better to create a „safe place" than rely on people wearing protective clothing or „Behave safely". The „hierarchy" of control reflects this idea.

As an overview the Hierarchy of Control comprises the following controls:

- Elimination
- Substitution
- Isolation
- Engineering controls
- Administrative controls
- Personal protective clothing and equipment.

The effectiveness of these controls is in descending order of effectiveness. These controls may be classified under three levels as set out below.

Level 1: Elimination (the ultimate 'safe place' option)

At the top of the hierarchy of control is elimination.

It is the best option for controlling hazards but is not always available or practicable. Elimination means changing the procedure so it does not have to take place at all.

For example:

- A cleaning process which uses ultrasound instead of a chemical avoids the need for the chemical in the workplace
- Buying precut steaks eliminates the need for slicing steaks and using knives
- Getting rid of noisy equipment or facilities removes the need for hearing protection.

Elimination of hazardous substances should always be the priority simply because this is the most effective way of making the workplace safe.

Where elimination is not reasonably practicable, steps must be taken to identify effective measures to reduce the risk (Levels 2 and 3).

Level 2: 'Safe place' options which reduce the risk: Isolation, Substitution and Engineering controls

If elimination is not practicable, there is other „safe place" options which reduce the risk: substitution, isolation and engineering controls.

Substitution means replacing a hazardous process or substance with a less hazardous one:

- A detergent may be substituted for a chlorinated degreaser
- Using a neutral detergent instead of caustic soda for cleaning
- A chemical could be used in pellet form instead of a powder to reduce the risk of inhalation
- Applying a substance with a brush might be safer than spraying the substance onto a surface
- Lifting smaller and/or lighter packages. This may mean purchasing 5kg packs rather than 25kg bags of product
- Using an electric forklift instead of a petrol one
- Vacuuming instead of sweeping.

Isolation involves separating the risky process from people either by distance or by using barriers to prevent exposure:

- Placing a noisy piece of equipment in a soundproof box or behind a baffling wall

- Physically stopping people (customers) from coming into contact with the hazard
- Moving the hazard to some distant location.

Engineering controls include plant or processes which:

- Minimize the generation of risk
- Suppress or contain the risk
- Limit the risk should an event occur.

Examples include:

- Ventilation booths for spray painting
- Machine guards to prevent clothing, jewellery and body parts being caught in machinery and equipment
- Machine operation controls such as „Emergency Stop" buttons, automatic cut-offs, the ability to remotely operate an item
- Ventilation – exhaust fans to remove dust, smoke
- Wetting down techniques to reduce dust
- Changing the levels or height of work levels to minimize bending, twisting and similar actions during manual handling.

Level 3: Safe person' options: Administrative controls; Personal protective equipment and clothing

If it is not practicable to make the workplace itself safe it is necessary to look for „safe person" options, which are a lower priority because they depend on people "doing the right thing".

Administrative controls are safe work practices which help to reduce employee exposure to risk.

For example:

- Restricting access to certain areas at nominated times when the risk is lowest or non- existent
- Good housekeeping practices (in terms of keeping workplaces clean and tidy), including regular cleaning of work areas and regular and appropriate maintenance of workplace items and equipment
- Changing purchasing procedures so substances (such as cleaning chemicals) are supplied in ready to use containers and decanting is not required

- Providing trolleys to move items to reduce need for potentially harmful manual handling
- Providing accurate work instructions and methods of work (work practices, standard operating procedures) to guide workers in the safe way to perform their work
- Changing work practices to include job rotation (but note this, on its own, is generally regarded as an insufficient control method. Job rotation is the practice of moving staff between different jobs to help eliminate boredom and repetition and the associated dangers these introduce to work
- Shorter working periods for jobs performed under difficult conditions such as limiting work needing to be undertaken in extreme cold, heat, noise or where there is excessive vibration
- Training – providing necessary training in practices such as such as lifting and manual handling techniques.

The effective use of administrative controls relies on full cooperation of employees, so it is essential extensive consultation occurs during their development and implementation.
Adequate supervision and training are also important and a legal requirement.
Personal protective equipment (PPE) and clothing includes such things as:

- Eye protection – goggles, face masks, visors
- Respiratory protection
- Gloves and gauntlets
- Safety shoes and boots – including „clogs" for kitchen workers
- Protective clothing – aprons, thermal wear/suits, „pull off" ties for security staff
- Head protection – hard hats, and caps for food handlers.

Personal protective equipment is generally the least effective way to control risk and should only be used if you can't reduce the risk enough using other means.
It should then be used in conjunction with other measures.
Personal protective equipment might also be used as a temporary measure until other controls can be implemented.
All personal protective equipment should:

- Meet the relevant in-country Standards
- Be appropriate to its application

- Be issued to an individual and not shared
- Be properly maintained and cleaned.

Employees who have to use personal protective equipment must be trained so they know why and how to use the equipment effectively.

Remember: the most effective method of controlling risks is usually a ***combination*** of the above options.

Consider this

If you consider the hazard of slips in the kitchen, you cannot eliminate the kitchen floor, neither is it possible to always ensure the kitchen floor is not slippery or wet.

However you can substitute work practices. For example, only clean when there is minimal foot traffic through the kitchen.

You can control the risk by proper engineering by using non-slip matting.

You can make an administrative arrangement (by directing staff not to enter the kitchen during service and cleaning) and training them to raise awareness of the problem.

You can also use personal protective equipment (provision of rubber sole shoes), so although the only acceptable control for a broken hand brake on the venue courtesy bus is elimination of the problem, for slips in the kitchen a combination of controls is acceptable.

Safety training

Previous notes have highlighted the need for employers to provide training to staff in relation to OHS issues.

Identifying the OHS training gap

The OHS training gap is the difference between the OHS competencies staff need in order to perform their job safely, and the OHS competencies they actually possess.

Competencies comprise three vital elements:

- The necessary knowledge
- The necessary skills
- The „right" attitude.

This gap can be identified by:

- Undertaking an OHS Training Needs Analysis (TNA). This is a formal and structured approach to identifying the gaps *for every staff member* in all areas of

their work. TNAs are an excellent way of determining the training needs for each staff member but they are relatively expensive and time consuming

- Observing staff performance to identify areas of their performance requiring attention
- Speaking to staff and asking them to identify the areas they believe they need OHS training in
- Looking at their personnel file/records (such as their application for employment and their résumé) to determine their existing skill/competency levels with a view to identifying the areas where training is required
- Employing the services of an outside consultant with specialist OHS knowledge and expertise to assess competency levels of staff within the business analyze the competencies needed and determine individual staff training requirements.
- The critical point to remember is that, once you have identified an OHS staff training need, it is you who must take action to provide the required training.

All employees benefit from OHS training. This includes casual, part-time and full-time staff and all staff is required to be supplied with such training.

Many long-serving staff is ignored when it comes to identifying OHS training needs. It is often thought they know what to do simply by virtue of their years of service, but this is often not the case and they should be included in any approach to identifying OHS training needs.

While individual staff requirements will vary because of their particular roles, all staff will benefit from understanding OHS requirements (legislated and internally imposed).

Possible training requirements for new staff

Staff who are new to the business or staff who have transferred internally from one department/area to another may need training which enables them to:

- Understand the hazards of their work and workplace because these always differ between workplaces, work stations and businesses on the basis of many factors such as equipment used, processes, and layout
- Know how to advise management or their HSR about identified workplace hazards so they can be investigated and resolved
- Understand workplace consultative arrangements, including the role and functions of DWG, HSR and Health and Safety Committee

- Understand and follow health and safety procedures applying in their workplace with special attention paid to OHS issues in their particular section of the workplace
- Understand their responsibilities under applicable legislation which may relate to:
  - ✓ Compliance with mandatory work practices
  - ✓ Need for certification or licenses in order to undertake specified work activities
  - ✓ Reporting when unsafe situations occur and/or when prescribed workplace accidents or injury occur
- Understand their responsibilities in relation to safe work practices and allied workplace safety issues under the policies and procedures the business has established.

OHS considerations for Induction and Orientation

Many of the OHS issues about which staff must be aware are communicated to them as part of their formal Induction and orientation session.

Induction training for new employees could include:

- A tour of the work area so they gain an overview of the business and appreciation of where various department, facilities and equipment are physically located
- An explanation of venue amenities and facilities relating to OHS. This can include discussion about:
  - ✓ First aid kits
  - ✓ First aid rooms
  - ✓ First aid providers
  - ✓ Emergency equipment and systems

Enabling OHS training for staff

Difficulties occurring when attempting to plan staff training for all team members must not stand in the way of doing the training. Do not fall for the trap of thinking „it's all too difficult", and therefore do nothing.

- To facilitate the delivery of OHS training to staff, there may be a need to:
- Organize time release for staff so they can attend training
- Roster staff differently. There can be a need to run multiple training sessions to
- ensure all staff who have a training need can be trained

- Conduct off-site training using external training providers
- Close a department for a period while staff undertake training
- Undertake training out of hours which may mean having to pay staff extra money to stay back after normal working hours in order to do their training.

The choice of strategy will depend on:

- The trading hours of the venue
- Numbers of staff who require training
- Urgency of the training need
- Type of OHS training to be done
- The general level of cooperation from all concerned.

Senior management should be involved at this stage in the planning so they can lend their support to the training initiatives, and approve the necessary resources and allocation of time required.

Integrating OHS training into overall training

The OHS training program for a business should be integrated into the general training program for the workplace.

You may achieve this by adding specific OHS courses (or units or modules) to the overall business training plan, or by including OHS components into existing training courses. For example, every training module *without exception* may include an OHS element addressing the specific OHS issues for the particular training module.

Establishing an effective OHS training program requires the business to set broad objectives for the training. Possible objectives may be:

- Ensuring all employees can perform their work safely and without risks
- Ensuring line managers have an understanding of, and ability to, develop and implement OHS management systems and procedures to support the „safe place" concept
- Ensuring any external contractors who work in the business understand and follow the health and safety procedures which apply to the property so their work aligns with other „safe place" initiatives in the organization

- Ensuring all new and transferred employees understand health and safety policies and procedures so they know what is expected in relation to actual workplace performance.

Examples of training interventions

Training interventions are activities used to provide on-site training to staff. OHS-related training interventions include:

- Workshops where staff are led by a supervisor or trainer and address one or more specific OHS issues using activities such as lecture, discussion, practical exercises, case studies which may be supplemented by the use of guest speakers
- Information sessions where management or a trainer gathers staff together and provides them with required information. Verbal delivery of the information is the most common practice but this may be supported by:
  - ✓ Handouts of notes, fact sheets and other literature such as materials prepared in house by the training department, or safety materials provided by manufacturers of equipment, suppliers of chemicals or the OHS authorities or agencies
  - ✓ PowerPoint presentations
- Workplace mentoring and coaching where individuals in the business (usually senior personnel with extensive experience) develop a personal relationship with one or more staff and use this relationship as the basis for sharing information, providing on the job advice and instruction and discussing and solving workplace issues
- Lectures. These are formal training sessions where trainers deliver talks a nominated topic. Lectures may be supported by notes written on a board, handouts, and/or PowerPoint presentations
- Practical demonstrations. Where the training requires staff to learn how to „do" something, practical demonstrations are required. Demonstrations may occur one on one (as part of the mentoring or coaching approach) or can occur in a group setting. It is important that the practical nature of demonstrations is underpinned by the provision of relevant knowledge so staffs understand what they are doing and why they need to do it. Opportunity for practice must be included.

- Health and safety meetings. These are regular workplace meetings where the sole focus of the meeting relates to OHS issues. These issues may be new legislated or organizational requirements, findings related to analysis of workplace accident and injury data, explanation of new products, equipment or operating procedures, discussion of risk identification activities (such as workplace inspections), risk assessment and analysis or consideration and research into potential risk control procedures.
- Introduction to fellow employees, especially those who constitute the DWG for the area in which they are going to work
- Introduction to HSR together with an explanation of their role, and details of how to engage with the established participative arrangements relating to workplace OHS
- Description of general workplace hazards and risk control measures including visual observation of problem areas, practice with control protocols and watching experienced staff perform work in a safe and proper manner
- Identification of the location of and demonstration of the use of fire fighting equipment. It is a standard requirement all staff have some form of training or experience in using fire-fighting equipment, especially fire blankets and fire extinguishers
- Details of emergency exits showing where they are, stressing the need to keep them free of obstruction and indicating any fire doors which may need to be closed in the event of fire.
- Identification and explanation of Emergency Management Plans for the business and details of evacuation plans for the business or area: this should include identification of:
    - ✓ Individual responsibilities under the plans
    - ✓ Evacuation routes – primary and secondary
    - ✓ Evacuation assembly points – primary and secondary
- Issue of personal protective clothing and equipment if required and explanation of when it must be used, and how it is to be used.

Training for various workplace roles

Supervisors need to be able to carry out any health and safety roles and functions assigned to them. This means a supervisor will not automatically know what is expected in terms of OHS simply because they are a supervisor.

They may need special training to:

- Recognize hazards in the workplace and conduct health and safety inspections
- Access and analyze identified hazards so they are fully understood in their context
- Select and apply appropriate risk control measures for identified hazards
- Investigate OHS situations such as incidents or dangerous occurrences
- Produce clear and accurate reports to support workplace research and investigation
- Communicate effectively with workers, managers and OHS authorities
- Consult effectively with management and others including external business, authorities or agencies
- Conduct effective on the job training on OHS issues
- Ensure employees understand and follow workplace procedures as required by legislation and the business.

Managers too may need training in order to discharge their legal obligations and/or to assist them participate in effective OHS collaborative and consultative processes.

They may require training in:

- OHS legislation as it applies to their business and their geographic location
- Health and safety principles and practice which serve to underpin OHS thinking, risk identification, risk assessment and analysis and development of effective risk control protocols
- Management systems to enable integration of OHS into other management activities and workplace priorities
- Assigning health and safety roles and functions to staff within the workplace
- Workplace hazard identification and assessment as part of the ongoing risk management procedures in place within the business
- Risk control strategies and options to address identified workplace risks.

A shared approach to training, where managers, supervisors and HSRs attend training *together* can produce good results.

Most OHS issues need managers and employees to work together to successfully resolve those issues, so it makes sense to have a joint approach to training.

Joint training can supplement specific training which relates to individual staff or DWG needs.

More on workplace health and safety training

Training is vital to assist employees perform their work safely. This means employers should arrange training which covers health and safety issues related to the tasks being performed, as well as training in the overall approach to health and safety taken by the business.

The importance of workplace OHS training in preventing workplace injury and illness is generally acknowledged and legislation may set out general and specific training requirements in certain areas for staff, management and/or HSRs.

Note training is never treated by legislation as a substitute for removing a hazard at its source.

For example, in manual handling if it is not practicable to carry out job modification or to provide and use mechanical aids to reduce the risk, it is necessary to implement a training program to show staff the safest way to address the task.

Higher levels controls (under the Hierarchy of Controls) must be considered first. The business cannot just default to „training" as the only method of risk control.

Self-Check 1	Written Test

Directions: Each question is in the form of multiple choices, only one answer is correct. Circle or highlight the letter that you think is correct.

1. Which of the following definitely would not be a confined space?
   a. A manhole
   b. A storage tank
   c. A vat
   d. A ventilated room
2. The primary hazard associated with confined spaces is:
   a. Mechanical or moving parts
   b. Sound
   c. Heat
   d. Oxygen deficiency
3. Portable self-contained breathing devices (SCBA's) should be used in confined spaces where hazardous atmospheres exist:
   a. With protective equipment and clothing
   b. If the entrance is large enough
   c. b and d
   d. Unless the atmosphere is ventilated
4. Testing the air in the confined space must be done:
   a. During work in the confined space
   b. Before entry into the confined space
   c. After the confined space is exited
   d. a and b

Note: - Satisfactory rating: 4 and above - Unsatisfactory Rating: below 4

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

Name: _____ Date: _____

Score = _____

Rating: _____

Information Sheet 2: Following established OHS for risk control

2.1. Following established OHS for risk control

Introduction

Following the introduction and application of risk control procedures to address an identified risk there must be an evaluation of the control and, where necessary, adjustment to ensure adequate control is applied as intended.

This Section discusses activities required to ensure risk controls work properly.

The need to plan monitoring of control measures

When risk controls have been implemented they need to be monitored to see if they have been effective in addressing the identified hazards.

The checking procedures used for risk control measures should be planned in the same way the implementation of the actual control measures are planned.

This means the planning phase should address:

- Who will do the checks? They must be attached to and become the responsibility of a nominated person or job role/position and this responsibility should be included in the relevant job description for the position
- When will they be done? Specify either dates, frequencies (every week, every month) or specific times (see 'Timing of the checks' below)
- What will be assessed as part of the checking process? A checklist can be used to guide this aspect of the process.

Actual workplace checks

Timing of the checks

Checks should be made of the control measures applied:

- Prior to their actual implementation to verify the control will achieve the outcome required as part of the risk assessment/analysis process
- During use to evaluate the effectiveness of the control during actual operation. Objective observation using a rating chart or checklist to guide observations is an effective way to achieve this.
- The key, obviously, is to watch the workplace activity to capture evidence to use as the basis for making a decision about the effectiveness of the control

- Immediately after use by talking with staff involved and, for example, testing/evaluating equipment involved.

Obtaining feedback from workers/operators about safety, ease of use or potential issues arising is imperative and demonstrates the business is committed to involving staff in a practical way in workplace safety.

Checks should be scheduled to ensure they are carried out when required.

Has a new problem been created?

Checks on the effectiveness of a control measure should seek to answer two questions:

- To what extent has the control effectively addressed the identified hazard?
- Has a new hazard been created by virtue of the introduction of the control?

When a new risk control initiative has been implemented it is important any monitoring of its application takes into account whether or not the initiative itself has created any new OSH issues and problems.

This highlights that it is not sufficient for monitoring to simply determine whether the identified hazard had been effectively controlled but monitoring must also identify if a new problem has been caused.

For example, a new system eliminating a manual handling or repetitive strain hazard could have inadvertently introduced a new/different hazard in terms of, for example, eye strain.

Once again, observation of the task and observation of the risk control measures as well discussions with operational staff are keys to working out if this is the case.

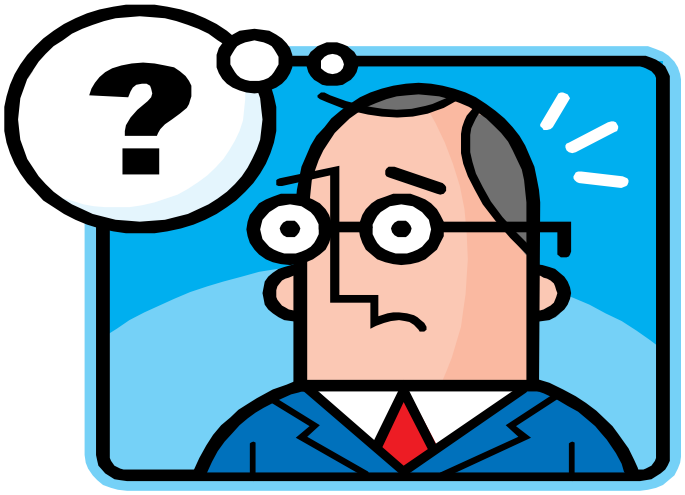

Figure 2.1: Checkpoint

Action to take

Where the approved risk control method has been monitored and found to have not fixed the identified hazard, or to have created a new or different hazard, this situation must be:

- Immediately resolved. If resolving the issue falls within your level of expertise and/or scope of authority or
- Reported to the appropriate person for their follow-up and action. This can mean reporting to senior management, the HSR, the Designated Work Group (or similar) or the OSH Committee.

A verbal report may suffice providing feedback from staff/operators identifying causal factors as well as potential additional controls which may be required.

Immediacy in reporting is essential to facilitate prompt supplementary action. Attention must always be paid to ceasing any work where a danger to staff or others exists.

The review of the situation commonly repeats the original three-stage risk management process – risk identification, risk analysis/assessment, risk control.

When revised controls are implemented, the revised controls must also be monitored to determine if they are effective or not.

Figure 2.2: Immediate action to control risk

Evaluating OSH workplace performance

At least every year the performance of the workplace and workers in relation to OSH must be analysed and evaluated.

This will enable businesses to gauge their OSH progress towards their workplace safety goals, and determine what requires change or further attention.

There are five steps to evaluating health and safety performance in the workplace:

Steps 1: Know what the OHS objectives are for the business

It is important to know what the business intended to achieve as a starting point for determining what it actually has achieved.

Goals should be to:

- Meet the legal requirements or standards for the business
- Ensure the workplace, as far as practicable, is safe and without risks to the health of everyone.

It is possible to evaluate a single part of the health and safety management system (for example training, or policies, or workplace inspections, or development of SOPs), or the entire system.

To evaluate OHS performance, it is important to look at what programs or strategies have been developed and implemented to achieve the set objectives. Specific objectives relate to strategies, commitment, roles and functions, and the environment within the workplace.

Some examples are:

- Strategic goals:
  - ✓ Health and safety strategies will be developed annually to improve health and safety performance
  - ✓ Health and safety systems and programs will be continually reviewed, upgraded and monitored to improve standards and performance
- Commitment and responsibility goals
  - ✓ Business commitment to OHS will be demonstrated at all levels
  - ✓ A high level of OHS awareness will be fostered at all levels
  - ✓ All managers will have responsibility for the health and safety of employees under their management
  - ✓ All employees will take as much care as possible for their own, and their work mates' health and safety
  - ✓ Specific, defined, responsibilities will be clearly understood by all employees
- Work environment goals
  - ✓ OSH practices and procedures, and the work environment, will be regularly reviewed and revised

- ✓ Formal consultation and communication with HSRs and employees in all health and safety matters will occur through health and safety committees, team briefings, and management involvement and commitment
- ✓ All incidents and near misses will be reported, investigated and corrective action taken as a priority
- ✓ The purpose of an investigation will be to determine the cause of the incident to prevent future occurrences.

Step 2: Develop OHS performance measures

Performance measures are designed to indicate achievement of the OHS objectives of the business.

These measures may be built into objectives, or built into the OHS programs established by the business.

Whatever indicators are chosen, they should be put in place at the beginning, when the OSH objectives, plans and programs are established.

It is advisable to develop long and short-term measures of OHS performance.

Short-term measures include:

- An assessment of whether plans are being implemented as intended. If they are not being implemented as intended, why not?
- The proportion of OHS grievances/issues successfully resolved at shop-floor level. The higher the number/ratio of issues resolved at shop-floor level, the better the OHS performance of the business
- Number of health and safety grievances/issues; a downward trend is positive.

Long-term indicators may include:

- Injury and illness rates
- Incidence of gradual onset injuries
- The hidden costs of injury and illness.

Other quantitative measures may include:

- The number of incidents
- The number of employees trained
- The number of work procedures developed or reviewed
- The number of hazards identified and eliminated.

Qualitative measures could include:

- The types of issues being raised by employees and HSRs
- Employee level of awareness of workplace health and safety policy
- How OSH performance is being taken into account in relation to the performance assessment of supervisors and managers
- Evidence management is leading by example.

An important measure of effectiveness is whether or not activity occurred in a timely way. Measures of this could include:

- Whether an established training timetable for OHS is being followed
- Whether the timetable for implementing the strategies to enhance workplace safety is being observed
- The response time for corrective action to identified risks following workplace inspections
- The time taken for maintenance requests to be completed.

Step 3: Collect information on your measures of effectiveness

Once the measures to be used have been decided, there is a need to decide how this information will be collected, how often it will be collected, and who will collect it.

It is useful to use a checklist when auditing the OHS system, or measuring if certain activities have been completed against a fixed time schedule.

This checklist is then a primary method of collecting information on the effectiveness of OSH training.

Some possible questions to ask are:

- Do the illness and injury recording procedures meet the specifications of relevant legislation, where applicable?
- Are all incidents, illness and injury, and near misses:
  - ✓ Recorded?
  - ✓ Investigated?
  - ✓ Reported if and where required?
  - ✓ Analysed for trends?
  - ✓ Reported to employees?

If measuring performance against specified targets, information from health and safety records should be reviewed. This could include reports on:

- The frequency of incidents and dangerous occurrences

- Average lost time
- Costs of accidents, injury and incidents
- Costs of training purchase of safety equipment and Personal protective equipment (PPE).

If evaluating the effectiveness of the OHS information and communication strategy, qualitative information should be collated from:

- Discussions with HSRs and employees
- Health and Safety Committee minutes
- Issues raised and resolved logbook
- Interviews, questionnaires or observations.

How often should you collect information?

This will vary according to the nature of the measures, and the system or strategy being evaluated. For example, some indicators relating to training will need to be assessed at the end of every training course.

The overall performance of the OHS management system may only need to be assessed annually.

Regardless, information needs to be collected on a regular basis so trends and changes can be identified.

Who should collect the information?

The responsibility for collecting OHS information should be clearly allocated to a specific job position.

In specific locations, supervisors can collect information on the areas under their control. Small workgroups or teams can collect information on their own area.

The manager whose function includes implementing a health and safety system (or OHS plan) in an area may also do the evaluating for the area.

The Health and Safety Committee and HSRs should be involved in evaluation.

This may include a role in collecting and providing information.

In larger organisations, external assistance may be called for to evaluate overall policy or management systems.

Step 4: Analyse the results and decide upon improvements

If a strategy is not working, there are a number of questions that can be asked to assist in determining the causes:

- Was the objective realistic and achievable?
- Is the objective relevant to current technology and values?
- Was the strategy implemented as planned?
- Was there adequate training, information and understanding of the strategy?
- Were there resources available to implement the strategy?
- Did work organisation allow the strategy to work?
- Was responsibility for implementing the strategy allocated?
- Are the responsibilities understood?
- Did the information you collect accurately measure performance of the strategy?

Use the information from this analysis to fine tune the strategy, to reset workplace standards and/or to identify areas of workplace health and safety needing systematic management.

Step 5: Implement changes and start again

Once improvements to the workplace OSH system have been identified, these results should be made available to management and staff.

Strategies to initiate corrective action may need to be developed and implemented.

Follow-up corrective action must be taken promptly to demonstrate commitment to genuine workplace safety.

New or improved strategies should be implemented and then the evaluation process will begin again, using any lessons, mistakes and achievements to help develop and perfect the process.

Self-Check 2	Written Test

Directions: Each question is in the form of multiple choices, only one answer is correct. Circle or highlight the letter that you think is correct.

1. Health and Safety at Work Law states which of the following: (Select all that apply)
   a) You have a right to a safe workplace
   b) Your employer must ensure, so far as is reasonably practicable, your health, safety and welfare whilst at work
   c) You also have responsibility for your safety
   d) Only your employer can be prosecuted for Health, Safety and Welfare breaches
2. A risk that needs to have action taken to control the health and safety hazard in the workplace is defined as a:
   a) acceptable risk
   b) significant risk
   c) insignificant risk
3. Failure to comply with Health & Safety legislation may result in which of the following? (Select all that apply)
   a) The employer or an individual employee could be prosecuted.
   b) The individual affected may claim for compensation
   c) There could be a significant risk to the employer and the employee's reputation and credibility

Note: - Satisfactory rating: 3 and above - Unsatisfactory Rating: below 3

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

Name: _____ Date: _____

Score = _____

Rating: _____

Information Sheet 3: Reporting and advising safety hazards

3.1. Reporting and advising safety hazards

Where workplace hazards are identified they must be immediately reported to the appropriate person such as a supervisor.

A verbal report is usually the best option as it is quick and allows the other person to ask questions to clarify and better understand the issue.

A written form such as a ‘Hazard notification’ or ‘Hazard report’ may also be required.

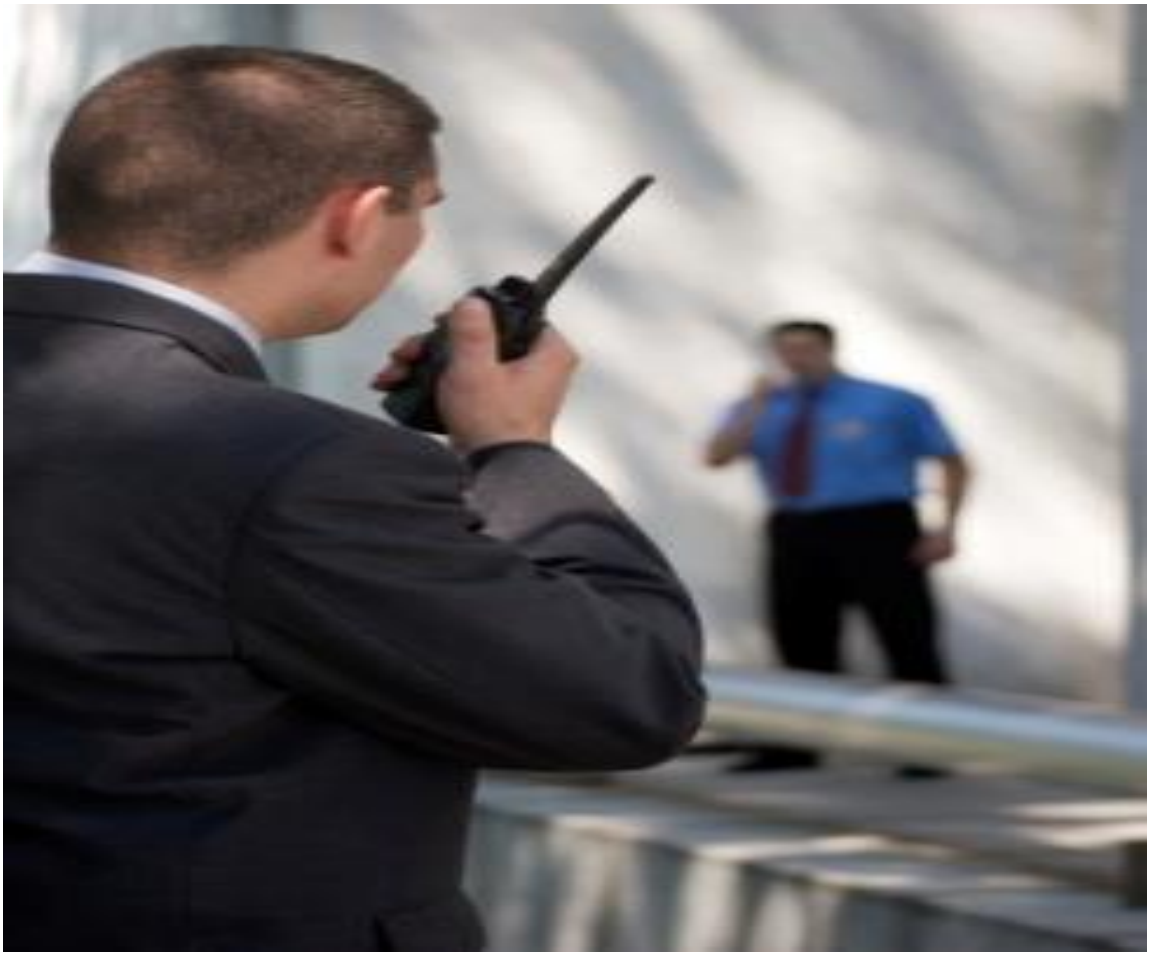

Figure 3.1: Hazard reporting

Self-Check 3	Written Test

Directions: Each question is in the form of multiple choices, only one answer is correct. Circle or highlight the letter that you think is correct.

1. Which of these is **most** likely to be a result of handling an overloaded electrical socket?
   a. Frostbite
   b. Asbestosis
   c. Asphyxiation
   d. Electric shock
2. Why should near misses be reported?
   a. To educate employees
   b. To test the first aider
   c. To ensure complete recovery
   d. To stop a more serious event occurring
3. Why do we report incidents?
   a. To raise awareness of unsafe practices so future accidents can be prevented
   b. To ensure that only serious incidents are reported
   c. To report individuals who are to blame
4. Identify barriers that prevent action being taken to reduce the risks from slips, trips or falls in the workplace:
   a. Believing that slips and trips are inevitable
   b. Clear, well-lit walkways
   c. Inadequate risk assessment and management controls.

Note: - Satisfactory rating: 4 and above - Unsatisfactory Rating: below 4

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

Name: _____ Date: _____

Score = _____

Rating: _____

Information sheet 4: Obtaining the nature and location of the work from work supervisor

4.1. Obtaining the nature and location of the work from work supervisor

Introduction

Organizations are places where groups of people work together to achieve a common goal, or goals. The organizations in which we work today are very different places from the traditional organizations of ten or twenty years ago. There has been tremendous upheavals affecting peoples" working lives, and there is no reason to expect that workplaces and jobs won't go on changing at the same or an even faster, rate.

These changes can be both exciting and unsettling for people. Probably those most likely to adapt to change are those who are multi-skilled and who are open to learning new skills and doing things differently.

Overview of management responsibilities

Not surprisingly, the roles of managers and supervisors in the workplace have also changed in recent years. It is not uncommon now for a worker to have both management and operational responsibilities and to be part of a work team.

Managers are often responsible for staff who have multiple tasks and who move between jobs and tasks. Content-free managers are common. That is, they have not necessarily been trained in, or worked directly in, the department or area they are managing. Most staff is directly or indirectly involved in setting goals for the organization and working out ways to best achieve them.

A manager is responsible for coordinating the work people do to achieve specific goals.

Because most organizations aim to make profits and meet customer expectations, managers are also required to make sure the work is done:

- Efficiently: that is, on time and within the given resource constraints
- Effectively: that is, the service or product meets quality standards and the job is done well.

Manager

A manager is also the person who deals with unexpected problems or issues and decides the most appropriate course of action to take.

Typically a manager has four functions:

- Planning: setting goals and targets, overseeing the development of plans, systems and processes for achieving goals, working out how best to get there within a budget
- Organizing: coordinating the resources, staff, plant and facilities to achieve goals
- Leading: providing the direction, support, encouragement, feedback and training staff need to do their job well
- Monitoring: supervising staff, and monitoring and adjusting systems and procedures to make sure goals are achieved as planned.

How do managers work?

Why do managers seem to work so differently from each other?

Why is it sometimes so hard to pin down exactly what they do in a day? Managers will work differently depending on a number of factors.

Their level in the organisation executive, middle or direct supervisor

Their management tasks and approach will change depending on their level of responsibility within the organization.

Chief executive officer

For example, a chief executive officer (CEO) is likely to be more involved in:

- Dealing with the board of management
- Broad organizational planning
- Positioning the enterprise in the marketplace
- Securing large contracts for the business
- Balancing the finances of the organization
- Leading the enterprise as a whole.

They are more reliant on conceptual skills.

Middle level manager

The middle level manager is more concerned with:

- Operational planning
- Establishing staffing levels within given budgets
- Dealing with unresolved problems
- Setting up systems and procedures

- Supervising sales and contracts
- Encouraging staff and setting up systems to support them.

They are likely to need strong planning and interpersonal skills

Supervisor

The supervisor or line manager is more likely to:

- Work directly with staff on a day-to-day basis
- Monitor their workload and workflow
- Handle queries and issues as they arise
- Verify systems are implemented and suggest changes if they are not working.

They are required to understand the technical details of how the operation is working, and they also need to have strong interpersonal skills.

The size and type of the organisation they work in

In large organizations, roles and responsibilities are more likely to be defined and separated, and managers will work in specific teams or units.

In a smaller enterprise, staff may be required to work across a number of areas (for example, in sales and marketing and distribution).

The culture of the enterprise

All organizations have a culture or a mind-set or a particular way of operating. This is sometimes hard to define or even to find, but it will always be there.

The culture of a business is often described as “the way we do things around here".

The culture could be:

- Supportive of staff
- Customer-oriented
- Friendly
- Comfortable
- Casual
- Total quality management in focus/nature
- Blaming
- Negative
- Stressful
- Or any combination of the above

For example, a small family run bed and breakfast in the country may encourage staff to wear jeans, work in a team circle, and interact constantly. This is a deliberate image and way of working that is encouraged by management to allow for creativity and to attract a particular customer base. Its culture may be described as flexible and creative.

Compare this to a conventional international hospitality chain where there are clear protocols about almost everything and staffs have unambiguous roles according to their classification. Its culture may be described as structured and safe.

Sometimes there is a publicly stated culture and also an underlying (or unwritten) one.

Most managers take their lead from the culture, but if the underlying culture is negative, many will try to turn this around so that at least their unit has a positive approach to its work.

Their preferred style of operation

Managers are people with different personalities.

They feel comfortable working in a way that reflects their personal style. This is not to say that managers cannot and should not learn, but it is an acknowledgment that management should know their strengths and build on these.

They should also know their shortfalls and work towards improving these.

Their management style could be:

- Laissez faire
- Team-oriented
- Task-oriented
- Autocratic
- Outgoing
- And many more.

For example, Tara is a shy and quiet person by nature.

She gets on with her job, is good at what she does, and has the respect of her fellow workers who report to her. She knows that she needs to work on her people skills as she tends to wait for staff to come to her rather than asking them questions about how they are going.

Tara should not try to change her personality and become the life of the party, but it would be good for her to work on her communication skills so that she is better able to

pick up on how people are going and whether or not they have any problems that affect their work.

'Monitor work operations'

Monitoring is a process of determining how well our plans are being implemented.

You cannot monitor something if you don't have a plan or basic structure of how something should be done, or a defined goal or target.

Work operations refer to the work itself and includes systems and procedures, staff performance, and levels of service in the workplace.

These operations can include:

- Service delivery: ensuring staff provide the level of service established/determined as appropriate for the establishment or department
- Customer satisfaction: generating feedback from customers about how they perceive the service being provided
- Products supplied and the nature of them: this can be the physical aspects and facilities of the rooms, drinks, food and entertainment we supply
- Dealing with paperwork: some staff may have as their main role the generation and administration of documentation: this has immediate impact on customers and internal calculation of statistics.

Self-Check 4	Written Test

Directions: Each question is in the form of multiple choices, only one answer is correct. Circle or highlight the letter that you think is correct.

1. **An acceptable method of rescue from a confined space is:**
   a. A rope tied around a workers waist
   b. A lone attendant entering the confined space as soon as trouble starts inside
   c. Rescue by any person, whether trained or not in first aid or CPR
   d. A trained person with SCBA entering the space after additional help arrives
2. **Residue left in tanks can cause:**
   a. Fire hazard
   b. Explosion hazard
   c. Respiratory hazard
   d. All of the above
3. **Possible precautions to take when someone is entering a confined space include:**
   a. Lockout - Tag out
   b. Permits
   c. Rescue
   d. All of the above
4. **When testing the air, what are you testing?**
   a. Oxygen levels
   b. Air Contaminants
   c. If a permit is required
   d. All of the above

Note: - Satisfactory rating: 4 and above - Unsatisfactory Rating: below 4

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

Name: _____ Date: _____

Score = _____

Rating: _____

Information sheet 5: Seeing and coordinating advice from the work supervisor

5.1. Seeing and coordinating advice from the work supervisor

Introduction

Management has responsibility for ensuring that operations in the establishment support the overall enterprise goals and in some instances, quality assurance initiatives. This presupposes goals, objectives and targets do in fact exist, and they have been communicated to the appropriate staff and managers. It is not safe to assume either or both of these exist or have been done.

Check to see what applies in your workplace.

Enterprise goals and quality initiatives

Many organizations have a way of operating called total quality management (TQM).

This basically means all employees are involved in continually improving the level of service, productivity and customer satisfaction.

TQM is regarded as a positive thing for organizations to be, or strive to become.

In a TQM organization:

- There must be full, top-down management commitment, support and understanding of the TQM philosophy
- It is important to get work systems and processes right
- Involvement of the whole workforce is necessary and this is done through teams
- Customer needs are identified and met
- Problems and issues are promptly identified and adjustments are made accordingly.

If an organization has adopted a TQM philosophy, then its goals and workplace operations will reflect this approach.

Why monitor and adjust?

There are good reasons to monitor progress and adjust plans. The benefits are:

- Things are more likely to happen as planned
- Management and staff actually know what's going on in the business
- Problems are identified and corrected
- Service and product are consistent over time
- Work operations fit with work and organization goals
- Staff feels supported and involved

- Customer needs are met.

What is monitored in a quality environment?

Monitoring in a quality environment doesn't just rely on the inspection and checking of procedures and work done.

It is a total concept whereby quality is built into every aspect of work operations and there is a continual process of improvement. It doesn't blame individuals but rather concentrates on seeking better ways to do things.

For example, the staff teams at the Serenity Health Resort meet monthly and lately have really been concentrating on ways of improving customer service.

They have reviewed their procedure for taking bookings and have decided to cut out the two-step process of people having to speak to two booking officers if they want a swim and a massage. The new process means customers now only need to speak to one person who takes both bookings. Even though the previous system worked well, it was not customer-friendly enough so it was changed by the team. Any aspect of work operations can be monitored with a view to improvement.

These can include:

- The procedures or systems that exist: such as dish antenna installation procedures
- The workflow: that is the order in which things are done (such as the sequence of adjusting the alignment of dish antenna)
- Whether or not there are gaps or overlaps in service provision
- The workload of staff: that is whether they are under-worked
- or over-worked at different times
- The time it takes to do a task or job
- Job design: that is whether jobs are challenging or interesting enough for staff
- Level of customer satisfaction with the service or product provided.

This does not mean all things are monitored at the same level all of the time.

Generally some sort of automatic review will be built into most work operations, such as three or six monthly reviews and reports.

Sometimes it will be necessary to concentrate more heavily on one area over another, such as an area where problems or complaints exist, or when a new system or procedure has been introduced.

Common industry problems can include:

- A high level of staff absenteeism
- Customers complaining they have to wait too long for a meal
- Takings in a certain bar are falling over the past three months
- Several guests have notified reception their bathrooms are dirty on check-in.

Who does the monitoring?

In the older style management, the manager monitored and controlled the work of the staff and made changes as seen fit. To some extent this is still true today, especially in premises that are owner-operated. In this scenario, the manager has the final responsibility for determining whether the goals set by the organization are achieved.

However, increasingly, today's manager will involve staff in setting the goals and in reviewing the progress of these, and coming up with ideas and solutions to problems. This is usually done in a team setting. So, the skills and work of the manager usually involve supporting, encouraging and training staff to monitor and report on progress and seek improvement. It can be seen the structure of the organization has moved from a hierarchical "top down" orientation to a more devolved and lateral management approach.

Self-Check 5	Written Test

Directions: Answer following question accordingly.

1. What is one important decision you've had to make as a supervisor? Why was it critical?
   a. _____
   b. _____
   c. _____
2. How would your previous direct reports describe your supervision style?
   a. _____
   b. _____
   c. _____
3. Has your supervision style changed over time? How?
   a. _____
   b. _____
   c. _____

Note: - Satisfactory rating: 3 and above - Unsatisfactory Rating: below 3

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

Name: _____ Date: _____

Score = _____

Rating: _____

Information sheet 6: Establishing sources of materials for the work

6.1. Establishing sources of materials for the work

To install your antenna you will need the following:

- Antenna of your choice.
- 75 ohm to 300 ohm transformer (should come with new antenna)
- Mounting kit (braces, u-bolts, etc.)
- Mast (antenna must be 10 feet (3.04 meters) above roof, you will need a 12 feet (3.66 meters) mast or two 6 feet (1.83 meters masts if you add a rotator)
- UV resistant outdoor coaxial cable (100 feet, 75 feet, 50 feet or 25 feet depending on your configuration with ground wire)
- Grounding block.
- Splitter (2 ways, 4 ways, etc., depending on how many TVs you want to connect).
- One digital converter for every TV connected to the antenna.
- Antenna rotator (optional, only if you pick unidirectional antenna).
- Hammer drill (for cement block or brick walls) or regular drill (for wood panel).
- Masonry or regular drill bits.
- Masonry or wood screws.
- TV signal booster (optional).
- Ty-wraps.

Self-Check 6	Written Test

Directions: Answer following question accordingly.

i. List antenna Installation tools check off list

1. _____
2. _____
3. _____
4. _____.....

Note: - Satisfactory rating: 10 and above - Unsatisfactory Rating: below 10

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

Name: _____ Date: _____

Score = _____

Rating: _____

Information sheet 7: Obtaining and checking tools, equipment and testing devices

7.1. Obtaining and checking tools, equipment and testing devices

Having ALL of the right tools and supplies at the installation will keep you from turning a 1 day install into a 3 day install. Pay close attention to the tools you will want to have on site as an installer.

Installation Tools

Dish assembly

- Socket Wrench Set
- Open End Wrenches
- Assorted Screwdrivers
- Dielectric Grease
- Bricks for Non-Pen

Cables making

- Snap On Coax Connectors
- Snap On Crimper
- Coax Wire Stripper
- Rubber Tape
- Electrical Tape
- Wire Cutters
- Power Screwdriver
- Hole-Saw
- Plastic Tie Straps
- Twine
- Fish Tape (Spring Steel)
- Silicone Calking & Gun
- Wall Outlets for Coax Entry

Grounding equipment

- Medium gage wire
- Assorted bolts and nuts
- Assorted Grounding Hardware
- Coax Cable grounding block

Dish aiming tools

- GPS Handheld
- Super Buddy
- Inclinometer angle meter
- 10’ of Coax cable
- Cell Phone

Networking

- Crossover Ethernet cable
- Loose Ethernet Connectors
- Bulk Ethernet Cables
- Ethernet Cable Crimper

Other helpful tools

- Rope
- Extension Ladder
- Extension Cord
- Pocket Knife
- Power Bar
- Flashlight
- Sunscreen
- Extra Batteries
- Windex
- Paper towels
- Packing Tape

Self-Check 7	Written Test

Directions: Answer following question accordingly.

1. Write at least three networking tools for antenna installation.

   a. _____

   b. _____

   c. _____

Note: - Satisfactory rating: 3 and above - Unsatisfactory Rating: below 3

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

Name: _____ Date: _____

Score = _____

Rating: _____

Operation Sheet 1	Installing and reparing antenna and satellite system

Purpose: - Identify tools and material Electronic devices and symbols to installing and Repairing .

Condition or situations for the operations:

- The trainees should be describe the job description and job analysis of an employee as given on assignment in group within one day time

Equipment tool& materials

*Soldering iron -knife *Tools for assemble/disassemble/wrenches

* Screw driver *satellite dish *F-connector

* DMM/AMM *Pliers * satellite dish finder

*Divider *coaxial cable *AV jack

* Nastro (Plaster) *Receiver

Procedure

- identify an electronics device depend on their purpose
- Demonstrate the correct procedures for analysis of trouble shoot for the following Antenna and Satellite System
- Read and use different reference books from the library (including internet) prepare introduction note and service manual and present for your class meet. (Your teacher gives the instruction according to as group formation).

Precautions:

- Upon carried our questioning of the officials they should be selective & exercise in order to get relevant information for their purpose.

Quality Criteria:

- Follow procedures in step by step
- The project must be functional
- Finishing on time

Your teacher will evaluate your output either satisfactory or unsatisfactory. If unsatisfactory, your teacher shall advice you on additional work. But if satisfactory, you can proceed to the next topic.

LAB Test 1	Installing and reparing antenna and satellite system

Name Trainer- date- E.C

Time start-2:15 Time finished-6:00

1. *You are required to perform any of the following*
   - Apply OH & S
   - Clean working area and correctly arranged
   - Personal protective equipment used in the working area
   - Select the necessary materials, equipments & tools
   - Explain the function of each materials, equipments & tools
2. Request your teacher for evaluation and feedback

   -Showing the practical activities

LG #4	3. LO #2. Install reception antennae and signal distribution systems

Instruction sheet

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

- Following established OHS risk control measures.
- Carrying out the installation efficiently without waste of materials
- Installing accessories straight and square in the required locations
- Determining the optimum location for an antenna to be installed
- Terminating cables and conductors
- Following procedures for referring non-routine events.
- Checking circuits/components

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:

- Follow established OHS risk control measures.
- Carry out the installation efficiently without waste of materials
- Install accessories straight and square in the required locations
- Determine the optimum location for an antenna to be installed
- Terminate cables and conductors
- Follow procedures for referring non-routine events.
- Check circuits/components

Learning Instructions:

Read the specific objectives of this Learning Guide.

- Follow the instructions described below.
- 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
- Accomplish the “Self-checks” which are placed following all information sheets.
- 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).
- If you earned a satisfactory evaluation proceed to “Operation sheets
- Perform “the Learning activity performance test” which is placed following “Operation sheets” ,
- If your performance is satisfactory proceed to the next learning guide,
- If your performance is unsatisfactory, see your trainer for further instructions or go back to “Operation sheets”.

Information sheet 1: Following established OHS risk control measures.

1.1. Following established OHS risk control measures

Your Company Name is committed to the goal of providing and maintaining a healthy and safe working environment, with a view to continuous improvement. This goal is only achievable by adherence to established objectives striving to exceed all obligations under applicable legislation, and by fostering an enthusiastic commitment to health, safety and the environment within Your Company Name personnel, contractors and visitors.

In particular:

- Management, working in cooperation with the Joint Health and Safety Committee, will strive to take all reasonable steps to reduce workplace hazards to as low as reasonably achievable.
- Supervisors and managers are held accountable for the health and safety of all employees under their supervision. This includes responsibility for applicable training and instruction, appropriate follow up on reported health and safety concerns, and implementation of recommended corrective action. This accountability is integrated into the performance appraisal system.
- Supervisors, workers and visitors are expected to perform their duties and responsibilities in a safe and healthful manner, and are accountable for the Health and Safety of themselves and others.
- Your Company Name is committed to providing all necessary training and instruction to ensure that appropriate work practices are followed on the job, and to promote their use off the job.
- If necessary, Your Company Name will take disciplinary action where individuals fail to work in a healthy and safe manner, or do not comply with applicable legislation or corporate policies and procedures.

Health, safety, the environment and loss control in the workplace are everyone's responsibility. Your Company Name expects that everyone will join in our efforts to provide a healthy and safe working environment on a continuous day to day basis. Only through the dedication and efforts of all individuals can Your Company Name succeed in providing a healthy safe working environment.

Occupational Health and Safety in Workplaces

Occupational Health and Safety and You

One of your most important responsibilities is to protect your Health and Safety as well as that of your co-workers. This booklet will discuss some of your duties under the occupational Health and Safety legislation and help you to make your workplace safer and healthier.

- ✓ **What the law requires**

Workplaces under the jurisdiction are governed by your provincial legislation.

The legislation places duties on owners, employers, workers, suppliers, the self employed and contractors, to establish and maintain safe and healthy working conditions. The legislation is administered by your provincial legislation. Your officials are responsible for monitoring compliance.

- ✓ **Duties of Employer**

Your employer is responsible for providing you with safe and healthy working conditions. This includes a duty to protect you from violence, discrimination and harassment. You must cooperate with your employer in making your workplace safe and healthy.

Your Responsibilities

You must also comply with the legislation. You have responsibilities to:

- Protect your own Health and Safety and that of your co-workers;
- Not initiate or participate in the harassment of another worker; and
- Co-operate with your supervisor and anyone else with duties under the legislation.

You're Rights

The legislation gives your three rights:

- The right to know the hazards at work and how to control them;
- The right to participate in Occupational Health and Safety; and
- The right to refuse work which you believe to be unusually dangerous.

You may not be punished for using these rights. An employer can be required to legally justify any action taken against a worker who is active in Health and safety.

You're Right To Know

The Act requires your employer to provide you with all the information you need to control the hazards you face at work. For example, chemicals at the workplace must be

listed. You are entitled to review this list. Your employer must train you to safely handle the chemicals you will work with. If you are inexperienced, you must receive an orientation which includes;

- What to do in a fire or other emergency;
- First aid facilities;
- Prohibited or restricted areas;
- Workplace hazards; and
- Any other information you should know.

You must also be supervised closely by a competent supervisor.

Your Right To Participate

You have the right to become involved in occupational Health and Safety. The legislation encourages employers and workers to work together to maintain a healthy and safe workplace. Employers at workplaces with (ten or more – consult your provincial act) workers must set up an occupational health committee of employer and worker representatives.

Committees Have Duties To:

- Regularly inspect the workplace;
- Conduct accident investigations;
- Deal with the Health and Safety concerns of employees;
- Investigate refusals to work;
- Meet at least (four times a year – consult your provincial act); and return minutes of each meeting to the Division.

Committee members are entitled to five days (consult your provincial legislation) of unpaid educational leave each year to take occupational Health and Safety courses.

They may attend courses provided by the Division without loss of pay or benefits.

Certain types of workplaces with less than (ten – consult your provincial act) employees must have a worker Health and Safety representative. The representative must be selected by the workers at the workplace. He or she has many of the responsibilities of an occupational health committee.

Your Right To Refuse

You have the right to refuse to do work which you believe is unusually dangerous.

The unusual danger may be to you or to anyone else. An unusual danger could include such things as:

- a danger which is not normal for your occupation or the job;
- a danger under which you would not normally carry out your job; and/or
- a situation for which you are not properly trained, equipped or experienced.

To exercise this right, use the following guidelines.

Once you believe that the work you have been asked to do is unusually dangerous, you should inform your supervisor. Make sure that the supervisor understands that you are refusing to do the disputed job for health and safety reasons. Work with the supervisor to attempt to resolve the problem.

If the problem cannot be resolved by the supervisor to your satisfaction, and no worker health and safety representative or occupational health committee exists at the workplace, your supervisor should phone the Division and ask for advice. You also have the right to contact the Division at any time.

The supervisor has the right to assign you to other work (at no loss in pay or benefits) until the matter is resolved.

Do not leave the site without the permission of your employer.

If a committee exists at the workplace, contact your local representative and ask for help. Your supervisor should contact the co-chairpersons and ask them to investigate. They will try to resolve the matter. If they cannot resolve the matter to your satisfaction, they will convene for an emergency committee meeting. The committee will investigate and prepare a report on the refusal.

You have the right to continue to refuse until:

- measures have been taken to satisfy you that the job is now safe to perform; or
- Your occupational health committee has investigated and ruled against your refusal.

If the committee rules against your refusal, you have the right to appeal the ruling to an occupational health officer. The officer will investigate and prepare a report on the disputed work. If you disagree with the decision of the officer, you may appeal to the director of the Division.

An employer cannot assign another worker to do the disputed job unless the replacement worker is advised in writing:

- of the refusal and the reasons for it;
- of the reasons why the employer believes that there placement worker can do the disputed job safely;
- that the replacement worker also has the right to refuse; and
- Of the steps to follow when exercising this right.

Duties

Branch Manager

- Ensure that all reasonable steps are taken to prevent accidents.
- Ensure that standards and procedures are developed and maintained.
- Be familiar with the Occupational Health & Safety act and any revised regulations and ensure they are followed.
- Ensure that all employees are instructed in the procedures and requirements of Occupational Health & Safety.
- Review accident reports, safety audits and other related material relative to health or safety.

Safety Officer

- Ensure that all reasonable steps are taken to prevent accidents.
- Be familiar with Occupational Health & Safety act, the company policy and any other legislation pertaining to health or safety.
- Ensure all policies and legislation is followed by all levels of employees.
- Ensure safety meetings are held and minutes are recorded, posted and filed accordingly to Occupational Health & Safety regulations.
- Ensure all accidents are reported and investigated.
- Ensure MSDS (Material Safety Data Sheet) sheets are provided for all hazardous materials delivered to the workplace and are readily available for employees to review.
- Review all MSDS and advise/train employees in the safe use, storage and transportation of controlled or dangerous products including what to do in case of an accidental spill or emergency.
- Ensure employees are instructed in the procedures and requirements of Occupational Health & Safety.

- Review all accidents and near misses to determine root and basic causes, with suggestion/implementation of changes to prevent re-occurrence.
- Ensure all employees are trained in WHMIS (Workplace Hazardous Material Information System)

All Other Staff

- Comply with all Company Procedures, Safety Policy and requirements of Occupational Health & Safety.
- Be responsible for working safely and carrying out their duties with skill and care as to not cause accidental injury to themselves, fellow employees or the general public.
- Immediately report all injuries, near misses or potential hazards to their supervisor.
- Know the location of all fire extinguishers, fire alarms or other warning devices.
- Ensure all personal safety equipment is being used properly.
- Never engage in horse play or tomfoolery.
- Maintain clean and orderly work area.
- When in doubt … ASK

Suppliers

Provide MSDS for all hazardous material shipped to our warehouse.

Ensure all reasonable steps are taken to prevent an accident.

Be familiar with Occupational Health & Safety act.

General Safety Rules

- **All** accidents, injuries or near misses, regardless of their nature, shall be promptly reported to the safety officer.
- Clothing shall be appropriate to the duties being performed. Long pants, a clean neat shirt and steel toed shoes are the minimum requirements.
- Hard hats and safety vests are provided for all warehouse staff and **must** be worn at all times in the warehouse, loading or unloading of vehicles in the yard.
- Running is **not** permitted except in extreme emergencies.
- Smoking is not permitted in any part of the warehouse or office. You may only smoke in designated areas.
- Visitors and customers are to be escorted by staff while on company property.

- Hand tools are to be used for their intended purpose only.
- Only licensed personnel may operate forklifts or other warehouse equipment and must wear a seatbelt while doing so.
- Riding on equipment is prohibited except where designated for operator.
- Horseplay, fighting or tomfoolery is strictly prohibited on Your Company Name premises.
- All spacers are to be of equal proportion and undamaged. Damaged spacers are dangerous.
- Open lifts are to be stored on the floor or in assigned bunks. Do not stack an open lift; this act **will** result in disciplinary action up to and including dismissal. All lumber lifts must be banded.
- Only solid spacers are to be used on lumber products, no particle board spacers.
- All bunked products will be placed securely in the bunks.
- All spills will be immediately cleaned up and reported.
- Drawers and filing cabinets will be kept closed when not in use.
- Filing cabinet drawers are to be filled from the bottom up or the cabinet is to be securely fastened /anchored.
- Lifts and clutter will be cleaned up before the end of your workday.
- Aisles are to be kept clear at **ALL** times.
- Do not unload a truck alone under any circumstances, if someone can not help you then wait or call someone else for help. (Applies on and off Your Company Name property).

Safety Tips

- If you are not sure…..ask.
- Follow instructions and don't take chances.
- Wear your personal safety equipment.
- Never operate equipment you have not been trained for.
- Keep your work area clean.
- Stay clear of forklifts while they are being operated.
- Avoid injury by lifting correctly. If it's heavy ask for help. Max weight to be lifted is 75lbs.

- Make sure the job can be done safely.
- **DO NOT** unloads a truck alone.
- Portable Ladders
- Portable ladders must be secured against movement and placed on a base that is stable; the base of an inclined portable ladder is to be no further from the base of the wall or structure than ¼ of the height to where the ladder contacts the wall or structure.
- Pallets & Storage Racks
- All employees must ensure that pallets used to transport or store materials/containers are loaded, moved, stacked, arranged and stored in a manner that does not create danger to workers.
- Your Company Name must ensure that racks used to store materials or equipment are designed, constructed and maintained to support the load placed on them and are placed on firm foundations that can support the load.
- Employees must report any damage to a storage rack to the manager as quickly as is practical. All managers and employees must take all reasonable steps to prevent storage racks from being damaged to the extent that their integrity as a structure is compromised.
- First Aid
- An employer must ensure that the first aiders at a work site have successfully completed a first aid training course approved by a Director of Medical Services and hold a valid certificate in first aid. (Consult with your local medical services)
- An employer must keep record at the site of workers who are first aiders and post these names where they are accessible by all employees.
- Every branch must have a first aid kit on site; each kit must contain the following: (see your Provincial legislation)
- 10 antiseptic cleansing towelettes, individually packaged
- 25 sterile adhesive dressings, individually packaged
- 10 - 10cm X 10cm sterile gauze pads, individually packaged
- - 10cm X 10cm sterile compress dressings, with ties individually packaged
- - 15cm X 15cm sterile compress dressings, with ties, individually packaged

- 2 conform gauze bandages – 75mm wide
- cotton triangular bandages
- safety pins - assorted sizes
- 1 pair of scissors
- 1 pair of tweezers
- 125mm x 4.5 m of adhesive tape
- 1 crepe tension bandage – 75mm wide
- 1 resuscitation barrier device with a one-way valve
- 4 pairs of disposable surgical gloves
- 1 first aid instruction manual (condensed)
- inventory of kit contents
- 1 waterproof waste bag

Accident and Near Miss Reporting

The following protocol must be followed.

- All employees must immediately report any occupational injury, accident or near miss to the safety officer or their supervisor.
- Supervisors must immediately tend to injuries and then report them to the safety officer.
- Branch managers must immediately discuss the incident with the safety officer and injured persons.

The purpose of this procedure is to comply with Occupational Health & Safety act, workers compensation board and to determine the cause of the accident and make recommendations to prevent further re-occurrence. All reports of injury must be filed.

If an injury occurs a record must be kept and include the following:

- ✓ name of worker
- ✓ name and qualifications of person giving first aid
- ✓ a description of illness or injury
- ✓ the first aid given to the worker
- ✓ the date and time the illness or injury
- ✓ the date and time the illness or injury was reported

- ✓ where at the work side the incident occurred
- ✓ the work-related cause of the incident, if any

The employer must retain the records kept for 3 years from the date the incident is recorded. A person who has custody of records must ensure that no person other than the worker has access to workers records unless:

- ✓ The record is in a form that does not identify worker
- ✓ The worker has given written permission to the person
- ✓ The Director of Medical Services or a person authorized by the director requires to be produced under the act.

An employer must give a worker a copy of the records pertaining to the worker if the worker asks for a copy.

Critical Injury Protocol

First and foremost, always take whatever measures are required to provide proper care of an injured worker.

If a critical injury has occurred and the worker has been cared for, the branch manager, safety officer and W.C.B must be notified. The appropriate report must be completed as soon as possible; this is to ensure that important details are not forgotten.

A critical injury is an injury that….

- Places life in jeopardy
- Produces unconsciousness
- Results in substantial loss of blood
- Involves the fracture of a leg or arm, but not a finger or toe
- Involves the amputation of a leg, arm, hand or foot, but not a finger or toe.
- Consists of burns to major portion of the body.
- Causes loss of sight in an eye.

Accident Investigation Policy

All accidents that result in injury or property damage or that could have resulted in serious injury or property damage (near miss) must be thoroughly investigated.

The investigation must determine the cause of the incident so that appropriate action can be taken to prevent recurrence.

The safety officer shall be responsible for conducting the investigation. The investigation report shall be completed as soon as possible after the incident and reported to the branch manager. The safety officer and appropriate supervisor shall determine what steps are to be taken to prevent recurrence.

Any disputes arising from the investigation will be investigated and arbitrated by the branch manager.

Alcohol and Drug Policy

It is the responsibility of all employees to ensure an alcohol and drug free environment. If there is any awareness or suspicion that any employee, supplier or visitor is under the influence of illegal narcotics or alcohol, will be removed from the premises immediately. Should an employee report to work while under the influence of such substances, the employee will be taken home either in a cab or by the Branch manager. This is a zero tolerance policy

Action

Careless work and irresponsible behavior directly affect the quality of health and safety in the workplace. Even absenteeism influences safety by placing more duties on fellow employees.

The following instances shall be cause for verbal or written warning and possible dismissal.

- Absenteeism without cause
- Health and safety violations
- Poor conduct or misconduct
- Theft
- Sexual harassment
- Racial discrimination
- Carelessness
- Willful damage to company property
- Drug or alcohol use

Compliance with company and legislative safety standards is necessary to maintain a safe and healthy work environment. As with any program non compliance issues must be dealt with.

The following is a guideline for disciplinary actions for safety infractions based on seriousness of the offence.

- *First offence, employee will be given a documented verbal warning
- *Second offence, employee will be given a written warning and a one day suspension
- *Third offence, employee may be suspended or terminated (suspension or termination to fit seriousness of the offence).

Hazard Warning Signs

Whenever possible, warning signs will be displayed where a potential hazard may cause injury. Warning signs must be strictly adhered to.

Warning signs must be posted where hazards exist and must not be removed unless hazard has been controlled.

Environmental Policy

Your Company Name is committed to the Protection of the Environment for Present and Future Generations. All Employees Are Responsible for incorporating into Their Planning and Work the Actions Necessary to fulfill this Commitment.

Your Company Name Will Meet These Responsibilities by Endeavoring to Provide the

Resources for Continuing To:

- Design and manage our operations to meet or surpass applicable environmental laws.
- Work in partnership with customers, suppliers, trade associations and government agencies to promote the environmentally safe handling and disposition of materials and products.
- Acquire knowledge and technologies to improve the environmentally save efficient use of our processes and products.
- Formulate and implement effective environmental emergency response systems.
- Involve our employees in our environmental programs and keep them informed of our performance.
- Promote employee awareness of this policy and enhance their capabilities to implement this policy.

Self-Check 1	Written Test

Directions: Each question is in the form of multiple choices, only one answer is correct. Circle or highlight the letter that you think is correct.

1. Identify barriers that prevent action being taken to reduce the risks from slips, trips or falls in the workplace:
   a. Believing that slips and trips are inevitable
   b. Clear, well-lit walkways
   c. Inadequate risk assessment and management controls.
2. As an employee you have a responsibility under health and safety law
   a. Take care of the health and safety of yourself and others;
   b. Co-operate with others to help comply with health and safety legislation;
   c. Follow any instructions and training given regarding the measures in place to control health and safety risks;
   d. Conduct monthly risk assessments
3. Who is responsible for health and safety?
   a. The chief executive
   b. A health & safety manager
   c. A divisional managers
   d. Individual employees

Note: - Satisfactory rating: 3 and above - Unsatisfactory Rating: below 3

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

Name: _____ Date: _____

Score = _____

Rating: _____

Information Sheet 2: Checking circuits/components

2.1. Checking circuits/components of antenna

Satellites being far from earth require directional antennas in order to communicate. A directional antenna normally uses a parabolic reflector (commonly referred to as a dish) to focus the radiated energy from the transmitter, and to focus the incoming energy to the receiver. This ability to focus energy is referred to as "antenna gain.

The larger the antenna the smaller the main lobe (beam width). In the case of an Intelsat Standard-A 30m antenna the accuracy must be approximately 0.015 degrees, which requires an automatic tracking device to control the azimuth and elevation adjustment of the antenna.

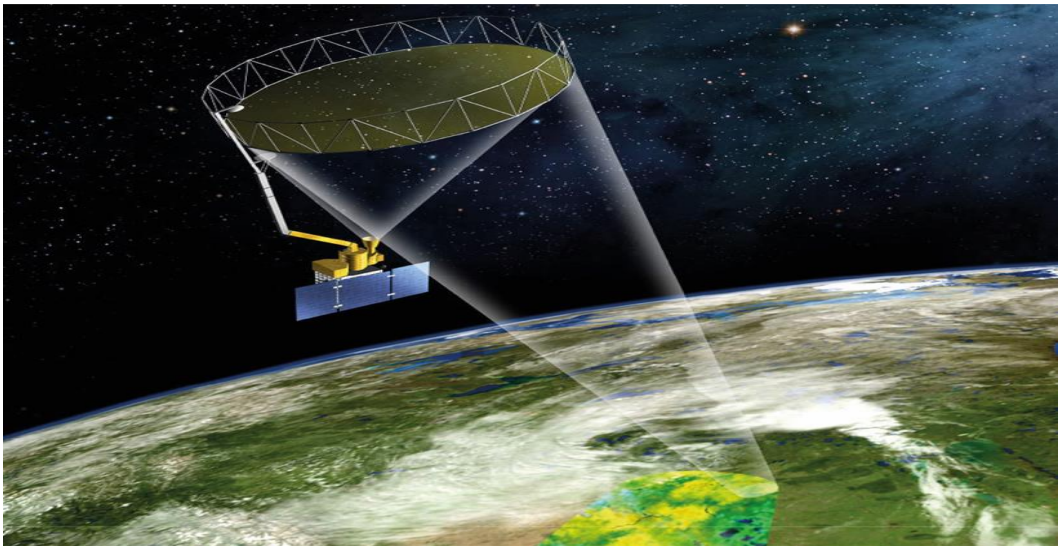

Figure 2.1: Earth station

The antenna system consists of the following parts: Mechanical system – comprising main reflector, back structure, pedestal or mount assembly, and for an automatic tracking antenna, the driving gear or servo system.

The primary source comprising the illumination horn, the associated reflector sub-assemblies, and non-radiating components (couplers, diplexers).

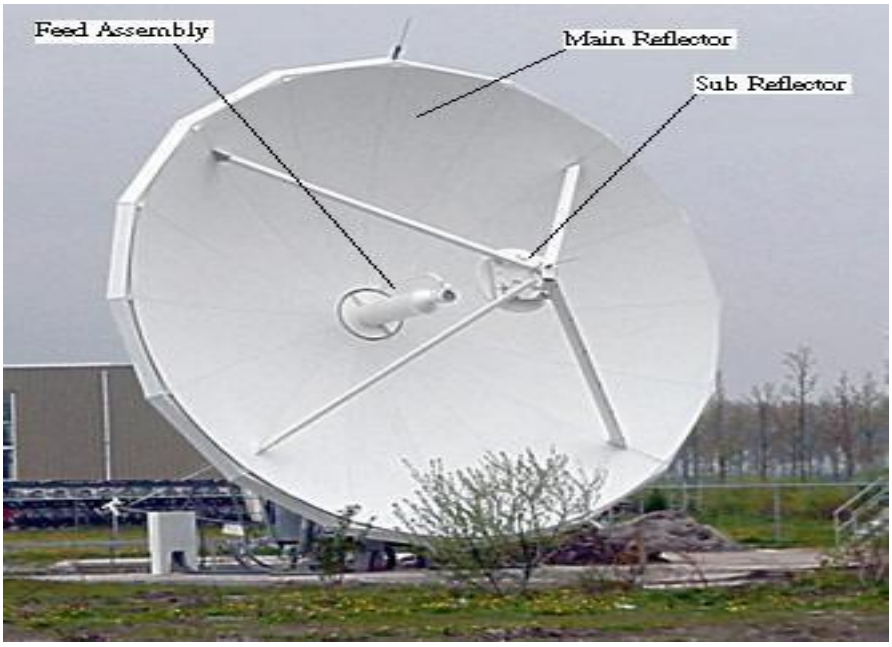

Figure 2.2: Parts of Dish Antenna

The features of an earth station antenna are common to transmission and reception and must adhere to the following test related standards:

- High gain for transmission and reception. This requires reflectors which are large in relation to the wavelength and have an accurate reflector contour. C Band antennas are typically larger than Ku.
- Low level of interference (for transmission) and of sensitivity to interference (for reception) This requires a very directional gain envelope with low levels outside the main lobe (low off axis side lobes)
- Radiation with high polarization purity (xpol)

There is a wide range of satellite earth station antennas. Each one refers to a particular use.

One of the classifications could be:

- Receive only antennas (e,g DBS and DTH)
- Transmitter or receiver fixed antennas
- Antennas with tracking system

Television Antenna

TVRO stands for Television Receive Only antenna

The antennas can range from 1.2 meters to more than 32 meters dependent on the application (e.g. SMATV or Turnaround).

Figure 2.3: TVO antenna

DBS stands for Direct Broadcast Satellite. DBS is broadcast by medium and high powered satellites operating in Ku Band. It's makes possible to pick up the signal with small dishes. The antennas diameter size typically ranges from 0.45 meters to 0.9 meters.

Figure 2.4: DTH (Direct to home) antenna

Transmitter or receiver fixed antennas

Antennas are used to establish a two way communication between the earth station and the satellite.

The antennas diameter size can range from 0.9 meters to more than 33 meters.

Figure 2.5: Reciever and Tranismitter antenna

Tracking antennas

Antenna is constantly re-peaking so as to be always precisely aligned towards the satellite. Also used with inclined orbit satellites.

Figure 2.6: Tracking antenna

Mobile antennas

On a moving vehicle (Ship, Train, Truck etc.) the antenna is constantly moving to be always aligned on the satellite.

Figure 2.7: Mobile Communication antenna

The antennas by their design can also be categorized in the following types:

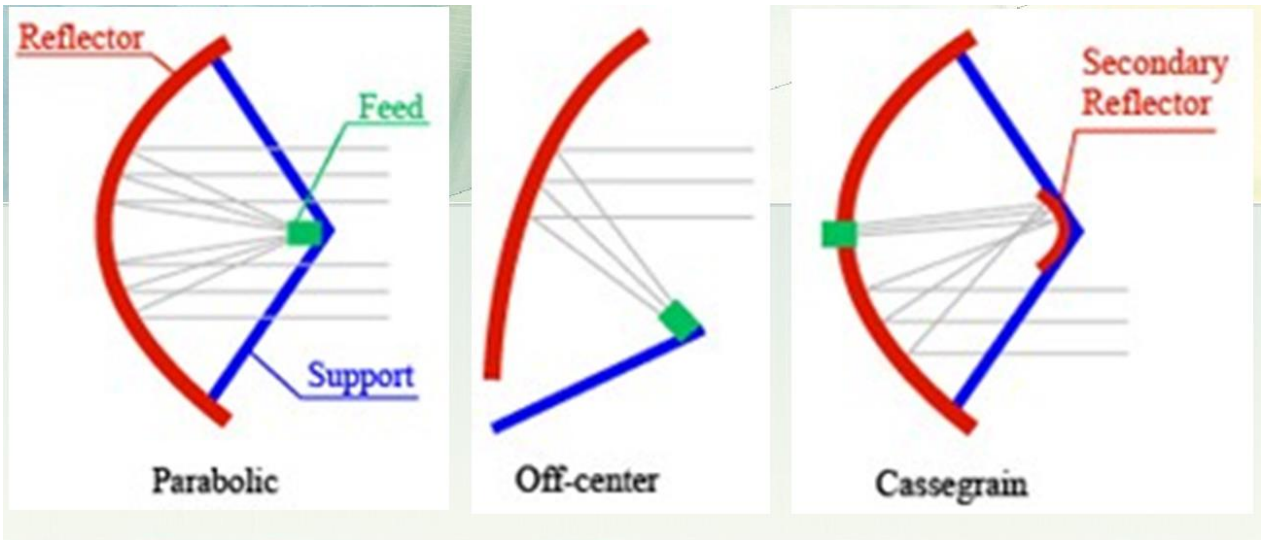

Figure 2.8: Different types of antenna in shape

Cass grain and Gregorian antennas make use of a dual reflector system fed by a primary radiator located at the focus of the system. Main earth station antennas are of this design. C Band antennas tend to be larger than Ku antennas because antenna gain is a function of frequency. Radiated power, or Effective Isotropic Radiated Power (EIRP) is a function of both antenna gain, HPA power, and losses caused by filters and waveguide runs, so designers can achieve the required EIRP by trading HPA power for antenna gain (or vice versa).

Classification of Earth Station Antennas

Earth stations that operate in the 6/4 GHz and 14/12 GHz bands are often classified according to the size of the antenna.

- Large earth stations – antenna approx. 15 to 33 meters
- Medium earth stations – antenna approx. 7 to 15 meters
- Small earth stations – antenna approx. 3 to 7 meters
- Very Small Aperture Terminals (VSAT) – antenna approx. 0.7 to 3 meters

Prime Focus Antenna

Most antenna systems, either parabolic with front feed or Cassegrain or Gregorian types are axisymmetrical. A prime focus antenna (below) gathers the reflected RF in a feedhorn, which is located directly at the focal point.

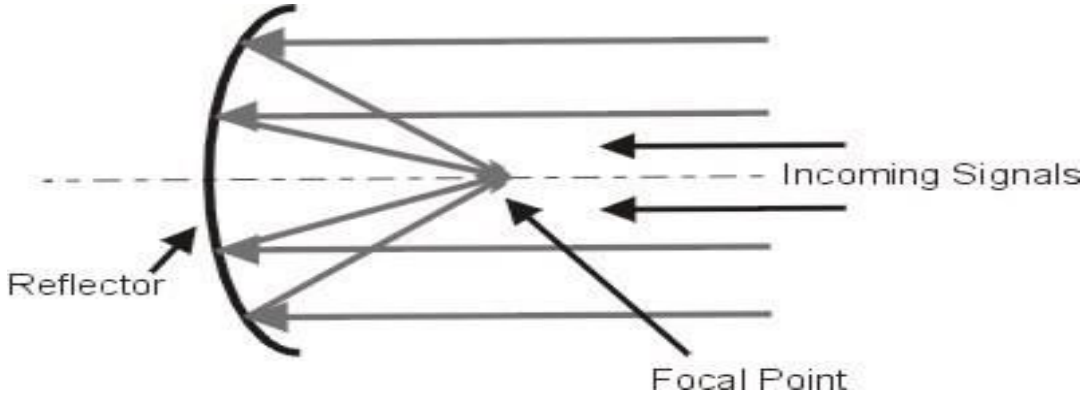

Figure 2.9: Prime focus array

For axisymmetric antennas, blockage by the feed and associated components, including the feed support structure, causes shadowing of the antenna reflector and so decreases antenna gain.

Figure 2.10: Prime focus antenna

Cassegrain Antenna

The Cassegrain antenna is a “rear fed” antenna which provides a convenient location for the complete feed system. The reflector system consists of a main reflector (which is

normally a “parabolic”) and a secondary reflector called a “sub-reflector”. A Cassegrain antenna has a hyperbolic sub-reflector.

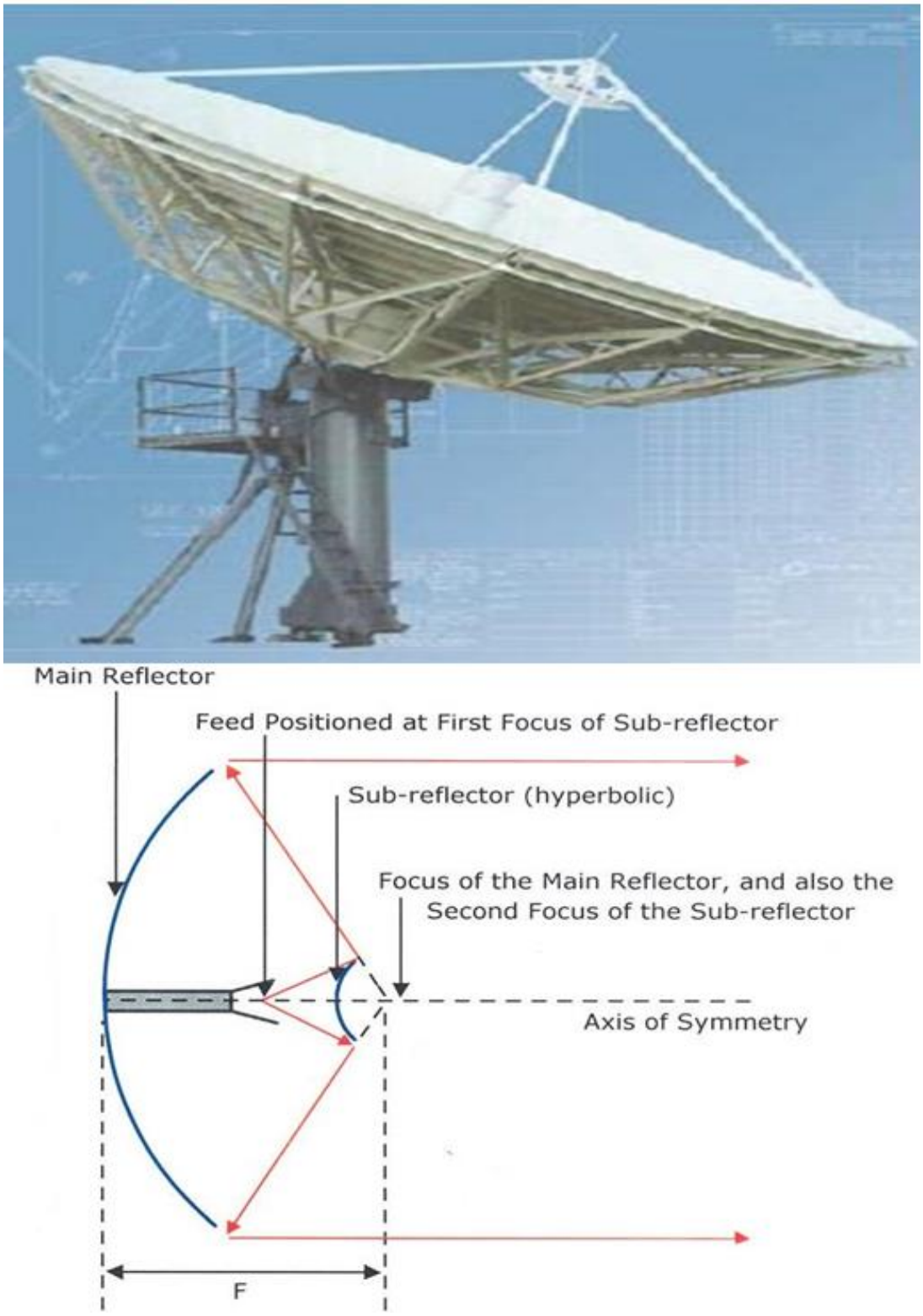

Figure 2.11: Reflector antenna

Cassegrain Antenna advantages

Parabolic antennas that are circularly symmetric about the "z-axis" are termed axis-symmetric antennas. They may consist of a single reflector or, as in the case of the Cassegrain antenna, multiple reflectors.

The ability to modify the sub-reflector gives two advantages:

- Reduction in "spillover"
- Uniform distribution of energy on the reflector resulting in an improvement in antenna efficiency

Cassegrain antennas exhibit lower noise temperatures than front-fed antennas due to the fact that the "spill-over" radiation from the primary feed is directed towards the sky, whereas with front-fed antennas spill- over is directed to / collected from the ground.

Cassegrain Antenna disadvantages

Cassegrain antennas suffer from a number of disadvantages:

- Direct radiation of the primary feed outside the sub-reflector diameter (spillover radiation) increases the side lobes of the antenna pattern
- Sub reflector struts are normally placed in the radiation area of the main reflector, causing a scattered radiation (increased side lobes)
- Blockage by the sub-reflector causes shadowing of the antenna reflector and so decreases antenna gain for transmit and receive

For the reasons stated above, it is very difficult to provide an efficient Cassegrain antenna smaller than 3 meters in diameter.

Gregorian antennas use an ellipsoidal sub- reflector as opposed to the hyperbolic sub-reflector of a Cassegrain antenna.

The radiation from the feed hitting the sub- reflector intersects after reflection, but before hitting the main reflector surface. As a result of this design, the structure of the Gregorian antenna cannot be as compact as that of the Cassegrain type.

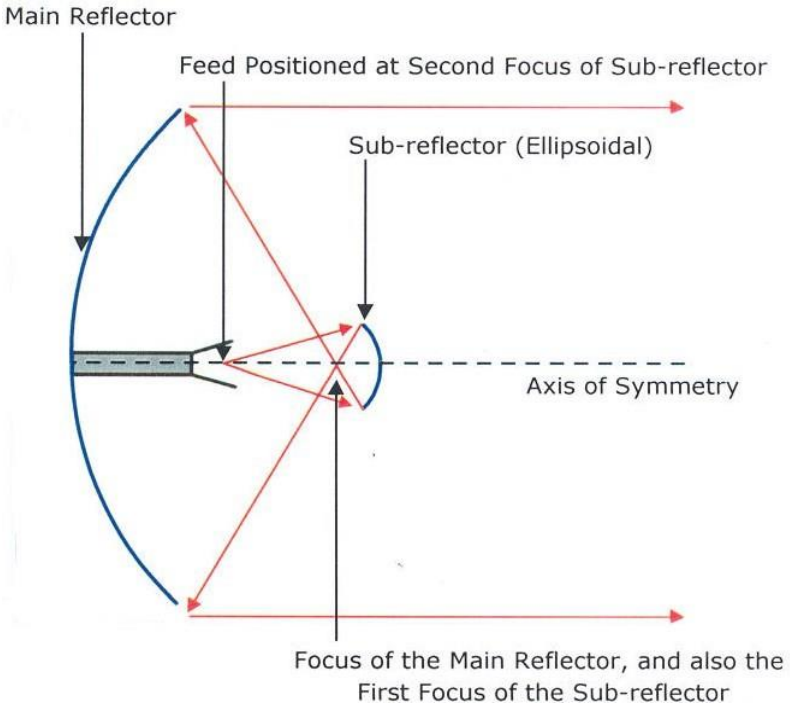

Figure 2.12: Radiation of electromagnetic Wave

An advantage of using the ellipsoidal sub reflector is that the feed and sub reflector edges are subject to less radiation and consequently less interference is caused.

Offset Antenna

Offset antennas are typically used for VSATs. An offset antenna is a section of a prime focus antenna. This type of antenna has significant advantages.

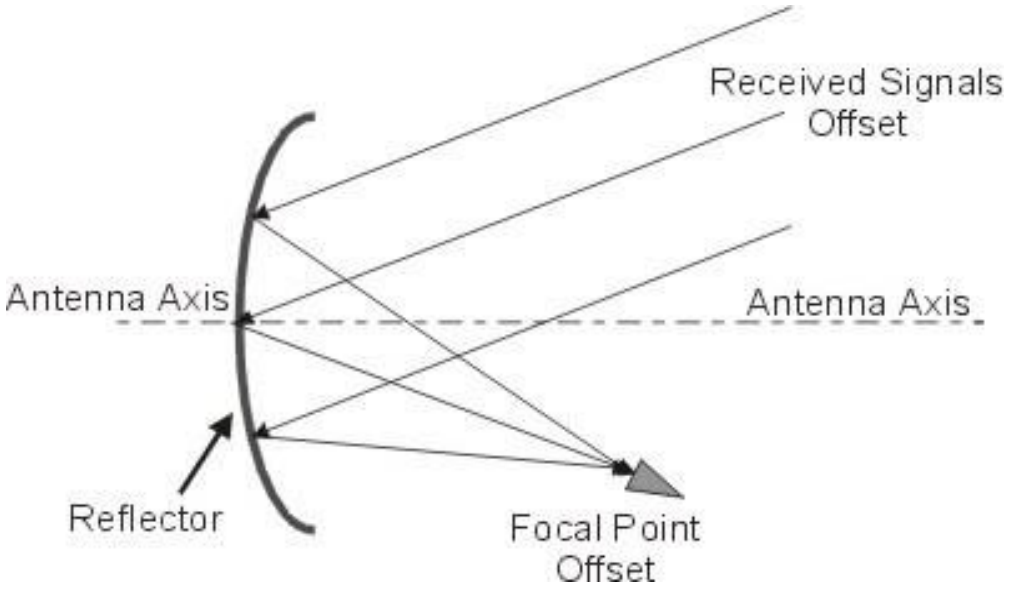

Figure 2.13: Ofsetantenna

The feed is located at the focus of the main parabola but is tilted towards the centre of the main reflector, and is not in the line of sight between the parabolic reflector and the satellite. Therefore there is no blockage of the signal. The offset antenna feed angle also provides better shielding from the hot earth (noise).

Satellite Frequency

- Terrestrial TV Range **470Mhz – 860Mhz**
- Terrestrial TV UHF (Ultra High Frequency)
- Satellite Range **10.70Ghz – 12.75Ghz**
- Satellite SHF (Super High Frequency)

Bandwidth & Polarity

- **Bandwidth:** The space of a single transmission
- **Frequency Range:** The total bandwidth of a satellite
- SES may only use **10.7Ghz – 12.75Ghz** ref
- Each transponder has a bandwidth of **36Mhz**
- Transponders are polarised horizontally and vertically
- Signals are polarised to make the best use of band space
- Low Noise Block (LNB) is used to receive signal, but is designed to process only one polarity at a time

SES Footprint – NSS12 Satellite East Africa Beam

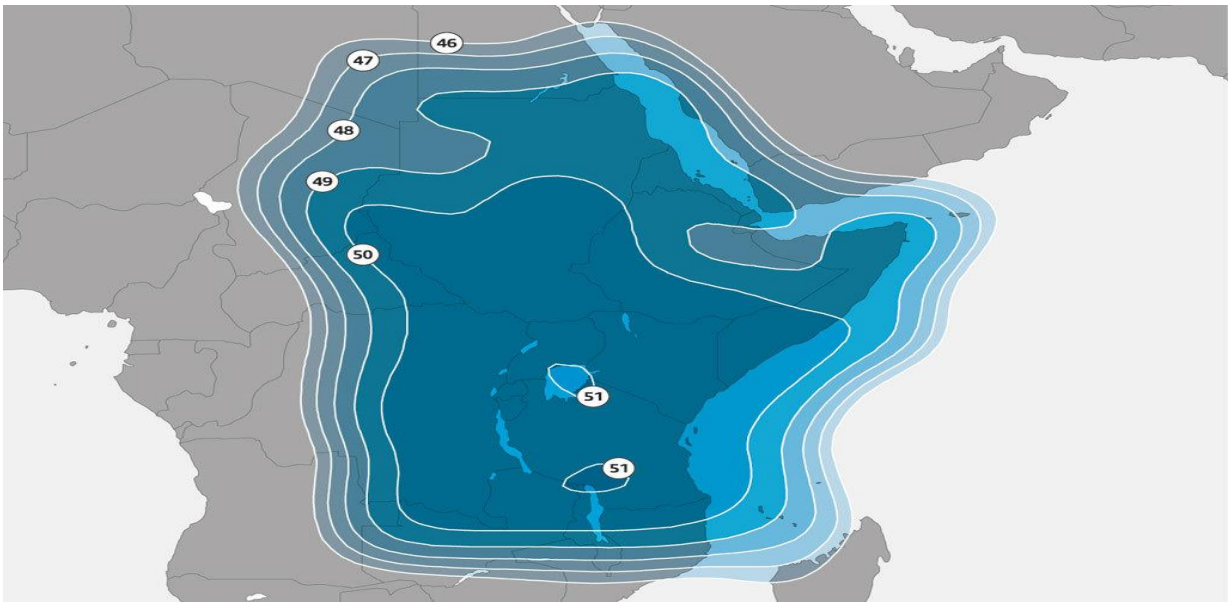

Figure 2.14: Satelite footprint

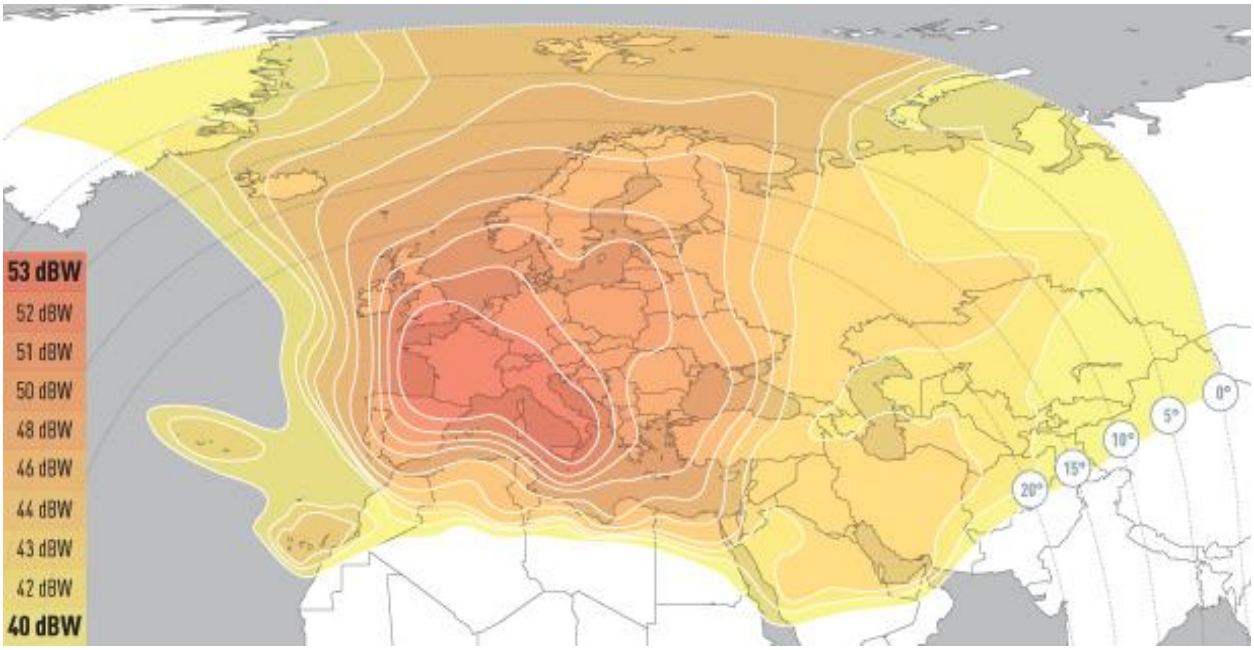

Figure 2.15: Supplier Footprint

- Main broadcasts from satellites located at NSS12.
- Positioned 36,000km above the Equator.
- This is known as a Direct to Home (DTH) system.

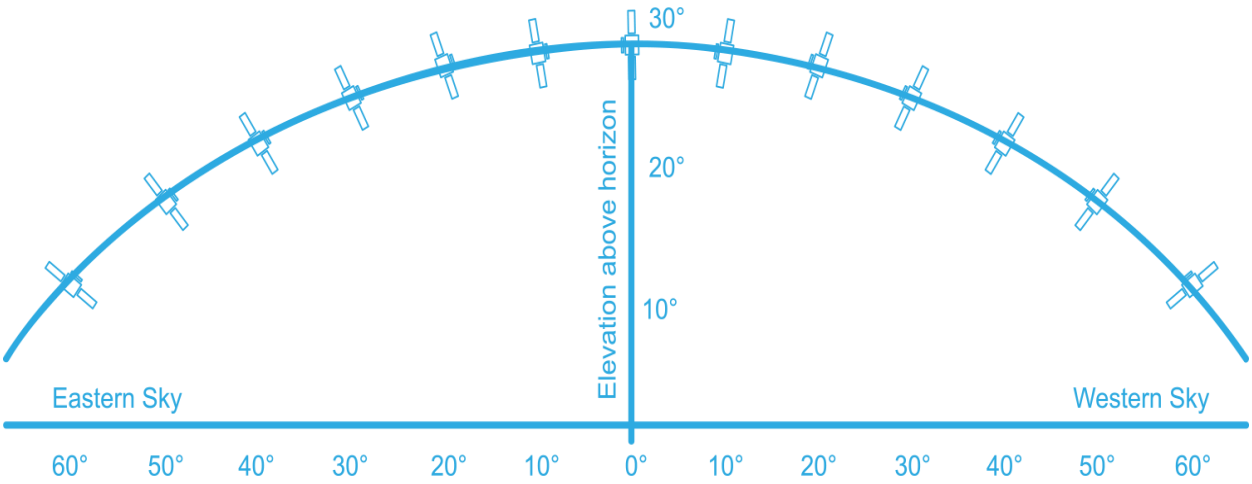

Figure 2.16: satellites location

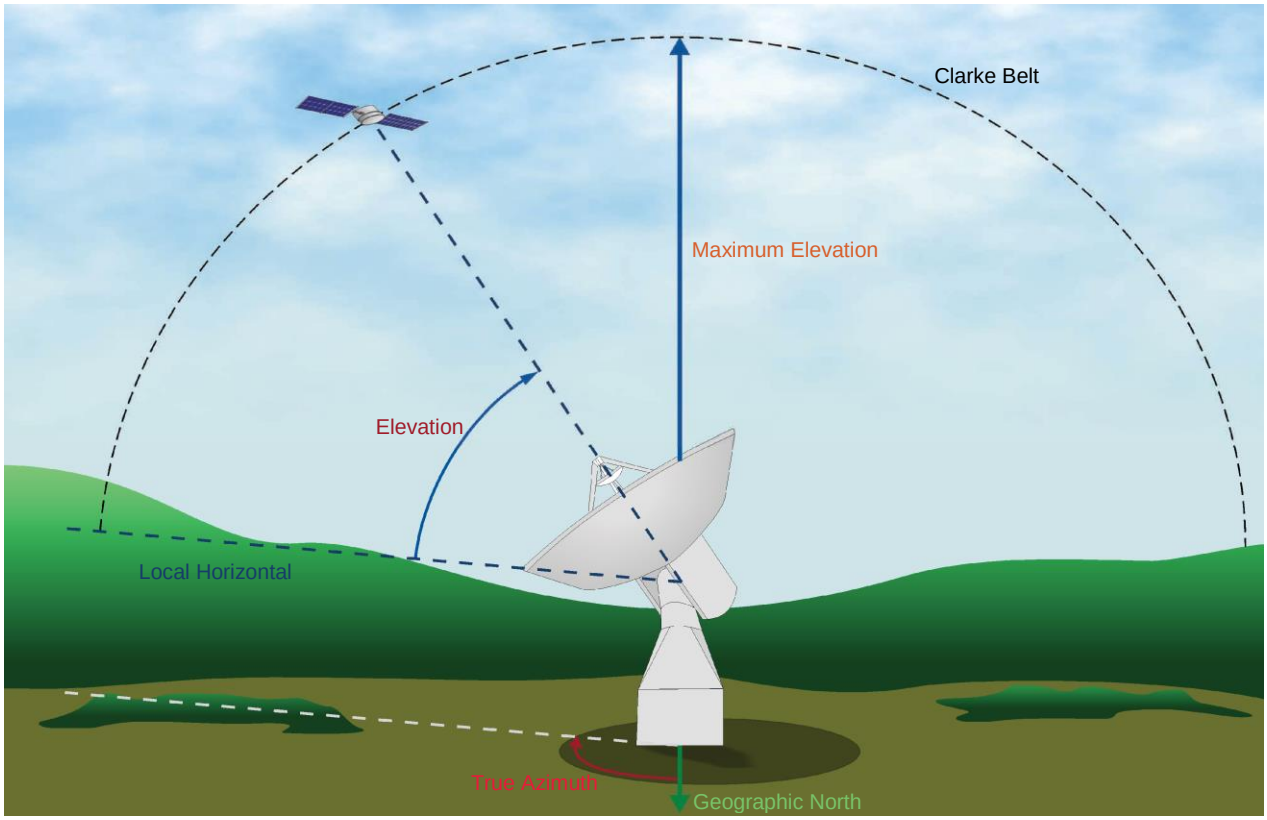

Figure 2.17: The Clarke belt and antenna look angles

Self-Check 2	Written Test

Directions: Each question is in the form of multiple choices, only one answer is correct.

Circle or highlight the letter that you think is correct.

1. The earth area covered by a satellite radio beam is known as _____

a. Beam width

b. Band width

c. Footprint

d. Zone

2. To make antenna more directional, either its size must be increased or

a. the number of its feed horns must be increased

b. the frequency of its transmission must be increased

c. its effective isotropic radiated power (EIRP) must be increased

d. its footprint must be increased

3. A satellite signal transmitted from a satellite transponder to earth's station is …….

a. Uplink

b. Downlink

c. Terrestrial

d. Earthbound

Note: - Satisfactory rating: 3 and above - Unsatisfactory Rating: below 3

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

Name: _____ Date: _____

Score = _____

Rating: _____

Information Sheet 3: Determining the optimum location for an antenna to be install

3.1. Determining the optimum location for an antenna to be install

Installing Antennas:

- Check if you need planning permission or listed building consent.
- Check if you need the landlord's or owner's permission.
- Use reputable and authorized suppliers and installers. Try to choose an antenna that is: no larger than that needed for good reception; and–within the specified size or volume limits for your area and property.
- Try to place the antenna where it will be:–inconspicuous and, if possible, where it will not be seen by neighbors or the general public;–unseen from the front of the house (preferably); and blending in with the chosen background.

Respect the environment. The cheapest option may not always be the most appropriate one for you or the environment. Don't forget that you are responsible for installing the antennas. If you do not place the antennas in the most appropriate position, the local planning authority may demand that you position it elsewhere (at your own expense).Satellite and antenna technology continues to change: you should be aware of the wide range of systems available so that you can make an informed choice.

Planning Regulations

You have a general permission to install antennas up to a specific size on property without the need for planning permission. This general permission depends on your house type and area. Your local planning authority can give you more advice. This guide looks at permission for:

- Houses and buildings up to 15 meters high;
- Houses and buildings up to 15 meters high in designated areas;
- Buildings 15 meters high or more; and4. Buildings 15 meters high or more in designated areas

Designated areas are

- Conservation areas;
- National Parks; and
- Areas of Outstanding Natural Beauty

Guidance on Installations

Advice on Good Sitting

When installing a dish or other antenna you must position it in such a way so that its effect on the outside appearance of the building is reduced as far as possible. You must also remove it when you no longer need it.

What you need to consider:

If an antenna is not positioned in the most appropriate place, this can make it more noticeable, or (depending on its color and appearance) make it stand out from its background.

What you need to consider:

If an antenna is not positioned in the most appropriate place, this can make it more noticeable, or (depending on its color and appearance) make it stand out from its background.

Remember, you are responsible for:

- Choosing the type of antenna; and
- Positioning the antenna on the building or in the garden.

When deciding on an antenna and where to position it, you should take into account its effect on neighbors, the public, and the environment. The retailer or installer may be able to give you advice on these matters. If there is any doubt, you should contact your local planning authority.

Things to think about

For dish antennas, you should be aware of the importance of color. For example, a white dish may blend against a white background but may be more obvious against darker backgrounds, such as brick, or stone. The materials or the design can also affect how suitable a particular antenna is. For example, a mesh or transparent dish may be less obvious than a solid one.

Where you position the antenna on the property is perhaps the most important thing to bear in mind when considering installing one. Although it is important to make sure your antenna provides adequate reception, it is also important to consider the visual effect of your antenna.

- an antenna mounted on the roof will be less noticeable than one mounted on a wall
- antenna on a wall at the back of the building will usually be less noticeable than on the front of the building

- antennas mounted close to the ground in the back garden will be less noticeable to neighbors than ones mounted on poles
- Antennas hidden behind a parapet or a chimney may be less noticeable than one mounted on the wall.

The Consequences of Poor Positioning

If your local planning authority thinks your antenna is in a poor position and could reasonably be moved to make it less noticeable, they may ask you to move it (at your own expense). You would not have to apply for planning permission.

If you refuse this request, your planning department may:

- demand that you apply for planning permission (for which you must pay a fee) based on the fact that the antenna's effect on the outside appearance of the building has not been reduced as far as possible; or
- Send you an enforcement notice or a breach of condition notice demanding that you move the antenna.

You are entitled to appeal if the planning department refuses your application for planning permission or sends you an enforcement notice. Reasons for an appeal could include that you think the chosen position of the antenna is appropriate, or that the measures you would need to take to move it are excessive, perhaps causing you unreasonable costs. But there is no right of appeal against a breach of condition notice.

It is an offence not to follow an enforcement notice or a breach of condition notice. You could have to pay a fine unless you have successfully appealed against an enforcement notice.

If your planning department asks you to move the antennas, they should use these guidelines to show, on a diagram, what reasonable measures you can take. The local planning authority cannot use this power to deny you the right to install an antenna.

You should remove any antenna which you no longer need.

Choosing Suppliers and Installers

Suppliers and installers should be familiar with the planning and environmental aspects of installation.

Alternatives to Individual Antennas

If you live in:

- a tower block;

- a small block of flats;
- a terrace of houses; or
- a semi-detached house;

It may be possible to use shared antenna systems without the need for each household to install an individual antenna. There are several main alternatives to an individual antenna.

Shared-antenna Systems

Shared antenna systems are worth considering if:

- planning permission is unlikely to be granted for several antennas on a single building;
- a shared system would be more environmentally friendly than for each home to have its own antenna;
- Landlords or owners have banned individual antennas.

If you live in a tower block or a large group of flats or houses, you should first check what arrangements, if any, have already been made for a shared system. You should always get professional advice to make sure the system you have chosen offers the best choice of programmes at a reasonable price and with the ability to accommodate future services. If you live in a semi-detached or terraced house, it may be possible to develop a shared system, although this may be more expensive than installing individual antennas. You may also need legal advice on the conditions for sharing. In any event, you should make sure that any shared system provides access to all the programmes everyone wants.

The same planning regulations apply to shared antennas as apply to individual antennas.

The landlord or the building owner is responsible for deciding whether or not to allow the installation of a shared system.

Cable Networks

Cable networks can be another way of bringing satellite TV or broadband to your home. You may want to ask your local planning authority whether your area is served by cable television. This is particularly important if:

- your home or building does not have a line-of-sight with the relevant transmitter;
- planning permission for an antenna is not granted;

- a shared system is not practical; or
- You do not want to have an antenna on the outside of your property.

The switchover to digital TV

The traditional, analogue TV signal will be replaced with a digital TV signal. This process is called ‘switchover’. To continue to receive TV after switchover you will need to have adapted or upgraded your TV equipment to receive the digital signal. You can receive digital TV through an aerial (often called Free view), or by satellite, cable or broadband. Satellite TV in the UK already uses a digital signal, so if you have satellite TV you will not need to adapt your TV equipment to continue to receive programmes.

Self-check 3	Written test

Directions: Answer following question accordingly.

1. Write the pre –install of antenna criteria must be must be stressed?

   a. _____

   _____

   _____

   _____

   _____

Note: - Satisfactory rating: 5 and above - Unsatisfactory Rating: below 5

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

Name: _____ Date: _____

Score = _____

Rating: _____

Information Sheet 4: Installing accessories straight and square in the required locations

4.1. Installing accessories straight and square in the required locations

Setting up the Wall Mount

Select a flat spot on or around your home: Find a level place that is accessible in case you need to clean off or adjust the satellite dish later. If you have space, the safest place for a satellite dish is on the ground. It will have plenty of room to point north or south, depending on where you live. Also, keep the dish away from falling snow or ice, such as from your roof or nearby trees.

- Remember where the TVs are in your home. Try to find a spot close to them to make the wiring process easier.
- If you mount the dish on the ground, you will need to dig a trench to safely run its cables to your home.

Check for any obstructions blocking the dish's view of the sky: Stand where you plan on installing the dish. Look up to the sky. If you see buildings, trees, or even clotheslines in the way, then find another spot. These obstacles stop the dish from receiving a clear signal, affecting your picture quality.

Figure 4.1: Line of Sight (LOS)

- One of the best ways to set up a dish is by anchoring a metal pole in the ground with concrete, then mounting the dish on top of it. The pole gives the dish more height without it needing to be on the roof.
- Satellite dish installers almost automatically go for the roof to guarantee the satellite isn't obstructed. You may need to do this too if you can't find a clear spot elsewhere.

- If you're in the northern hemisphere, the dish needs to point south to receive a signal. If you're in the southern hemisphere, it needs to point north, so keep that in mind when looking for obstacles.

Hold the dish's mount to your home and mark the screw positions: The dish's mount is an L-shaped rod with a base plate that fastens to your home. Position the base plate flat against the wall or roof in the location you chose. Look for a series of holes on the plate for bolts. Then, use a permanent marker to note the position of these holes on the roof.

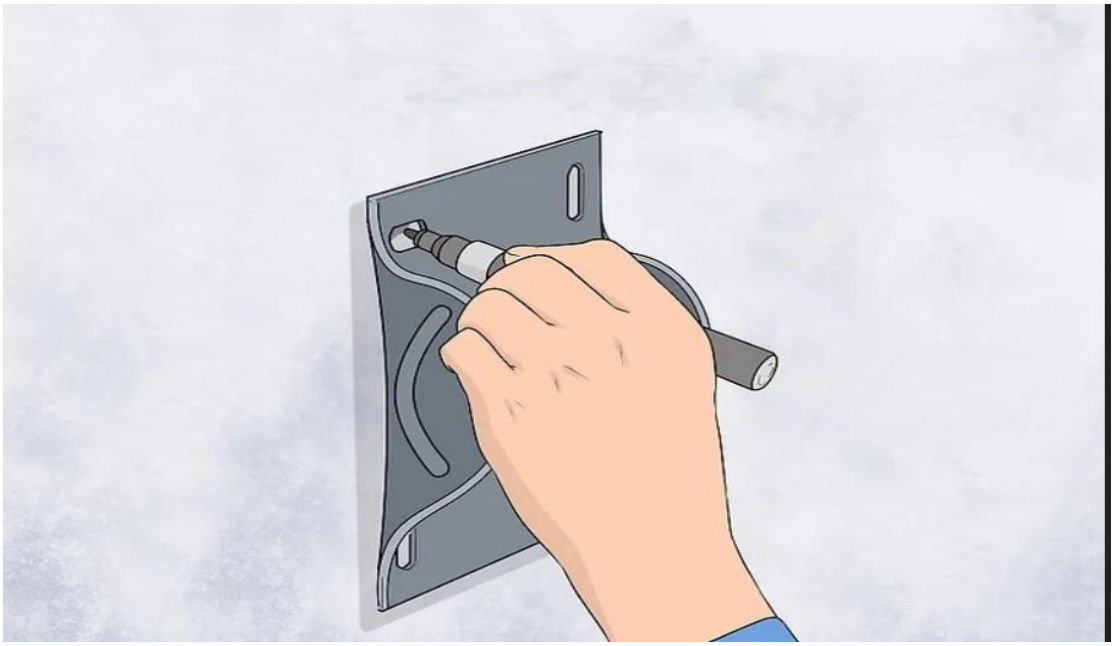

Figure 4.2: Mark screw position

- If you're attaching the satellite to the side of your home, make sure the holes align with a wall stud or another sturdy structure. Don't try to anchor it to siding, since it won't hold.

Calculate the size of the pilot holes needed to secure the mount: The exact size and depth of the holes depends on the dish you're installing, so reference the components that came with the satellite. Generally, you will need to make a series of 4 holes about ½ in (1.3 cm) in diameter. Estimate the holes needed to be about {convert|2+1/2|in|cm|abbr=on}} deep, although this will also vary a little from installation to installation.

Figure 4.3: pilot holes needed to secure the mount

- Check the metal fixings that came with your satellite for a number engraved on them. That number will tell you how wide the holes need to be.
- To find the depth the holes need to be on your particular installation, add about $^{2}\!/_{10}$ in (0.51 cm) to the length of the metal fixings meant to plug into the holes.

Create the pilot holes using a drill bit the same size as the mounting bolts. Use a masonry drill bit to break through stone and other tough surfaces without damaging your drill. The bit needs to create holes that are the perfect size for the bolts. Drill into the spots you marked earlier once you are ready. Make sure the holes you create are straight so the mounting bolts fit properly.

- If the holes are too big, the bolts will fall out. If they are too small, the bolts won't fit.
- Erring on the side of caution is better when drilling. You can always widen a small hole.

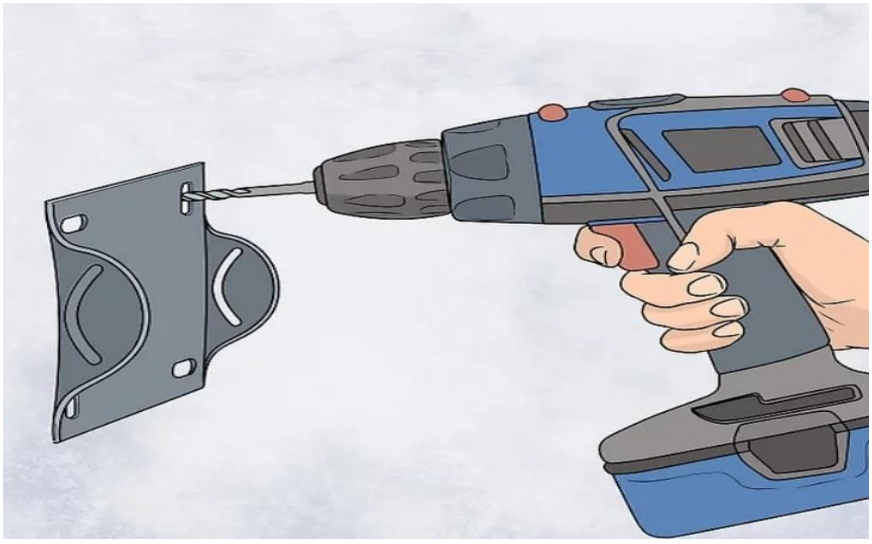

Figure 4.4: Create the pilot holes

Place the mount's metal plugs into the holes you drilled. Your dish will come with a set of metal plugs that serve as wall anchors. One end of each plug will have a bolt hole in it. Flip the plugs so the openings face toward you rather than the wall. You need those openings to secure the mount.

- The opposite ends of each plug will look like a split tail. When you bolt the wall mount in place, the tails open up, making the plugs harder to remove.

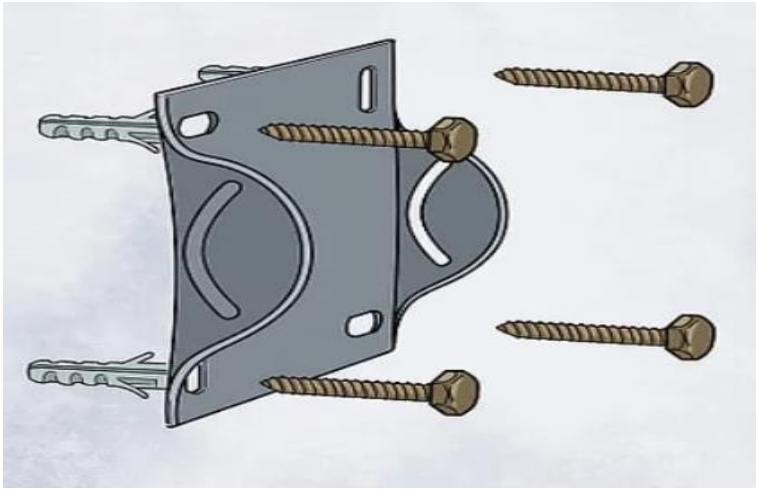

Figure 4.5: Place the mount's metal plugs

Secure the plugs into the wall with a hammer and chisel: Place the tip of a chisel against one of the bolts. Give the chisel's handle a couple of good whacks to push the

bolt into the wall. Keep hammering until the bolt is flush with the wall. Then, repeat this with the remaining bolts.

- Make sure the bolts are level with the wall, or else the dish's mount won't anchor properly.

Place the metal plugs and hammer them into the wall. Your dish will come with a set of plugs that serve as wall anchors. Position them so their open end faces out from the wall. That opening is for bolting the wall mount in place. After pushing the plugs into the holes, tap them in with a hammer and chisel.

- Make sure the plug-in are firmly positioned inside the wall. They are what anchor the mount to the wall or ceiling. If they are loose, your dish could end up crashing to the ground!

Bolt the mount onto the plugs in the wall. Position the mount back on the wall, lining up the holes in the plate with the pilot holes you drilled. Find the bolts that came with your dish, usually ½ in (1.3 cm) lag bolts. Fasten the bolts by using a cordless screwdriver. Make sure the mount feels secure in the wall before you move on.

- If the mount wobbles when you touch it, try tightening the bolts a little more. If you're sure they are in properly, take them out and check the plugs again.

Cap each bolt with a metal washer and locking nut. These components prevent the bolts from coming back out of the wall. Slide the washers on first, which are flat metal disks that help the nuts work properly. Then, add the nuts and turn them clockwise with a wrench until they feel tight and no longer move.

- Be careful not to over tighten the nuts. Stop twisting them when they become hard to move. As long as they are not loose, the mount will also stay in place.

Assembling the Dish

Attach the antenna bracket to the low noise block (LNB) arm. Your dish will most likely come with a flat metal plate meant to connect the satellite dish to the L-shaped LNB arm and other components. Position the plate so the prongs are on the left and right, facing you. Hold the LNB arm between the prongs with the tail end extending out past the opposite side of the plate. Place some ¾ in (1.9 cm) lag bolts through the arm and into the plate, tightening them clockwise with a wrench.

- Remember to put a metal washer and locking nut on the ends of the bolts to ensure they can't come loose.

- The exact installation process, including the size of the bolts, may vary a little depending on the dish you have. Refer to the owner's manual for more specific instructions.

Clip the antenna adjustment panel over the plate's prongs. The panel will look like a square box with one end open. The sides of the panel fit over the plate's prongs and attach with more ¾ in (1.9 cm) lag bolts. Add a washer and nut on the end of each bolt after tightening them.

- The adjustment panel has a curved slot on it. This slot is what you use to point the satellite up or down.

Fit the U-shaped rod inside the adjustment panel. Your dish will have a bent metal rod that fits into one of the slots on the adjustment panel. Slip the rod inside, sliding its prongs through the holes. Make sure the prongs point toward you rather than the tail end of the LNB rod you connected earlier. Fit a small clamp over it, followed by a washer and nut on each prong.

- The clamp is little more than a flat piece of metal meant to hold the U-shaped rod in place.
- The adjustment panel has 3 different slots. Use the slots to reposition the satellite dish. In most cases, the middle slot is best for setting the dish at the proper angle.

Bolt the antenna bracket to the back of the satellite dish. You have a couple more bolts to add to finish the bulk of the assembly, and this is one of the easiest parts to finish. Line up the holes on the plate with the holes on the back of the dish. Stick the longest bolts you have, usually 2 to 3 in (5.1 to 7.6 cm) in length, through the front of the dish. Then, place a washer and nut on the end of each bolt, tightening it with your wrench.

- Make sure all of the components stay bolted together. If they feel shaky, carefully separate them and tighten the bolts.

Install the LNB on the end of the LNB arm. One last component, the LNB, controls the dish's functionality. First, slide the handle of the LNB onto the open end of the arm. Secure it with nuts and bolts, then take the LNB out of the box. It looks almost like a round speaker or flashlight. Position it on the handle, facing it toward the dish before bolting it in place.

- Some stronger satellites have up to 3 LNBs designed to feed a stronger satellite signal into your home.
- You may need to loosen the LNB later to readjust it and improve the signal quality.

Connect the adjustment panel on the dish to the wall mount. Fit the dish onto the open end of the mount. If everything is attached correctly, it will fit inside or behind the adjustment panel. You can then add the 1 or 2 remaining bolts to fasten these pieces together. If the dish looks good, then you're ready to position it to communicate with a satellite.

- These parts can attach in a variety of different ways depending on what satellite you have, so be sure to refer to the owner's manual.
- If the mount is meant to attach to the back of the panel, your satellite will also come with a pair of clips. Position them behind the mount, then add the screws through them to bind the parts together.
- **Select a satellite you wish to connect to.** Pick a satellite that is in range of your particular dish. There are numerous satellites out there, but dishes cannot get signals from all of them. If you bought your dish from a TV service, for instance, you may have a hard time connecting to their competitor's satellites.
- To differentiate between satellites, look at the names listed along with the coordinates. Tracking sites list the names, which usually include the owning company or the service they provide.
- If you bought a satellite service, it is possible to receive signals from satellites outside that service. Since you usually need to replace several parts, it's easier to get a new satellite instead.
- Try to pick a satellite close to your area. If you subscribe to a particular TV service, you will need to use the company's satellites. The biggest providers have multiple satellites.

Find the satellite's location before positioning the dish. You're going to need to point the dish in the correct direction, then angle it up at the sky. This is difficult to do if you don't know the satellite's positioning. Fortunately, satellites don't move much, so you can use a positioning database to adjust your dish.

- Type in your address and choose a satellite you wish to connect to. The site will give you the precise positioning needed for your dish to receive the signal.
- You won't be able to receive a signal from a distant satellite. Don't expect to reach a Chinese satellite if you're in North America, for instance.

Use the azimuth number to rotate the satellite. Have a compass handy and locate true north first. Then, look at the azimuth number and find where that is on the compass. North is considered to be 0 degrees, east is 90 degrees, south is 180 degrees, and west is 270 degrees. Rotate the satellite dish horizontally until it points in the correct direction.

- For example, if you need to point the dish to 225 degrees, find north first. Then, turn the satellite southwest from there.

Move the dish vertically to adjust its elevation. Once you know the elevation needed to reach the satellite, go behind the dish. Examine the end of the mount where it connects to the dish. You will see a bolt inside a slot labeled by degrees, usually 10 to 60. Loosen the bolt by twisting it counter clockwise, and then reposition the dish to the proper elevation.

- Adjusting the elevation is usually pretty easy because of the labeled slot. Moving the bolt along the slot raises or lowers the dish.
- For instance, if the dish requires a 53-degree elevation, it will point up into the sky almost as much as it possibly can. Slide the loosened bolt back toward the 60-degree marker.

Adjust the dish's polarization until you get a clear signal. The final part that needs to be adjusted is LNB, responsible for receiving and sending the signal into your home. It is usually an arm on the front that points toward the dish. Test out the signal quality by hooking the dish up to the receiver and a TV, and then loosen the connecting nut on the arm by turning it counter clockwise with a wrench. Gradually move the arm about ½ in (1.3 cm) at a time until the signal quality is perfect.

- This part is easier if you are able to set up a TV close to the dish. If the TV is far away, have someone else stand near it and give you feedback.
- You may need to wait to adjust the LNB until you're done with the wiring. Take care of it before then if you're able so you don't have to keep climbing on the roof to make adjustments.

- The LNB can sometimes be controlled by turning a mount part on the back of the dish left or right.
- The initial survey is important to a successful installation.
- The direction of the dish will vary for each installation.
- Direct Line of Sight (LOS) to the satellite must be ensured.
- The engineer must discuss and agree on the dish position and cable rooting with the customer.
- Keep restrictions in mind, e.g. conservation areas and council regulations.
- The customer should be aware of any regulations
- Check for potential obstructions (trees, buildings, or anything else) that could impact the signal at a later date.
- Identify the approximate direction from existing installations.
- Find the exact direction by using a compass for NSS12.
    - ✓ Orbital position:
    - ✓ Azimuth:
    - ✓ Elevation:
    - ✓ LNB Skew:
- Use an inclinometer to find the elevation angle that ensures a clear Line of Sight.
- A Swan Neck Bracket or T&K Bracket can give clearance from Soffit and roof pitch.

Figure 4.6: Brackets & Mounts

- **Azimuth:** The dish alignment window of between 307° and 4°.
- **Elevation:** The angle of the dish will require alignment.

- Dish pointing between 59.2° from the horizontal.
- The further North the installation, the less the elevation angle will be.
- Both **azimuth** and **elevation** settings will vary depending on geographical location. The above figures provide a starting point.

Figure 4.7: Azimuth and elevation settings

Self-Check 4	Written Test

Directions: Answer following question accordingly.

1. A standard installation of antenna and satellite antenna will consists

   a._____

   _____

   _____

   _____

   _____

   _____

   _____

   _____

   _____

   _____

Note: - Satisfactory rating: 5 and above - Unsatisfactory Rating: below 5

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

Name: _____ Date: _____

Score = _____

Rating: _____

Information Sheet 5. Terminating cables and conductors

5.1. Terminating cables and conductors

One of the benefits of the Home Network system is the ability to distribute a variety of signals using multiple media types. Coaxial (coax) cable is generally used for the distribution of video transmissions throughout a residence or commercial building. Security camera equipment, TV antenna, cable TV, or Direct Satellite Systems may generate the video signal.

- The four types of cable commonly used for satellite installations and their specifications are similar [For reference only].
- Two sizes of “F” connector available for standard and twin cable.
- Both cable types available in black and white.

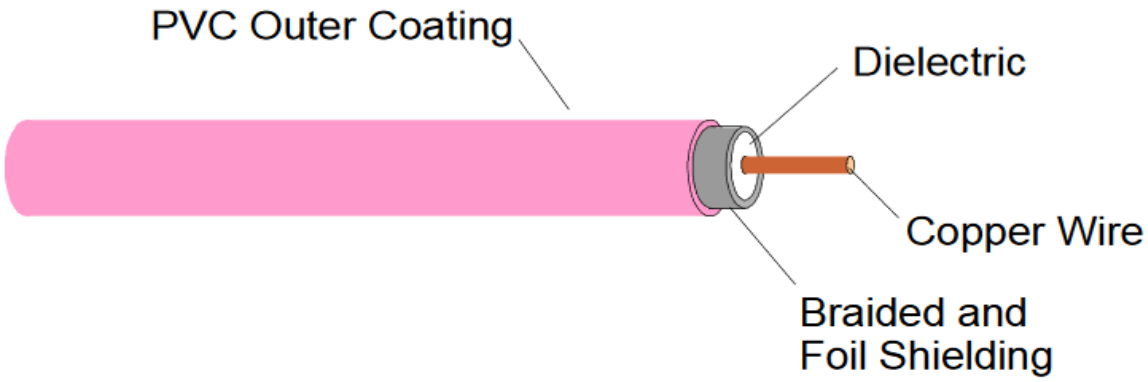

Figure 5.1: Typical Coax Cable Construction

Figure 5.1: Coaxial cable

Coax Cable Specifications

Coaxial cable comes in a variety of grades. The grade that is recommended is a quad shielded RG6 cable. RG6 cable is recommended because it is heavily shielded from electrical interference. Installing RG6 is fairly simple, but there are some installation issues that need to be followed:

- Never pull coax cable in a conduit that is also used for electrical power.
- Avoid installing coax cable over any object or device that may give off electrical interference such as fluorescent lighting and high voltage transformers.
- Avoid bending cable too tightly--no tighter than four times its diameter.

Tools Required for Making Coax Connections

The tools required for coax connections are straight forward and relatively inexpensive. They are as follows:

- Coax Stripper
- Compression Tool
- Cable Cutters
- Connectors

Creating Coax Cables

Coax cable is fairly simple to terminate if you have the right tools. The following steps illustrate the process of making a coax connection using RG6 cable and connectors.

- An F-connector is used to terminate the down lead.
- Always ensure the braid is not shorter than the inner core.
- For an LNB connection finger tighten then quarter turn with 11mm spanner/pliers.
- Always ensure a drip loop is formed.
- Use self-amalgamating tape to seal the F-connector to the LNB.

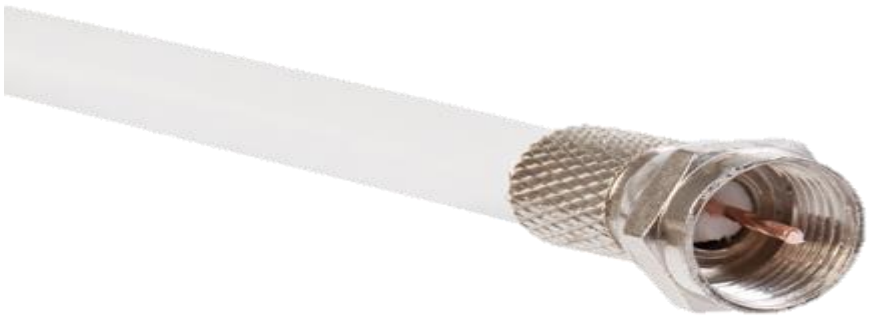

Figure 5.2: Crimping the Coax Connector

Testing Coax Cable

Coax cable is very reliable. If the connectors are installed correctly, you will seldom have a problem. Test the copper conductor by placing a clip or probe at each end of the conductor. If the copper conductor is broken, there will be no reading on the dial. Test the ground by placing clips or probes on the shielded portion of the cable. If there is no movement on the dial, there is a broken connection. You can also plug the cable into video connections. If the signal is transported, you know it works. Note: It is a good idea to test the cable while still on the spool to ensure that you have a good spool, with no breaks in it. It is much easier to test a thousand feet of cable while it is spooled than to run it and then discover that it was a bad spool after it is in the wall.

Main factors that determinate the quality of the cable:

- Diameter of the cable.
- Type of dielectric or inner sheath.
- Whether cable and dielectric are in good order throughout the cable length

Better dielectric = thinner cable, same efficiency.

Signal Attenuation is a reduction in the signal amplitude

- Possible causes:
  - ✓ Low quality cable.
  - ✓ Higher frequencies.
- Longer cable runs standard and twin cables have a maximum cable

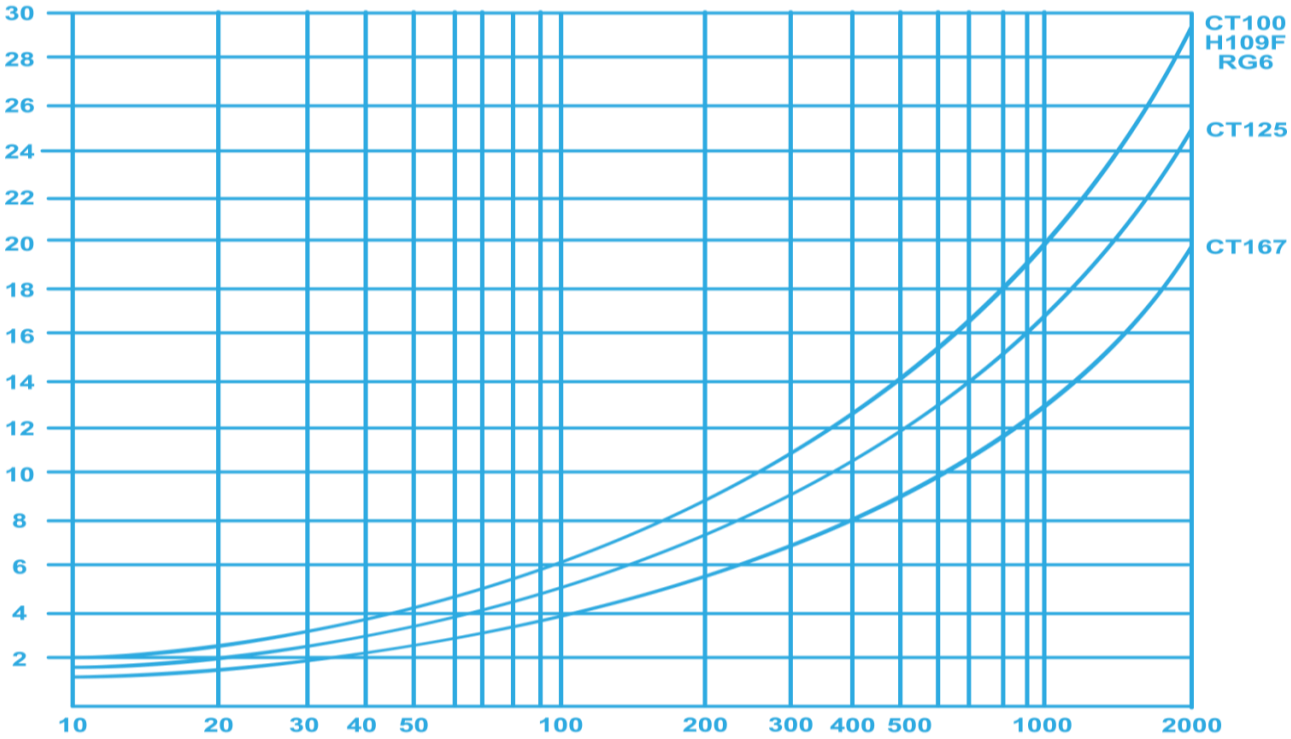

Figure 5.3: Coaxial cable characteristics

Return Loss/ Signal Reflection

Data Corruption

- Indication of the number of errors that require correction.
- Signal strength and signal quality bar graphs.
- Signal quality represents Bit Error Rate (BER).
- A high bar reading means fewer errors for the system to correct.
- Good signal strength does **not** automatically mean good signal quality.

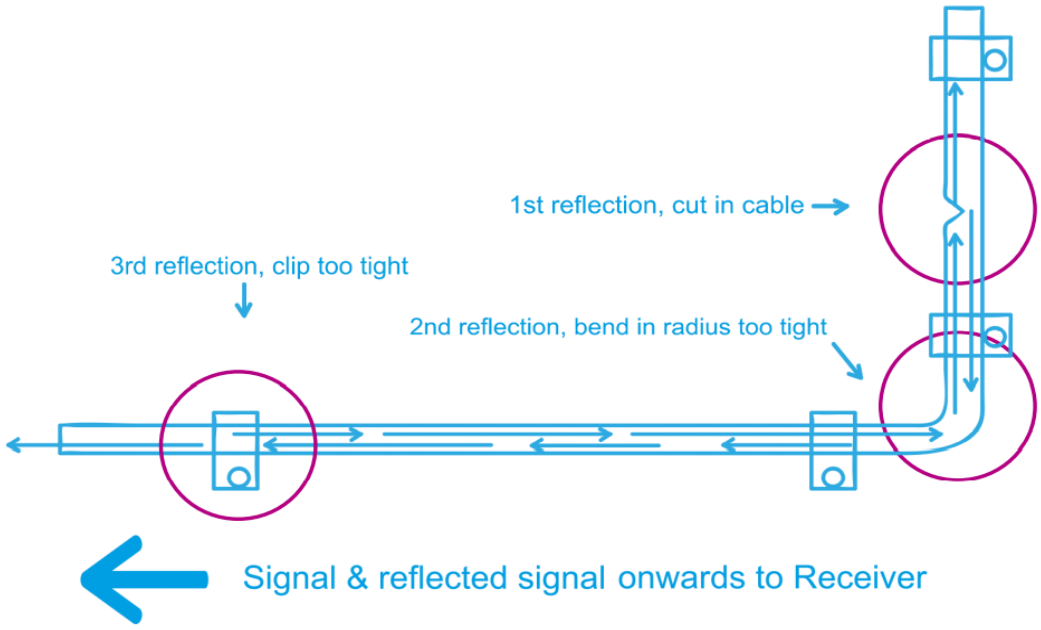

Figure 5.4: Return Loss/ Signal Reflection

External Cable Routing

- Agree on the cable colour with customer before commencing work.
- Select the correct cable colour for the background, i.e. black cable for a dark-faced wall.
- Follow horizontal mortar lines and leave a loop slightly protruding from the corner.
- Ensure that the cable is not too tight. It should allow for contraction due to changes in temperature.
- Dress cables behind or close to drain pipes.
- Always use the minimum number of bends.
- Always use a cable reel holder to dispense cable.
- Ensure cable is not kinked or damaged when removing from the reel.
- Drip loop formed at point where cable enters properly.
- Minimum bend radius to be applied.
- Hole sealed with flexible mastic.
- Cover plate fitted, as required.
- Cover plates available in various colours to suit surface

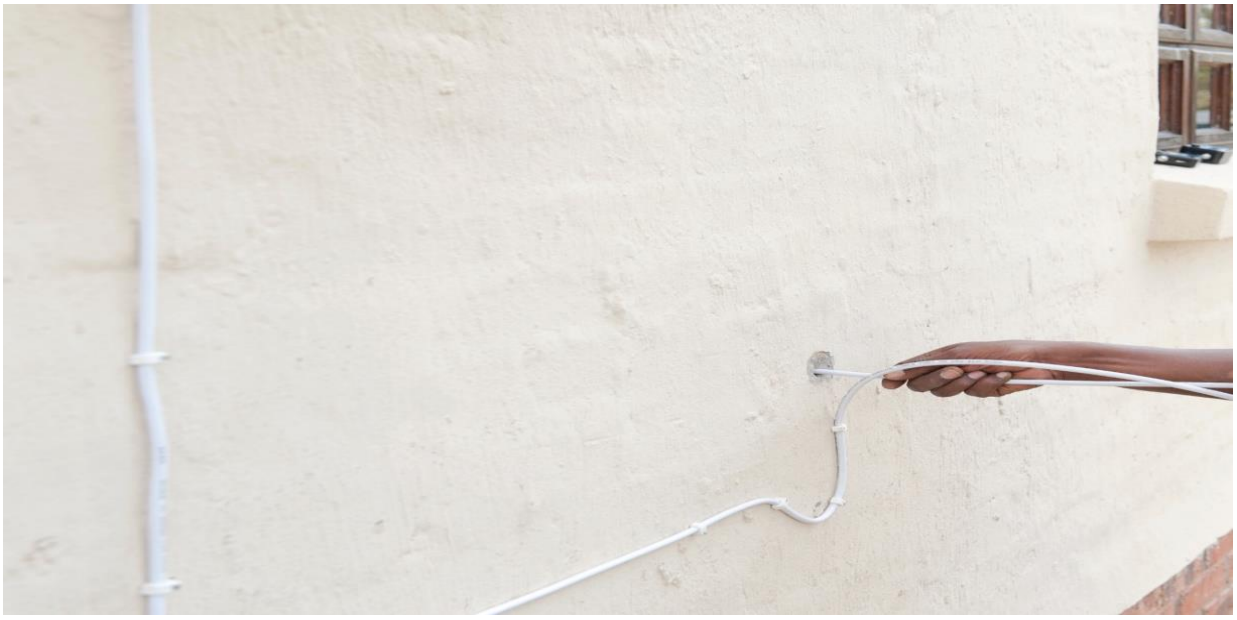

Figure 5.5: External Cable Routing

Securing the Cable

- Always ensure correct size clips are used – for example, a standard IF cable requires No.7 clips.
- Clips to be hammered into mortar line.
- 2ft spacing – horizontal runs.
- 2-4ft spacing – vertical runs.
- Purpose-made clips available for twin cable.

Figure 5.6: Use wire clips

Catenary Cabling Techniques

- A catenary wire should be used to support long cables that run overhead or over rooftops or access roads.
- The catenary wire should be galvanised multi-stranded steel and be stretched taut between strong anchorage points.
- The coaxial cable should then be attached to the catenary wire with the coaxial cable looped at each end. This ensures that all the tension is in the catenary cable and **not** the coaxial cable.

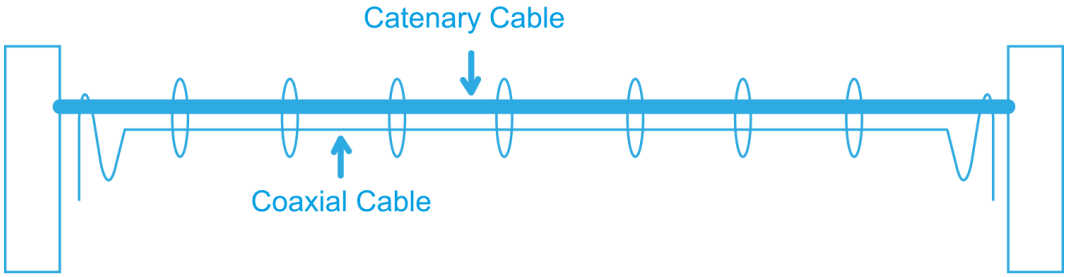

Figure 5.7: Catenary Cabling Techniques

Catenary wires that go over a road must be at least six metres above ground and local planning.

- These are examples of bad cabling techniques.
- In your groups, discuss the issues in these photographs and what must be done to fix it.

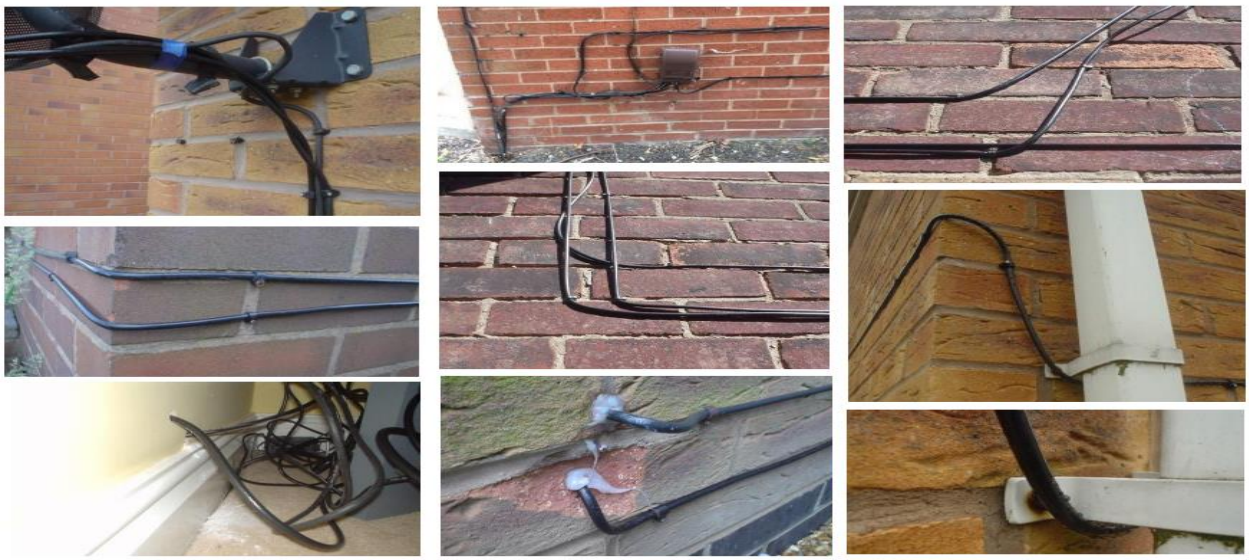

Figure 5.8: Example of Catenary Cabling Techniques

Self-Check 5	Written Test

Directions: Each question is in the form of multiple choices, only one answer is correct. Circle or highlight the letter that you think is correct.

1. Which of the following is not a guided medium?
   a. twisted-pair cable
   b. coaxial cable
   c. fiber-optic cable
   d. atmosphere
2. Cable consists of two insulated copper wires twisted together.
   a. Coaxial
   b. Fiber-optic
   c. Twisted-pair
   d. none of the above
3. Consists of a central conductor and a shield.
   a. Coaxial
   b. Fiber-optic
   c. Twisted-pair
   d. none of the above

Note: - Satisfactory rating: 5 and above - Unsatisfactory Rating: below 5

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

Name: _____ Date: _____

Score = _____

Rating: _____

Information Sheet 6: Following procedures for referring non-routine events

6.1. Following procedures for referring non-routine events

- Heed all warnings.
- Follow all instructions.
- Do not use this apparatus near water.
- Clean only with a dry cloth.
- Do not block any ventilation openings. Install in accordance with the manufacturer's instructions.
- Do not install near any heat sources such as radiators, heat registers, stoves, or other apparatus (including amplifiers) that produce heat.
- Do not defeat the safety purpose of the polarized or grounding-type plug. A polarized plug has two blades with one wider than the other. A grounding-type plug has two blades and a third grounding prong. The wide blade or the third prongs are provided for your safety. If the provided plug does not fit into your outlet, consult an electrician for replacement of the obsolete outlet.
- Protect the power cord from being walked on or pinched, particularly at plugs, convenience receptacles, and the point where they exit from the apparatus.
- Use only attachments/accessories specified by the manufacturer.
- Unplug this apparatus during lightning storms or when unused for long periods of time.
- Refer all servicing to qualified service personnel. Servicing is required when the apparatus has been damaged in any way, such as the power supply cord or plug is damaged, liquid has been spilled or objects have fallen into the apparatus, the apparatus has been exposed to rain or moisture, does not operate normally, or has been dropped.

Self-Check 6	Written Test

Directions: Answer following question accordingly.

1. A Dealing with unplanned events will consists

   a._____

   _____

   _____

   _____

   _____

   _____

   _____

   _____

   _____

Note: - Satisfactory rating: 5 and above - Unsatisfactory Rating: below 5

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

Name: _____ Date: _____

Score = _____

Rating: _____

Information Sheet 7: Carrying out the installation efficiently without waste of materials

7.1. Carrying out the installation efficiently without waste of materials

- Unplug the receiver from the AC power outlet before cleaning.
- Do not place the receiver in an enclosure such as a cabinet without proper ventilation.
- Do not install the receiver in any area where the temperature can be less than 40°F or more than 113°F.
- Do not stack the receiver on top of or below other electronic devices
- Do not place candles or other melt able objects on top of the receiver
- Operate the receiver using only the type of power source indicated on the marking label. Unplug the receiver power cord by gripping the power plug, not the cord.
- Do not overload wall outlets or extension cords, as this can result in a risk of fire or electrical shock.
- Never insert objects of any kind into the receiver through openings, as the objects may touch dangerous voltage points or short out parts. This could cause fire or electrical shock.
- Do not locate the antenna near overhead light or power circuits, or where it can fall into such power lines or circuits. When installing the antenna, take extreme care to avoid touching such power lines or circuits, as contact with them can be fatal.
- Do not attempt to service the receiver yourself, as opening or removing covers may expose you to dangerous voltage, and will void the Limited Warranty. Refer all servicing to authorized service personnel.
- Use an outlet that contains surge suppression or ground fault protection. For added protection during a lightning storm, or when the receiver is left unattended and unused for long periods of time, unplug the power cord from the wall outlet, disconnect the lines between the receiver and the antenna, and disconnect the telephone line.

This will provide some protection against damage caused by lightning or power line surges.

Self-Check 7	Written Test

Directions: Answer following question accordingly.

1. Write safety tips installation of antenna and satellite antenna

   a._____

   _____

   _____

   _____

   _____

   _____

   _____

   _____

   _____

Note: - Satisfactory rating: 5 and above - Unsatisfactory Rating: below 5

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

Name: _____ Date: _____

Score = _____

Rating: _____

Operation Sheet 1	Install reception antennae and signal distribution systems

Operation title- Installing and Repairing Antenna and Satellite System

Purpose: - To terminate cables & conductors with manufacture's specifications

-To install the optimum location for the assemble & disassemble equipments

Condition or situations for the operations:

-The trainees should be describe the job description and job analysis of an employee as given on assignment in group within one day time and Cleaning working area i.e. remove unwanted particles

Equipment tool& materials

*Soldering iron -knife *Tools for assemble/disassemble/wrenches

* Screw driver *satellite dish *F-connector

* DMM/AMM *Pliers * satellite dish finder

*Divider *coaxial cable *AV jack

*Nastro (Plaster) *Receiver

Procedure

3. Clean working area
4. To identify the part of assemble & disassemble equipments, material
5. Use Personal protective equipment in the working area.
6. To disassemble necessary equipment by using proper handling tools
7. Clean the spare parts of disassemble equipments
8. To assemble the disassemble equipment & search the signal
9. Insert the signal

Precautions:

- A large grounding rod connected to both the communication device
- Do not tech wire with power
- Always Clean Equipment tool& materials

Quality Criteria:

- Safety rule apply
- Follow procedures in step by step

- The project must be functional
- Finishing on time

Your teacher will evaluate your output either satisfactory or unsatisfactory. If unsatisfactory, your teacher shall advice you on additional work. But if satisfactory, you can proceed to the next topic.

LAB Test 1	Install reception antennae and signal distribution systems

Name Trainer: _____ date: _____ E.C

Time start: 2:15 Time finished: 6:00

4. You are required to perform any of the following
   A. Clean working area and correctly arranged
   B. Personal protective equipment used in the working area
   C. To gather complete necessary documents from the work bench
   D. assemble all parts of antenna or satellite dish
   E. Connect the coaxial cable to the dipole & TV RF input
   F. To set the maximum gain of antenna in the position of transmission station
5. Request your teacher for evaluation and feedback

"Showing the practical activities"

LG #3	LO #3. Set-up reception antennae and signal distribution systems and report

Instruction sheet

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

- Following OHS for work completion.
- Making adjustments to the antenna and the system
- Cleaning and making work site safe.
- Notifying the completion of the installation work to supervisor

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:

- Follow OHS for work completion.
- Make adjustments to the antenna and the system
- Clean and making work site safe.
- Notify the completion of the installation work to supervisor

Learning Instructions:

Read the specific objectives of this Learning Guide.

- Follow the instructions described below.
- 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
- Accomplish the “Self-checks” which are placed following all information sheets.
- 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).
- If you earned a satisfactory evaluation proceed to “Operation sheets
- Perform “the Learning activity performance test” which is placed following “Operation sheets” ,
- If your performance is satisfactory proceed to the next learning guide,
- If your performance is unsatisfactory, see your trainer for further instructions or go back to “Operation sheets”.

Information sheet 1: Following OHS for work completion.

1.1. Following OHS for work completion

A standard installation will consist of the following:

- Assembly and installation of mount on customer premises
- Provision and installation of appropriate ballast
- Assembly of 1.2M, 1.8M or 2.4M antenna, as required, on mount
- Assembly and installation of outdoor electronics on antenna
- Installation and termination of up to121.9M of cable
- Pointing, peaking and commissioning of the Virtual satellite system
- Verification of operation with the relevant NOC
- Application testing as required by the customer
- Site cleanup
- Completion of the installation sheet

Dish Installation

Install dish as per manufacturer's instructions

- Ensure level surface, mount at 90 degrees
- Ensure direct Line Of Sight to Satellite (No obstructions)

Self-Check 1	Written Test

Directions: Answer following question accordingly.

1. Write the steps followed the installation of antenna and satellite antenna

   a._____

   _____

   _____

   _____

   _____

   _____

   _____

   _____

   _____

Note: - Satisfactory rating: 5 and above - Unsatisfactory Rating: below 5

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

Name: _____ Date: _____

Score = _____

Rating: _____

Information Sheet 2: Making adjustments to the antenna and the system

2.1. Making adjustments to the antenna and the system

Two aerials set up on a roof. Spaced horizontally and vertically;

It is sometimes desired to receive signals from transmitters which are not in the same direction. This can be achieved, for one station at a time, by using a rotator operated by an electric motor to turn the antenna as desired.

Alternatively, two or more antennas, each pointing at a desired transmitter and coupled by appropriate circuitry, can be used. To prevent the antennas interfering with each other, the vertical spacing between the booms must be at least half the wavelength of the lowest frequency to be received (Distance=λ/2). The wavelength of 54 MHz (Channel 2) is 5.5 meters (λ x f = c) so the antennas must be a minimum of 2.25 meters, or ~89 inches apart. It is also important that the cables connecting the antennas to the signal splitter/merger be exactly the same length, to prevent phasing issues, which cause ghosting with analog reception. That is, the antennas might both pick up the same station; the signal from the one with the shorter cable will reach the receiver slightly sooner, supplying the receiver with two pictures slightly offset. There may be phasing issues even with the same length of down-lead cable. Band pass filters or "signal traps" may help to reduce this problem.

For side-by-side placement of multiple antennas, as is common in a space of limited height such as an attic, they should be separated by at least one full wavelength of the lowest frequency to be received at their closest point. Often when multiple antennas are used, one is for a range of co-located stations and the other is for a single transmitter in a different direction.

Self-Check 2	Written Test

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

2. Set-up reception antennae are sometimes desired to receive signals from transmitters which are the same direction.

   A. True B. false

3. The vertical spacing between the booms must be at least half the wavelength of the lowest frequency to be received.

   A. True B. false

4. Which one is common in a space of limited height?

   A. Yagi antenna B. reception antenna C. multiple antenna D. all

Information Sheet 3: Cleaning and making work site safe

1.1. Cleaning and making work site safe

Work site is cleaned and made safe in accordance with established procedures. Work supervisor is notified of the completion of the installation work in accordance with established routines.

Properly installed masts, especially tall ones, are guyed with galvanized cable; no insulators are needed. They are designed to withstand worst-case weather conditions in the area, and positioned so that they do not interfere with power lines if they fall.

Self-check 3	Written test

Directions: Answer following question accordingly.

1. Write safety tips installation of antenna and satellite antenna

   a._____

   _____

   _____

   _____

   _____

   _____

   _____

   _____

   _____

Note: - Satisfactory rating: 5 and above - Unsatisfactory Rating: below 5

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

Name: _____ Date: _____

Score = _____

Rating: _____

Information Sheet 4: Notifying the completion of the installation work to supervisor

4.1. Notifying the completion of the installation work to supervisor

Site Survey

Upon completion of an initial review, CIT will determine the completeness of the submitted request, and if the request is deemed sufficient, a site survey with the wireless telecommunications provider will be scheduled to determine whether the proposed site meets the service provider's requirements. If the proposed site meets the service provider's criteria, CIT will provide their determination, approving or denying, the request to the service provider within sixty (60) business days after the site survey.

If the service provider's application is found deficient, NIH will notify the service provider and request supplemental information to identify:

I. unique conditions;
II. property restrictions; and/or
III. Other circumstances which may affect the timing or ultimate determination for site approval. If the sitting request(s) is within the Washington, DC metropolitan area, the National Capital Planning Commission will also be consulted.

Point of Contact (POC):

To enable the service provider to plan for the potential use of the requested site, NIH's response will include the name and telephone number of the CIT point of contact responsible for coordinating the project.

- Need for Additional Information

If additional information has been requested, NIH will review and respond to the service provider's supplemental response, in writing, within ten (10) business days of receipt. NIH's response will advise if other reviews and/or reporting requirements are needed to develop a license agreement prior to NIH's final determination, including, but not limited to: 1) an Environmental Assessment; 2) an Environmental Impact Statement; 3) public hearings any further review.

a. Final Decisions

Final decisions will be rendered by ORFDO Director, in writing, in coordination with CIT, within ten (10) business days after the completion of all required reviews, evaluations and/or assessments. If the service provider's request is denied, ORFDO will notify the

service provider of such denial, in writing, and provide the rationale for such determination.

- Formal Documentation

  NIH retains sole discretion to approve, or deny, all site requests.

- Negotiation of Terms of Agreement

  If NIH approves the installation of an antenna, a revocable license agreement will be executed to document the terms, conditions and responsibilities of NIH and the telecommunications service antenna provider. The Terms of Agreement may include, but is not limited to: any recurring fees (i.e., utilities, etc.) and non-recurring fees (including third- party RF testing and rooftop appraisals);

- any special conditions required to protect NIH from any costs or liabilities arising from the service provider's use of NIH owned or controlled space (i.e., rooftop mounting standards, roof leaks, RF emissions standards, restrictions for sub-letting, public liability insurance);
- access procedures to enter NIH facilities for implementation, maintenance and/or removal of the service provider's equipment; and
- Assurances of the timely removal, or transfer of ownership, of the service provider's equipment and/or structures by the service provider.

Following the execution of a license agreement with the service provider, ORFDO will coordinate site access for installation and/or maintenance of the telecommunication antenna site. NIH and the service provider will maintain regular communication throughout the Terms of Agreement.

- **Compliance with the Terms of the Agreement**

To minimize the risk of EMI with the specialized medical and research equipment in NIH facilities, and to ensure the safety of NIH community, CIT will provide third- party contact information to the service provider in order to perform RF testing, at the service provider's expense, prior to the system being activated. RF testing will be performed to ensure the service provider is operating within the RF emissions standards, as identified in the Terms of Agreement. RF testing results will be provided to the CC-BEIP to review potential impact(s) to medical equipment.

CIT will regularly monitor the service provider's:

- equipment and work performed at the site(s);
- ✓ compliance with cost mechanisms and with the Terms of Agreement; and
- ✓ Will coordinate site compliance issues with DFP, technical compliance issues with ORFDO DTR and DFS, and license compliance issues with OA, with guidance from OGC.

The service provider will not sublicense equipment or services without the express written approval of the NIH.

- ✓ Changes in company ownership will require an updated proposal submission and a new agreement may be required.
- ✓ At least thirty days prior to any modifications, the CIT Project Manager must review, and approve, any modification to equipment or work to be performed.

Self-Check 4	Written Test

Directions: Answer following question accordingly.

1. Write notifying the completion tips installation of antenna and satellite antenna

   a._____

   _____

   _____

   _____

   _____

   _____

   _____

   _____

   _____

Note: - Satisfactory rating: 5 and above - Unsatisfactory Rating: below 5

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

Name: _____ Date: _____

Score = _____

Rating: _____

Operation sheet1	Installing and repairing antenna and satellite system

Installing and Repairing Antenna and Satellite System

Purpose: - to assemble the antenna.

Condition or situations for the operations:

-The trainees should be describe the job description and job analysis of an employee as given on assignment in group within one day time

-Check the required materials, select the appropriate tools & equipments, ensures the occupational health & safety, and prepare the consumer electronic products & systems in the practical work area.

Equipment tool& material

*Soldering iron -knife *Tools for assemble/disassemble/wrenches

* Screw driver *satellite dish *F-connector

* DMM/AMM *Pliers * satellite dish finder

*Divider *coaxial cable *AV jack

*Nastro (Plaster) *Receiver

Procedure

In the practical work area prepare and place the required materials, tools & equipments, and ensures the safety requirements and select the required consumer electronics products & systems according to the task requirements.

1. Check & list all materials needed for the task requirement and ask the shop assistant if it is available, if not ask for the alternative materials.

2. Select the appropriate tools & equipments use according to the task requirements and place in the practical work area, make sure the 5s are properly followed.

3. Make sure that the workstation is in good condition and safety rules or occupational health and safety must be present.

4. To assemble the disassemble equipment & search the signal

5. Insert the signal

Precautions:

Upon measuring the voltages in the circuit of consumer electronic products & systems, assure that the equipment will be handle with care because it has a sensitive components and devices. Some of parts of cell phone set like screen& different spare part are also sensitive and requires care.

Quality Criteria:

- Follow procedures in step by step
- The project must be functional
- Finishing on time

Your teacher will evaluate your output either satisfactory or unsatisfactory. If unsatisfactory, your teacher shall advice you on additional work. But if satisfactory, you can proceed to the next topic.

LAB Test	Installing and repairing antenna and satellite system

Name Trainer: date: _____ E.C

Time start: 2:15 Time finished-6:00

6. You are required to perform any of the following

- Clean working area correctly arranged.
- Personal protective's is used in the working area.
- To assemble the satellite antennae.
- To connect the satellite dish to receiver and TV set.
- To set the decoder/ receiver setting.
- To adjust the correct position of the satellite dish by using satellite finder.
- To search BBC, ETV1, ETV2, ETV3, MBC ACTION, by Ethiosat.

2. Request your teacher for evaluation and feedback

-Showing the practical activities

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The trainers who developed the TTLM

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Self-check

LO 1

Self-check 1: key answer

1. **A**
2. **C**
3. **D**
4. **A**

Self-check 2: key answer

1-A

2- B

3 - A

Self-check 3: key answer

1. B
2. A
3. C
4. A

Self-check 4: key answer

1. **A**
2. **B**
3. **C**
4. **D**

Self-check 5: key answer

Q.1.

- Confirmation they feel comfortable making decisions independently
- Evidence they have taken on more decision-making responsibility over time
- Confidence in their thought process behind making important choices

Q.2.

- Self-awareness about how they are perceived by other employees
- Indications they have asked their direct reports for feedback
- An alignment with your company culture

Q.3.

- Indications their supervision skills have grown over time
- Proof they have received feedback well and adjusted their style as necessary
- Confirmation they are self-aware about their need to evolve

Self-check 6: key answer

1. **A**

2. C

3. A

Self-check 7: key answer

1 .D

2. C

3. A

4. D

LO 2

Self-check 1: key answer

1. D

2. C

3. A

4. B

5. E

Self-check 2: key answer

1. C

2. B

3. B

Self-check 3: key answer

1. C
2. C
3. D
4. A

Self-check 4: key answer

1. C

2. C

Self-check 5: key answer

1. A
2. A

Self-check 6: key answer

1. A

2. B

Self-check 7: key answer

1. C

LO 3

Self-check 1: key answer

1. D

2. B

Self-check 2: key answer

1. C
2. A

Self-check 3: key answer

1. C

2. B

3. C