Ethiopian TVET-System

Irrigation and Drainage Design and Construction Supervision

Level IV

Based on Feb, 2017G.C. Occupational Standard

Module Title: Establish Quality Standards

TTLM Code: EIS IDD4 TTLM 0920v2

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This module includes the following Learning Guides

LG 35: Establish quality specifications for product

LG Code: EIS IDS4 M8 LO1-LG-35

LG 36: Identify hazards and critical control points

LG Code: EIS IDS4 M8 LO2-LG-36

LG 37: Assist in planning of quality assurance procedures

LG Code: EIS IDS4 M8 LO3-LG-37

LG 38: Implement quality assurance procedures

LG Code: EIS IDS4 M8 LO4-LG-38

LG 39: Monitor quality of work outcome

LG Code: EIS IDS4 M8 LO5-LG-39

LG 40: Participate in maintaining and improving quality at work

LG Code: EIS IDS4 M8 LO6-LG-40

LG 41: Report problems that affect quality

LG Code: EIS IDS4 M8 LO7-LG-41

Instruction Sheet	Learning Guide 35: Establish quality specifications for product

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

- Sourcing market specifications and identifying legislative requirements
- Developing and agree upon quality specifications
- Documenting and introducing quality specifications to organization staff
- Updating quality specifications when necessary.

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

- Source market specifications and identify legislated requirements
- Develop and agree upon quality specifications
- Document and introduce quality specifications to organization staff
- Update quality specifications when necessary.

Learning Instructions:

1. Read the specific objectives of this Learning Guide.
2. Follow the instructions described below
3. Read the information written in the “Information Sheets 1- 4”. Try to understand what are being discussed.
4. Accomplish the “Self-checks 1,2 , 3 and 4” in each information sheets on pages 13, 23, 28 and 30.
5. Ask from your teacher the key to correction (key answers) or you can request your teacher to correct your work. (You are to get the key answer only after you finished answering the Self-checks).
6. Ensure you have a formative assessment and get a satisfactory result; then proceed to the next LG.

Information Sheet-1	Sourcing market specifications and identifying legislative requirements

1.1 Introduction to specification/ standard

A specification/standard is a statement that describes an expected level of service or performance. As an alternative, the concept of quality standards (QS) has replaced these problematic ones, as a way to express an expected level of service delivery or performance and as a reference point against which to measure excellence and quality.

A standard is

a) Something that is established by the authority, custom or general consent as a model or example to be followed;

b) Something established for use as a rule or basis of comparison in measuring or judging capacity, quantity, content, extent, value, quality, etc.

c) The type, the model or example commonly or generally accepted or adhered to; criterion set for usage or practice;

d) A level of excellence, attainment, etc.

1.2 Understanding quality

Different meaning could be attached to the word quality under different circumstances. The word quality does not mean the quality of manufactured product only. It may refer to the quality of the process (i.e., men, material, and machines) and even that of management. Where the quality manufactured product referred as or defined as “Quality of product as the degree in which it fulfills the requirement of the customer. It is not absolute but it judged or realized by comparing it with some standards”.

Quality begins with the design of a product in accordance with the customer specification further it involved the established measurement standards, the use of proper material, selection of suitable manufacturing process etc., quality is a relative term and it is generally used with reference to the end use of the product.

Quality is the outcome of the sum of all of the features and characteristics of a program, process, or service that impact their ability to meet or surpass the needs and requirements of a customer

Definitions of Quality:

People have found many ways to describe quality. Some of the most popular definitions for quality are listed below.

A. A degree of excellence
B. Conformance to requirements
C. Totality of characteristics which act to satisfy a need
D. Fitness for use
E. Fitness for purpose
F. Freedom from defects
a. Customers satisfactions

1.3 Dimensions of quality

In order to develop a more complete definition of quality, we must consider some of the key dimensions of a quality product or service

1. **Performance**: refers to a product's primary operating characteristics. Does the product or service do what it is supposed to do, within its defined tolerances?
2. **Features**: Does the product or services possess all of the features specified, or required for its intended purpose?
3. **Reliability**: the likelihood that a product will not fail within a specific time period. Will the product consistently perform within specifications?
4. **Conformance**: the precision with which the product or service meets the specified standards. Does the product or service conform to the specification?
5. **Durability**: measures the length of a product's life. How long will the product perform or last, and under what conditions?
6. **Serviceability**: is the speed with which the product can be put into service when it breaks down, as well as the competence and the behavior of the service person. Is the product relatively easy to maintain and repair?
7. **Aesthetics**: the subjective dimension indicating the kind of response a user has to a product. It represents the individual's personal preference.
8. **Perception**: perception is reality. The product or service may possess adequate or even superior dimensions of quality, but still fall victim to negative customer or public perceptions. As an example, a high quality product may get the reputation for being low quality based on poor service by installation or field technicians

1.4 Characteristics of quality

There are certain characteristics or attributes by which the quality of an audit is measured. The general characteristics of the quality may include:

Table 1. Characteristics of quality

Significance	How important is the subject matter that was examined in the audit? This, in turn, can be assessed in several dimensions, such as the financial size of the audited entity and the effects the audited entity has on the public at large, or on major national policy issues.
Scope	Did the audit task plan properly address all elements needed for a successful audit? Did the execution of the audit satisfactorily complete all the needed elements of the task plan?
Reliability	Are the audit findings and conclusions an accurate reflection of actual conditions with respect to the matter being examined? Are all assertion in the audit report or other product fully supported by the data gathered i the audit? Is all material evidence that was gathered in the audit properly reflected in the opinion or findings and conclusions?
Objectivity	Was the audit carried out in an objective and fair manner, without favour or prejudice? The auditors should base their assessment and opinion purely on the facts and sound analysis of the available information.
Timeliness	Were the audit results delivered at an appropriate time? This may involve meeting a legal or statutory deadline, or delivering audit results when they are needed for a policy decision, or when they will be most useful in correcting management weaknesses
Clarity	Was the audit report clear and concise in presenting the results of the audit? This typically involves being sure that the scope, findings and any recommendations can be readily understood by busy executives and parliamentarians who may not be experts in the matters that are addressed, but may need to act in response to the report.
Efficiency	Were the resources assigned to the audit reasonable in light of the significance and complexity of the audit?
Effectiveness	Did the findings, conclusions and recommendations get an appropriate response from the audited entity, the government and/or parliament?

1.5 Quality specification

Quality specifications are detail requirement that define the quality of a product, service or process. Quality includes tangible elements such as measurement and intangible elements such as small and taste.

Quality standards may include standards for:

Materials: Material standards are specifications that specify material properties. Typically quality standards or requirements, like surface finish or specific performance criteria.

Services: Service standards are important for customers, potential customers, employees and management of a business. They help to define what a customer can expect and to remind management and employees of the challenge and obligations that they face.

Output: The services provided must comply with the requirements of the Patents Act, and meet the expectations of its customers. The Product Quality Standards (PQS) are categorized according to the extent to which they affect the validity of the IP Right.

Processes/procedures: Process Quality Standards. Process quality standards protect the business owner from unnecessary costs in product repair or manufacturing rejects. These standards ensure that employees building products or providing services follow a specific procedure so that the results always meet the design quality standards.

1.6. Organizational quality standards

Organizations turn to standards for guidelines, definitions, and procedures that help them achieve objectives such as:

- Satisfying their customers' quality requirements
- Ensuring their products and services are safe
- Complying with regulations
- Meeting environmental objectives
- Protecting products against climatic or other adverse conditions
- Ensuring that internal processes are defined and controlled
- Use of quality standards is voluntary, but may be expected by certain groups of stakeholders.

Additionally, some organizations or government agencies may require suppliers and partners to use a specific standard as a condition of doing business.

1.7 Principles of organizational quality standards

The International Standard for Quality management (ISO 9001:2015) adopts a number of management principles that can be used by top management to guide their organizations towards improved performance.

Customer focus: The primary focus of quality management is to meet customer requirements and to strive to exceed customer expectations.

Rationale: Sustained success is achieved when an organization attracts and retains the confidence of customers and other interested parties on whom it depends. Every aspect of customer interaction provides an opportunity to create more value for the customer. Understanding current and future needs of customers and other interested parties contributes to sustained success of an organization.

Leadership; Leaders at all levels establish unity of purpose and direction and create conditions in which people are engaged in achieving the organization's quality objectives.

Engagement of people: Competent, empowered and engaged people at all levels throughout the organization are essential to enhance its capability to create and deliver value.

Process approach: Consistent and predictable results are achieved more effectively and efficiently when activities are understood and managed as interrelated processes that function as a coherent system.

Improvement: Successful organizations have an ongoing focus on improvement. Improvement is essential for an organization to maintain current levels of performance, to react to changes in its internal and external conditions and to create new opportunities.

Evidence based decision making: Decisions based on the analysis and evaluation of data and information are more likely to produce desired results.

Relationship management: For sustained success, an organization manages its relationships with interested parties, such as suppliers, retailers

1.8 Quality management system

Quality management – coordinated activities to direct and control an organization with regard to quality. Direction and control with regard to quality usually includes establishment of the quality policy and quality objectives, quality planning, quality control, quality assurance, and quality improvement

- **Quality** –degree to which a set of inherent characteristics fulfills requirements.
- **Quality policy** – overall intentions and direction of an organization related to quality as formally expressed by top management
- **Quality objective–** something sought, or aimed for, related to quality
- **Quality planning** – part of quality management focused on setting quality objectives and specifying necessary operational processes and related resources to fulfill the quality objectives.
- **Quality control –** part of quality management focused on fulfilling quality requirements. The purpose of quality control is to ensure that all quality requirements are being met.
- **Quality assurance** – part of quality management focused on providing confidence that quality requirements will be fulfilled. The practice that encompasses all procedures and activities directed toward ensuring that a specified quality of product is achieved and maintained. In the testing environment, this includes monitoring all the raw materials, supplies, instruments, procedures, sample collection/ transportation/ storage/processing, recordkeeping, calibrating and maintenance of equipment, quality control, proficiency testing, training of personnel, and all else involved in the production of the data reported.
- **Quality improvement** – part of quality management focused on increasing the ability to fulfill quality requirements

Quality management system is management system to direct and control an organization with regard to quality.

Figure 1. Quality management system

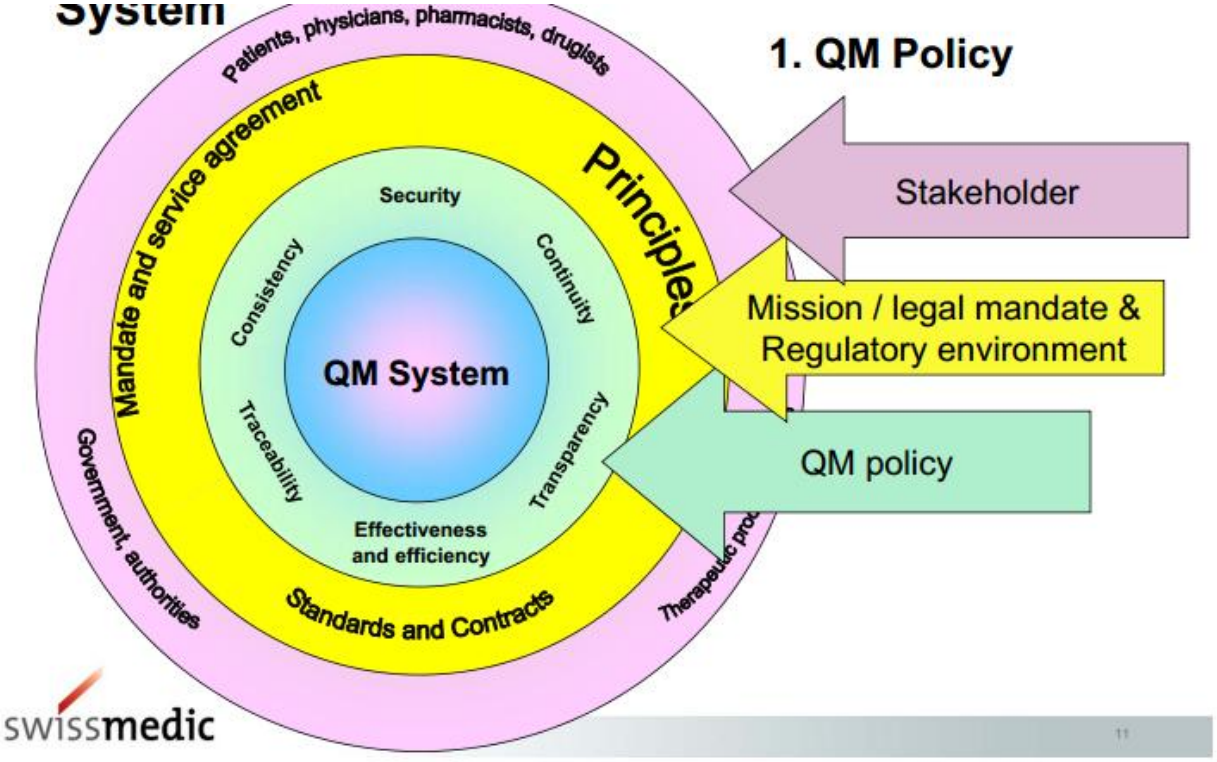


Figure 2. key elements of quality management system

1.9 Sourcing market specifications

Before developing and agreed up on quality specification for irrigation sector, the primary job of the irrigation technician should be sourcing of market specification, this include defining and describing what is needed and soughing information on the current situation. This information is required for understanding the market needs and aligning the development of the standard with the market requirement. The information that is sought from the regarding market specification may be collected from end-users, customers or stakeholders.

1.10. Identifying legislated requirements

Quality management means what the organization does to ensure that its products or services satisfy the customer's quality requirements and comply with any regulations applicable to those products or services. Even though market specifications are identified, this is not enough for developing standards/specification for irrigation sector rather the legislative (Federal and regional) and organizational requirement related to quality specification should be identified and followed within day-today work activities

1.11 ISO (International Organization for Standardization)

Because a company can have any kind of quality system it wants, customers do not know in advance whether the system is good or bad. The world recognized that this was a problem. The International Organization for Standardization (ISO) intended to correct this, by standardizing quality systems. ISO develops all kinds of standards, such as traffic symbols, material standards, inspection practices, and more. In 1987 ISO published “ISO 9001” a document (or standard) that lists some internationally-accepted, basic rules for a model quality system.

- Remember:
  - “ISO” is an organization
  - “ISO 9001” is a document

ISO 9001 does nothing more than just list some rules for managing a company’s quality system. These rules have been recognized by the world as generally-accepted “good practices”

Any organization quality system is unique.

It is based on:

1. The company Quality Policy
2. Customer requirements
3. Employee requirements
4. Other stakeholder requirements
5. ISO 9001 requirements

Self-Check -1	Written Test

Direction I: Matching item (2 points each)

Instruction: Match column B with column A of the following questions and write your answer on the answer sheet provided in the next page:

A	B
1. Organization quality standard	A. Serviceability
2. A statement that describes an expected level of service or performance	B. Quality specifications
3. ISO 9001" is a document	C. Quality
4. Detail requirement that define the quality of a product, service or process.	D. Aesthetics
5. Engagement of people	E. Performance
6. A degree of excellence	F. Quality management
7. The speed with which the product can be put into service when it breaks down	G. Principle of Organizational quality standards
8. Ensures that an organization, product or service is consistent	H. Complying with regulations
9. Product's primary operating characteristics	I. Specification/standard
10. ISO"	J. Quality document
11 The subjective dimension indicating the kind of response a user has to a product. It represents the individual's personal preference.	K Standard organization

Note: **Satisfactory rating - 11 points and above** **Unsatisfactory - below 11 points**

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

Answer Sheet-1

Score = _____

Rating: _____

Name: _____ Date: _____

Direction I: Matching questions

1. .....
2. .....
3. .....
4. .....
5. .....
6. .....
7. .....
8. ……
9. .....
10. ……
11. ……

Information Sheet-2	Developing and agree upon quality specifications

2.1 Principles in developing standards

The principles which intended to provide useful guidance in the development of operational standards in departments and functions within organizations are

1. **Meaningful to individuals**. Standards should be responsive. In other words, they should be meaningful to the individuals delivering the service, expressed in terms to which they can relate and refer to aspects of the service customers find important. Typically, standards should cover elements of service that are visible and measurable;
2. **Based on consultation.** Standards should be developed in consultation with those who deliver the service and, where possible, representatives of the customers who avail of them (e.g. focus groups);
3. **Attainable and challenging**. Standards should be realistic, while at the same time they should provide a challenge to service deliverers;
4. **Affordable.** Standards should be attainable within available resources;
5. **Owned by managers and employees.** Standards should be an essential management tool in service delivery. Setting and using standards should strive to continually improve the cost effectiveness of service delivery;
6. **Published.** Standards should be published and made known to all concerned;
7. **Used to measure performance**. Performance achievements should be measured against the standards, as well as customer satisfaction with the service provided. The performance measures used should be comparable over time and tracked to demonstrate improvements;
8. **Reviewed and updated.** Standards should be reviewed regularly and adjusted to reflect new circumstances.

2.2 Knowing your business

Who are the customers for your services? All those who have dealings with the organization. There may be several different customers for each service, each of whom has different perspectives and expectations. Customer management is the art of balancing these differing expectations.

There are many stakeholders of the organization (the owners and employees, the local and environmental community, legislative and governing bodies, suppliers, etc.). While these stakeholder needs are critically important for the organization to identify and satisfy, our concern here lies primarily with the external customer.

2.2.1 Identifying your services

Customers deal with your organization and avail of the services and products on offer in a wide variety of ways. In all cases, there is a transaction or interaction between the company's personnel and the customer.

The key to identifying your services is to identify the various interactions or dealings you have with the customer.

This is where the concept of 'Moments of Truth' may help. The complete customer interaction is made up of all moments where the customer has an experience and associates this with the name of your organization. Therefore, the interaction includes looking at your adverts, phoning your organization, visiting your organization, using its services and products, and so on.

Investigating the whole interaction is impossible in a single session, so it is necessary to find a way to focus on areas of service where you can make a difference. A useful focus is in situations where customers are in an important contact and the company has a critical opportunity to impress or disappoint the customer.

These Moments of Truth are often forgotten events, for example when they walk through the door to a reception desk. A positive Moment of Truth with a customer takes you closer to the promised land of satisfied customers and repeat business. A negative Moment of Truth creates dissatisfied customers who look elsewhere to get their needs met.

Focusing on the services you deliver by using Moments of Truth will help identify where potential weaknesses may exist or where there are areas for improvement in the services delivered. From this, the standards should be developed or reviewed to ensure the services and products on offer relate as closely as possible to the expectations of your customers.

2.2.2 Knowing what is being done now

As well as developing standards to meet financial realities and customers' expectations, you must assess these standards in light of your current ability to meet them and your past performance. To determine your current level of service delivery, you will need an appropriate performance measurement and monitoring system. Monitoring performance, which includes assessing customer satisfaction, is essential if you want to establish and work to operational standards.

2.3 Consultation with customers and employees

Consult with customers to find out what is important, how satisfied they are with current service delivery, what's working well and what needs to be fixed. By being aware of the costs of delivering services, consulting with customers about the services they receive, and inviting them to contribute to improvement ideas, you will find it easier to match your customers' expectations with what your organization can deliver. Customers should ideally be partners in the delivery of services.

Research has shown that customers regard the following factors as critical to good service

- Responsiveness
- Competence
- Easy access
- Courtesy
- Good communication
- Credibility
- Reliability and accuracy
- Security
- Appearance of employees
- Attractive physical facility

Keep these characteristics in mind when you develop operational standards. In addition, consider feedback from employees and customers, and your employee's capabilities.

Why consultation

Consultation with customers is important for two reasons. If you for your own ideas of what customers want, you run the risk of being out of touch with what your customers actually

consider to be the most important aspects of service delivery. Also, customer satisfaction depends not only on the quality of the service, but on customers' initial expectations. In addition, such consultations will indicate where you can improve service to provide the greatest pay-off in terms of increased customer satisfaction.

You can assess customer satisfaction and expectations by providing suggestion boxes, monitoring the number and nature of complaints, using questionnaires, carrying out mystery guest appraisals and conducting surveys, focus groups, customer panels and site visits, among other methods.

Consult with your front-line employees to find out how they think service can be improved within existing resource levels. Front-line employees are directly placed to facilitate customers by delivering the service and can often generate innovative ideas for improving service at no extra cost. Through open and honest consultations, such suggestions can be aired and examined. In addition, to gain their commitment to any new processes and new standards, it is essential to involve frontline employees in their development.

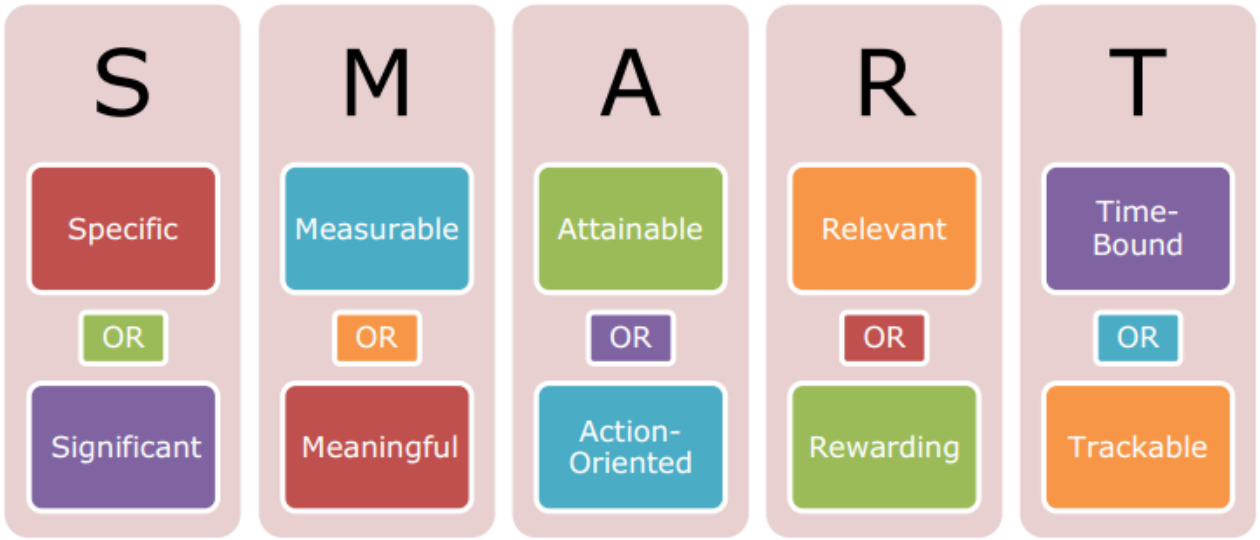
Front-line employees see their jobs as providing quality service to their customers. Standards must enable them to do so.

2.4 Implementing standards

2.4.1 Set customer-sensitive standards

Establishing standards and making them integral to management will take time. As mentioned, you need to develop a careful, well-thought-out strategy that recognizes the different types of services and customers you have and your knowledge of how well standards are delivered. However, rather than wait until complete and ‘perfect’ standards are developed, you should develop your standards progressively. Publish standards in areas of greater importance or impact first, i.e. those critical for operational success.

Use the SMART acronym when developing standards.



Specific:	A specific, clear standard has a much greater chance of being achieved than a general one.
Measurable:	Establish clear criteria for measuring progress toward achieving each standard.
Attainable:	When you identify standards that are most important to you, you begin to figure out ways you can make them happen.
Realistic:	To be realistic, a standard must represent an outcome toward which you are both *willing* and *able* to work.
Timely:	A standard should be set within a timeframe, i.e. it must relate to the *now* with a view to the *future*.

2.4.2 Empower and train service providers

Front-line employees should have the authority and accountability to make the decisions that matter to customers. They should be properly trained and equipped to make those decisions, and should have access to the tools they need to deliver quality service. Employees cannot be responsive to customers if they are overly restricted by rules and regulations, if the information they need to deliver good service is not readily available, or if they are not encouraged to be innovative and to take measured risks.

2.4.3 Communicate standards and report on performance

Standards are intended to let your employees know the level of performance expected of them. Reporting on performance against standards is critical if you are to make operational standards achievable. Standards are understood However, you can only do so

if standards are readily available to and understood by employees involved in their delivery, and if they are clear and easy to understand. The following principles will help you decide the best way to publicize your standards and report performance against those standards.

A. Making communication clear and effective

To be effective, communication must capture the audience's attention and be easy to understand. Use 'plain language'. Write your standards using words and language that are familiar to your employees. Test the standards, if necessary, to determine how well employees understand and receive them.

B. Build upon current communication methods

Look at the way you are communicating with your employees now and use those methods to start communicating your standards and performance measurements. Identify all current internal communication methods you use. These may include posters, circulars, meetings, letters, email, training sessions, briefings, induction packages, bulletin boards and suggestion boxes. Always look for innovative and cost- effective ways to communicate with your employees, taking into account their characteristics and needs are important.

2.5 Evaluating Standards

Service delivery targets (dealing with responsiveness, reliability, accuracy, etc., as above) and complaint systems should be openly displayed or available to employees. Standards are meant to be monitored, changed and improved over time. They are not cast in concrete once they are set. If you are actively using standards in managing your organization, you will be measuring performance against your standards and striving for continuous improvement.

Throughout the implementation of your standards, there is a need to constantly focus on the critical goals that can bring visible progress and enhancement. Otherwise, there is a tendency for busy employees to lose sight of the ultimate objective of performance improvement, and treat its implementation as a mere data collection exercise for management. Your team must create measures that support their standards, or they will not fully exploit their ability to perform to the standard. In addition, to remain competitive and relevant, the measures need to be continually reviewed and revised as the

environment and economy changes. So, develop ways to measure your performance against standards, and monitor performance constantly.

Setting customer-driven standards and measuring how well your company is doing is a continuous process. It should quickly identify problems with customer service. All parts of the business should be involved in finding solutions to these problems and discussing these solutions with customers, where appropriate.

Examples of Standards Measurement Tools:

- Feedback Questionnaires
- Complaints Analysis
- Mystery Guest
- Team Self-assessment
- Employee comments

There are a number of measurement tools a company can use. The selection of appropriate measures will depend on the value of the information received in return for the effort put into the measurement activity, what action is taken when the measures show below par performance and how performance can be tracked over time using the measures in order to show improvements.

2.6 Improving standards

Continually improve delivery systems and standards means: review policies, procedures and practices periodically to ensure 'customer friendliness' and to find new ways to improve services through initiatives such as:

- Using new technology where cost-effective;
- Cutting red tape;
- Using plain language;
- Re-examining and redesigning or streamlining work flow; and
- Simplifying or getting rid of unnecessary rules and practices.

Continuous improvement will allow you to set higher and higher standards and maximize customer satisfaction. By consulting customers, monitoring performance and encouraging innovation, you will be able to deliver better service.

2.7 Dealing with customer complaints

Complaint and redress mechanisms may already exist, even if not written down and fully communicated. In other areas, it may be necessary to revisit existing complaint systems from the customer's perspective and make them more visible to customers. In some cases, simple complaint procedures can be established. In all instances, you should have a coherent and consistent strategy for dealing with complaints from customers.

Handling customer complaints properly means:

- Offering many different ways of complaining to customers (web, e-mail, survey, complaints card..) Customers have their preferred ways of communication;
- Encouraging customers to complain;
- Making sure customers only need to mention the problem once;
- Making sure customers feel trusted when they complain;
- Making sure customers' expectations are managed; they are told when they will get an answer;
- Establishing clear limits on when to say NO to a customer;
- Documenting and managing complaints in a consistent way across the business;
- Recording and reporting complaints (number and type), if necessary;
- Analyzing, prioritizing, interpreting, sharing and acting upon complaints information regularly across the business in a simple and concise manner;
- Reviewing services by taking into account customer complaints.

Self-Check -2	Written Test

Direction I: Multiple Choice Questions (2 point each)

Instruction: Choose the best answer of the following questions and write your answer on the answer sheet provided:

1. Identify the incorrect statement about standards
   A. Standards should be responsive; they should be meaningful to the individuals delivering the service.
   B. Standards should be developed in without the consultation with those who deliver the service
   C. Standards should be realistic, while at the same time they should provide a challenge to service deliverers;
   D. Standards should be reviewed regularly
2. Consultation with customers is important for two reasons. If you for your own ideas of what customers want, you run the risk of being out of touch with what your customers actually consider to be the most important aspects of service delivery.
   A. True
   B. False
3. When developing standards all are important. Except?
   A. General
   B. Measurable
   C. Reliable
   D. timely
4. Continually improve delivery systems and standards means:
   A. Using new technology where cost-effective;
   B. Cutting red tape;
   C. Using plain language
   D. All
5. Handling customer complaints properly means: Except?
   A. Discouraging customers to complain
   B. Making sure customers feel trusted when they complain
   C. Establishing clear limits on when to say NO to a customer
   D. Reviewing services by taking into account customer complaints

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

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

Answer Sheet-2

Score = _____
Rating: _____

Name: _____ Date: _____

Direction I: Multiple Choice Questions

1. .....
2. .....
3. .....
4. .....
5. .....

Information Sheet-3	Documenting and introducing quality specifications to organization staff

3.1 Introduction

After quality specification has been develop for any organization it should be documented and communicated to organizational staff/ personnel. Communication change, especially a movement toward higher quality, is challenging to communicate effectively, yet the communication process is essential for the organization leaders to move the organization forward by disseminating information regarding quality specification. These communication lines also bring about a sense of camaraderie between all individuals involved and help sustain the drive for the successful completion of long-term quality goals. Communication systems also must allow for employees to give feedback and provide possible solutions to issues the organization must face regarding quality specification.

3.2 Documenting Quality Specification

After quality standard are established it should be documented and stored in a desired place where every employee can access the document and follow the quality specification. The quality document consists of company quality policies, procedures (SOP), quality specification for the inputs, process and work output and product/service quality specification.

Creating and updating documented information is the process of recording data in a defined and clear manner. In doing this, all specifications must be outlined and identified for monitoring and future reference. You should seek to confirm that when documented information is created or updated, that it is appropriately identified and described (e.g. title, date, author, reference number).

It must be in an appropriate format (e.g. language, software version, images) and on appropriate media (e.g. paper, electronic). Confirm that documented information is reviewed and approved for suitability and adequacy.

3.3 Creating and Updating Documented Information for ISO 9001

When documented information is created and updated, there are a few main points that must be considered and followed in order to be compliant with ISO 9001 guidelines. .

Creating and Updating Documented Information Requirements:

1. Identifications and descriptions should be clearly defined (include credentials such as date, time, title, author, reference number, etc.)
2. Appropriate formatting must be followed for each type of document
3. Appropriate media should be maintained for each type of document
4. All documented information must be reviewed and approved before being considered adequate (creating and updating)

The first and most important thing to keep in mind when creating and updating information for ISO 9001 is that all identifications and descriptions that are being recorded should be clearly defined.
Ideally, these records will be as detailed and specific as possible for monitoring purposes. If the documentation is created in a manner that is vague or unreadable, it will have virtually no use to the company after it has been completed.

In order to create and update clear and concise documents for ISO 9001, credentials such as the date, time, title, author, and reference number should be indicated directly on the document.

Next, all documentation must follow the correct formatting requirements. Since there will be several different types of documents filled out and used throughout the course of any business, there will also be a corresponding format for each of these documents.

In order for the documentation to be considered accurate and effective, it must be following the indicated format for the type of document that it is considered. Along with the proper formatting techniques, the appropriate media must be maintained for the documentation in question

3.4 Introducing quality specifications to organization staff

Quality does not only relate solely to the end of products and services an organization provides but also related to the way the organization employees do their job. Organizational employees constitute the most important resource for improving quality. Having this in mind Iintroducing qquality specifications to oorganization staff/personnel is essential part of quality management. At the start defining and quality policy and quality objectives of the organization should be understood and implemented by all employees at any level.

Self-Check -3	Written Test

Direction I: Short answer questions (12 points)

Instruction: Give short answer for the following questions and write your answer on the answer sheet provided on the next page:

1. Communication process is essential for the organization leaders to move the organization forward by disseminating information regarding quality specification. Explain? (4 points)
2. Why introducing quality specifications to organization staff? (2 points)
3. What is the importance of quality documentation? (2 points)
4. What are the requirements of creating and updating documented Information? (4 points)

Note: **Satisfactory rating - 6 points and above** **Unsatisfactory - below 6 points**

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

Answer Sheet-3

Score = _____

Rating: _____

Name: _____ Date: _____

Direction I: Short answer questions

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

Information Sheet-4	Updating quality specifications when necessary

4.1 Updating quality standards

High quality products and service are essential to build and maintain high levels of quality can create challenges for organizations. Consumer expectations shift at rapid pace, and what is considered high quality today may not hold true in immediate future. Not to mention, gaps in quality standard will increase over time, especially if you have not established a culture of quality within the organization. As expectations continuously evolve and customer experience increasingly prioritized, the need for quality standard is greater than ever. These standards should align with the expressed need of your target customers, reflect your business strategy and internal business logic while also continuously reinforcing quality as a core value throughout your entire organization.

Quality standards are based on the best, most up-to-date evidence. To keep quality standards current and relevant, they need to be updated regularly to reflect the most recent evidence and account for changes in practice.

Standards may also change if current practice changes. Certain quality statements may need to be retired over time if provincial performance in those areas has demonstrably improved without creating more regional variation in outcomes.

Self-Check -4	Written Test

Direction I: True or False item (2 points each)

Instruction: Write true if the statement is correct false otherwise and write your answer on the answer sheet provided.

1. High quality products and service are essential to build and maintain high levels of quality can create challenges for organizations.
2. As expectations continuously evolve and customer experience increasingly prioritized, the need for quality standard is greater than ever.
3. Quality standards are based on the best, most up-to-date evidence.

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

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

Answer Sheet-4

Score = _____

Rating: _____

Name: _____ Date: _____

Direction I: Short answer questions

1. .....
2. .....
3. .....

Instruction Sheet	Learning Guide 36: Identify hazards and critical control points

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

- Identifying critical control points impacting on quality
- Determining degree of risk for each hazard
- Accomplishing necessary documentation

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

- Identify critical control points impacting on quality
- Determine degree of risk for each hazard
- Accomplish necessary documentation

Learning Instructions:

1. Read the specific objectives of this Learning Guide.
2. Follow the instructions described below
3. Read the information written in the “Information Sheets 1- 4”. Try to understand what are being discussed.
4. Accomplish the “Self-checks 1, 2 and 3 ” in each information sheets on pages 41, 45 and 47.
5. Ask from your teacher the key to correction (key answers) or you can request your teacher to correct your work. (You are to get the key answer only after you finished answering the Self-checks).
6. If you earned a satisfactory evaluation proceed to “Operation sheets 1 on pages 48 and do the LAP Test on page 49”. However, if your rating is unsatisfactory, see your teacher for further instructions or go back to Learning Activity.
7. After accomplishing the Operation sheets and LAP Tests, ensure you have a formative assessment and get a satisfactory result; then proceed to the next LG.

Information Sheet-1	Identifying critical control points impacting on quality

1.1 Introduction

Hazards affecting quality are controlled to a certain extent through the validation of critical operations and processes are vital. Critical Control Point (CCP): A step at which control can be applied and is essential to prevent or eliminate a hazard or reduce it to an acceptable level.

Critical limit: A criterion which separates acceptability from unacceptability.

Deviation: Failure to meet a critical limit.

1.2 Hazard Analysis Critical Control Point (HACCP)

HACCP stands for Hazard Analysis Critical Control Point. HACCP is a systematic approach to the identification, evaluation, and control of hazards. It is a proactive strategy where hazards are identified and assessed, and control measures are developed to prevent, reduce, or eliminate the hazard.

HACCP involves seven principles:

1. Hazards analysis

2. Critical control points identification. These are points in irrigation system at which a potential hazard can be controlled or eliminated.

3. Establish preventative measures with critical limits (values) for each control point.

4. Establish procedures to monitor the critical control points

5. Establish corrective actions to be taken when monitoring shows that a critical limit has not been met.

6. Establish procedures to verify that the system is working properly.

7. Establish effective record keeping to document the HACCP system, such as records of hazards and control methods, the monitoring of safety requirements and actions taken to correct potential problems.

1.3 Conducting hazard analysis

The purpose of the hazard analysis is to develop a list of hazards which are of such significance that they are reasonably likely to cause injury or illness if not effectively controlled in irrigation system construction, operation and maintenance. Hazards that are not reasonably likely to occur would not require further consideration within a HACCP

plan. A hazard is defined as a biological, chemical, physical or psychological agent that is reasonably likely to cause illness or injury in the absence of its control.

The hazard analysis and identification of associated control measures accomplish three objectives: Those hazards and associated control measures are identified. The analysis may identify needed modifications to a process or product so that product safety is further assured or improved. The analysis provides a basis for determining CCPs.

The process of conducting a hazard analysis involves two stages.

- hazard identification
- hazard evaluation

In stage two of the hazard analysis, decides which potential hazards must be addressed in the HACCP plan. During this stage, each potential hazard is evaluated based on the severity of the potential hazard and its likely occurrence. Severity is the seriousness of the consequences of exposure to the hazard. Considerations of severity can be helpful in understanding the public health impact of the hazard.

Consideration of the likely occurrence is usually based upon a combination of experience, expertise, and information in the technical literature. When conducting the hazard evaluation, it is helpful to consider the likelihood of exposure and severity of the potential consequences if the hazard is not properly controlled.

In addition, consideration should be given to the effects of short term as well as long term exposure to the potential hazard.

Upon completion of the hazard analysis, the hazards associated with each step in the construction, operation and maintenance of irrigation system should be listed along with any measure(s) that are used to control the hazard(s). The term control measure is used because not all hazards can be prevented, but virtually all can be controlled. More than one control measure may be required for a specific hazard. On the other hand, more than one hazard may be addressed by a specific control measure

The hazard analysis summary could be presented in several different ways. One format is a table such as the one given above. Another could be a narrative summary of the HACCP hazard analysis considerations and a summary table listing only the hazards and associated control measures.

Table 2. Analysis summary

Step	Potential hazard(s)	Justification	Hazards to be addressed in plan? Y/N	Control measures(s)

1.4 Determine critical control points (CCPs)

A critical control point is defined as a step at which control can be applied and is essential to prevent or eliminate a safety hazard or reduce it to an acceptable level. The potential hazards that are reasonably likely to cause illness or injury in the absence of their control must be addressed in determining CCPs.

Complete and accurate identification of CCPs is fundamental to controlling safety hazards. The information developed during the hazard analysis is essential for the HACCP in identifying which steps in the process are CCPs. One strategy to facilitate the identification of each CCP is the use of a CCP decision tree (Examples of decision trees are given below). Although application of the CCP decision tree can be useful in determining if a particular step is a CCP for a previously identified hazard, it is merely a tool and not a mandatory element of HACCP. A CCP decision tree is not a substitute for expert knowledge.

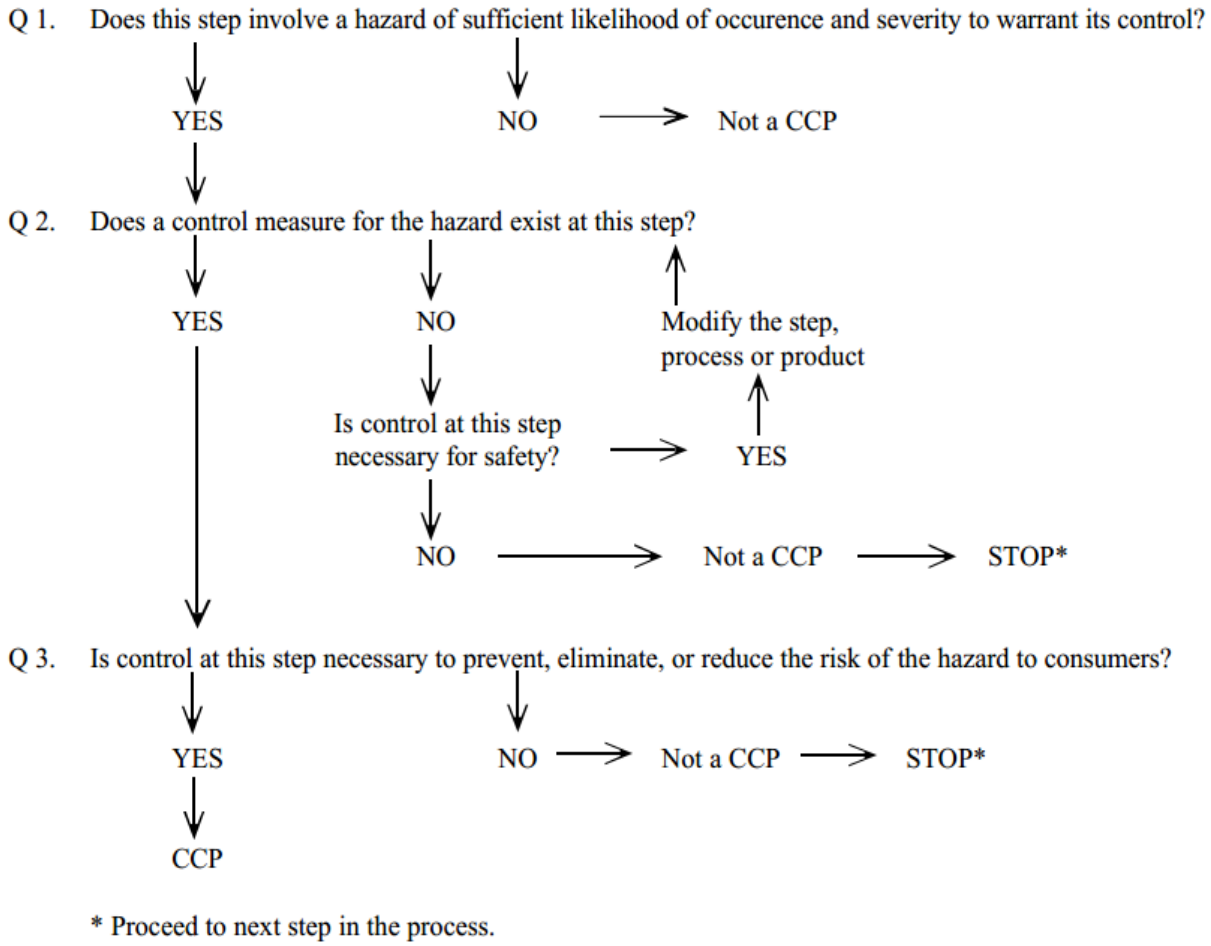
Critical control points are located at any step where hazards can be prevented, eliminated, or reduced to acceptable levels. CCPs must be carefully developed and documented. In addition, they must be used only for purposes of product safety.

CCP Decision Tree

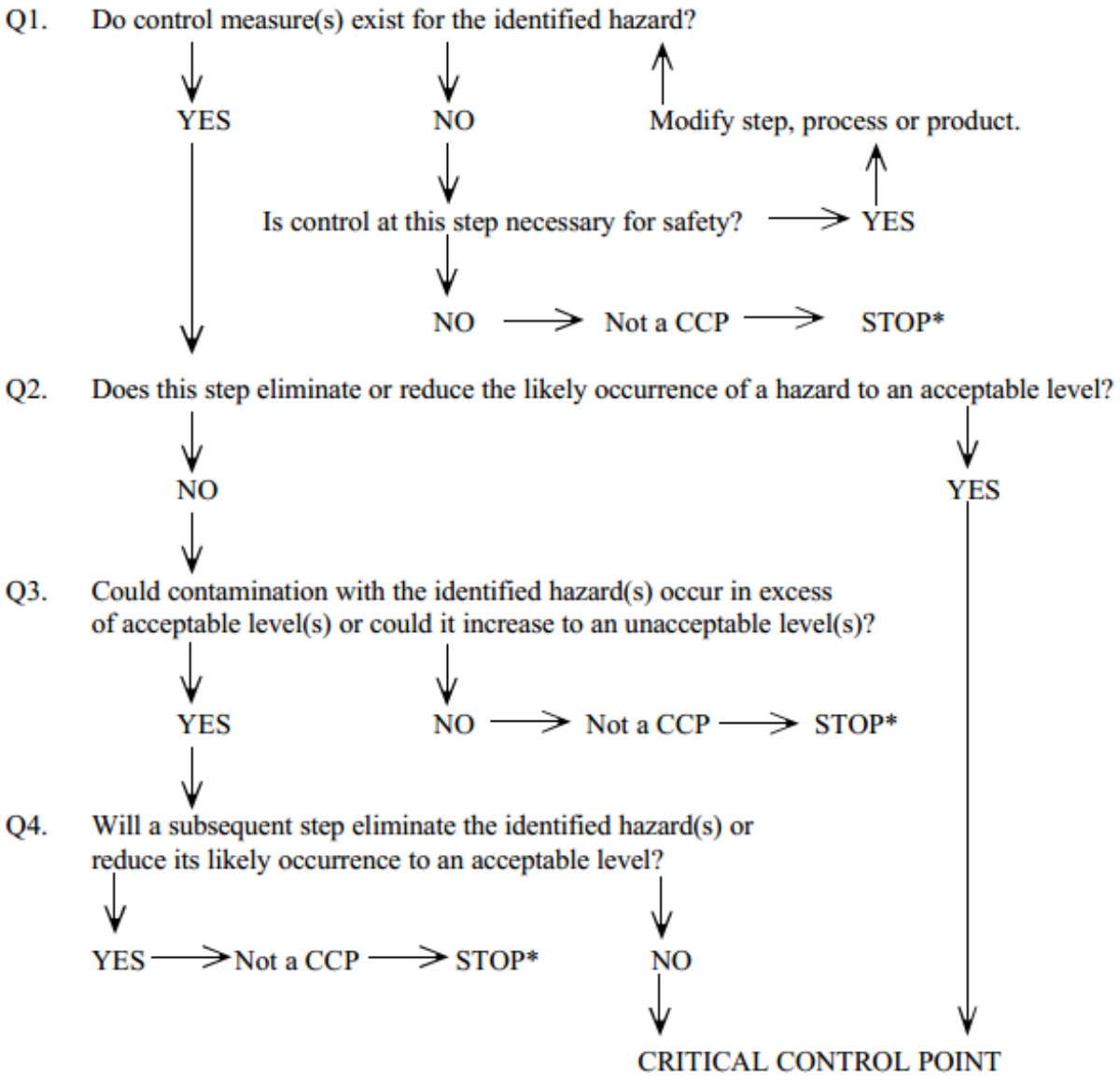
Important considerations when using the decision tree:

- The decision tree is used after the hazard analysis.
- The decision tree then is used at the steps where a hazard that must be addressed in the HACCP plan has been identified.

- A subsequent step in the process may be more effective for controlling a hazard and may be the preferred CCP.
- More than one step in a process may be involved in controlling a hazard.
- More than one hazard may be controlled by a specific control measure.



* Proceed to next step in the process.



1.5 Establish critical limits

A critical limit is a maximum and/or minimum value to which a biological, chemical physical or phycological parameter must be controlled at a CCP to prevent, eliminate or reduce to an acceptable level the occurrence of hazard. A critical limit is used to distinguish between safe and unsafe operating conditions at a CCP. Each CCP will have one or more control measures to assure that the identified hazards are prevented, eliminated or reduced to acceptable levels. Each control measure has one or more associated critical limits.

Critical limits may be based upon factors such as: temperature, time, physical dimensions, humidity, moisture level, pH, salt concentration, visual appearance. Critical limits must be scientifically based. For each CCP, there is at least one criterion that is to be met.

Table 3. Critical limit

Step	CCp	Critical limit
	Yes	

1.6 Establish monitoring procedures

Monitoring is a planned sequence of observations or measurements to assess whether a CCP is under control and to produce an accurate record for future use in verification. Monitoring serves three main purposes. First, monitoring is essential to safety management in that it facilitates tracking of the operation. If monitoring indicates that there is a trend towards loss of control, then action can be taken to bring the process back into control before a deviation from a critical limit occurs. Second, monitoring is used to determine when there is loss of control and a deviation occurs at a CCP, i.e., exceeding or not meeting a critical limit. When a deviation occurs, an appropriate corrective action must be taken. Third, it provides written documentation for use in verification

Personnel who monitor CCPs are often associated with production (e.g., line supervisors, selected line workers and maintenance personnel) and, as required, quality control personnel. Those individuals must be trained in the monitoring technique for which they are responsible, fully understand the purpose and importance of monitoring, be unbiased in monitoring and reporting, and accurately report the results of monitoring. In addition, employees should be trained in procedures to follow when there is a trend towards loss of control so that adjustments can be made in a timely manner to assure that the process remains under control.

The person responsible for monitoring must also immediately report a process or product that does not meet critical limits.

All records and documents associated with CCP monitoring should be dated and signed or initialed by the person doing the monitoring.

When it is not possible to monitor a CCP on a continuous basis, it is necessary to establish a monitoring frequency and procedure that will be reliable enough to indicate that

the CCP is under control. Statistically designed data collection or sampling systems lend themselves to this purpose.

Most monitoring procedures need to be rapid because they relate to on-line, “real-time” processes and there will not be time for lengthy analytical testing. Examples of monitoring activities include: visual observations and measurement of temperature, time, pH, and moisture level.

Where there is a deviation from established critical limits, corrective actions are necessary. Therefore, corrective actions should include the following elements: (a) determine and correct the cause of non-compliance; (b) determine the disposition of non-compliant product and (c) record the corrective actions that have been taken. Specific corrective actions should be developed in advance for each CCP and included in the HACCP plan. As a minimum, the HACCP plan should specify what is done when a deviation occurs, who is responsible for implementing the corrective actions, and that a record will be developed and maintained of the actions taken.

Individuals who have a thorough understanding of the process, product and HACCP plan should be assigned the responsibility for oversight of corrective actions. As appropriate, experts may be consulted to review the information available and to assist in determining disposition of non-compliant product.

1.7 Establish verification procedures

Verification is defined as those activities, other than monitoring, that determine the validity of the HACCP plan and that the system is operating according to the plan.

One aspect of verification is evaluating whether the facility’s HACCP system is functioning according to the HACCP plan. An effective HACCP system requires little end-product testing, since sufficient validated safeguards are built in early in the process. Therefore, rather than relying on end-product testing, firms should rely on frequent reviews of their HACCP plan, verification that the HACCP plan is being correctly followed, and review of CCP monitoring and corrective action records.

Another important aspect of verification is the initial validation of the HACCP plan to determine that the plan is scientifically and technically sound, that all hazards have been

identified and that if the HACCP plan is properly implemented these hazards will be effectively controlled.

Information needed to validate the HACCP plan often include (1) expert advice and scientific studies and (2) in-plant observations, measurements, and evaluations.
Subsequent validations are performed and documented by a HACCP team or an independent expert as needed. For example, validations are conducted when there is an unexplained system failure; a significant product, process or packaging change occurs; or new hazards are recognized.

In addition, a periodic comprehensive verification of the HACCP system should be conducted by an unbiased, independent authority. Verification activities are carried out by individuals within a company, third party experts, and regulatory agencies. It is important that individuals doing verification have appropriate technical expertise to perform this function.

Table 4. Example of a Company Established HACCP Verification Schedule

A	Frequency	Responsibility	Reviewer
Verification Activities Scheduling	Yearly or Upon HACCP System Change	HACCP Coordinator	Plant Manager
Initial Validation of HACCP Plan	Prior to and During Initial Implementation of Plan	Independent Expert(s)[a]	HACCP Team
Subsequent validation of HACCP Plan	When Critical Limits Changed, Significant Changes in Process, Equipment Changed, After System Failure,	Independent Expert(s)[a]	HACCP Team
Verification of CCP Monitoring as Described in the Plan	According to HACCP Plan (e.g., once per shift)	According to HACCP Plan (e.g., Line Supervisor)	According to HACCP Plan (e.g., Quality
Review of Monitoring, Corrective Action Records to Show Compliance with the	Monthly	Quality Assurance	HACCP Team
Comprehensive HACCP System Verification	Yearly	Independent Expert(s)[a]	Plant Manager

1.8 Establish record keeping and documentation procedures

Record keeping and documentation is important factor in HACCP because all the method of HACCP will be wrapped up and recorded so that the recordings are documented and stored for future use.

Self-Check -1	Written Test

Direction I: Matching item (2 points each)

Instruction: Match column B with column A of the following questions and write your answer on the answer sheet provided:

A	B
1. A step at which control can be applied and is essential to prevent or eliminate a hazard or reduce it to an acceptable level	**A.** purpose of the hazard analysis
2. any step where hazards can be prevented, eliminated, or reduced to acceptable levels	**B.** A critical limit
3. is a maximum and/or minimum value to which a biological, chemical physical or physiological parameter must be controlled at a CCP	**C.** hazard identification and hazard evaluation
4. A criterion which separates acceptability from unacceptability	**D.** Verification
5. Defined as those activities, other than monitoring, that determine the validity of the HACCP plan and that the system is operating according to the plan.	**E.** Critical Control Point (CCP)
6. Failure to meet a critical limit	**F.** Monitoring
7. A planned sequence of observations or measurements to assess whether a CCP is under control	**G.** Critical control points are located at
8. Develop a list of hazards which are of such significance that they are reasonably likely to cause injury or illness if not effectively controlled	**H.** Deviation
9. Hazard analysis	**I** Critical limit

Note: **Satisfactory rating - 9 points and above** **Unsatisfactory - below 9 points**

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

Answer Sheet-1

Score = _____

Rating: _____

Name: _____ Date: _____

Direction I: Matching questions

1. .....
2. .....
3. .....
4. .....
5. .....
6. .....
7. .....
8. .....
9. .....

Information Sheet-2	Determining degree of risk for each hazard

2.1 Introduction

Determination of degree of risk is important because it help us which type of hazard should be control giving priorities.

2.2 Determining degree of risk for each hazard

In any risk assessment, the degree of risk and thus prioritization for action is, to a certain extent, based on personal judgment and opinion. However, you should show that you have based your priorities for action on sound reasons.

Risk is a function of the probability of an event occurring and the degree of damage that would result should it happen. Information from the environment assessment is required in order to conduct a risk assessment

Making a risk assessment is a useful way in which to approach this aspect of site management. Environmental risk deals with the probability of an event causing an undesirable effect. There are three elements to consider when defining risk

1. a time frame over which the risk or risks are being considered
2. a probability of the occurrence of one or more events
3. a measure of the consequences of those events

Assigning a risk designation rating the hazard is one way to help determine which hazard is the most serious and thus which hazard to control first. Priority is usually established by taking into account the severity, probability and frequency of the exposure. By assigning a priority to the hazard, you are creating a rating or an action list.

The following factors play an important role:

- Frequency of exposure,
- Severity of exposure,
- Probability of occurrence

When the hazard is identified, determine the controls which are already in place to ensure this information is taken into account when assigning a risk designation.

Table 5 Frequency, probability and severity of exposure

Score	1	2	3	total
Severity - impact of exposure	Class C hazard - likely to cause minor, no disabling injury or illness, or no disruptive property damage	Class B hazard - likely to cause serious injury, illness, resulting in temporary disability or property damage that is disruptive but not extensive.	Class A hazard - likely to cause permanent injury, loss of life or body part and/or extensive loss of structure, equipment or material.	
Frequency of exposure	Rarely (< 1 month	Often (3 times/week)	Every day	
Probability of exposure	Unlikely	Could occur	Will occur if not attended to	

Once each hazard has been assigned a score for severity, frequency and probability based on the chart above, total the 3 items (S + F + P + Total).

Low (3,4) indicates that risks are considered acceptable. No further action or additional controls are necessary. Any actions to further reduce these risks are assigned a low priority. Regular monitoring should be performed to ensure that the controls are maintained and continued to be effective. Medium (5,6,7) consideration should be as to whether the risks can be lowered, where applicable, to a tolerable level and preferably to an acceptable level.

The risk measures should be implemented within a defined time period. Arrangements should be made to ensure that controls are maintained, particularly if the risk levels are associated with harmful consequences. High (8, 9) – These risks are unacceptable. Substantial improvements in risk control measures are necessary so that the risk is reduced to an acceptable level.

Risk reduction measures should be implemented urgently and it may be necessary to consider suspending or restricting the activity until short and long term controls are

implemented that reduces the risk so that it is no longer high. If it is not possible to reduce the risk, the work should remain prohibited.

Self-Check -2	Written Test

Direction I: Matching item (2 points each)

Instruction: Match column B with column A of the following questions and write your answer on the answer sheet provided:

A		B	
1.	Based on personal judgment and opinion	**A.**	Risk factors
2.	Is function of the probability of an event occurring and the degree of damage that would result should it happen	**B.**	the degree of risk
3.	Severity, probability and frequency	**C.**	Risk

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

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

Answer Sheet-2

Score = _____

Rating: _____

Name: _____ Date: _____

Direction I: Matching questions

1. .....
2. .....
3. .....

Information Sheet-3	Accomplishing necessary documentation

3.1 Record and documentation

Generally, the records maintained for the HACCP system should include the following:

1. A summary of the hazard analysis, including the rationale for determining hazards and control measures.
2. The HACCP Plan

Listing of the HACCP team and assigned responsibilities.

Verified flow diagram.

HACCP Plan Summary Table that includes information for:

- Steps in the process that are CCPs
- The hazard(s) of concern.
- Critical limits
- Monitoring*
- Corrective actions*
- Verification procedures and schedule*
- Record-keeping procedures*

* A brief summary of position responsible for performing the activity and the procedures and frequency should be provided

The following is an example of a HACCP plan summary table:

Table 5. HACCP plan summary

CCP	Hazards	Critical limit(s)	Monitoring	Corrective Actions	Verification	Records

3. Support documentation such as validation records.
4. Records that are generated during the operation of the plan.

Self-Check -3	Written Test

Direction I: Short answer questions (9 points)

Instruction: Give short answer for the following questions and write your answer on the answer sheet provided:

1. List the component of records maintained for the HACCP system? (4 points).
2. What are the components of HACCP Plan Summary? (5 points).

Note: **Satisfactory rating - 4 points and above** **Unsatisfactory – below 4 points**

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

Answer Sheet-3

Score = _____

Rating: _____

Name: _____ Date: _____

Direction I: Short answer questions

1. .....
2. .....

Operation sheet -1	Performing HACCP System

Information: Your trainer provides you a surface irrigation site.

Procedures of performing HACCP system

Step 1: Conduct a hazard analysis.

Step 2: Determine the Critical Control Points (CCPs).

Step 3: Establish critical limit(s).

Step 4: Establish a system to monitor control of the CCP.

Step 5: Establish the corrective action to be taken when monitoring indicates that a particular CCP is not under control.

Step 6: Establish procedures for verification to confirm that the HACCP system is working effectively.

Step 7: Establish documentation concerning all procedures and records appropriate to these principles and their application.

LAP Test -1	Practical Demonstration

Name: _____ **Date:** _____

Time started: _____ **Time finished:** _____

Instruction I: Given necessary templates, tools and materials you are required to perform the following tasks within 100 hours. Your will be given an irrigation site.

Task 1: Perform HACCP System

Instruction Sheet	Learning Guide 37: Assist in planning of quality assurance procedures

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

- Developing procedures for each identified control point to ensure optimum quality
- Minimizing hazards and risks through application of appropriate controls.
- Developing processes to monitor the effectiveness of quality assurance procedures.

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

- Develop procedures for each identified control point to ensure optimum quality
- Minimize hazards and risks through application of appropriate controls.
- Develop processes to monitor the effectiveness of quality assurance procedures.

Learning Instructions:

1. Read the specific objectives of this Learning Guide.
2. Follow the instructions described below
3. Read the information written in the “Information Sheets 1- 4”. Try to understand what are being discussed.
4. Accomplish the “Self-checks 1,2, 3 and 4 ” in each information sheets on pages 63,70,74 and 78.
5. Ask from your teacher the key to correction (key answers) or you can request your teacher to correct your work. (You are to get the key answer only after you finished answering the Self-checks).
6. If you earned a satisfactory evaluation proceed to “Operation sheets 1, on pages 80 and do the LAP Test on page 81”. However, if your rating is unsatisfactory, see your teacher for further instructions or go back to Learning Activity.
7. After accomplishing the Operation sheets and LAP Tests, ensure you have a formative assessment and get a satisfactory result; then proceed to the next LG.

Information Sheet-1	Developing procedures for each identified control point to ensure optimum quality

1.1 Introduction

After HACCP has been set up the next steps is will be the development of procedures for the identified control point this can be done by planning and implementing quality assurance.

1.2 Quality assurance

Quality Assurance (QA) is a management method that is defined as “all those planned and systematic actions needed to provide adequate confidence that a product, service or result will satisfy given requirements for quality and be fit for use”.

A quality assurance system is a set of policies and procedures that define the way your business operates so as to deliver a consistent high level of customer service meet legal requirements and generally assist you in working out ways of doing things better.

Documenting them has extra benefits – the ability to train employees to a consistent high standard of performance and as a source of information so people aren’t always asking their manager or supervisor questions of procedure

Quality assurance begins by asking two fundamental questions:

1. Are we doing the right things?
2. Are we doing these things in the right way?

1.2 Objectives of QA

The objectives of quality assurance system are:

- To ensure that correct procedures are in place and followed, and report to the accountable manager
- To ensure that corrective actions procedures are followed for identified non conformities and, when necessary, to prevent the recurrence of such non-conformity (follow up from audits)
- To prevent the accountable manager for the purpose of analysis and review, quality indicators such as audits, accidents and incidents reports as well as customer compliant.(how are we doing and where can we improve)

1.3 Quality control

Quality control popularly abbreviated as QC. It is a process used to ensure quality in a product or a service. It does not deal with the processes used to create a product; rather it examines the quality of the "end products" and the final outcome.

The main aim of quality control is to check whether the products meet the specifications and requirements of the customer. If an issue or problem is identified, it needs to be fixed before delivery to the customer.

QC also evaluates people on their quality level skill sets and imparts training and certifications. This evaluation is required for the service based organization and helps provide "perfect" service to the customers.

1.4 Difference between quality control and quality assurance?

Sometimes, QC is confused with the QA. Quality control is to examine the product or service and check for the result. Quality assurance is to examine the processes and make changes to the processes which led to the end-product.

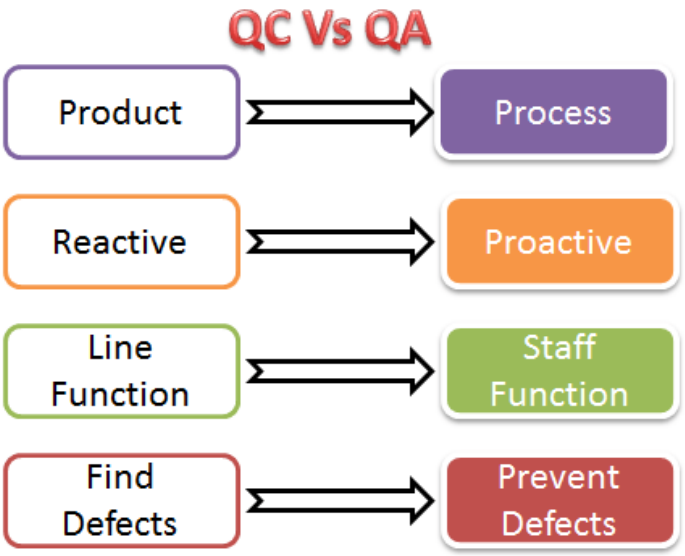


Table 6. Examples of QC and QA activities

Quality Control Activities	Quality Assurance Activities
Walkthrough	Quality Audit
Testing	Defining Process
Inspection	Tool Identification and selection
Checkpoint review	Training of Quality Standards and Processes

Quality Assurance-: “Do it right the first time“--Preventive Quality checks. Quality Control: Fix it whenever it goes or is going wrong. In recent years, QA is defined to include QC. Usually the contractor (or a third party) is responsible for performing Quality Control (QC) making sure that the standards are meet for production.

Usually the government or outside third party is responsible for performing Quality Assurance (QA) QA is spot checking of contract compliance, test results, and ultimately making sure that the quality control process is working.

1.5 What is a quality assurance plan?

Quality assurance begins with a quality assurance plan. A quality assurance plan is a document, constructed by the project team, meant to ensure the final products or services are of the utmost quality. A quality assurance plan contains a set of documented activities meant to ensure that customers are satisfied with the goods or services an organization provides.

1.5.1 Definition of quality objectives

No matter what system you use, you will need to be sure that the objectives have been defined for the project. Part of determining the objectives for the quality plan project involves identifying the requirements of the customers. For example, if a particular store generates many complaints about the level of customer service, more employees training may be required. Second, the level of quality must be defined. Is your company going for zero defects? Or is one in one hundred okay? Make sure your objectives are well written and specific.

1.5.2 Defining roles and responsibilities

Once the quality objectives have been defined and stated, the next important part of creating a quality assurance plan is to define the roles and responsibilities of team members. In doing this, you will want to list each role that will be required. Once you have listed the roles, then you can itemize the responsibilities of each role. Be specific. You want the person who is assigned the roles to understand completely what is meant by each responsibility written for them.

1.5.3 Coordinating with other plans

No project plan occurs in a vacuum. This is even more true with the quality assurance plan. Make sure you are on the same level as those working on the risk management plans, the resource management plans, and the change management plans. It would be a terrible thing to work hard on a quality assessment plan that contradicts something in the risk management plan. Talk to the other people and project managers in your department.

1.5.4 Definition Tasks and Schedule

Once the objectives and roles have been defined, and the other teams have been coordinated with, you can then begin to define tasks and create a schedule. Each and every task should relate directly to the quality objectives. Once each task has been defined, using the objectives as a reference, then you can begin to set the schedule. You can schedule two ways: either from the deadline in or from the start date out. Each has their own benefits..

1.6 Continuous improvement: the Plan-Do-Check-Act cycle

In organizations that apply quality assurance, continuous improvement of quality is key. This process of continuous improvement is reflected in Deming's improvement cycle, known as the Plan-Do-Check-Act or PDCA cycle. A systematic PDCA approach leads to quality control, quality assurance and quality improvement

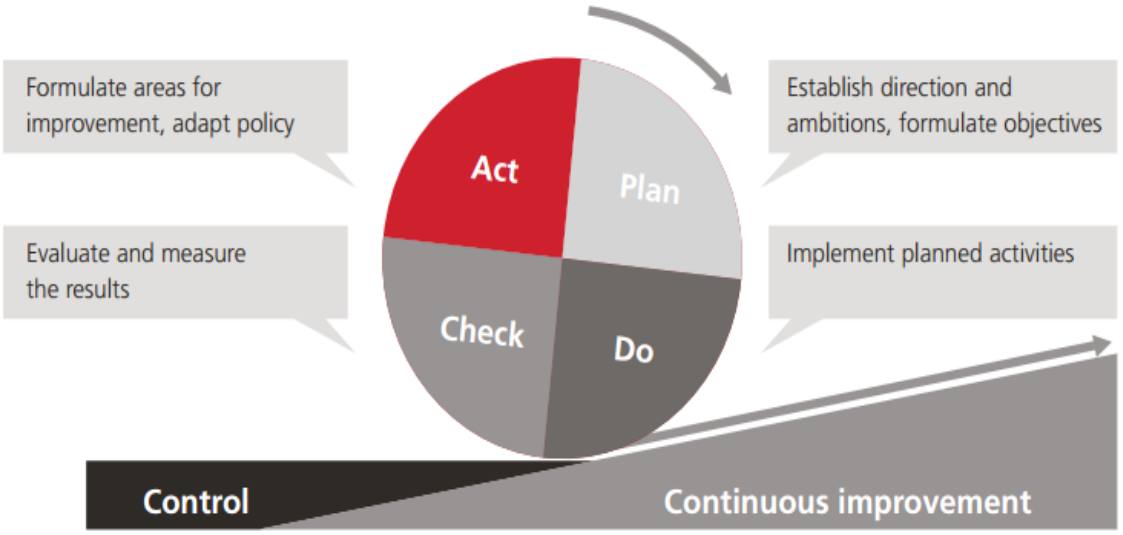


Figure 3. The PDCA cycle: progressing through the different stages of the cycle should lead to continuous improvement

The cycle involves the following four steps:

- Plan - Organization should plan and establish the process related objectives and determine the processes that are required to deliver a high-Quality end product.
- Do - Development and testing of processes and also "do" changes in the processes
- Check - Monitoring of processes, modify the processes, and check whether it meets the predetermined objectives
- Act - Implement actions that are necessary to achieve improvements in the processes

An organization must use Quality Assurance to ensure that the product is designed and implemented with correct procedures. This helps reduce problems and errors, in the final product

For a smooth progression through the PDCA cycle, objectives need to be worded as specifically as possible and plans/improvement plans drawn up in such a way as to leave no doubt about how they should be implemented. The Plan stage should state how the results will be evaluated in the Check stage. The aim here is to make it possible to retrospectively identify the cause of any disappointing results and then to implement concrete improvement measures

Self-Check -1	Written Test

Direction I: Fill in the blank space (2 points each)

Instruction: fill in the blank space of the following questions from the given answers provided to you and write your answer on the answer sheet provided:

1. ----------is a management method that is defined as “all those planned and systematic actions needed to provide adequate confidence that a product, service or result will satisfy given requirements..
2. ----------is a set of policies and procedures that define the way your business operates so as to deliver a consistent high level of customer service meet legal requirements..
3. ---------- is a process used to ensure quality in a product or a service. It does not deal with the processes used to create a product; rather it examines the quality of the "end products" and the final outcome.
4. ----------is a document, constructed by the project team, meant to ensure the final products or services are of the utmost quality.
5. ----------organization should plan and establish the process related objectives and determine the processes that are required to deliver a high-Quality end product.
6. ----------development and testing of Processes and also "do" changes in the processes
7. ----------monitoring of processes, modify the processes, and check whether it meets the predetermined objectives
8. ----------implement actions that are necessary to achieve improvements in the processes

Quality Assurance (QA)	Plan	Quality control
A quality assurance plan	Do	Check
Quality assurance system	Act	

Note: **Satisfactory rating - 8 points and above** **Unsatisfactory - below 8 points**

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

Answer Sheet-1

Score = _____
Rating: _____

Name: _____ Date: _____

Direction I: True or False item

1. .....
2. .....
3. .....
4. .....
5. .....
6. .....
7. .....
8. .....

Information Sheet-2	Minimizing hazards and risks through application of appropriate controls

2.1 Risk control

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.

What are the controls and which is best?

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:

1. Elimination
2. Substitution
3. Isolation
4. Engineering controls
5. Administrative controls
6. Personal protective clothing and equipment.

Figure 4: Hierarchy of risk control methods

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:

- Farming organically, in order to avoiding using a toxic pesticide.
- Switching to a less toxic pesticide, or substituting a liquid pesticide which is sprayed to one in granular form.

Elimination 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 are 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:

- Using a neutral detergent instead of caustic soda for cleaning

- Applying a substance with a brush might be safer than spraying the substance onto a surface

I**solation** 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

Engineering controls include plant or processes which:

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

Examples include:

- 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

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 nonexistent
- Good housekeeping practices.
- Providing accurate work instructions and methods.
- Training

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

- Respiratory protection
- Gloves and gauntlets
- Safety shoes and boots
- Protective clothing
- Head protection

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.

2.2 Identifying appropriate controls

Now that we have explored the different types of control, it is important to decide which method/s of control to be applied to each risk in the workplace. This is a simple process but takes time. One possible way of doing this is through the use of Risk Control Identification Cards' A template and an example are provided on the next page.

EXAMPLE

Hazard: Smoking in bars
Elimination: Introduce laws to ban
Substitution: N/A
Engineering Controls: Air purifiers/ventilation systems/air flow design
Isolation: Designated smoking areas
Administrative Controls: No smoking policy/ "No Smoking" signage
Personal Protective equipment: N/A

Table 7: Risk control identification card

Self-Check -2	**Written Test**

Direction I: Multiple Choice Questions (2 point each)

Instruction: Choose the best answer of the following questions and write your answer on the answer sheet provided:

1. After workplace risks and hazards have been identified and analyzed
   A. Risk should be assessed
   B. suitable risk controls must be implemented
   C. hazard should be ignored
   D. OHS should be reported
2. Risk control is a requirement as part of the employer's duty to provide and maintain
   A. True
   B. False
3. The most effective risk control measure is?
   A. Elimination
   B. Substitution
   C. Engineering control
   D. PPE
4. The least effective risk control measure is?
   A. Elimination
   B. Substitution
   C. Engineering control
   D. PPE
5. The OHS procedures for your organization may cover
   A. Acquisition, use, storage and disposal of hazardous chemicals.
   B. Consultation arrangements for workers in work area.
   C. Hazard reporting procedures.
   D. All
6. …….. means changing the procedure so it does not have to take place at all.
   A. Substitution
   B. Engineering control
   C. Elimination
   D. Administrative control
7. Replacing a hazardous process or substance with a less hazardous one:
   A. Substitution
   B. Engineering control

C. Elimination

D. Administrative control

8. Machine guards to prevent clothing, jewellery and body parts being caught in machinery and equipment. This type of risk control is?

A. Administrative control

B. Substitution

C. Engineering control

D. Elimination

9. Providing accurate work instructions and methods. This type of risk control method is?

A. Elimination

B. Substitution

C. Engineering control

D. Administrative control

10. Personal protective equipment might also be used as a temporary measure until other controls can be implemented

A. True

B. False

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

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

Answer Sheet-2

Score = _____

Rating: _____

Name: _____ Date: _____

Direction I: Multiple choice type questions

1. .....
2. .....
3. .....
4. .....
5. .....
6. .....
7. .....
8. .....
9. .....
10. .....

Information Sheet-3	Developing processes to monitor the effectiveness of quality assurance procedures

3.1 Introduction

Monitoring implies the act of conducting a planned sequence of observations or measurements of control parameters to assess whether a CCP is under control. Policies and processes are the main pillars of a coherent organizational quality assurance system that forms a cycle for continuous improvement and contributes to the accountability of the organization.

It supports the development of quality culture in which all internal stakeholders assume responsibility for quality and engage in quality assurance at all levels of the organization. In order to facilitate this, the policy has a formal status and is publicly available organizations should monitor and periodically review their programmes to ensure that they achieve the objectives set for them and respond to the needs of the stakeholders. These reviews should lead to continuous improvement of the programme. Monitoring is the collection and analysis of information about a project or programme, undertaken while the project/ programme is ongoing.

3.2 Ongoing Monitoring

What is important to remember is that a QA must be built in to the processes of the internal audit activity and not on to the way the activity conducts its business. The most obvious internal method for continuously assessing quality is management oversight of internal audit work.

Adequate supervision from the beginning through the end of the engagements is a fundamental element of a QA.

The Deming Cycle (or Plan-Do-Check-Act cycle) provides a possible structure in establishing the QA. Applying the Deming Cycle to the ongoing monitoring portion of the QA might look like figure 5 (Ongoing Monitoring). The steps in the Deming Cycle are as follows:

1. **Plan** means establishing expectations for operating a process to meet specific objectives, goals, or deliverables.

2. Do means executing the process and collecting data for analysis and follow-up in the Check and Act steps of the cycle.

3. Check is the step where actual results are compared to expected outcomes and differences are analyzed.

4. Act is where feedback is provided to the operators of the process to reinforce expectations established in the previous Plan step. It is in this step that improvements to the process are identified and implemented.

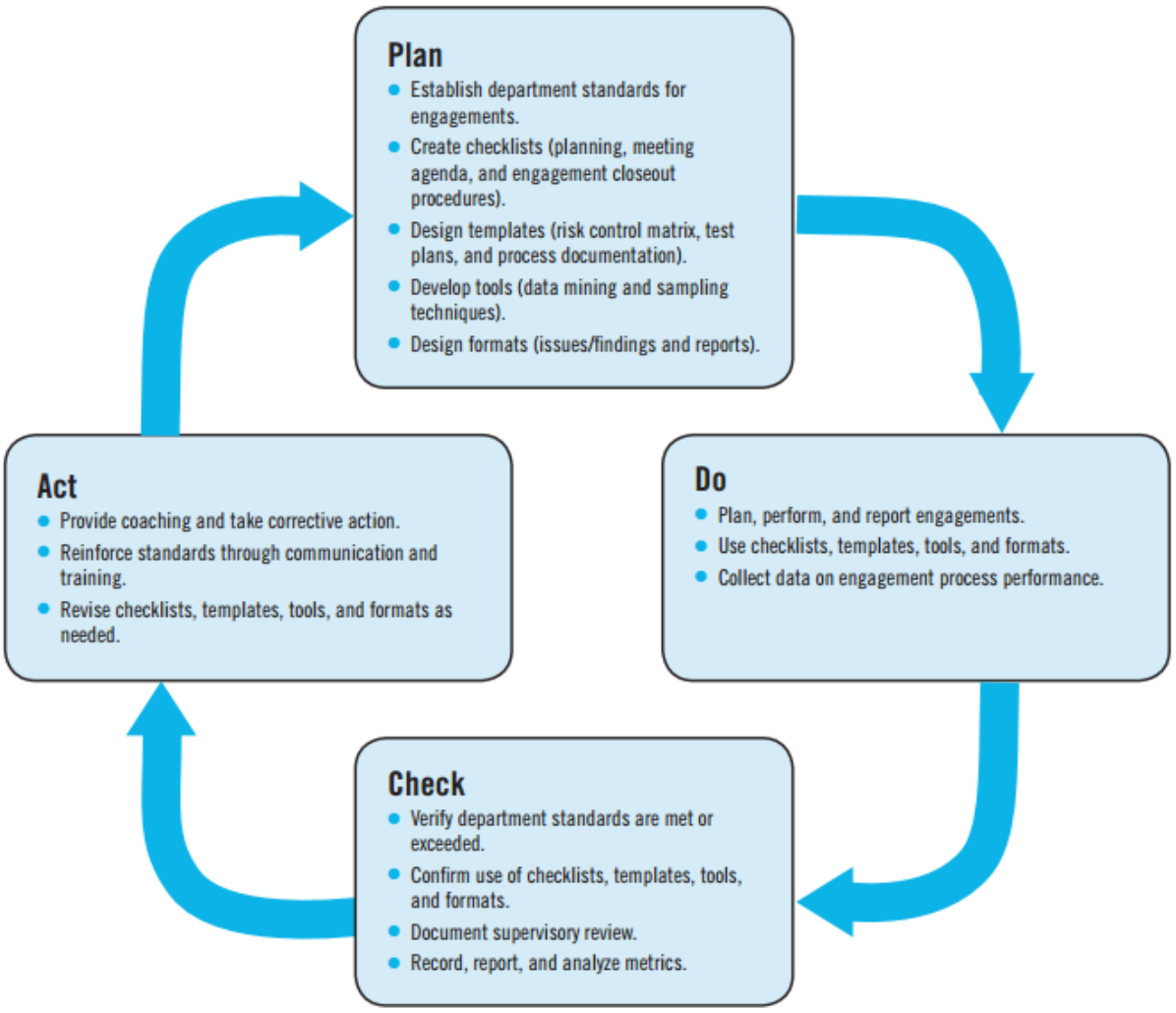


Figure 5. Ongoing monitoring

Self-Check -3	Written Test

Direction I: True or false item (2 point each)

Instruction: write true if the statement is correct, False otherwise of the following questions and write your answer on the answer sheet provided:

1. Monitoring implies the act of conducting a planned sequence of observations or measurements of control parameters to assess whether a CCP is under control.
2. QA must be built in to the processes of the internal audit activity
3. As far as ongoing monitoring is concerned, do means establishing expectations for operating a process to meet specific objectives, goals, or deliverables.

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

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

Answer Sheet-3

Score = _____

Rating: _____

Name: _____ Date: _____

Direction I: True false item

1. .....
2. .....
3. .....

.

Operation Sheet -1	Preparing a quality assurance plan

Procedure of preparing a quality assurance plan

Steps

Step 1: Visualize and think about what you want your team to achieve.

Step 2: Set policies and procedures for each department. ...

Step 3: Share the news

Step 4: Implement the procedures

Step 5: Get feedback

Step 6: Measure results

Step 7: Communicate results.

Step 8: Adjust as needed.

LAP Test -1	Practical Demonstration

Name: _____ **Date:** _____

Time started: _____ **Time finished:** _____

Instruction I: Given necessary templates, tools and materials you are required to perform the following tasks within *30 hours.*

Task 1: prepare a quality assurance plan

Instruction Sheet	Learning Guide 38: Implement quality assurance procedures

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

- Allocating responsibilities for carrying out procedures to staff and contractors.
- Preparing instructions in accordance with the enterprise's quality assurance program.
- Giving induction training on the quality assurance policy for staff and contractors
- Giving in-service training for staff and contractors relevant to their allocated safety procedures.

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

- Allocate responsibilities for carrying out procedures to staff and contractors.
- Prepare instructions in accordance with the enterprise's quality assurance program.
- Give induction training on the quality assurance policy for staff and contractors
- Give in-service training for staff and contractors relevant to their allocated safety procedures.

Learning Instructions:

1. Read the specific objectives of this Learning Guide.
2. Follow the instructions described below
3. Read the information written in the "Information Sheets 1- 3". Try to understand what are being discussed.
4. Accomplish the "Self-checks 1, 2 and 3 " in each information sheets on pages 73, 75, 78 and 81.
5. Ask from your teacher the key to correction (key answers) or you can request your teacher to correct your work. (You are to get the key answer only after you finished answering the Self-checks).
6. If you earned a satisfactory evaluation proceed to "Operation sheets 1 and 2 on pages 82 and 83, do the LAP Test on page 84". However, if your rating is unsatisfactory, see your teacher for further instructions or go back to Learning Activity.
7. After accomplishing the Operation sheets and LAP Tests, ensure you have a formative assessment and get a satisfactory result; then proceed to the next LG.

Information Sheet-1	Allocating responsibilities for carrying out procedures to staff and contractors

1.1 Introduction to quality management

A quality management system is a management technique used to communicate to employees what is required to produce the desired quality of products and services and to influence employee actions to complete tasks according to the quality specifications. This indicated allocating roles and responsibilities for carrying out procedures for employees is vital to keep the specified quality requirement.

1.2 Quality assurance role and responsibilities

Before involving in quality assurance procedures everyone in the organization should be allocated with the specific roles and responsibilities to understand and improve the quality system. This means:

- Understand the Quality Policy
- Understand the Quality Manual (managers and supervisors)
- Understand the Procedures related to the area
- Make suggestions for improvement, or report existing problems

1.3 Communicate roles and responsibility

There is no point in defining the roles and responsibility if the employees are not aware of them. Each employee should be clear made aware of what is expected of him or her. This can be done through various communication method, such as direct conversation with the concerned employees, group workshops and trainings and other activities

1.4 Handing over roles and responsibility

The following measures will help to ensure smooth handing over responsibilities. The person handing over the role and the responsibility should ensure that:

- List down all the activities that are currently being worked on
- Coordination must be between the person handing over the responsibility and employs
- During the actual agreed upon handover, make it detail as you can
- All important updates and details regarding the hand over must be furnished
- Document everything

- Complete the hand over report

Table 8. roles and responsibility

	Role and responsibility Identified in	Activities (include but not limited to)
1		
2		
3		
4		

Self-Check -1	Written Test

Direction I: True or false item (2 points each)

Instruction: Write true if the statement is correct False otherwise for the following questions and write your answer on the answer sheet provided. Justification is required for the incorrect questions.

1. Allocating roles and responsibilities to carry out procedures for employees is vital to keep the specified quality requirement
2. It is vital to defining the roles and responsibility if the employees are not aware of them.
3. Everyone in the organization should be allocated with the specific roles and responsibilities after involving in quality assurance procedures.
4. Best ways to communicate roles and responsibility are direct conversation with the concerned employees, group workshops and trainings and other activities
5. In handing over roles and responsibility List down all the activities that are currently being worked on is not important

Note: **Satisfactory rating – 5 points and above** **Unsatisfactory - below 5 points**

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

Answer Sheet-1

Score = _____

Rating: _____

Name: _____ Date: _____

Direction I: True or False Item

1. .....
2. .....
3. .....
4. .....
5. ……

Information Sheet-2	Preparing instructions in accordance with the enterprise's quality assurance program

2.1 Introduction

After assigning roles and responsibilities for employees the next step will be the preparation of instructions in accordance with the enterprise's quality assurance program. The instruction in provided in the quality assurance manual. So understanding the quality assurance manual will help you how to implement the instruction according to your organizational standard.

2.2 Quality assurance manual

The quality assurance manual is a living document that contains policies and procedures designed to manage quality in accordance with the requirements of quality assurance order. It helps to provide for a system of documented instructions and records for all aspects of quality assurance

2.3 Components of quality assurance manual

The following are examples of sections that a quality manual should contain:

- Table of Contents.
- Introduction.
- Facility Background.
- Purpose.
- Scope.
- Quality Policies and Objectives.
- Organization and Structure of Documentation.
- Facility's Products
- Instructions
- Implementation of QA/QC

2.4 Implementing quality assurance

Quality assurance is a process that assures assemblies and/or systems are built and inspected properly and that they retain their quality and performance during operation. Quality assurance ensures us that systems are developed and maintained according to plans and requirements. Quality requirements will be considered to have been fulfilled

only when the customer receives a highly reliable product, which fully conforms to all applicable specifications.

Self-Check -2	Written Test

Direction I: Short answer questions (2 points each)

Instruction: Give short answer for the following questions and write your answer on the answer sheet provided:

1. Explain about quality assurance document.(2 points)
2. What are the components of quality assurance document? (6 points)

Note: **Satisfactory rating - 4 points and above** **Unsatisfactory - below 4 points**

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

Answer Sheet-2

Score = _____

Rating: _____

Name: _____ Date: _____

Direction I: Matching questions

1. .....
   .....
   ..
2. .....
   .....
   .

Information Sheet-3	Giving induction training on the quality assurance policy for staff and contractors

3.1 Introduction

Training is an essential element of a successful QA/QC program. It provides the basic knowledge required to accomplish a procedure correctly. Training also provides the understanding of a given task or procedure, thereby enabling the individual involved to make an informed and effective decision.

3.2 Induction training

Induction training is a form of introduction for new employee in order to enable them to do their work in anew profession or job role within an organization. Training can be systematic or unsystematic. Induction training is systematic training. The systematic model supplements natural learning with systematic intervention that relates to the organizational objectives. Induction training provides employees with a smooth entry in to organization by providing them with the information they require to get started.

The goal of induction training includes:

- Create positive atmosphere
- Address any new job concerns
- Increase comfortable level and feeling of belongings
- Increase knowledge of the organization and its policy and procedure
- Share organizational value
- Share job specific information

3.2 Giving induction training

Managers must ensure that staffs are fully competent to perform the tasks that they are undertaking. Additionally, it is the responsibility of each staff member to declare any concerns and seek assistance if the task that they are engaged in exceeds their level of competence. All new directly employed staff should receive comprehensive induction training as specified in organization Induction policy and procedures. Other staff receives appropriate induction training according to their post and experience. Managers ensure that all staff receives induction training in line with the organization induction policy and procedures. It is recognized that with temporary staff time scales may be limiting but as an

absolute minimum ‘day one’ items from the induction checklist are covered with all temporary staff.

Organizations should have a policy for quality assurance that is made public and forms part of their strategic management. Internal stakeholders should develop and implement this policy through appropriate structures and processes, while involving external stakeholders. Training to the required level of competence, on quality assurance policy should be given to staff and contractors. These trainings includes:

- QA requirements and principle
- Specialized training in communication and interviewing skill
- Ongoing quality awareness training include training in applicable standard operating procedures and other quality document
- Training on regular inspection
- Procedures for carrying out audits and reporting result

Self-Check -3	Written Test

Direction I: Short answer (8 points)

Instruction: Give short answer for the following questions and write your answer on the answer sheet provided in the next page:

1. Training is an essential element of a successful QA/QC program. Explain? (2 points)
2. What is induction training? (2 points)
3. List the goal of induction training? (4 points)

Note: **Satisfactory rating - 4 points and above** **Unsatisfactory - below 4 points**

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

Answer Sheet-3

Score = _____

Rating: _____

Name: _____ Date: _____

Direction I: Give short answer

1. .....
2. .....
3. .....

.

Information Sheet-4	Giving in-service training for staff and contractors relevant to their allocated safety procedures

4.1 Introduction

Training is one of the most important components within any organization safety management system. It gives employees an opportunity to learn their jobs properly, bring new ideas into the workplace, reinforce existing ideas and practices, and it helps to put our Safety and Health Program into action.

4.2 In-service training

In-service training is professional training or staff development effort, where professionals are trained and discussed their work with others in the peer group. The primary purpose of in- service training is to enable employees to acquire new understanding and instructional skills

4.3 Safety procedures

Safety procedure that requires in-service training include the following

- Use of tools and equipment
- Workplace environment and handling of material safety,
- Following occupational health and safety procedures
- Respect the policies, regulations, legislations, rule and procedures for manufacturing/production works

4.4 Safety procedures 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.

Training program that focus on health and safety concerns determine the best way to deal with a particular hazard. When a hazard is identified, it will first try to remove it entirely. If that is not feasible, we will then train workers to protect themselves, if necessary, against the remaining hazard. Once decided that a safety or health problem can best be

addressed by training (or by another method combined with training), it will follow up by developing specific training goals based on those particular needs.

At a minimum, employees must know the general safety and health rules of the worksite, specific site hazards and the safe work practices needed to help control exposure, and the individual's role in all types of emergency situations. We will ensure all employees understand the hazards to which they may be exposed and how to prevent harm to themselves and others from exposure to these hazards.

Providing health and safety training is good for business because:

I. Health and safety training is a sound investment

- The money you spend on health and safety training saves money in the long term. A workplace that is not healthy and safe may have to face insurance claims, medical bills, higher insurance premiums, replacement labor costs and lost productive time.

II. Health and safety training is not optional

- The law states that as an employer you are responsible for providing health and safety information and training to your employees.

III. Health and safety training is responsible

- Training reduces the risk of pain and injury at work.

Self-Check -4	Written Test

Direction I: Short answer (6 points)

Instruction: Give short answer for the following questions and write your answer on the answer sheet provided in the next page:

1. Training is one of the most important components within any organization safety management system. Explain? (2 points)
2. Explain the importance of In-service training? (2 points)
3. List safety procedure that requires in-service training? (4 points)
4. Why provision of health and safety training is good for business? (4 points)

Note: **Satisfactory rating - 6 points and above** **Unsatisfactory - below 6 points**

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

Answer Sheet-4

Score = _____

Rating: _____

Name: _____ Date: _____

Direction I: Give short answer

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

Operation Sheet -1	Implementing Quality Assurance

Procedures of implementing quality assurance

Step 1: Prepare the team

Step 2: Gather basic data

Step 3: Develop quality procedures for critical processes

Develop quality assurance practices around all the operations that critically impact the business

Critical processes are those that effect productivity or customer relations or that waste manager/supervisor time

Step 4: Document quality assurance policies and procedures

Procedures should be clear:

- write instructions the way you would say them
- include all of the information required for a competent person to complete a given task but Don't over elaborate

Construct a template for recording policies and procedures so they are developed consistently.

As well as a description of how the task is done a procedure document should include:

- title and date for identification and version Control
- employee responsible for seeing the operation/task is carried out – usually the Supervisor (position, not name)
- who does the task (position, not name)
- objective; what the policy/procedure is meant to achieve
- records to be kept as p[art of the task

Step 5: Embed quality assurance processes in operations

a. Train people in quality assurance processes
b. Make a copy of the appropriate documentation available in each work area.
c. Include in performance review discussions.

Step 6: Monitor and constantly improve quality assurance processes

Step 7: Audit compliance with quality assurance procedures

Operation Sheet -2	**Providing an induction training to new staff**

Instruction: your trainer will provide you a situation in the irrigation site, in which there are new staff members which require an induction training

Procedure of providing induction training to new staff

Step 1: prepare an induction checklist

An Induction Checklist is completed and signed by the member of staff and their line manager to demonstrate that training has been undertaken

Step 2: prepare the training (organizational policy and procedure regarding quality assurance)

Step 3: Ensure everyone who will be involved in the way the new process is performed attends the training.

Step 4: Develop a list of training sessions and people (including owner/mangers where appropriate) who need to attend.

Step 5: Develop a training schedule and notify employees of what they will need to attend and the details of when and where.

Step 6: Decide on how the training will be provided: Training can be organized /run by in-house experts or outsourced to specialists, some processes can be trained using commercially available video products

Step 6: Assist in provision of the training

LAP Test -1	Practical Demonstration

Name: _____ **Date:** _____

Time started: _____ **Time finished:** _____

Instruction I: Given necessary templates, tools and materials you are required to perform the following tasks within *80 hours.*

Task 1: Implement quality assurance

Task 2: Prepare an induction training to new staff

Instruction Sheet	Learning Guide 39: Monitor quality of work outcome

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

- Identifying quality requirements
- Inspecting inputs to confirm capability to meet quality requirements
- Conducting work to produce required outcomes
- Monitoring work processes to confirm quality of output and/or service.
- Adjusting processes to maintain outputs within specification.

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

- Identify quality requirements
- Inspect inputs to confirm capability to meet quality requirements
- Conduct work to produce required outcomes
- Monitor work processes to confirm quality of output and/or service.
- Adjust processes to maintain outputs within specification.

Learning Instructions:

1. Read the specific objectives of this Learning Guide.
2. Follow the instructions described below
3. Read the information written in the “Information Sheets 1- 5”. Try to understand what are being discussed.
4. Accomplish the “Self-checks 1, 2, 3, 4 and 5 ” in each information sheets on pages 91, 96, 99, 102 and 104.
5. Ask from your teacher the key to correction (key answers) or you can request your teacher to correct your work. (You are to get the key answer only after you finished answering the Self-checks).
6. If you earned a satisfactory evaluation proceed to “Operation sheets 1 on pages 105 do the LAP Test on page 106”. However, if your rating is unsatisfactory, see your teacher for further instructions or go back to Learning Activity.
7. After accomplishing the Operation sheets and LAP Tests, ensure you have a formative assessment and get a satisfactory result; then proceed to the next LG.

Information Sheet-1	Identifying quality requirements

1.1 Introduction

At its simplest, a standard is an agreed, repeatable way of doing something. From a practical perspective, standards are those that are recognized by a business as important enough to be published and monitored for continuous improvement. Before monitoring work outcome of any organizational activity the requirements should be known first otherwise we cannot measure the effectiveness of each activity.

1.2 Quality requirements

Quality requirement is defined as the condition used to assess the conformance of the project by validating the acceptability of an attribute or characteristic for the quality of a particular result.

In a nutshell, the quality requirement defines the expectations of the customer for quality, the internal processes as well as the attributes of products that indicate whether the quality factors are satisfied or not.

The quality requirements are defined in terms of the quality criteria, quality factors, and quality metrics. The quality criteria document the internal process and attributes of the product/service that will be monitored all throughout the work process. The quality factors document the perceived aspects of the user regarding the deliverables to determine if the work satisfies the expectations from customers. Lastly, the quality metrics document the indicators used to measure the quality of the product.

1.3 Irrigation water quality parameters

Before applying water to crops the quality of it should be checked and matched against the standard. The list of physicochemical routinely measured to determine irrigation water quality are pH, electrical conductivity (EC), calcium (Ca), magnesium (Mg), sodium (Na), carbonate (CO_3) or bicarbonate (HCO_3), chloride (Cl), sulfate (SO_4) and nitrate (NO_3).

Chemical data are used for mathematical calculations (SAR, RSC, % Na, KR and MH) for better understanding the suitability of groundwater quality for irrigation purposes. For

understanding and determination irrigation water quality recall unit of competency Monitor surface water system operation **(EIS IDD3 07 0317**)

1.4 Irrigation water quality requirements

In responding to the challenge of improving water quality, countries develop water quality standards for different purpose intended to protect public health. Recognizing this, the World Health Organization (WHO) has developed a series of normative "guidelines for irrigation water quality (table 9).

I. Sodium percentage (% Na)

EC and sodium concentration are very important in classifying irrigation water. The salts, besides affecting the growth of the plants directly, also affect soil structure, permeability and aeration, which directly affect plant growth.

% Na= $[(Na^{+} + K^{+})*100]/ (Ca^{2+}+Mg^{2+} + Na^{+} + K^{+})$

II. Sodium Adsorption Ratio (SAR)

While a high salt concentration in water leads to formation of saline soil, a high sodium concentration leads to development of an alkaline soil. The sodium adsorption ratio (SAR) parameter evaluates the sodium hazard in relation to calcium and magnesium concentrations.

SAR= $Na^{+}/ [(Ca^{2+} + Mg^{2+}) /2]^{0.5}$

III. Residual Sodium Carbonate (RSC)

Another way to examine the irrigation water is to estimate the residual sodium carbonate (RSC).The relative proportion of $HCO_3^{-} + CO_3^{2-}$ to the contents of $Ca^{2+} + Mg^{2+}$ is known as residual sodium carbonate (RSC). The RSC has the following equation

RSC= $(CO_3^{-}+HCO^{3})-(Ca^{2+}+Mg^{2+})$

Magnesium Hazard (MH)

Magnesium hazard (MH) value for irrigation water is given by the following equation.

MH= $Mg^{2+}/(Ca^{2+} + Mg^{2+}) *100$

classification	Class	Ranges

scheme		
RSC (mq/l)	Good	<1.25
	Medium	1.25 - 2.5
	Bad	>2.5
SAR	Excellent	0 - 10
	Good	10 -18
	Fair	18 - 26
	Poor	>26
MH (%)	Suitable	<50
	Unsuitable	>50
EC (us/cm)	Excellent	<250
	Good	250 – 750
	Permissible	750 – 2000
	Doubtful	2000 – 3000
	Unsuitable	>3000
TDS (mg/l)	Fresh	<1000
	Brackish	1000 – 10000
	Saline	10000 – 100000
	Brine	>100000
SSP	Excellent	<20
	Good	20 – 40
	Permissible	40 – 60
	Doubtful	60 – 80
	Unsuitable	>80

Table 9: irrigation water quality requirement

1.6 Construction quality requirement

Quality in construction industry can be defined as the attainment of acceptable levels of performance from construction activities. This performance would be attained when the activity meets or exceeds the requirement of the client or the owner. The quality of any product or service is achieved when it conforms to the desired specifications.

Examples of construction quality requirement includes

- Sand must be free from foreign material
- Maximum silt content of a san must not exceed 4%
- Aggregate should be varying size
- Water used for mixing and curing should be water used for drinking purpose
- Reinforcement bar must be free from rest
- Mix ratio of 1:2:3 should be used for retaining walls
- Water/cement ratios should be in the range between 0.4 and 0.65
- Curring must be 28 days
- Form work materials must be free from unwanted materials and should be painted inside with mould oil
- Maximum formwork removal time
- The standard batching box size should be 18*40*50
- Form work removal time should be

  Table 10. period of form work removal

S. No.	Description of structural member	Time Period
1	Walls, columns and vertical sides of beams	1 to 2 days
2	Slabs (props left under)	3 days
3	Beam soffits (props left under)	7 days
4	Removal of props to slabs	
	(a) For slabs spanning upto 4.5 m	7 days
	(b) For slabs spanning over 4.5 m	14 days
5	Removal of props to beams and arches	
	(a) Spanning upto 6 m	14 days
	(b) spanning over 6 m	21 days

- The transport time of any concrete should be as short as possible. Ideally, the concrete should be poured within 15 minutes after the mixing has been completed. When rotating drum trucks are used, a maximum of two hours is normally permitted for transport

- Placing and compaction of concrete should be done without causing any segregation of its ingredients. When placing the concrete, care need to be taken not to damage the formwork or dislodge the reinforcement
- The concrete should be placed in layers not higher than 30 cm when compacted by hand and in layers not higher than 60 cm when compacted by vibration
- Slabs and floors should be poured in one continuous operation to avoid any
- When compacting the vibrator is immersed into the concrete at regular intervals of half a metre a part
- Vibration should not be longer than 10 seconds in one place and the vibrator should be kept away from the formwork and reinforcement bars.

Self-Check -1	Written Test

Direction I: Matching item (2 point each)

Instruction: mach column A with the below listed question and write your answer on the answer sheet provided:

	A
A.	Construction materil specification
B.	SAR
C.	Quality requirement
D.	Greater than 50

1. Irrigation water quality paramter
2. the condition used to assess the conformance of the project by validating the acceptability of an attribute or characteristic for the quality of a particular result
3. Acceptable level of magnizium hazard
4. Sand must be free from foreign material

Note: **Satisfactory rating - 4 points and above** **Unsatisfactory - below 4 points**

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

Answer Sheet-1

Score = _____

Rating: _____

Name: _____ Date: _____

Direction I: Maching Questions

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

Information Sheet-2	Inspecting inputs to confirm capability to meet quality requirements

2.1 Introduction

Inspection is an important tool to achieve quality concept. It is necessary to assure confidence to manufacturer/service provider and aims satisfaction to customer. Inspection is an indispensable tool of modern manufacturing process. It helps to control quality, reduces manufacturing costs, eliminate scrap losses and assignable causes of defective work.

2.2 Inspection

The inspection and test unit is responsible for appraising the quality of incoming raw materials and components as well as the quality of the manufactured product or service. It checks the components at various stages with reference to certain predetermined factors and detecting and sorting out the faulty or defective items. It also specified the types of inspection devices to use and the procedures to follow to measure the quality characteristics.

Inspection only measures the degree of conformance to a standard in the case of variables. In the case of attributes inspection merely separates the nonconforming from the conforming. Inspection is the most common method of attaining standardization, uniformity and quality of workmanship. It is the cost art of controlling the production quality after comparison with the established standards and specifications. It is the function of quality control. If the said item does not fall within the zone of acceptability it will be rejected and corrective measure will be applied to see that the items in future conform to specified standards.

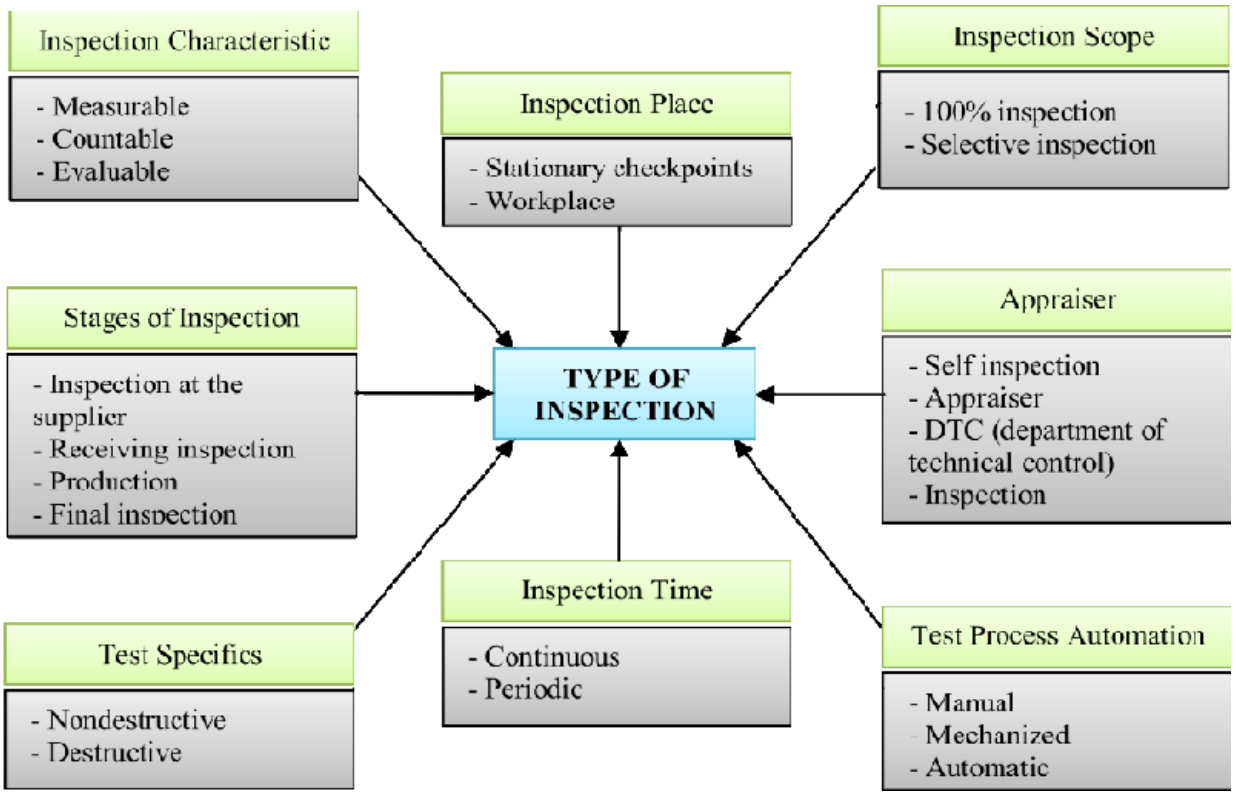


Figure 6 inspecting characteristic

2.3 Methods of inspection

The two types of inspection are

1. Direct inspection
2. Indirect inspection

Direct inspection: Inspection of inputs can be through visual inspection where a person walking through the organization where inputs are placed and ready for production or service and physically inspecting the condition visually. Example of visual inspection is inspecting whether appropriate mix design (1:2:3) are used in construction of irrigation structures.

Indirect inspection: refers to the use of technology for helping to inspect instead of the person who walk through.

Sometimes inspection cannot be conducted using visual inspection which does the simple and easy method, taste/measurement is recommended. Example of testing method is checking the compressive strength of concrete that is used for the construction of irrigation structures or tasting the water quality that is used for irrigation purpose.

2.4 Inspecting inputs

Inspections of inputs in the organization help clarify production requirements and specifications and firmly establish whether the manufacturer/service provider will be able to deliver on the promise to produce a quality product/service using the correct inputs and manufacturing process. Inspection may be carried out initially inline and final inspection. Initial inspection focused mainly on the quality of row materials. This can be under the Pre-product inspections are carried out before production begins and up until 20% of production has been completed. An important part of the Initial Production Check, is to inspect the first item to come in to the production line for process. This is the first and last chance to physically or test inspects the input and spots any defects so corrections can be made ahead of the process**.**

Input inspection includes:

- Material inspection
- Workmanship inspection
- Tools/equipment/machine inspection

2.5 Input Inspection checklist

Inspection is supported with checklists. There is no hard and fast rule for the preparation of inspection checklist, depending on the required inspection type, method any organization can prepare its own checklist. Examples of construction input inspection checklist are given below. The inspection report can also be presented by separate inspection report.

Inspection checklist

Inspection Location: Irrigation site **Date of Inspection: 15/10/2020**

Department/Areas Covered: Construction **Time of Inspection: 4:00 A.M**

No	Activities	Yes/no	Remark
1	Sand free from foreign material	N	The sand contain debris
2	Silt content of a san must not exceed 4%	N	The silt content is 10%
3	Aggregate are varying size	Y	
4	Water used for mixing and curing should be water used for drinking purpose	Y	

5	Reinforcement bar must be free from rest	Y	
6	Presence of skilled person	Y	
7	Mixers are secured and in position	Y	

Inspected by: _____

Table 11. inspection checklist

Inspection Report

Inspection Location: _____ **Date of Inspection:** _____

Department/Areas Covered: _____ **Time of Inspection:** _____

Observations		**For Future Follow-up**		
problem	Recommended Action	Responsible Person	Action Taken	Date

Copies to: _____ Inspected by: _____

Table 12. inspection report

Self-Check -2	Written Test

Direction I: Multiple Choice Questions (2 point each)

Instruction: Choose the best answer of the following questions and write your answer on the answer sheet provided:

1. Which of the following statement is true about inspection?
   A. Inspection is an important tool to achieve quality concept
   B. Inspection is an indispensable tool of modern manufacturing process
   C. Inspection only measures the degree of conformance to a standard in the case of variables
   D. All

2. In which method of inspection a person walk through the organization and observe the activities
   A. Visual inspection
   B. Testing
   C. Measurement
   D. All

3. Identify inspection of inputs?
   A. Material inspection
   B. Workmanship inspection
   C. Tools/equipment/machine inspection
   D. All

Note: **Satisfactory rating – 3 points and above** **Unsatisfactory - below 3 points**

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

Answer Sheet-2

Score = _____
Rating: _____

Name: _____ Date: _____

Direction I: Multiple Choice Questions

1. .....
2. .....
3. .....

Information Sheet-3	Conducting work to produce required outcomes

3.1 Conduct work according to specification

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. After inspection has been performed through monitoring process work should be conducted to produce the required outcome because monitoring activity will give us the chance to be in line with the organizational requirement in terms of quality specification.

Self-Check -3	Written Test

Direction I: Short answer (4 points)

Instruction: Give short answer for the following questions and write your answer on the answer sheet provided in the next page:

1. Monitoring help to conducting work to produce required outcomes. Explain? (4 points)

Note: **Satisfactory rating - 2 points and above** **Unsatisfactory - below 2 points**

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

Answer Sheet-3

Score = _____

Rating: _____

Name: _____ Date: _____

Direction I: Give short answer

1. .....
   .....
   .....

.

Information Sheet-4	Monitoring work processes to confirm quality of output and/or service

4.1 Introduction

Monitoring process determine how well our plans are being implemented. If we monitor the work process starting from the input phase the outcome will be as required as guided by organizational policy regarding quality requirement 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 include 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

4.2 Monitoring quality requirement

Monitor and control activities to ensure quality results. This means you:

- Check that there are sufficient resources available to complete work activities within your own area of responsibility.
- Follow legal and standard operational requirements to monitor your work.
- Monitor consistently the variances in work activities against specifications.
- Complete all relevant quality checks correctly and accurately.

4.3 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. Any aspect of work operations can be monitored with a view to improvement.

These can include:

- The procedures or systems that exist
- The workflow – that is the order in which things are done
- Whether or not there are gaps or overlaps in service provision
- The workload of staff
- The time it takes to do a task or job
- Job design
- 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.

4.4 Reporting quality requirement

Report on quality of work activities against specifications

This means you:

- Report all instances of noncompliance accurately and promptly to relevant person(s).
- Identify and report opportunities for improvement in work activities to relevant person(s).
- Identify implications of changes on quality control mechanisms and make sure that the change is documented accurately.
- Access information from appropriate sources to support your report and recommendations.
- Complete all quality records accurately and in line with operational procedures

Self-Check -4	Written Test

Direction I: Short answer (8 points)

Instruction: Give short answer for the following questions and write your answer on the answer sheet provided in the next page:

1. What is monitored in a quality environment? (2 points)
2. How do you report on quality of work activities against specifications? (4 points)
3. What is the importance of monitoring process? (2 points)

Note: **Satisfactory rating - 4 points and above** **Unsatisfactory - below 4 points**

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

Answer Sheet-4

Score = _____

Rating: _____

Name: _____ Date: _____

Direction I: Give short answer

1.....
.....
.....

2.....
.....
.....

3.....
.....
.....

Information Sheet-5	Adjusting processes to maintain outputs within specification

5.1 Introduction

A process has been defined as a sequence of interdependent procedures, operations or steps that consume resources and convert the inputs into outputs. Each operation or step adds to the next to achieve a goal or desired result. In every process, there exists a certain amount of variation. Variation in a process cannot be eliminated, but it can be measured, monitored, reduced and controlled.

Even though we have monitored the inputs as well as the process of any organizational work, still we cannot make it 100%. This will trigger us to adjusting processes to maintain outputs within specification. Depending up on the result from monitoring data different adjustment will be given.

5.2 Process adjustment

Process control is important methods that have been used for improving product quality and process productivity. PC is used for process monitoring and for process adjustment. PC reduces variability by adjusting the process to keep the product variability on target.

In order to achieve this high level of final product quality, organizations should be producing low variability product at every step of the manufacturing process. Rather than wait till the end of the process to discover poor quality product/service, they should be monitoring, in real-time, raw materials and the intermediate steps in our process. When they discover unusual variability the lofty aim is to make (permanent) process adjustments to avoid that variability from ever occurring again.

Notice here that process monitoring is not intended to be automatic feedback control. It has the same principles of quantifying unusual operation (errors), but the intention with process monitoring is:

- that any process adjustments are infrequent,
- these adjustments are made manually,
- and take place due to special causes.

Automatic feedback control is applied continuously by computer systems and makes short-term, temporary changes to the system to keep it at the desired target.

Self-Check -5	Written Test

Direction I: Short answer (2 points)

Instruction: Give short answer for the following questions and write your answer on the answer sheet provided in the next page:

1. Why adjustment of process is important? (2 points)

Answer Sheet-5

Score = _____

Rating: _____

Name: _____ Date: _____

Direction I: Give short answer

1.....
.....
.....

Note: **Satisfactory rating - 1 points and above** **Unsatisfactory - below 1 points**

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

Operation Sheet -1	Monitoring quality of work outcome

Procedures for monitoring quality of work outcome

Steps

Step 1: Work out what needs to be monitored

Generally, things to be monitored include:

- Areas showing early warning signs things are not going according to plan
- Areas of critical activity to the organization
- Areas due for scheduled review.

Step 2: decide on methods or measurement to use

- Observation
- Statistical and written reports
- Surveys
- Checklists
- Flowcharts
- Benchmarking

Step 3: Compare what is happening with what should be happening

- Here you review and analyze what's actually happening.
- You may refer back to your original goals, objectives or targets and, using various tools, compare your progress against these targets.
- Sometimes you will realize your original target was unrealistic or there have been changes that require you to adjust your original target

Step 4: Take appropriate action

LAP Test -1	Practical Demonstration

Name: _____ **Date:** _____

Time started: _____ **Time finished:** _____

Instruction I: Given necessary templates, tools and materials you are required to perform the following tasks within *30 hours.*

Task 1: Monitoring quality of work outcome

Instruction Sheet	Learning Guide 40: Participate in maintaining and improving quality at work

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

- Monitoring work area, materials, processes and product routinely
- Identifying and reporting non-conformance in inputs, process, product and/or service
- Taking corrective action within level of responsibility, to maintain quality standards.
- Raising quality issues with designated personnel.

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

- Monitor work area, materials, processes and product routinely
- Identify and report non-conformance in inputs, process, product and/or service
- Take corrective action within level of responsibility, to maintain quality standards.
- Raise quality issues with designated personnel.

Learning Instructions:

1. Read the specific objectives of this Learning Guide.
2. Follow the instructions described below
3. Read the information written in the “Information Sheets 1- 4”. Try to understand what are being discussed.
4. Accomplish the “Self-checks 1, 2, 3, and 4 ” in each information sheets on pages 112, 123, 131 and 137.
5. Ask from your teacher the key to correction (key answers) or you can request your teacher to correct your work. (You are to get the key answer only after you finished answering the Self-checks).
6. If you earned a satisfactory evaluation proceed to “Operation sheets 1 and 2 on pages 138 and 139, do the LAP Test on page 141. However, if your rating is unsatisfactory, see your teacher for further instructions or go back to Learning Activity.
7. After accomplishing the Operation sheets and LAP Tests, ensure you have a formative assessment and get a satisfactory result; then proceed to the next LG

Information Sheet-1	Monitoring work area, materials, processes and product routinely to ensure compliance with quality requirements

1.1 Introduction

Monitoring is the systematic process of collecting, analyzing and using information to track a programme progress toward reaching its objectives and to guide management decisions. To endure compliances with quality requirement of work are, material, process and product monitoring is essential.

1.2 Monitoring

Monitoring is a process of continual gathering of information and assessment of it in order to determine whether progress is being made towards pre-specified goals and objectives, and to highlight whether there are any unintended (positive or negative) effects from a project and its activities. It is an integral part of the project cycle and of good management practice.

Monitoring systems provide managers and other stakeholders with regular information on progress relative to targets and outcomes. This enables managers to keep track of progress, identify any problems, alter operations to take account of experience, and develop any budgetary requests and justify them. This enables the early identification of problems so that solutions can be proposed. It is considered to be a critical part of good management.

1.3 When should monitoring take place?

The time when monitoring should take place is

1. Monitoring is a continuous process that occurs throughout the life of a program
2. To be most effective, monitoring should be planned at the design stage of a program, with all the resources (time, money, and personnel) that will be required calculated and allocated in advance.
3. Monitoring should be conducted at every stage of the program, with data collected, analyzed, and used on a continuous basis.

1.4 Methods of monitoring

The methods chosen for monitoring performance are generally built into the planning process. It is a good idea when planning to keep in mind the reporting on the success or otherwise of goals. It is frustrating to set a goal but not be able to say whether or not it has been achieved.

There are many tools or methods available to monitor progress or outcomes of work operations.

Some examples are:

- Reports – statistical, financial, written or verbal
- Obtaining customer feedback – verbal or written, individual or focus groups, structured or unstructured in format
- Using a pretend customer – getting someone to pretend to be a customer in your premises and then critically feeding back what it was like, what could be improved etc.
- Walking about the premises and observing what takes place and how it could be improved, what could be improved
- Use of checklists to tick off whether or not required service points are being adhered to by front line staff when they interact with customers
- Brainstorming sessions where staff are asked to contribute any thoughts or ideas they may have about improving a particular aspect of service, or about introducing a new initiative
- Staff input and review – obtaining „grass roots" input to potential and actual problems, and asking those directly concerned about how the situation can be resolved

1.4 Monitoring work area, materials, processes and product

At each and every point of monitoring detail monitoring of work area, materials, processes and product/service should be inspected using different methods should be conducted.

Monitoring work area in irrigation sectors includes: monitoring the effectiveness of the workers, tools/equipments/machines and the irrigation site setup. Not only the work area is monitored but also the materials/inputs of the irrigation system such as water, fertilizers …

furthermore the process of irrigation system and the output of the system should also be monitored.

1.5 Types of indicators, reasons for monitoring and potential actions

Consideration should be given to the need for monitoring when options are described in a policy brief. The extent to which monitoring is necessary and what exactly should be monitored will depend on how much uncertainty there is regarding the inputs, activities, outputs, and impacts of an option

Table 13. Types of indicators, reasons for monitoring and potential actions

Types of indicator	Definitions	Reasons for monitoring	Potential actions
Inputs	Financial, human, and material resources	Uncertainty about the magnitude of the resources required	Adjustments to the budget
Activities	Ways in which inputs are used	Uncertainty about how resources will be used, or to ensure that resources are used as intended	Changes in how resources are allocated or used
Outputs	Services provided, changes or short-term effects of activities	Uncertainty about the immediate effects of activities	Changes in the budget, how resources are used and the activities that are undertaken, or a decision to continue or discontinue the implementation of the option
Impacts	Desirable and undesirable effects that are important to those affected	Uncertainty about the extent to which outputs accurately and comprehensively reflect the likely impacts of the option	Changes in the services provided or their provision, or a decision to continue or discontinue the implementation of the option, or the undertaking of an impact evaluation

Self-Check -1	Written Test

Direction I: short answer (12 point each)

Instruction: Give short answer for the following question and write your answer on the answer sheet provided:

1. Define monitoring. Explain its purpose? (2 point each)
2. When should monitoring take place? (2 point each)
3. List and explain the methods of monitoring? (6 point each)
4. Explain about monitoring work area, materials, process and output monitoring of irrigation system. (2 point each)

Note: **Satisfactory rating - 6 points and above** **Unsatisfactory - below 6 points**

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

Answer Sheet-1

Score = _____

Rating: _____

Name: _____ Date: _____

Direction I: short answer questions

1. .....
2. .....
3. .....
4. .....
5. .....

Information Sheet-2	Identifying and reporting non-conformance in inputs, process, product and/or service

2.1 Introduction

Non-conformances are problems that have been found and need be addressed. They can be found anywhere – in a product, in service delivery, in work execution, in a process or even in the Quality Management System itself.

Non-conformances are a core pillar of a Quality Management System (QMS). The QMS will require you to document and maintain a record of non-conformances, actions taken to address the issue and record of close-out of the issue.

2.2 Types of non-conformance

There are two types of non-conformance namely

1. Minor non-conformance
   - Isolated occurrence
   - Minimal customer impact
   - Issue can be resolved quickly / efficiently
   - Creates little / no waste
2. Major non-conformance
   - Regulatory requirements issue
   - Causes major delay impacting schedule
   - Results in rework or cost overrun
   - Same minor issue repeated frequently

What You Need

1. A Quality Management System (QMS)
   - Business processes to manage quality in the organization and in work product delivery.
2. Non-Conformance Report (Form)
   - A way to efficiently and consistently capture identified non-conformances
3. Non-Conformance Register
   - A log of identified non-conformances
4. Actions / Corrections

- Document what you are doing to fix it

5. Correction Verification
   - Objective evidence of what was done against each documented action to fix the problem
6. Correction Acceptance
   - Sign-off on verification that NCR is closed
7. Root Cause Analysis (RCA)
   - Drill in to get to the heart of what went wrong using an RCA method like 5-Why
8. Corrective Actions
   - Do any significant systemic changes need to be made to the quality management system

Table 14. Non conformance register example

#	Issue	Raised By	Raised	Findings	Actions	Evidence	Status	Closed
001	Defect in	J. Smith	1/1/2015	Steel beam structurally damaged	Replace	New beam received (see report)	Closed	1/5/2015

Table 15. Non conformance report form

NONCONFORMANCE REPORT (NCR)

Identification

Originator	Organization	Date	Report Number

Nonconformance Description (Describe the nonconformance; ensure the applicable requirements, planned activities, procedures, specifications, drawing, standards, serial numbers, etc. are noted. Indicate who documented the nonconformance.).

Risk Level

Steps to Prevent Inadvertent Use of the Item or Process

Corrective/Preventive Action and Disposition

Planned Corrective/Preventive Action (Describe for each cause what action(s) will be taken with the item or process, including, as applicable, the completion dates, disposition of material, and responsible staff for each action. Describe, as applicable, what actions are needed to prevent recurrence of the identified nonconformance, such as process improvement, procedure revisions, training plan, etc., and include completion dates and responsible staff for each action.).

Independent verification required? Yes ☐ No ☐

Person(s) Responsible for the Corrective/Preventive Action and Disposition	Approval of Corrective/Preventive Action and Disposition
_____	_____
Name *Date*	*Name* *Date*

Closing the Nonconformance

Action Completed	Independent Verification Completed (if required)
_____	_____
Name *Date*	*Name* *Date*

Distribution:

EMSMR/CFT Member Initial ☐ Final ☐

2.3 Root Cause Analysis (RCA):

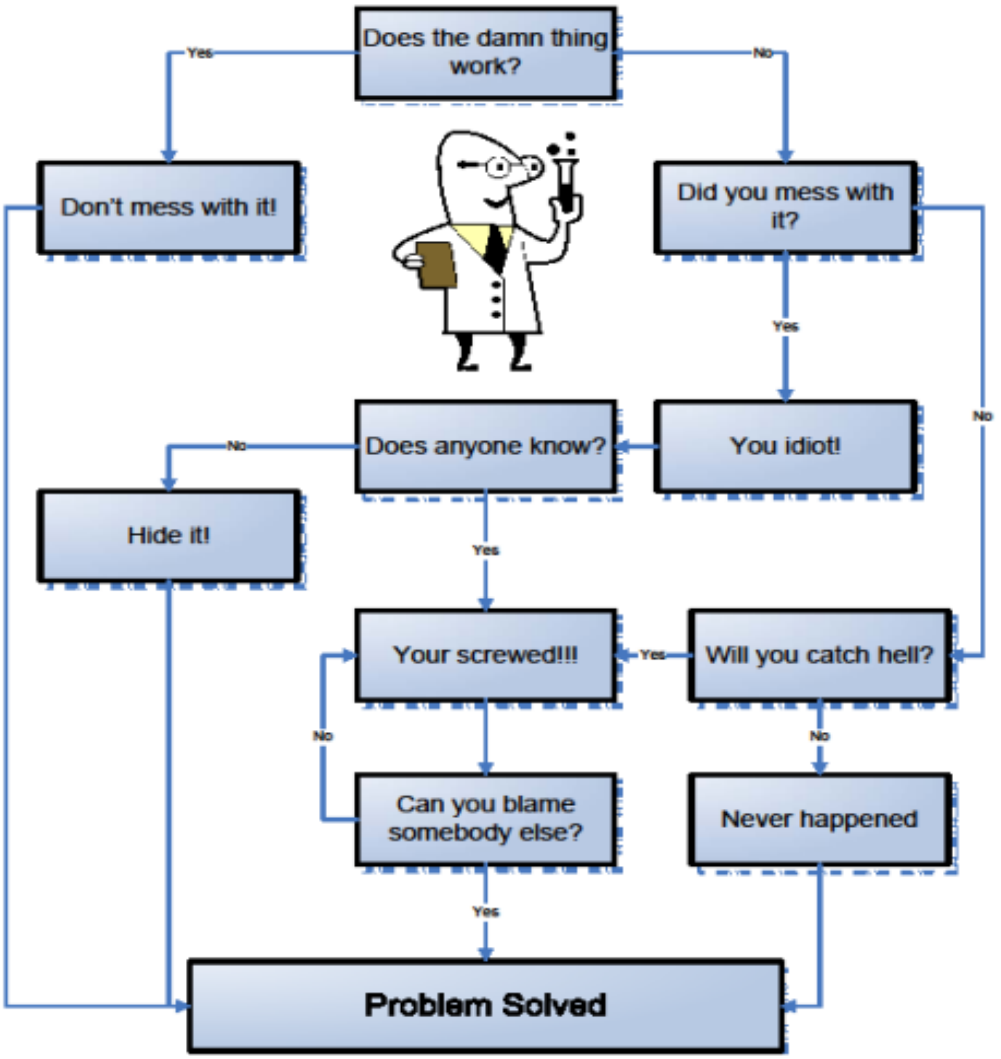


Figure 7. Root cause analysis

Root cause analysis is a technique used to identify the conditions that initiate the occurrence of an undesired activity or state.

The process of problem solving used to identify the underlying or initiating source of a nonconformance.

Investigate

Interview

- Don't be a cop
- No personal agenda
- Be friendly
- Explain the process
- Listen

Examine the Evidence

- Understand how the process is intended to work.
- Evaluate all evidence for nonconformance.
- Involve individuals independent from the process if possible

Identify Contributing Causes

Use data gathered

- Documentary evidence
- Interview

Don't stop at;

- human error
- insufficient training

Tools

Cause Analysis

- 5 Whys
- Fishbone Diagram (Ishikawa)
- Fault Tree Analysis
- Risk Assessment
- Pareto analysis (80/20 rule)
- Failure mode and effects analysis (FMEA)

1. 5 Whys

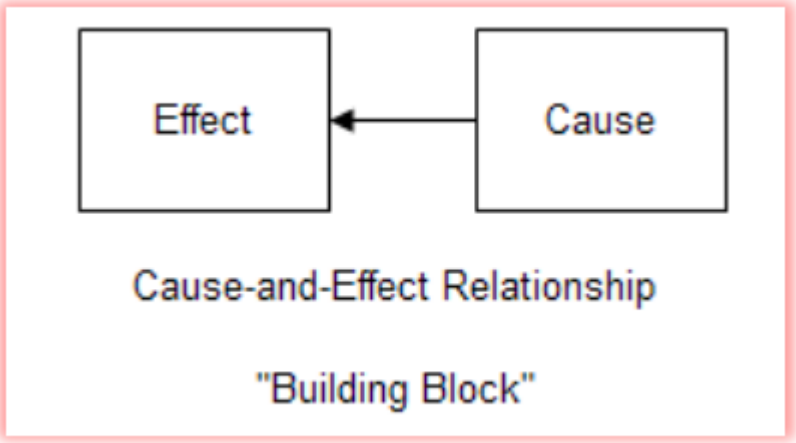


Figure 8. Cause and effect relationship

Ask: “Why did this happen?” Write down the response, then ask the question again. Write down the response. Ask the question 5 -6 times and you may get to the “root cause” of the problem. May ask what and when questions,

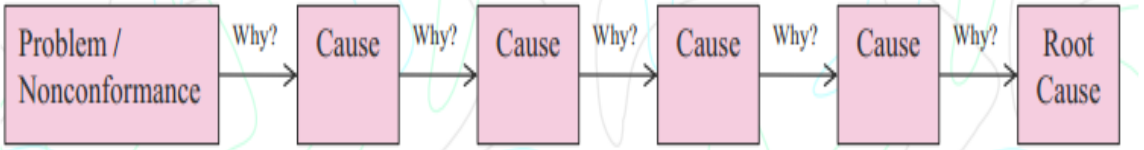


Figure 9. 5W

5 Whys Example:

1. Why won’t the car start?

   The engine won’t turn over.

2. Why won’t the engine turn over?

   The battery is dead.

3. Why is the battery dead?

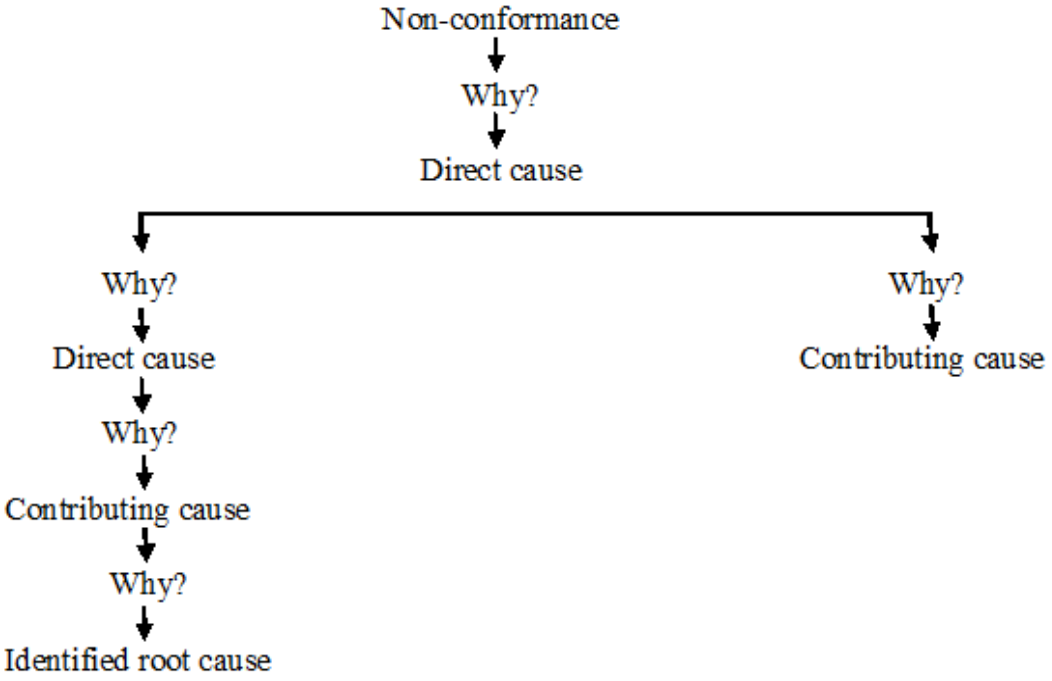
   The alternator is not functioning.

4. Why is the alternator not functioning?

   The belt is broken.

5. Why is the alternator belt broken?

The belt was not replaced according to the manufacturer's maintenance schedule.



2. Fishbone Diagram

The system failure is described in a box to the right of the diagram.

Add Bones

- Categories (4 M's)
    - Man Power (Personnel)
    - Machines (Equipment)
    - Materials (Reagents and Supplies)
    - Methods
- Primary Causes
- Secondary Causes

People (manpower) includes: Training, verbal miscommunication, lack of communication, staff changed mid-project

Process/Methods include:

– Procedures, workflow,

– Measurement (Calibrations performed, but were they appropriate?)

Equipment (machines)

– Defective, not maintained, not calibrated, overloaded

Management

– Reviewed annually?

Environment

– Temperature, humidity, work area, distractions

Materials

– Incorrect, degradation, certificates of analysis

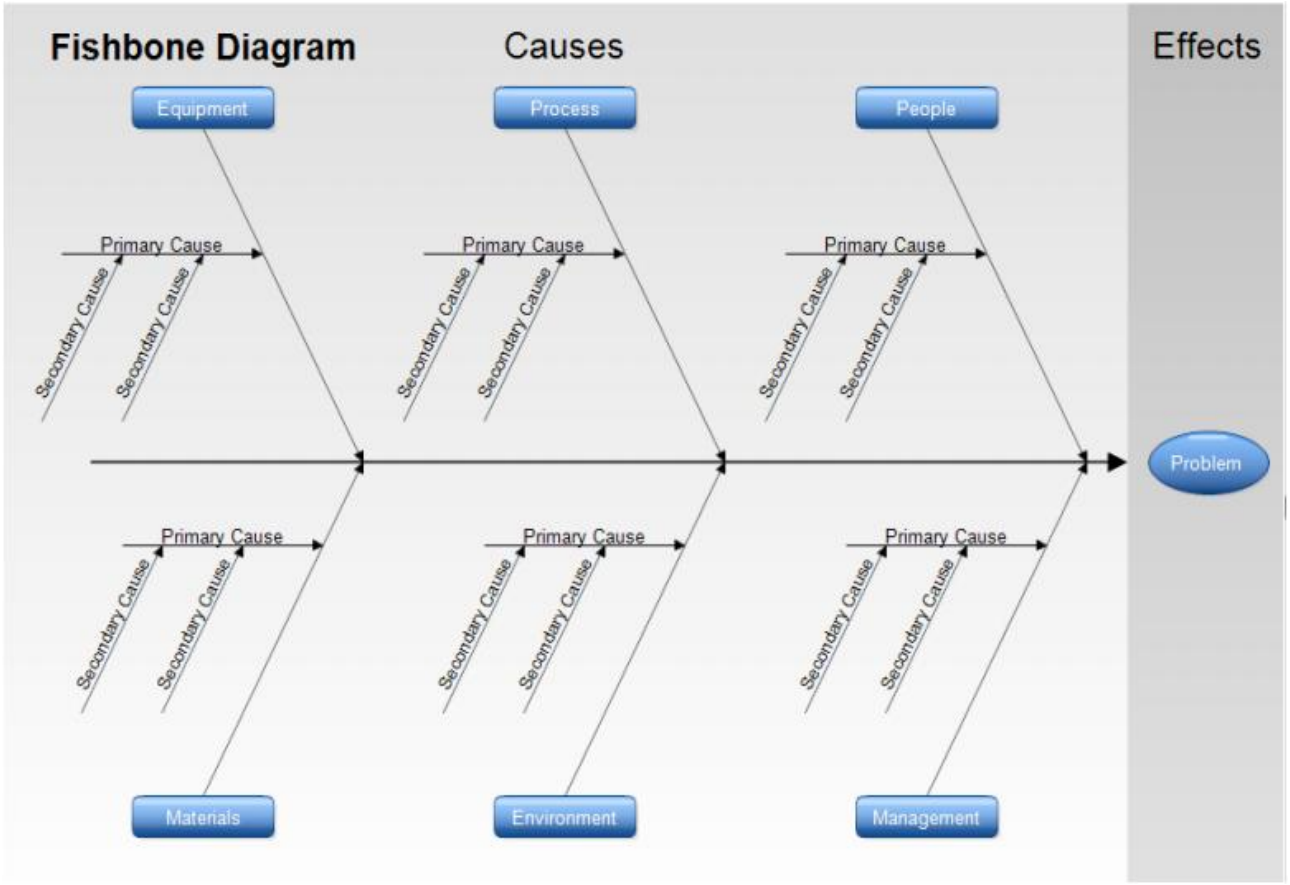


Figure 10. Fish bone

3. Fault Tree Analysis

- Top down analysis.
- Start with the system failure and work down to the root cause.
- Uses common logic symbols.

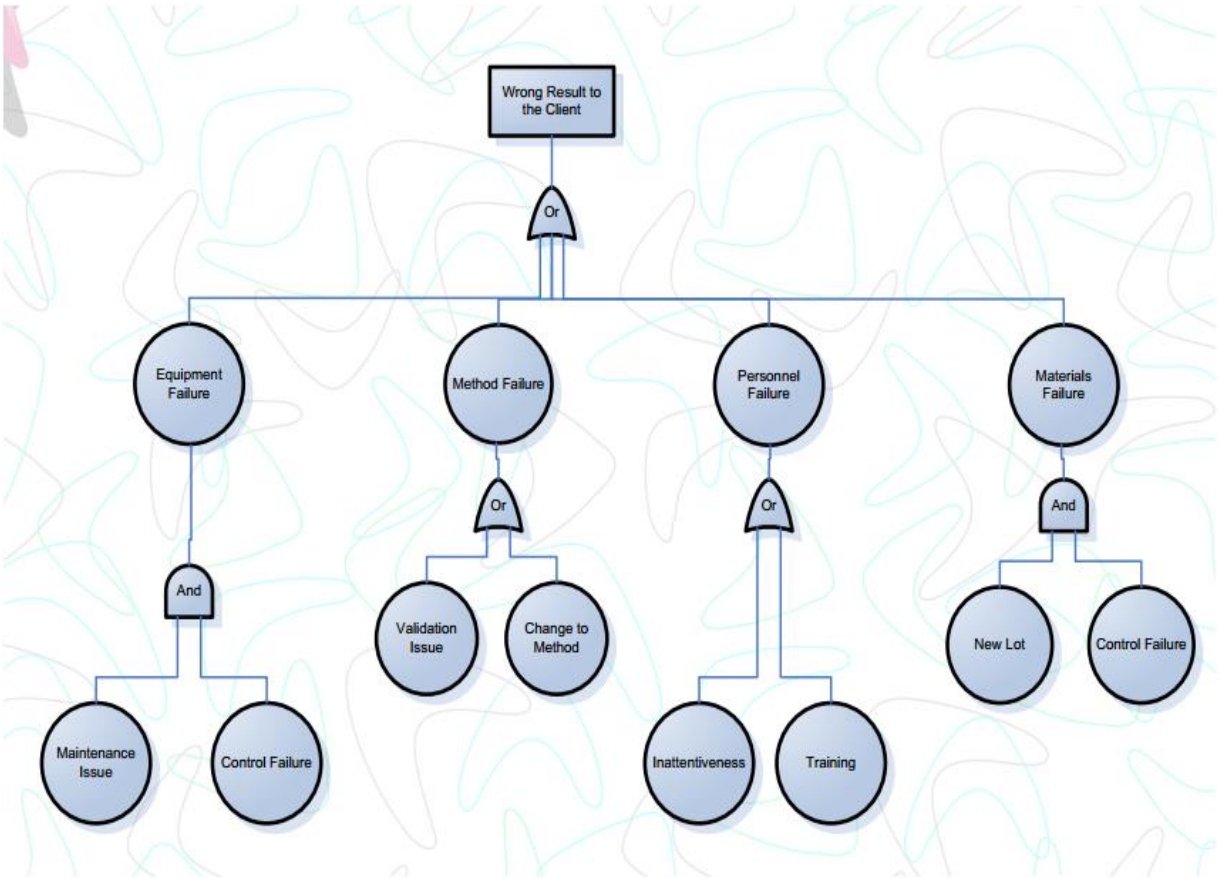


Figure 11. Fault tree analysis

4. Pareto Analysis

- 80% of the problems are produced by 20% of the possible causes
- 80% of the customer complaints arise from 20% of our services

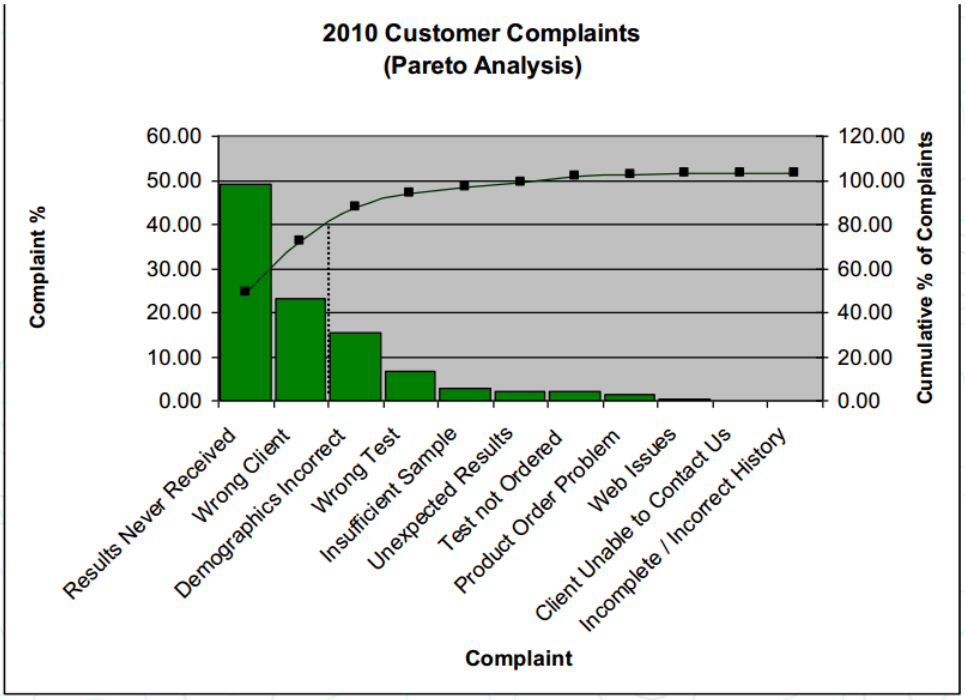


Figure 12. Pareto analysis example

5. Failure mode and effects analysis (FMEA)

Evaluate each of the possible system failures utilizing the following.

- Severity of Failure (Rank 1 – 10)
- Probability of Reoccurrence (Rank 1 – 10)
- Ability to Control (Rank 1 – 10)

(Severity) x (Probability) x (Control) = Risk Priority

Table 16. Risk priority

Failure	Severity	Probability	Control	Risk
Wrong Client Selected at Data Entry	8	3	7	168
Client Does not Receive Results, but are on Web View	4	4	7	112

Self-Check -2	Written Test

Direction I: Multiple Choice Questions (2 point each)

Instruction: Choose the best answer of the following questions and write your answer on the answer sheet provided:

1. Non-conformances are problems that have been found and need be addressed. They can be found in----------
   A. a product
   B. in service delivery
   C. in work execution
   D. All
2. Identify the major non-conformance
   A. Isolated occurrence
   B. Minimal customer impact
   C. Same minor issue repeated frequently
   D. Creates little / no waste
3. The Identify minor non-conformance
   A. Regulatory requirements issue
   B. Issue can be resolved quickly / efficiently
   C. Causes major delay impacting schedule
   D. Results in rework or cost overrun
4. A technique used to identify the conditions that initiate the occurrence of an undesired activity or state is?
   A. Root cause analysis
   B. Non conformance logo
   C. Non conformance register
   D. Quality management
5. Which type of root cause analysis emphasize on for cause and effect relation be
   A. Fish diagram
   B. Fault tree analysis
   C. 5W
   D. Pareto analysis (80/20 rule)

Note: **Satisfactory rating – 5 points and above** **Unsatisfactory - below 5 points**

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

Answer Sheet-2

Score = _____
Rating: _____

Name: _____ Date: _____

Direction I: Multiple Choice Questions

1. .....
2. .....
3. .....
4. .....
5. .....

Information Sheet-3	Taking corrective action within level of responsibility, to maintain quality standards

3.1 Introduction

Corrective action is the action taken to eliminate the causes of an existing nonconformity, defect or other undesirable situation in order to prevent recurrence. It deals with a nonconformity that has occurred. It is usually a set of actions that laws or regulations require an organization to take in manufacturing, documentation, procedures, or systems to rectify and eliminate recurring nonperformance. It must be systematically implemented and observed for its ability to eliminate further recurrence of non-conformation. Non-conformance may be a market complaint or customer complaint or a failure of machinery or a quality management system, or misinterpretation of written instructions to carry out a work.

3.2 What needs corrective action?

Corrective action is an aspect of quality management that aims to rectify a task, process, product, or even a person's behavior when any of these factors produce errors or have deviated from an intended plan. Corrective actions can be thought of as improvements to an organization to eliminate undesirable effects. Corrective actions can apply to an entire project when the deliverables, whether tangible or service, deviate from the required output. Taking corrective action requires identifying the problem and implementing a potential solution.

What Needs Corrective Action?

- Nonconforming work : Nonconforming work is work that does not meet the defined requirements and requires rework this includes quality control failure or reporting error
- Audit deficiencies: during an internal audit, or audit from an external organization
- Complaints
- Departures from Policies and Procedures: the policies and procedures of the organization were not followed
- Proficiency Test failures: detected through proficiency

3.3 Corrective measures

Even among quality management professionals, confusion over the differences between corrective and preventive actions often persists, as people sometimes consider the two actions to be the same. Some of the confusion arose because ISO 9000 originally listed the two actions adjacent to each other, with corrective actions listed first. The revision of ISO 9000:2015 indicates that preventive actions are more of a culture and part of day-to-day good practice. Some organizations also mistake every instance of nonconformity for something that requires documentation — one way to create never-ending paperwork.

3.4. A Corrective action plan (cap):

CAP Is a step by step plan of action that is developed to achieve targeted outcomes for resolution of identified errors in an effort to identify the most cost-effective actions that can be implemented to correct error causes.

A corrective action plan (CAP) describes, step by step, how you plan to resolve a problem or nonconformity. A CAP details the resources needed to correct the causes of a problem in the most cost-effective and cost-efficient way. The plan's objectives and benefits include the following:

- It provides a standard way to address deficiencies.
- It offers premade templates that describe what types of information you need in your plan.
- It provides a process to start, research, implement, and close out a corrective action program.
- It clarifies team member or contractor responsibilities.
- It specifies what types of issues require a corrective action plan.

A corrective action plan should be very specific, such as when you're detailing a problem in a particular part in a production line. But it may also be general: For instance, you'll need to speak in broader terms when providing detailed guidelines for addressing different severities of hazardous waste sites throughout the country and generating the paperwork required for permitting construction in such conditions.

A plan or the template for dealing with troubles may detail interim measures to mitigate problems before you find a more comprehensive solution. Deadlines also apply to the

creation of corrective action plans. For example, regulatory entities may impose longer lead times, whereas issues in factories may require shorter turnaround times.

A corrective action plan may also include the following information:

- Stakeholders
- Resources available to solve the problem
- Constraints
- Due dates
- Metrics for completion progress updates

3.5. Preventive action

An action taken to eliminate the cause of a potential nonconformity, defect, or other undesirable situation in order to prevent occurrence. Preventive action is any proactive methodology used to determine potential discrepancies before they occur and to ensure that they do not happen (thereby including, for example, preventive maintenance, management review or other common forms of risk avoidance). Corrective and preventive actions both include stages for investigation, action, review, and further action if required. It can be seen that both fit into the PDCA (plan-do-check-act) philosophy as determined by the Deming-Stewart cycle.

3.6 Identification and control of non-conformances, corrective action and continuous improvement

3.6.1 Initiation of corrective action

Every employee is responsible for being aware of any existing or potential nonconformance of the activities of the quality System, in their or any functional section of the organization. This, therefore, means that anyone in the organization may propose initiation of corrective action by completing the top portion of the Corrective Action Report (CAR) Form. Nevertheless, only the Laboratory Director or the Quality Manager can authorize and request for their implementation. Corrective actions may be requested when a condition, which is adverse to quality or which has the potential for process improvement is identified. This includes nonconforming supplies received from a supplier.

The identified nonconformance is registered in the Corrective Action Report (CAR) Form provided by the quality manager. The Quality Manager records all CARs in the Corrective

Action Status Log. The Corrective Action Report (CAR) Form is assigned a serial number by the quality manager.

Table 17. Corrective action status logo

CORRECTIVE ACTION (CA) FORM

ACTION(S) TAKEN TO RESOLVE ISSUE AND PREVENT RECURRENCE: *Include SOP revision, staff training, purchase of standards or equipment, document/form revision, etc.*

Corrective Action(s)	Contact Person Responsible	Proposed Implementation Date	Date Completed	Evidence Of Completion
Additional Comments/Supplemental Information:				

Submitted By:		Date:
Reviewed By:	Responsible Supervisor or Manager	Date:

Table 18. Corrective action status logo

LOG NUMBER	RESPONSIBILITY	DATE OPENED	DATE CLOSED

3.6.2 Assessment of nonconformities

The assessment of the reported quality system non-conformances is carried out by all those involved including the Laboratory Director and the quality manager.

All corrective actions start with an investigation to determine the root cause(s) of the problem. A thorough analysis of all related processes, operations, quality records, and

specifications, which may have contributed to the deficiency, is conducted by the responsible function(s). All potential corrective actions are identified and the action(s) most likely to eliminate the problem and to prevent recurrence is selected. The investigation and analysis of the root cause and preventive measures shall be fully documented by the group or individual assigned to the problem. The analysis shall include review of all applicable data to determine the extent and cause of the problem and analysis of trends in processes or performance of work to prevent non-conformances.

This involves a search for the root cause of the nonconformance employing quality control problem solving tools in complicated cases.

All problems are evaluated in terms of potential impact on quality costs, performance, reliability, safety, and customer satisfaction. All problems are classified as either minor or major. Resolutions to all corrective and preventive actions are to a degree appropriate to the magnitude and the risk of the problem. Resolutions are reviewed and approved by the Quality Manager and/or Technical Manager. Where the response is unsatisfactory, the corrective action request is re-issued. The Quality Manager conducts periodic reviews/follow up to determine if the corrective and preventive actions have been implemented and are effective.

Every effort is made to ensure that the client's concerns are assuaged. If lab results are affected, then the customer is notified in writing.

3.6.3 Implementation of corrective measures

The corrective measures are implemented via the section supervisors and their subordinates. The responsibility for implementation includes recording the corrective measures executed on the Corrective Action Report (CAR) Form and passing this on to the quality manager. Suitable corrective measures may include:

(i) working out new Quality System Documentation
(ii) servicing, calibration, standardization of test facilities
(iii) decommissioning and/or exchange of test facilities
(iv) training of staff members
(v) improvement of the test methods

3.6.4 Monitoring the effectiveness of corrective action

On the basis of the corrective measures, the quality manager supervises the timing, realization and any further measures which may be necessary. The quality manager determines if the corrective measures executed are effective, e.g., by an internal quality audit. The effectiveness is determined by improvement to, and/or elimination of the nonconformity. Positive results are formally concluded and the success documented on the Corrective Action Report Form. If the results are negative, the assessment is reconvened. It is the responsibility of the quality manager to ensure that the results are communicated throughout the laboratory.

3.6.5 Preventive action

It is the responsibility of the quality manager to analyze the quality system activities, audit results, customer complaints, so as to detect and eliminate potential causes of nonconformities. When preventive actions have been identified, the Laboratory management Team will determine the actions that are required to prevent the potential non-conformances; and these are documented and monitored.

3.6.6 Documentation

All deviations or non-conformances and corrective measures are documented on the Corrective Action Report (CAR) Form and filed in the quality management according to Control of Quality Records Procedure.

Self-Check -3	Written Test

Direction I: Fill in the blank space (2 points each)

Instruction: fill in the blank space of the following questions from the given answers provided to you and write your answer on the answer sheet provided:

1. ---------- is the action taken to eliminate the causes of an existing nonconformity, defect or other undesirable situation in order to prevent recurrence
2. ---------- is work that does not meet the defined requirements and requires rework this includes quality control failure or reporting error
3. The revision of ISO 9000:2015 indicates that ---------- are more of a culture and part of day-to-day good practice
4. ---------- describes, step by step, how you plan to resolve a problem or nonconformity

Corrective action	preventive actions
Nonconforming work	A corrective action plan (CAP)

Note: **Satisfactory rating - 4 points and above** **Unsatisfactory - below 4 points**

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

Answer Sheet-3

Score = _____

Rating: _____

Name: _____ Date: _____

Direction I: Fill in the blank space

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

Information Sheet-4	Raising quality issues with designated personnel

4.1 Introduction

After corrective measure has been set for the identified non-conformity the next step will be to raise quality issues with the responsible person.

4.2 Quality audit

An audit is a systematic, independent and documented process for obtaining audit evidence and evaluating it objectively to determine the extent to which audit criteria are fulfilled

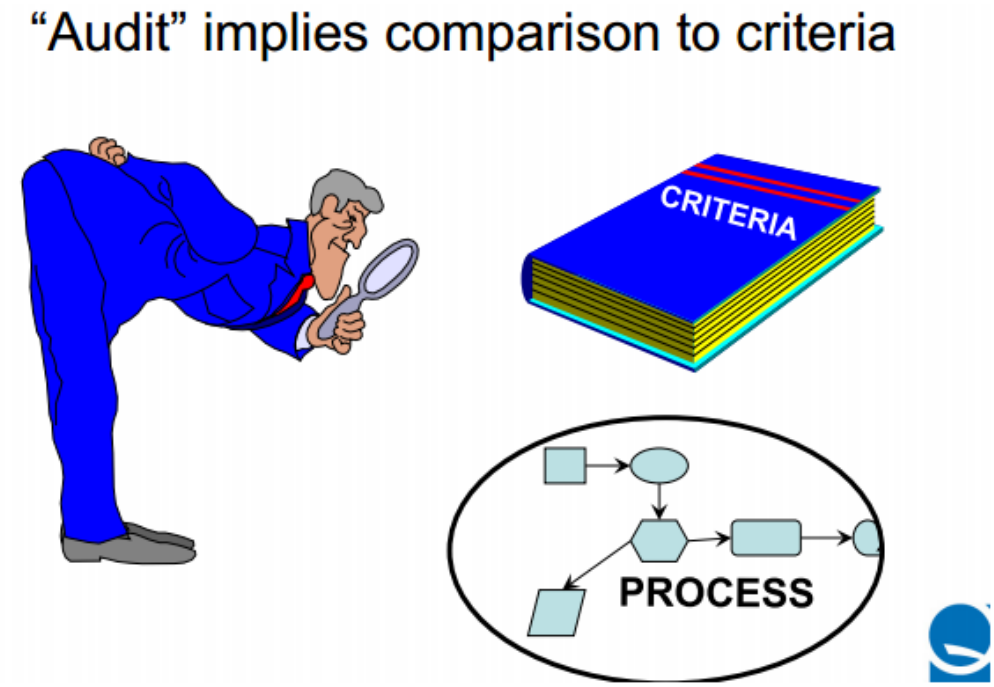


Figure 13. Auditing

Examples of auditing criteria includes: Standard operating procedures, quality system procedures, training procedures, calibration procedures, startup/shutdown procedures, maintenance procedures, emergency procedures, design procedures, records procedures, customer complaint procedures and specifications

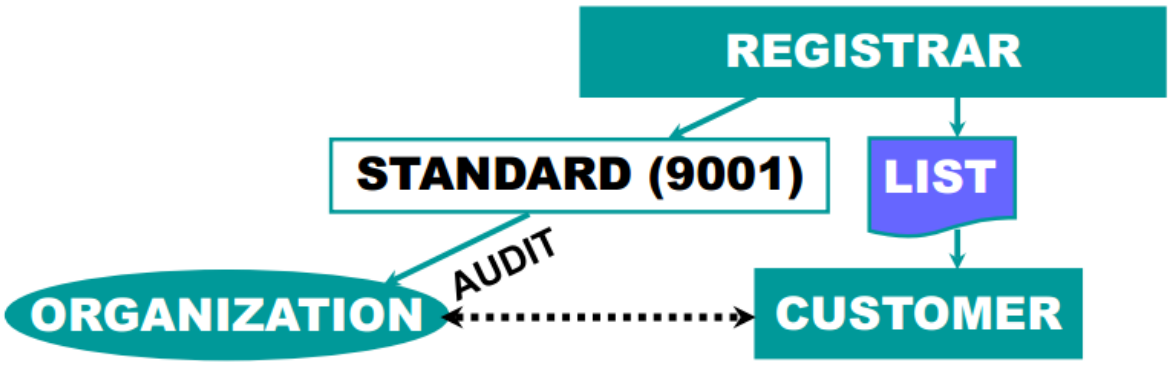
4.3 Types of audit

There are three types of audit program:

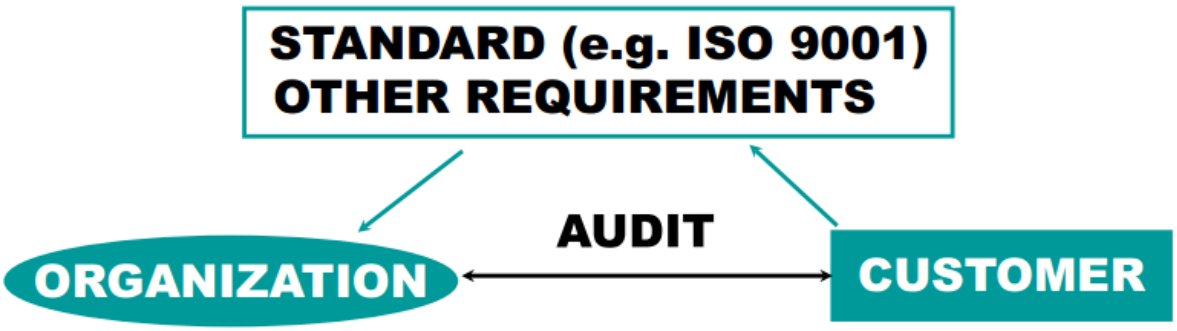
- third-party audit (international standard certification),
- second-party audit (customer audit) and

- internal audit(first party)

External independent audits – third party conformity to a specific standard



Customer audits are conducted at planned intervals and any customer's requests. If any nonconformity is found after the ISO 9001 and customer audits, the Quality Assurance team must conduct an internal audit.



Internal auditing is performed as a preventive and monitoring tool to ensure compliance and effectiveness of the QMS, and to identify opportunities for improvements.

4.4 Objectives of quality audit

The main objectives of the quality audit are:

1. Determining the conformity or non-conformity of the quality system elements with specified requirements.
2. Ensuring whether the products are fit for use, safe for the consumers and regulations are being followed.
3. There is conformance to specifications and that written procedures are suitable and are being followed.
4. Finding out whether the quality policies of organisations meet quality standards adequately.

5. The data system is able to provide adequate information on quality to all concerned.

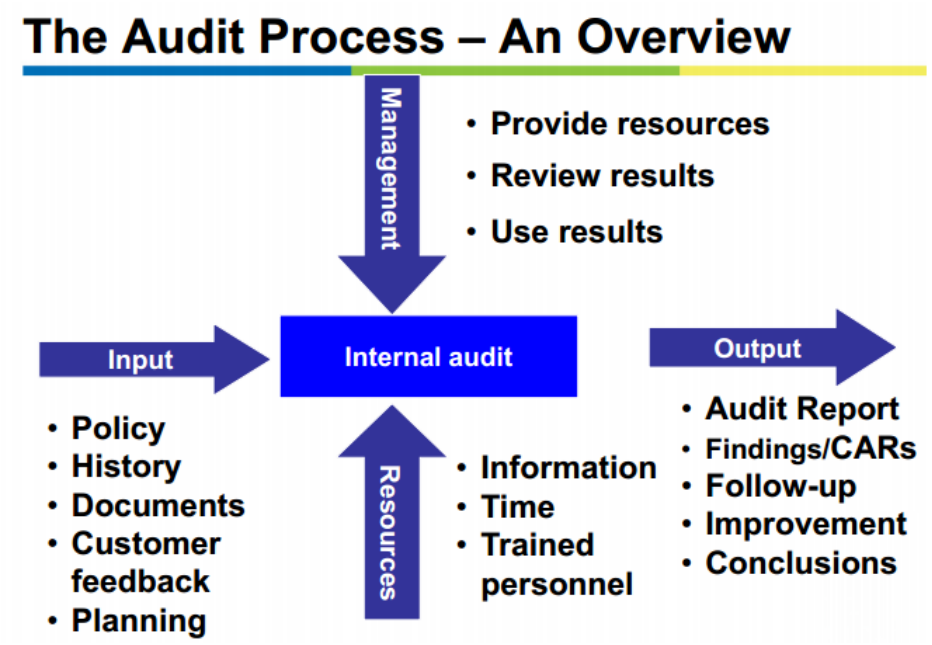
6. Corrective action is taken with respect to deficiencies.
7. Opportunities for improvement are identified

4.5 Quality audit execution

After the initiation and planning of the quality audit, the Auditor starts to undertake the auditing in the various activities and departments. The auditor undertakes the audit in accordance with the time scale that has been set enjoining meetings with the client, and auditee organizations.

Auditors usually Prepare a check-list as are minder to aid during the assessment. The format of the check-lists are at the auditor's discretion. A Good guide to the preparation of check-lists is to think in terms Of "what to look at "and" what to look for". For example, it may be decided to look at documents, records, products, equipment, procedure set. Auditor generally uses check-lists during the process of the audit to evaluate efficacy of the system. During the course of the audit, time should be set aside to check and ensure that the programme is running according to the Plan and that necessary changes do not invalidate the original plan. The non-conformities are identified and graded according to their significance.

They should be recorded as in the non-conformity report. The non-conformities could be categories as minor or major. Minor non-conformities are those which constitute an isolated witnessed incidence of failure to comply with a procedure or quality management system requirement while major non-conformities reveal failure of complete system so absence of such systems. When a number of minor non-conformities of the same kind considered together indicate a systems failure they become major non-conformities. Finally, audit findings are presented to the auditee organization and corrective action identified to improve the situation.



4.6 Audit report

After completion of the quality audits reports should be provided using the audit report form.

Table 19. Audit report form

AUDIT No: AUDIT DATE: AUDIT SCOPE: AUDITOR:
Action items and observations identified as per attached audit list: Number of actions: _____ Number of observations: _____
Corrective action(s) was/were agreed to be completed by the following date: __ /__ / 20__ AUDITEE: _____ (signature) AUDITOR:

FOLLOW-UP COMMENTS: All action items completed: YES „ NO „
If no, provide an explanation: AUDITOR: _____ DATE: __ /__ / 20__

Self-Check -4	Written Test

Direction I: Short answer (10 points)

Instruction: Give short answer for the following questions and write your answer on the answer sheet provided in the next page:

1. What is a quality audit? (2 points)
2. Explain about the three types of Audits? (4 points)
3. How to execution quality audit? (4 points)

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

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

Answer Sheet-4

Score = _____

Rating: _____

Name: _____ Date: _____

Direction I: Give short answer

1.....
.....
.....

2.....
.....
.....

3.....
.....
.....

Operation Sheet -1	Performing quality audit

Instruction: The trainer will provide you the necessary conditions to perform the quality audit.

Procedures of performing quality audit

Step 1: Prepare detailed plans for each audit

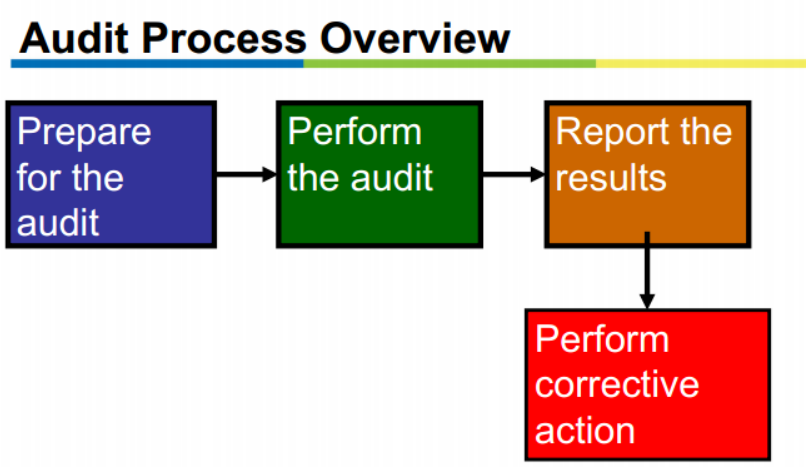
- Define audit objectives
- Define audit scope
- Define audit resources
- Define audit criteria
- Prepare and distribute an audit notification to auditee
- Gather and understand relevant documents
- Prepare work plan i.e. audit plan

Step 2: Execute each audit

Step 3: Report audit results including conclusions and recommendations

Step 4: Corrective actions if needed

Step 5: Follow-up to ensure corrective actions are effective



Operation Sheet -2	Taking Corrective Action Process

Instruction: using the data from auditing process take a corrective measures via the following steps

Procedure of Taking Corrective Action Process

Step 1: Define the nonconformity

- Document the event
  - ✓ Concise
  - ✓ Only the facts

Step 2: Communicate and assign responsibility

- Supervisor
- Quality Assurance
- Management

Step 3: Correct the immediate problem

- performing rework.
- contacting the client.
- issuing a corrected report

Step 4: Investigate

- Use available documentary evidence
- Maintenance logs
- Control charts
- Corrective action logs
- Customer complaint logs
- Proficiency test results
- Training logs
- Test Reports
- Etc…

Step 5: Identify the initiating cause root case

- Investigate
  - ✓ Use available documentary evidence
  - ✓ Interview

- Involve the appropriate individuals
- Use available root cause tools

Step 6: Identify appropriate corrective action

- Brainstorm
  - ✓ No bad ideas
  - ✓ Evaluate ideas for feasibility
- Document all corrective actions identified during he investigation.
- Select the corrective action that will eliminate or greatly reduce the recurrence of the nonconformity

Step 7: Implement corrective action

- Create a project plan
  - ✓ Assemble ideas into a workable process
  - ✓ Determine budget
  - ✓ Assign responsibilities
  - ✓ Set deadlines
- Complete projects
  - ✓ On time
  - ✓ On budget
- Revise documentation (Policies, SOPs, Forms)
- Train
- Communicate
- Support

Step 8: Implement and monitor for reoccurrence

- Different for each corrective action
- Review for reoccurrence (fault monitoring)
  - ✓ Ongoing quality control
  - ✓ Internal audits
  - ✓ Management reports

LAP Test -1	Practical Demonstration

Name: _____ **Date:** _____

Time started: _____ **Time finished:** _____

Instruction I: Given necessary templates, tools and materials you are required to perform the following tasks within *80 hours.* Your trainer will develop a scenario for you.

Task 1: perform quality audits

Task 2: Take corrective action

Instruction Sheet	Learning Guide 41: Report problems that affect quality

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

- Recognizing potential or existing quality problems
- Identifying instances of variation in quality from specifications or work instructions
- Reporting variation and potential problems to supervisor/manager

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

- Recognize potential or existing quality problems
- Identify instances of variation in quality from specifications or work instructions
- Report variation and potential problems to supervisor/manager

Learning Instructions:

1. Read the specific objectives of this Learning Guide.
2. Follow the instructions described below
3. Read the information written in the “Information Sheets 1- 2 and 3”. Try to understand what are being discussed.
4. Accomplish the “Self-checks 1 and 2 and 3” in each information sheets on pages 145, 150 and 151.
5. Ask from your teacher the key to correction (key answers) or you can request your teacher to correct your work. (You are to get the key answer only after you finished answering the Self-checks).
6. After You accomplish the self check, ensure you have a formative assessment and get a satisfactory result; then proceed to the next LG.

Information Sheet-1	Recognizing potential or existing quality problems

1.1 Introduction

Managers need to identify quality problems and issues quickly and take appropriate action swiftly. Failure to identify these issues and act appropriately creates an enormous potential for negative consequences for the organization including lack of repeat business, damage to the reputation of the venue and general decline in sales and profit. An on-going approach to monitoring workplace operations is needed to identify and address these situations.

1.2 Quality problems

Quality problems can arise on any project, and can take on many forms. Many of the problems are minor irritants that keep you from implementing the most optimal solution, but nevertheless can be tolerated. Many need to be resolved before you can implement your solution. A few of them are "show-stoppers." All of these problems can be resolved using similar techniques. Obviously the larger the problem, the more complex the solution might be. However, the same basic problem solving approach can be applied to each situation.

1.3 Recognizing quality problem

After monitoring process held in the organization we may face with quality problems which can be identified from the result of monitoring process this problems should be recognized and identifying instances of variation in quality from specifications or work instructions should be addressed to come up with the desirable solution.

1.4 Irrigation water quality problems

The common type of irrigation water quality problems include

1 Salinity hazard

This is directly related to the quantity of salts dissolved in the irrigation water. All irrigation water contains potentially injurious salts and nearly all the dissolved salts are left in the soil after the applied water is lost by evaporation from the soil or through transpiration by the plants. Unless the salts are leached from the root zone, sooner or later they will accumulate in quantities which will partially or entirely prevent growth of most crops.

2 Sodicity (alkali) hazard

This is another problem often confronting long-term use of certain water for irrigation and relates to the maintenance of adequate soil permeability so that the water can infiltrate and move freely through the soil. The problem develops when irrigation water contains relatively more sodium ions than divalent calcium and magnesium ions while the total concentration of salts is generally not very high.

Accumulation of sodium ions on to the exchange complex results in a breakdown of soil aggregates responsible for good soil structure needed for free movement of water and air through the soils. As in the case of sodic soils, accumulation of sodium on the exchange complex can be reduced by applying appropriate quantities of amendments, e.g. gypsum.

3 Toxicity hazard

A third problem results from the existence, in some water, of such toxic substances as boron or heavy metals. Boron, though an essential element for plant growth and nutrition, is required only in very small amounts. A high concentration of boron in the irrigation water can have a toxic effect on the growth of many plants. Similarly, certain other ions, e.g. chloride, sodium, etc., could prove toxic to specific crops if present in excessive quantities.

Self-Check -1	Written Test

Direction I: Short answer (6 points)

Instruction: Give short answer for the following questions and write your answer on the answer sheet provided in the next page:

1. What is the importance of knowing quality problem? (2 points)
2. How do you recognize quality problem? (4 points)

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

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

Answer Sheet-4

Score = _____

Rating: _____

Name: _____ Date: _____

Direction I: Give short answer

1.....
.....
.....

2.....
.....
.....

Information Sheet-2	Identifying instances of variation in quality from specifications or work instructions

1.1. Introduction to quality deviation

Quality deviation is departure from an agreed-upon course, design, mean, or method. It is the act of deviating, a wandering from the way, variation from the common way, from an established rule, etc.; departure, as from the right course or the path of duty.

It is a departure from standard procedures or specifications resulting in non-conforming material and/or processes or where there have been unusual or unexplained events which have the potential to impact on product quality, system integrity or personal safety.

In manufacturing, a deviation is a notable statistical different in the units being produced. It typically means that there is an increase in product defects or a notable change in product quality that is the same throughout several batches but not in accordance with product designs. Deviations typically present serious problems for manufacturers in terms of both profit and safety. Deviation processes help businesses quickly deal with such issues as effectively as possible.

1.2. Different levels of deviation

For the ease of assessing risk any deviation can be classified into one of the three levels 1, 2 & 3 based on the magnitude and seriousness of a deviation.

Level 1: Critical Deviation

Deviation from organization standards and/or current regulatory expectations that provide immediate and significant risk to product quality, safety or data integrity or a combination/repetition of major deficiencies that indicate a critical failure of systems.

Level 2: Serious Deviation

Deviation from organization standards and/or current regulatory expectations that provide a potentially significant risk to product quality, safety or data integrity or could potentially result in significant observations from a regulatory agency or a combination/repetition of "other" deficiencies that indicate a failure of system(s).

Level 3: Standard Deviation

Observations of a less serious or isolated nature that are not deemed Critical or Major, but require correction or suggestions given on how to improve systems or procedures that may be compliant but would benefit from improvement (e.g. incorrect data entry).

1.3. Types of deviations

The types of deviation are

- Production Deviation - usually raised during the manufacture of a batch production.
- EHS Deviation - raised due to an environmental, health and safety hazards.
- Quality Improvement Deviation - may be raised if a potential weakness has been identified and the implementation will require project approval.
- Audit Deviation - raised to flag non-conformance identified during internal, external, supplier or corporate audits.
- Customer Service Deviation - raised to track implementation measures related to customer complaints.
- Technical Deviation - can be raised for validation discrepancies. For example: changes in Manufacturing Instruction.
- Material Complaint - raised to document any issues with regards to non-conforming, superseded or obsolete raw materials/components, packaging or imported finished goods.
- System routing deviation - raised to track changes made to Bill of materials as a result of an Artwork change

1.4 Source of identifying deviation

The **following** are sources for identifying deviations:

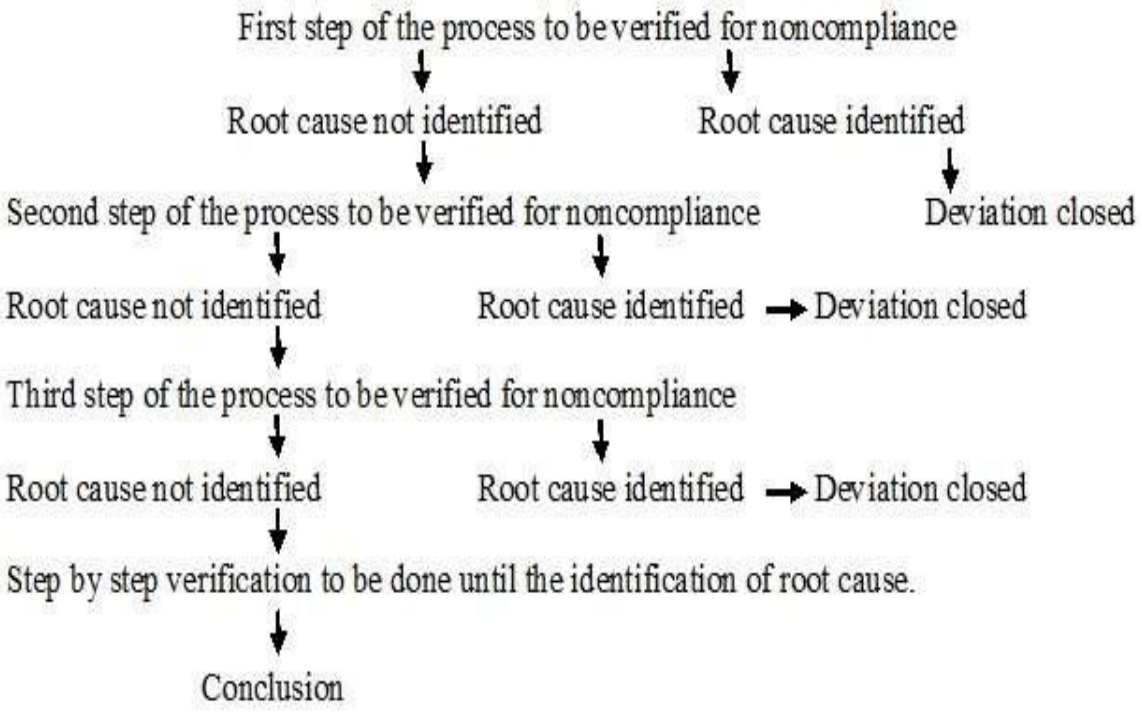
1. Internal, external, supplier audits
2. Customer complaint
3. Process controls e.g.: statistical analysis
4. Root cause analysis
5. Quality risk assessments
6. Product or materials deviation
7. Deviation of manufacturing facility, equipment, operations.

1.5 Deviation Investigation tools may be of different types

Deviation Investigation tools may be of different types this includes:

1. Process open flow chart

A visual representation of process open flow chart techniques is useful as a starting point for most of the investigations (Figure 2). In most of the deviations, it facilitates the identification of root cause.



2. Fish bone analysis

A fishbone diagram is a visualization tool for categorizing the probable or potential causes of a deviation in order to recognize the root cause.

3. Five Why's

To identify the root cause of a deviation, five why's technique shall be used in connection with the cause and effect diagram to probe more deeply.

4. 5W and 1H technique

This is the technique used in the failure situations. Most important steps are What: Whether all information was captured about the non compliance? Who: Operators involved in activity are having training and experience? When: Time of the non compliance happen? Where: Whether the location is suitable for process activities? Why: Reason for non compliance to be questioned? After completing the 5W, conclusion will be questioned by How?

Self-Check -2	Written Test

Direction I: Short answer item

Instruction I: Give short answer to the following questions on the answer sheet provided in the next page.

1. What is quality deviation?(2 points)
2. How do you identify quality deviation? (4 points)
3. List types of deviations(3 points)
4. Explain about different levels of deviation. (5 points)
5. What are the sources of identifying deviation? (4 points)

Note: **Satisfactory rating – 5 points and above** **Unsatisfactory - below 5 points**

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

Answer Sheet-2

Score = _____

Rating: _____

Name: _____ Date: _____

Direction I: Multiple Choice Questions

1. ……
   ……
2. ……
   ……
3. ……
   ……
4. ……
   ……
5. ……
   ……

Information Sheet-3	Reporting variation and potential problems to supervisor/manager

3.1 When to Report Deviation

A Deviation should be raised when there is a deviation from methods or controls specified in manufacturing documents, material control documents, standard operating procedure for products and confirmed out of specification results and from the occurrence of an event and observation suggesting the existence of a real or potential quality related problems.

A deviation should be reported if a trend is noticed that requires further investigation. All batch production deviations (planned or unintended) covering all manufacturing facilities, equipments, operations, distribution, procedures, systems and record keeping must be reported and investigated for corrective and preventative action. Reporting deviation is required regardless of final batch disposition. If a batch is rejected a deviation reporting is still required.

3.2 Investigation and reporting deviations

Deviation investigations are one of the most important quality activities in any organization. Clearly, many organizations have room to improve in the writing and managing of deviation investigations.

3.2.1 What to check during the deviation assessment

QA delegate has to conduct a primary Investigation on the deviation reported and evaluate the following information

1. Scope of the deviation - batch affected (both in-process and previously released)
2. Trends relating to (but limited to) similar products, materials, equipment and testing processes, product complaints, previous deviations, annual product reviews, and /or returned goods etc where appropriate.

- A review of similar causes.
- Potential quality impact.
- Regulatory commitment impact.
- Other batches potentially affected.
- Market actions (i.e. recall etc)

The aim of the reporting process is to establish whether project objectives have been achieved, what resources have been expended, what problems have been encountered, and whether the project is expected to be completed on time and within budget. If performance is sufficient the project will receive payment from the programme for costs incurred, paid and reported.

3.2.2 Types of report forms

1) Start-up report: Some programmes use this to complement information needed for monitoring of project implementation. It mostly includes formal information about contact details and partnership organizations. Normally it doesn't require any formal approval and its data can be changed anytime.

2) Preparation costs report: Programmes for which preparation costs are eligible often have a separate report form for the reimbursement of preparation costs incurred prior to submission of project proposal. This report could be:

- a separate report form called preparation costs report;
- a part of the start-up report (if a programme is using it);
- a part of the first progress report.

3) Progress report: The progress report is a written document describing the activities that have taken place during the project implementation by project partners that conveys details such as what objectives have been achieved, what resources have been expended, what problems have been encountered, and whether the project is expected to be completed on time and within budget.

4) Final report: The last report submitted to the programme is in most cases called final report, but also terms such as closure report and project end report have been used. Different practices of the final report content and procedure were observed:

5) Follow-up report: The use of follow-up report was observed in one programme. It's a report about sustainability of results which has to be submitted once a year for some years after project closure.

Self-Check -3	Written Test

Direction I: Short answer (6 points)

Instruction: Give short answer for the following questions and write your answer on the answer sheet provided in the next page:

1. When to Report Deviation? (2 points)
2. How do you investigate nd report deviation? (4 points)

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

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

Answer Sheet-3

Score = _____

Rating: _____

Name: _____ Date: _____

Direction I: Give short answer

1. ……
   ……
2. ……
   ……

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List of Reference Materials

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