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Acknowledgment
Welcome to the Module “Applying of Quality Standards”. This module contains training materials and activities for you to complete.

The unit of competency “Apply Quality Standards” contains knowledge, skills and attitudes required for a Computer Hardware Servicing NC II course.

You are required to go through a series of learning activities in order to complete each of the learning outcomes of the module. In each learning outcome there are Information Sheets and Activity Sheets. Follow these activities on your own and answer the Self-Check at the end of each learning activity.

If you have questions, don’t hesitate to ask your for assistance.

Recognition of Prior Learning (RPL)

You may already have some of the knowledge and skills covered in this module because you have:
- been working for some time
- Already have completed training in this area.

If you can demonstrate to your students that you are competent in a particular skill or skills, talk to him/her about having them formally recognized so you don’t have to do he same training again. If you have a qualification or Certificate of Competency from previous training shows it to your students. If the skills you acquired are still current and relevant to this module, they may become part of the evidence you can present for RPL. If you are not sure about the currency of your skills, discuss it with your teacher.

After completing this module ask your trainer to assess your competency. Result of your assessment will be recorded in your competency profile. All the learning activities are designed for you to complete at your own pace.

Inside this module you will find the activities for you to complete followed by relevant information sheets for each learning outcome. Each learning outcome may have more than one learning activity.
INTRODUCTION:

This module contains information and suggested learning activities on Computer Hardware Servicing. It includes training materials and activities for you to complete.

Completion of this module will help you better understand the succeeding module on Computer Hardware Servicing.

This module consists of 3 learning outcomes. Each learning outcome contains learning activities supported by each instruction sheets. Before you perform the instructions read the information sheets and answer the self-check and activities provided to as certain to yourself and your teacher that you have acquired the knowledge necessary to perform the skill portion of the particular learning outcome.

Upon completion of this module, report to your teacher for assessment to check your achievement of knowledge and skills requirement of this module. If you pass the assessment, you will be given a certificate of completion.

SUMMARY OF LEARNING OUTCOMES:

Upon completion of the module you should be able to:

LO1 Assess Condition of Received Equipment
LO2 Assess own work
LO3 Validate one’s work for quality improvement

ASSESSMENT CRITERIA:

Refer to assessment criteria of learning outcomes #1-3 of this module.

PRE-REQUISITES:

- PC Operation
Checklist - help organize data by category

Durability - enduring; resisting wear

Flowchart - describes process in as much detail as possible by graphically displaying the steps in proper sequence

Hardware - refers to the electronic and mechanical components that make a computer system.

Histogram - plots data in a frequency distribution table

Hostile - being an enemy; unfriendly

ISO - International Standardization Organization

OHS - Occupational Health and Safety procedures

Pareto diagram - puts data in a hierarchical order which allows the significant problems to be connected first.

PPE - personal protective equipment

Quality - essential character nature; degree or grade of excellence

Scatter diagram - shows how two variables are related and is this used to test for cause and effect relationships

Standards - as one serving the emblem of a nation; something as accepted as a basis for comparison
Learning Outcome #1: Assess Condition of Received Equipment

ASSESSMENT CRITERIA:

1. Work instruction is obtained and work is carried out in accordance with the standard operating procedures.
2. Received materials are checked base on the workplace standards and specifications.
3. Faulty materials related to work are identified and isolated.
4. Faults and any identified causes are recorded and/or reported to the concerned person-in-authority in accordance with the workplace procedures.
5. Faulty materials are replaced in accordance with workplace standard operating procedures (SOP).
6. Safety precautions are observed at all times.

REFERENCES:

- http://www.empf.org/empfasis/aug04/prop.htm
- http://www.lakeland.cc.il.us/~internal/policymanual/10fiscalaffairs/1026.POL.htm
- www.cdpr.ca.gov
- www.freepatentsonline.com
The student must relate material properties to product and process quality. These are the factors that must be taken into consideration when choosing the right material for their components and assemblies:

1. **Selection of material**

   Material selection is one of the most common tasks for design engineering. The ability to assess the material’s impact on the performance of a product is crucial for reliable performance. Sometimes, buyers are also considering the label or name of the company which are producing great quality of materials and are known in the market. Examples are the name HP for printer and Intel for some computer hardware.

2. **Testing of material**

   The testing of material properties is widely understood to be the key to obtaining data for a project, performing failure analysis, or understanding material interactions. Material testing also provides information on the quality of incoming and outgoing products. Inspection test equipment and techniques are demonstrated for a wide range of materials and assemblies during the class. This provides the participants with both knowledge of the common failure modes.

3. **Cost of material**

   The cost of material is also considered when buying or selecting materials for a specific project. The amount may vary but never taken for granted the quality and the reliability of the material. Will you buy material which is less expensive but worst quality? Will you buy material which you cannot afford? People look for places which can meet their standards and right cost for materials to buy.

   **Characteristic of common materials for increased security** is also a great factor in the design and planning process. Evaluation of longevity criteria and assessment of site environmental factors are vital to project planning. Specific knowledge about the project and general common sense must dictate design and material selection. Although many materials can offer enhanced protection, often the most cost-efficient and readily available material that provides reasonable life expectancy for the project must be considered.

Before planning and designing takes place, you should evaluate the material options and system requirements. Teachers should add several useful reference manuals to their libraries such as installation of hardware, networking, troubleshooting as well as basic PC Operation and Internet for additional information that the students may used in their projects.

The characteristic of the materials to be used for specific project must be:
✓ of good quality

- This is the most important factor when choosing materials to buy. Products with good quality are long-lasting and safe to use because you know that it follows certain standards before being commercialized.

✓ reliable

- It means that you can be sure that it will perform its function well, will operate safely and will give the best it could give.

✓ suitable for the application/purposes

- Choose the materials which are very necessary to make the project possible. Making a list of products/materials to buy is a good trait of a wise consumer. Products which are not to be used must be crossed out.

✓ low cost

- It doesn't mean that you will choose for the less expensive one and exclude the quality. Low cost means you can afford to buy the materials without hurting your pocket and assure of better quality.
I. Enumerate the following. Use a separate sheet of paper in answering.

1. Give three factors to be considered when choosing the right material?

   __________________________________________

   __________________________________________

   __________________________________________

2. Give three characteristic of materials to be used for specific project?

   __________________________________________

   __________________________________________

   __________________________________________

II. What Good Quality means?

   __________________________________________

   __________________________________________

   __________________________________________
These are the things to be considered when:

A. Receiving Materials:

1. Match the packing slip to the items received and ensures that the materials are destined on tour department.

2. That you are receiving the materials indicated on the purchase order with regard to quantity and discount.

3. That the materials are in acceptable condition.

4. That terms regarding installation and/or set-up of equipment are met.

B. Receiving Reports

Whenever goods are received:

1. The person receiving the goods must document, using the administrative software, that all goods were received for each requisition before any payment can be made to the vendor.

2. Any exceptions must be noted so that partial payments can be processed or defective goods can be returned.

C. Return of Merchandise

When merchandise is received which is incomplete or defective, the supervisor will return the materials to the supplier or to the store where it was bought and make arrangements with the vendor for replacement.

D. Make an Inventory Report of the Materials

All materials received must be listed and be reported to monitor how many materials are already on hand, purchased or damaged.

Effective management checks are an important means of providing assurance of the integrity and security of the benefit processes. They are also useful in identifying training needs; indicating possible weaknesses in procedure and ensuring the section meets its accuracy target set for Best Value Performance Indicators purposes.

Methodology

The teacher will be the assessor. Students will be randomly assigned that will: 1.) act as Quality Checker; 2.) responsible for monitoring and coordinating the checking arrangements and; 3.) must generate reports when receiving the equipments.
The Quality checker will record the date of receipt, name of the materials purchased, quantity, official receipt number, signature of the person who bought the materials and signed his name afterwards. The Quality checker will identify if the materials are in good condition or damage and/or needing for replacements. This will also be recorded on his report.

**Feedback**

Once the Quality checker has completed all the reports, the assessor will check if the Quality Checker provides all the data needed in the report.

**Example of Log Report (to be completed by the Quality checker)**

<table>
<thead>
<tr>
<th>Date Received</th>
<th>O.R. #</th>
<th>Item Name</th>
<th>Quantity</th>
<th>Signature</th>
<th>Quality Checker</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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</tr>
</tbody>
</table>

**Example of Assessment of Materials Received (to be completed by the Quality checker)**

<table>
<thead>
<tr>
<th>Quality Checker:</th>
<th>Date:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Item Name</th>
<th>Total no. in Good Condition</th>
<th>Total no. of Errors</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
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</tbody>
</table>
You are assigned to be the Quality checker for the Month of June. Make a Log Report, and Assessment Report using the following data below. Make sure you will record all the items listed and if they were in good condition or not. Write your answer on a sheet of paper.

1. - June 9, 2008
   - 5 Hard disk, 2 128MB SDRAM memory chips
   - Received from Jun Salcedo (PC chain), OR #20256
   - Found out that 1 Hard disk has error need for replacement

2. - June 15, 2008
   - Refill ink cartridge from STARINK Shop, OR# 5623

3. - June 20, 2008
   - 10 PS/2 keyboard, 10 Optic mouse, 2 power supply
   - Received from Allan Rivera (Octagon), OR#12544
   - 3 defective keyboard need replacement

4. - June 28, 2008
   - 2 CD-Rom drive
   - Received from Jun Salcedo (PC Chain), OR#20400
1. What is workplace procedure?
2. Give five examples of behavior that may affect the quantity of work.
3. Give five examples of behavior that may affect the quality of work.

Reference:
www.yahoo.com
www.wikipedia.com

Program/ Course: Computer Hardware Servicing NC II
Unit of Competency: Apply Quality Standards
Module: Applying of Quality Standards

Learning Outcome #2: Assess Own Work

ASSESSMENT CRITERIA:

1. Work performance is documented in accordance with workplace procedures.
2. Completed work is checked against workplace standards.
3. Errors are identified and corrected.
4. In case of deviations from specific quality standards causes are documented and reported in accordance with the workplace’s standard operating procedures.

REFERENCES:

- http://xnet.rrc.mb.ca/healthsafety/safeworkprocedures
Workplace Procedure is a set of written instructions that identifies the health and safety issues that may arise from the jobs and tasks that make up a system of work.

A safe working procedure should be written when:

- designing a new job or task
- changing a job or task
- introducing new equipment
- reviewing a procedure when problems have been identified, example from an accident or incident investigation

The safe working procedure should identify:

- the teacher for the task or job and the students who will undertake the task
- the tasks that are to be undertaken that pose risks
- the equipment to be used in these tasks
- the control measures that have been formulated for these tasks
- any training or qualification needed to undertake the task
- the personal protective equipment to be worn
- action to be undertaken to address safety issues that may arise while undertaking the task

Following certain procedures is very important to perform a given operation. The table below shows different elements and their corresponding performance criteria to be able to identify occupational health and safety hazards, and assess risk, as well as follow instructions and procedure in the workplace with minimal supervision. The students will also be capable of participating and contributing to OHS management issues.

<table>
<thead>
<tr>
<th>ELEMENT</th>
<th>PERFORMANCE CRITERIA</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Identify hazards and assess risk.</td>
<td>1.1 Identify hazards in the work area and during the performance of workplace duties.</td>
</tr>
<tr>
<td></td>
<td>1.2 Assess level of risk</td>
</tr>
<tr>
<td>2. Follow procedures and strategies for</td>
<td>2.1 Report hazards in the work area to designated</td>
</tr>
<tr>
<td>ELEMENT</td>
<td>PERFORMANCE CRITERIA</td>
</tr>
<tr>
<td>---------</td>
<td>----------------------</td>
</tr>
<tr>
<td>risk control.</td>
<td>personnel according to workplace procedures</td>
</tr>
</tbody>
</table>

2.2 Follow workplace procedures and work instructions for assessing and controlling risks with minimal supervision.

2.3 Whenever necessary, within the scope of responsibilities and competencies, follow workplace procedures for dealing with hazards and incidents, fire and/or other emergencies.

3. Contribute to OHS in the workplace.

3.1 Describe employee rights regarding consultation on OHS matters

3.2 Raise task and/or job specific OHS issues with appropriate people in accordance with workplace procedures and relevant OHS legislative requirements

3.3 Contribute to participative arrangement for OHS management in the workplace within organisational procedures and the scope of responsibilities and competencies

3.4 Provide feedback to supervisor on hazards in work area in line with organisational OHS policies and procedures

3.5 Provide support in implementing procedures to control risks in accordance with organisational procedures

Work instruction may be:

- Verbal
- Written
- In English
- In a community language
- Provided visually eg. video, OHS signs, symbols and other pictorial, presentation, etc.

Controlling risks in the work area may include:

- Application of the hierarchy of control, namely:
  - Eliminate the risk
  - Reduce/minimise the risk through
  - Engineering controls
  - Administrative controls
  - Personal protective equipment

Reports identifying workplace hazards may be verbal or written and may include:

- Face to face
- Phone messages
- Notes
- Memos
- Specially designed report forms
### ELEMENT

Examples of OHS issues which may need to be raised by workers with designated personnel may include:

<table>
<thead>
<tr>
<th>Performance Criteria</th>
</tr>
</thead>
<tbody>
<tr>
<td>☑ Hazards identified</td>
</tr>
<tr>
<td>☑ Problems encountered in managing risks associated with hazards</td>
</tr>
<tr>
<td>☑ Clarification on understanding of OHS policies and procedures</td>
</tr>
<tr>
<td>☑ Communication and consultation processes</td>
</tr>
<tr>
<td>☑ Follow up on reports and feedback.</td>
</tr>
<tr>
<td>☑ Effectiveness of risk controls in place</td>
</tr>
<tr>
<td>☑ Training needs</td>
</tr>
</tbody>
</table>

Examples of contributions may include:

<table>
<thead>
<tr>
<th>Performance Criteria</th>
</tr>
</thead>
<tbody>
<tr>
<td>☑ Recommendations on changes to work processes, equipment or practices</td>
</tr>
<tr>
<td>☑ Listening to the ideas and opinions of others in the team</td>
</tr>
<tr>
<td>☑ Sharing opinions, views, knowledge and skills</td>
</tr>
<tr>
<td>☑ Identifying and reporting risks and hazards</td>
</tr>
<tr>
<td>☑ Using equipment according to guidelines and operating manuals</td>
</tr>
</tbody>
</table>

### TYPES AND WORK-RELATED ERRORS

**A. Quantity of work** *(untimely completion, limited production)*

1. Poor prioritizing, timing, scheduling

2. Lost time
   - Tardiness, absenteeism, leaving without permission
   - Excessive visiting, phone use, break time, use of the Internet
   - Misuse of sick leave

3. Slow response to work requests, untimely completion of assignments

4. Preventable accidents

**B. Quality of work** *(failure to meet quality standards)*

1. Inaccuracies, errors

2. Failure to meet expectations for product quality, cost or service
3. Customer/client dissatisfaction
4. Spoilage and/or waste of materials
5. Inappropriate or poor work methods

**Work Behavior Which Result in Performance Problems**

**A. Inappropriate behavior (often referred to as "poor attitude")**
- Negativism, lack of cooperation, hostility
- Failure or refusal to follow instructions
- Unwillingness to take responsibility ("passing the buck")
- Insubordination
- Power games

**B. Resistance to change**
- Unwillingness, refusal or inability to update skills
- Resistance to policy, procedure, work method changes
- Lack of flexibility in response to problems

**C. Inappropriate interpersonal relations**
- Inappropriate communication style: over-aggressive, passive
- Impatient, inconsiderate, argumentative
- Destructive humor, sarcasm, horseplay, fighting
- Inappropriate conflict with others, customers, co-workers, supervisors

**D. Inappropriate physical behavior**
- Smoking, eating, drinking in inappropriate places
- Sleeping on the job
- Alcohol or drug use
- Problems with personal hygiene
- Threatening, hostile, or intimidating behavior
I. Write **QN** if the statement affects the quantity of work and **QL** if the statement affects the quality of work. Write your answer on the space provided before each number.

- _____ 1. Poor scheduling of work
- _____ 2. Failure to meet expectations for product quality, cost or service
- _____ 3. Customer/client dissatisfaction
- _____ 4. Preventable accidents
- _____ 5. Misuse of sick leave
- _____ 6. Tardiness
- _____ 7. Slow response to work requests
- _____ 8. Break time
- _____ 9. Excessive visiting
- _____ 10. Spoilage and/or waste of materials

II. Write **TRUE** if the statement is correct and **FALSE** if the otherwise is wrong.

- _____ 1. Poor attitude results in performance problem.
- _____ 2. A safe working procedure should be written when retrieving old tasks.
- _____ 3. Preventable accidents may affect the quality of work.
- _____ 4. Following certain procedure is very important in performing given operation or to a given event.
- _____ 5. Safe working procedure should not identify the tasks that are to be undertaken that pose risks.

III. What is Workplace Procedure?

____________________________________________________
____________________________________________________
____________________________________________________
____________________________________________________

Use a T-Chart to compare and contrast the activities of the student inside the classroom against workplace procedure. Write your answer on a sheet of paper.

<table>
<thead>
<tr>
<th>Similarities</th>
<th>Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Standards are sets of rules that outline specification of dimensions, design of operation, materials and performance, or describe quality of materials, products or systems. These standards should cover the performance expectations of the product for particular applications. The intent of standards is to provide at least minimum quality, safety or performance specifications so as to ensure relatively uniform products and performance, and to remove ambiguity as to the suitability of certain commercial products for particular applications. Following standards may reduce the risk of error in working.

Specific quality standards for:

1. Hardware

The durability of the work depends on the quality of its component parts and the assembly skills of those who install it. If the best-quality products or hardware are used but are installed incorrectly, the system will be a failure.

The application of suitable hardware and products must be supported by adequate levels of training of person who use them so that they can identify and use only appropriate products.

In judging a product or hardware, the person must consider factors such as the following:

- Is the product or hardware under consideration suitable for the application or purpose?
- Will it be harmful to the health of the community in its normal use?
- Is there a risk of this hardware being released into the environment (e.g. the water) in the first instance or after the working life of the product or hardware has expired?

2. Production Process

In production process, checking of quality assurance must be highly considered. Quality assurance covers all activities from design, development, production, installation, servicing and documentation. This introduced the rules: “fit for purpose” and “do it right the first time”. It includes the regulation of the quality of raw materials, assemblies, products and components; services related to production; and management, production, and inspection processes.

A. FAILURE TESTING

A valuable process to perform on a whole consumer product is failure testing, the operation of a product until it fails, often under stresses such as increasing vibration, temperature and humidity. This exposes many unanticipated weaknesses in a product, and the data is used to drive engineering and manufacturing process improvements.

B. STATISTICAL CONTROL

Many organizations use statistical process control to bring the organization to Six Sigma levels of quality, in other words, so that the likelihood of an unexpected failure is confined to six standard deviations on the normal distribution. Traditional statistical process controls in manufacturing operations usually proceed by randomly sampling and testing a fraction of the output. Variances of critical tolerances are continuously tracked, and manufacturing processes are adjusted before bad parts can be produced.
C. COMPANY QUALITY

The company-wide quality approach places an emphasis on three aspects:

1. Elements such as controls, job management, adequate processes, performance and integrity criteria and identification of records
2. Competence such as knowledge, skills, experience and qualifications
3. Soft elements, such as personnel integrity, confidence, organizational culture, motivation, team spirit and quality relationships.

The quality of the outputs is at risk if any of these three aspects are deficient in any way.

D. TOTAL QUALITY CONTROL

Total Quality Control is the most necessary inspection control of all in cases where, despite statistical quality control techniques or quality improvements implemented, sales decrease.

As the most important factor had been ignored, a few refinements had to be introduced:

1. Marketing had to carry out their work properly and define the customer’s specifications.
2. Specifications had to be defined to conform to these requirements.
3. Conformance to specifications i.e. drawings, standards and other relevant documents, were introduced during manufacturing, planning and control.
4. Management had to confirm all operators are equal to the work imposed on them and holidays, celebrations and disputes did not affect any of the quality levels.
5. Inspections and tests were carried out, and all components and materials, bought in or otherwise, conform to the specifications, and the measuring equipment was accurate, this is the responsibility of the QA/QC department.
6. Any complaints received from the customers were satisfactorily dealt with in a timely manner.
7. Feedback from the user/customer is used to review designs.
8. Consistent data recording and assessment and documentation integrity.
9. Product and/or process change management and notification.
To conclude, the above forms are the basis from which the philosophy of Quality Assurance has evolved, and the achievement of quality or the “fitness-for-purpose” is “Quality Awareness” throughout the company.

4. Final Product

Table 1.2.1 shows the Quality System Elements required by ISO 9000 in the making of the final product.

Table 1.2.2 Quality System Elements.

<table>
<thead>
<tr>
<th>Quality System Requirements</th>
<th>Contents</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Management responsibility</td>
<td>Define and document commitment, policy and objectives, responsibility and authority, verification resources and personnel. Appoint a management representative and conduct regular reviews of the system.</td>
</tr>
<tr>
<td>2 Quality system</td>
<td>Establish and maintain a documented quality system ensuring that products conform to specified requirements.</td>
</tr>
<tr>
<td>3 Contract Review</td>
<td>Ensure that customer’s contractual requirements are evaluated and met.</td>
</tr>
<tr>
<td>4 Product development</td>
<td>Plan, control and verify product development to ensure that specified requirements are met.</td>
</tr>
<tr>
<td>5 Document control</td>
<td>System for control and identification of all documents regarding quality, e.g. procedures, instructions, and specifications.</td>
</tr>
<tr>
<td>6 Purchasing</td>
<td>Ensure that purchased products conform to specified requirements.</td>
</tr>
<tr>
<td>7 Product identification and traceability</td>
<td>System to identify and control traceability of product at all stages from raw materials through production to the final product as delivered to the customer.</td>
</tr>
<tr>
<td>8 Process control</td>
<td>Ensure and plan the control of production which directly affects quality by documented work instructions, monitoring and control of processes.</td>
</tr>
<tr>
<td>9 Inspection and testing</td>
<td>Inspect and test incoming products, intermediate and final product; establish product conformance to specified requirements and identify non-conforming products; maintain inspection and test records.</td>
</tr>
<tr>
<td>10 Inspection, measuring and test equipment</td>
<td>Selection and control of equipment to ensure reliability and accuracy in measuring data.</td>
</tr>
<tr>
<td>11 Inspection and test status</td>
<td>For the whole process the products shall be identified and clearly marked concerning test status, including indication of conformance or non-conformance.</td>
</tr>
<tr>
<td>12 Control of non-conforming products</td>
<td>Identification, documentation, evaluation, isolation (if possible) and disposition of non-conforming products.</td>
</tr>
<tr>
<td>13 Corrective actions</td>
<td>Prevention of reoccurrence of failures (non-conformance).</td>
</tr>
<tr>
<td>14 Handling, storage, packaging and</td>
<td>Protection of the quality of the product during handling, storage, packaging and delivery.</td>
</tr>
<tr>
<td>Quality records</td>
<td>Records, including those which demonstrate that the specified requirements have been met, shall be controlled and maintained</td>
</tr>
<tr>
<td>-----------------</td>
<td>----------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Internal Quality Audits</td>
<td>Regular, planned internal audits shall be carried out, documented and recorded to verify the effectiveness of the quality system</td>
</tr>
<tr>
<td>Training</td>
<td>Training requirements at all levels shall be identified and the training planned, conducted and recorded</td>
</tr>
<tr>
<td>Cleaning and Disinfection</td>
<td>Although not required by the ISO 9000 standards, these two points should be given special attention in all food companies</td>
</tr>
<tr>
<td>Personal hygiene</td>
<td></td>
</tr>
</tbody>
</table>

4. Customer Service

According to Turban et al, 2002, “Customer service is a series of activities designed to enhance the level of customer’s satisfaction – that is, the feeling that a product or service has met the customer’s expectation”. Its importance varies by product, industry and customer.
SELF CHECK 1.2.2

Quality Standards

I. Write T if the statement is correct and F if the otherwise.

______ 1. Standards are set of rules that describe quality of materials, product or system.

______ 2. Quality assurance does not cover all the activities from design, development, up to documentation.

______ 3. Customer service is a series of activities designed to enhance the level of customer satisfaction.

______ 4. Customer service is not important in the company’s customer value proposition.

______ 5. The durability of the work do not depend on the skills of those who install it.
1. Group yourselves into six members.
2. Conduct a Simulation on: “Production Process and Customer Service”

In this activity you will be rated according to the following:

<table>
<thead>
<tr>
<th>Descriptive Criteria</th>
<th>Scoring Criteria</th>
</tr>
</thead>
<tbody>
<tr>
<td>Excellently done</td>
<td>5</td>
</tr>
<tr>
<td>Very Satisfactorily done</td>
<td>3-4</td>
</tr>
<tr>
<td>Satisfactorily done</td>
<td>1-2</td>
</tr>
<tr>
<td>Unsatisfactorily done</td>
<td>0</td>
</tr>
</tbody>
</table>
When do you say that your work is of good quality?

1. What are quality checking procedures?
2. Give the processes for quality improvement?

Reference:

www.wikipedia.com
Program/ Course: **Computer Hardware Servicing NC II**  
Unit of Competency: **Apply Quality Standards**  
Module: **Applying Quality Standards**

**Learning Outcome #3:** Validate One’s Work for Quality Improvement

**ASSESSMENT CRITERIA:**

1. Work is carried out in accordance with process improvement procedures.  
2. Performance of operation or quality of service is monitored to ensure customer satisfaction.

**REFERENCE:**

- http://www.paramounthealthcare.com/body.cfm?id=65  
- http://www.mcrcc.osmre.gov.ph  
- http://www.standards.dfes.gov.uk  
- http://www.swce.gov.uk  
- http://deming.eng.clemson.edu/pub/tutorials/qctools/flowm.htm  
- http://www.empf.org/empfasis/aug04/prop.htm
In technical usage, *quality* can have two meanings:

1. the characteristics of a product or service that bear on its ability to satisfy stated or implied needs.

2. a product or service free of deficiencies.

The quality of a product or service refers to the perception of the degree to which the product or service meets the customer’s expectations. Quality has no specific meaning unless related to a specific function and/or object. Quality is a perceptual, conditional and somewhat subjective attribute.

The dimensions of quality refer to the attributes that quality achieves in *Operations Management*:

- Quality $\leftrightarrow$ Dependability $\leftrightarrow$ Speed $\leftrightarrow$ Flexibility $\leftrightarrow$ Cost

- Quality supports dependability
- Dependability supports Speed
- Speed supports Flexibility
- Flexibility supports Cost.

In the manufacturing industry it is commonly stated that “Quality drives productivity.” Improved productivity is a source of greater *revenues*, employment opportunities and technological advances. The best way to think about quality is in process control. If the process is under control, inspection is not necessary. However, there is one characteristic of modern quality that is universal. In the past, when we tried to improve quality, typically defined as producing fewer defective parts, we did so at the expense of increased cost, increased task time, longer cycle time, etc.

**Quality Management Terms:**

- *Quality Improvement* can be distinguished from Quality Control in that Quality Improvement is the purposeful change of a process to improve the reliability of achieving an outcome.
- *Quality Control* is the ongoing effort to maintain the integrity of a process to maintain the reliability of achieving an outcome.
- *Quality Assurance* is the planned or systematic actions necessary to provide enough confidence that a product or service will satisfy the given requirements for quality.
Quality and Task-Completion Checking

With development teams of two or three in daily contact and frequently exchanging views and criticisms, detailed, written quality and task-completion checking procedures may be felt to be unnecessary. Procedures still need to be agreed and the results need to be documented. The need to check quality and task completion applies at all stages of the development process but is underlined especially during the prototype validation stages.

The importance of documenting checks applies whatever the size of the team and whatever the complexity of the software. In the production of assets, this may involve checking to confirm the following:

- that all the asset files listed in the product specification document have been produced;
- that files are correctly named;
- that files are the correct byte size or near the projected file size (examining the file-sizes in a directory listing can be helpful in identifying problem files which are either much too large or much too small);
- that files are the correct resolution (screen-size and bit-depth in the case of graphics; duration, sampling frequency and bit-depth in the case of sound files);
- that the quality of files displaying on the target monitor or heard on target listening equipment is acceptable.

Note that sampling is seldom a satisfactory checking method. Checking should be exhaustive, unless for reasons of time or economy this is impossible. Usually, however, trying to economize on checking and testing is a false economy and cutting corners here will often come back to haunt the development team. At the end of the day, all files will need to be tested and, if at all possible, this should be done sooner rather than at a later trial stage.

Quality Improvement Processes

Manufacturers can choose from a variety of tools to improve their quality processes. The trick is to know which tools to use for each situation and increasing the sophistication of the tools in the repertoire.

Easy to implement and follow up, the most commonly used and well-known quality process is the plan/do/check/act (PDCA) cycle (Figure 1). Other processes are a takeoff of this method, much in the way that computers today are takeoffs of the original IBM system. The PDCA cycle promotes continuous improvement and should thus be visualized as a spiral instead of a closed circle.

Another popular quality improvement process is the six-step PROFIT model in which the acronym stands for:

P = Problem definition.
R = Root cause identification and analysis.
O = Optimal solution based on root cause(s).

F = Finalize how the corrective action will be implemented.

I = Implement the plan.

T = Track the effectiveness of the implementation and verify that the desired results are met.

If the desired results are not met, the cycle is repeated. Both the PDCA and the PROFIT models can be used for problem solving as well as for continuous quality improvement. In companies that follow total quality principles, whichever model is chosen should be used consistently in every department or function in which quality improvement teams are working.

Figure 1. The most common process for quality improvement is the plan/do/check/act cycle outlined above. The cycle promotes continuous improvement and should be thought of as a spiral, not a circle.

Once the basic problem-solving or quality improvement process is understood, the addition of quality tools can make the process proceed more quickly and systematically. Seven simple tools can be used by any professional to ease the quality improvement process: flowcharts, check sheets, Pareto diagrams, cause and effect diagrams, histograms, scatter diagrams, and control charts. (Some books describe a graph instead of a flowchart as one of the seven tools.)

The key to successful problem resolution is the ability to identify the problem, use the appropriate tools based on the nature of the problem, and communicate the solution quickly to others. Inexperienced personnel might do best by starting with the Pareto chart and the cause and effect diagram before tackling the use of the other tools. Those two tools are used most widely by quality improvement teams.
FLOWCHARTS

Flowcharts describe a process in as much detail as possible by graphically displaying the steps in proper sequence. A good flowchart should show all process steps under analysis by the quality improvement team, identify critical process points for control, suggest areas for further improvement, and help explain and solve a problem.

Flowcharts can be simple, such as the one featured in Figure 2, or they can be made up of numerous boxes, symbols, and if/then directional steps. In more complex versions, flowcharts indicate the process steps in the appropriate sequence, the conditions in those steps, and the related constraints by using elements such as arrows, yes/no choices, or if/then statements.

Figure 2. A basic production process flowchart displays several paths a part can travel from the time it hits the receiving dock to final shipping.

CHECK SHEETS

Check sheets help organize data by category. They show how many times each particular value occurs, and their information is increasingly helpful as more data are collected. More than 50 observations should be available to be charted for this tool to be really useful. Check sheets minimize clerical work since the operator merely adds a mark to the tally on the prepared sheet rather than writing out a figure (Figure 3). By showing the frequency of a particular defect (e.g., in a molded part) and how often it occurs in a specific location, check sheets help operators spot problems. The check sheet example shows a list of molded part defects on a production line covering a week's time. One can easily see where to set priorities based on results shown on this check sheet. Assuming the production flow is the same on each day, the part with the largest number of defects carries the highest priority for correction.
Figure 3. Because it clearly organizes data, a check sheet is the easiest way to track information.

**PARETO DIAGRAMS**

The Pareto diagram is named after Vilfredo Pareto, a 19th-century Italian economist. It is caused by 20% of the potential sources.

A Pareto diagram puts data in a hierarchical order (Figure 4), which allows the most significant problems to be corrected first. The Pareto analysis technique is used primarily to identify and evaluate nonconformities, although it can summarize all types of data. It is perhaps the diagram most often used in management presentations.

To create a Pareto diagram, the operator collects random data, regroups the categories in order of frequency, and creates a bar graph based on the results.

Figure 4. By rearranging random data, a Pareto diagram identifies and ranks nonconformities in the quality process in descending order.

**CAUSE AND EFFECT DIAGRAMS**

The cause and effect diagram is sometimes called an Ishikawa diagram after its inventor. It is also known as a fish bone diagram because of its shape. A cause and effect diagram describes a relationship between variables. The undesirable outcome is shown as effect, and related causes are shown leading to, the said effect. This popular tool has one severe limitation, however, in that users can overlook important, complex interactions between causes. Thus, if a problem is caused by a combination of factors, it is difficult to use this tool to depict and solve it.
A fish bone diagram displays all contributing factors and their relationships to the outcome to identify areas where data should be collected and analyzed. The major areas of potential causes are shown as the main bones, later, the subareas are depicted. Thorough analysis of each cause can eliminate causes one by one, and the most probable root cause can be selected for corrective action. Quantitative information can also be used to prioritize means for improvement, whether it be to machine, design, or operator.

**HISTOGRAMS**

The histogram plots data in a frequency distribution table. What distinguishes the histogram from a check sheet is that its data are grouped into rows so that the identity of individual values is lost. Commonly used to present quality improvement data, histograms work best with small amounts of data that vary considerably. When used in process capability studies, histograms can display specification limits to show what portion of the data does not meet the specifications.

After the raw data are collected, they are grouped in value and frequency and plotted in a graphical form (Figure 6). A histogram's shape shows the nature of the distribution of the data, as well as central tendency (average) and variability. Specification limits can be used to display the capability of the process.

*Figure 6. A histogram is an easy way to see the distribution of the data, its average, and variability.*
SCATTER DIAGRAMS

A scatter diagram shows how two variables are related and is thus used to test for cause and effect relationships. It cannot prove that one variable causes the change in the other, only that a relationship exists and how strong it is. In a scatter diagram, the horizontal (x) axis represents the measurement values of one variable, and the vertical (y) axis represents the measurements of the second variable. Figure 7 shows part clearance values on the x-axis and the corresponding quantitative measurement values on the y-axis.

**Figure 7.** The plotted data points in a scatter diagram show the relationship between two variables.

CONTROL CHARTS

A control chart displays statistically determined upper and lower limits drawn on either side of a process average. This chart shows if the collected data are within upper and lower limits previously determined through statistical calculations of raw data from earlier trials (Figure 8).

**Figure 8.** Data points that fall outside the upper and lower control limits leads to investigation and correction of the process.

In preparing a control chart, the mean upper control limit (UCL) and lower control limit (LCL) of an approved process and its data are calculated. A blank control chart with mean UCL and LCL with no data points is created; data points are added as they are statistically calculated from the raw data.
I. Define the following.

1. Quality

________________________________________________________________________
________________________________________________________________________

2. Flow Chart

________________________________________________________________________
________________________________________________________________________

3. Check Sheet

________________________________________________________________________
________________________________________________________________________

4. Pareto Diagram

________________________________________________________________________
________________________________________________________________________
Provided with the needed tools, testing devices and materials in improving quality processes, classify them using a check sheet to determine their condition.

<table>
<thead>
<tr>
<th>CONDITION</th>
<th>Good</th>
<th>Defective</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Tools</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Testing devices</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Materials</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.</td>
<td></td>
<td></td>
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<td>2</td>
<td></td>
<td></td>
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<tr>
<td>3</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**ASSIGNMENT**

As a Computer Hardware Servicing student, what tools are appropriate in your industry?

Cut pictures of tools used in Computer Hardware Servicing and be able to identify their functions.

**Reference:**
- Mc Laughlin, Robert, Sasser, Susan Ralston, *Fix your own PC*, Philippines Graphics Arts, Inc., Tandang Sora St., Caloocan City
ANSWER KEY 1.1.1

1. Selection of material, Testing of Material, Cost of Material
2. Good Quality, Reliable, Low Cost, Suitable for Project
3. – Match the packing slip to the items received and ensures that the materials are destined on tour department.
   - That you are receiving materials indicated on the purchase order regard with its quantity and discount.
   - That the materials are in acceptable condition.
   - The terms regarding installation and/or set-up of equipment are met.

ANSWER KEY 1.2.2

I. II.
1. QN 1. TRUE
2. QL 2. FALSE
3. QL 3. TRUE
4. QN 4. TRUE
5. QN 5. FALSE
6. QN
7. QN
8. QN Workplace procedure is a written
9. QN instructions that identifies the health
10. QL and safety issues that may arise from
    jobs and tasks.

ANSWER KEY 1.2.2

1. T
2. F
3. T
4. F
5. F

ANSWER KEY 1.3.1

1. Quality is the characteristics of a product that bear on its ability to satisfy or implied needs.
2. Flowchart describes a process by graphically displaying the steps in proper sequence.
3. Check Sheet helps organize data by category.
4. Pareto Diagram puts data in hierarchical order which allows the most significant problems to be corrected first.