

AQS110 – Introduction to Quality and Metrology
LABORATORY EXERCISE #1

Writing a Work Instruction

Purpose

The purpose of this laboratory exercise is to demonstrate how to create a written procedure that will subsequently be used to carry out the task. This lab will also introduce flow charting and how it can be useful for documenting a process or understanding the steps involved in task that needs to be documented.

Format

- A. Flowchart – hand drawn is acceptable, using the symbols contained on pages 4-5.
- B. Work Instruction – handwritten or typed (word document in BB)
 - The work instruction shall follow the format of the template provided on page 7.
 - Hand written documents must be readable as they will be used by another person in the class to complete the task.
 - Complete sentences and correct spelling are necessary.
 - The work instruction will be words only, pictures or other figures are not allowed.

Due Date

Laboratory Exercise:

The lab will be conducted in two parts.

First, each of you will be given a picture; all the pictures will be different. Your task will be to create a flowchart and work instruction so that someone else can redraw the picture.

Second, the work instructions will be given to another student who will redraw the picture using only the document provided.

After the drawing is complete, the work instruction you created will be returned to you with the result. There will be individual questions for you to answer and a group discussion to follow.

Procedure**A. Pre-Laboratory Preparation**

1. Each student will be given a picture with 4 shapes. Each picture will be different and have a different title.
2. Create a flowchart and work instruction that will be used by another student to redraw the picture you've been given.
3. The flowchart shall be created using the symbols listed in this exercise. It is likely that the sub-process symbol will not be needed. Page 6 has been provided to be used to draw the flowchart. Microsoft® Word can also be used by "inserting-shapes". Hand drawn or a word document will be acceptable. Be sure your name is included on the page(s).
4. The flowchart shall contain all the steps necessary to recreate the picture.
 - a. Creating the flowchart is a way to organize your thoughts and help to break down the activity into small tasks.
5. Using the Work Instruction Template (page 7), write out the detailed tasks of redrawing the picture, your name shall appear on the author line.
 - a. Handwritten documents must be readable as they will be used by another person in the class to complete the task.
 - b. The title of your work instruction will be
Redrawing [shape name on the drawing given to you]
 - c. The instruction shall be complete sentences.
 - d. The work instruction will be words only, pictures or other figures are not allowed.
 - e. The work instruction shall include the following statement:
"When the drawing is complete, print your name and the date in the bottom right corner."
 - f. For the purposes of this exercise, Revision History and Approval should be together on a separate page (the last page) of the instruction.
 - g. The title block shall be on all pages.

B. Laboratory Exercise

1. The work instructions and flow charts will be handed into me when you arrive in class.
2. Each student will receive a box with the following items:
 - a. One sheet of paper
 - b. 5 colored pencils (black, blue, green, orange and red)
 - c. a purple pen
3. The work instructions will be distributed randomly.
4. Each student is to use the work instruction provided to draw the picture. 20 minutes will be allotted to recreate the drawing.
5. As the user of the work instruction you will likely have questions. Write them down on the work instruction using the purple pen. Then use your best judgment with the tools provided to complete the task.
6. Once everyone has completed their drawings, they will be collected along with the annotated work instructions.
7. The drawing and annotated work instructions will be returned to their creator.

C. Debrief

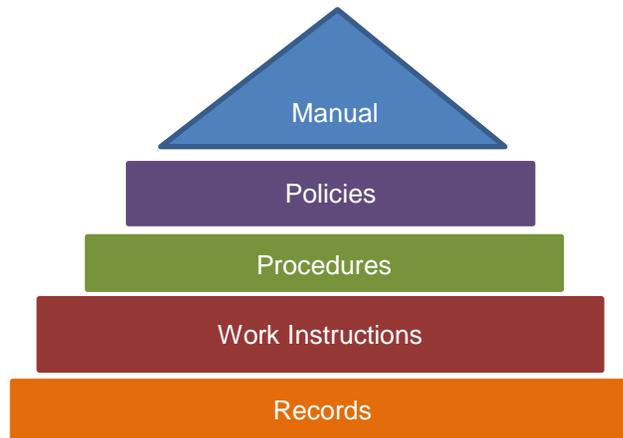
1. Answer the questions on page 8 individually.
2. There will then be a group discussion about the exercise.

Background

A. Documentation

Documentation is a building block of a quality system, and is required by many regulations and standards. In the lectures, documentation is referred to as “Say what you do”.

As shown in the pyramid below, there are multiple levels of documents. The detail contained in a document increases as you move down the pyramid.



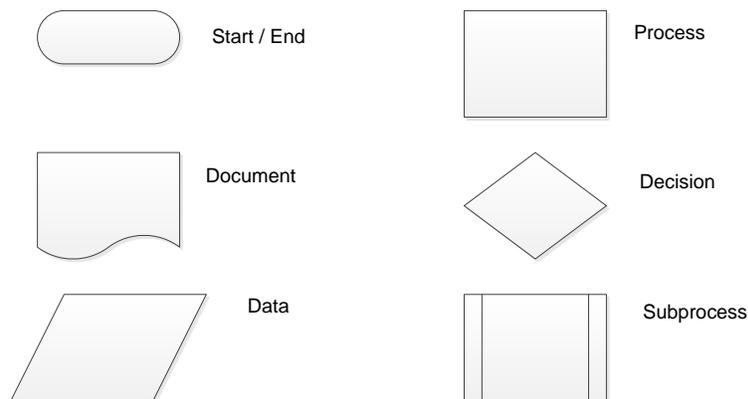
- Quality Manual is a high level document and provides an overview of the quality system and business operation of the manufacturer.
- Policies are the next level down and will provide general guidelines by which the company conducts the various manufacturing (service) operations.
 - For instance, most companies will have policies on: identifying approved suppliers, how long records and documents shall be retained, documentation practices, production environment requirements, etc.
 - In larger corporations or companies with multiple sites, policies are typically corporate-wide and all locations are required to follow the guidelines. However, a specific plant (or sales) location could also have site specific policies or procedures that further define how that specific site will implement the corporate policy.
- Procedures typically provide the operational detail regarding how the business has implemented the policies and provide general information on the day-to-day operations. These are typically called Standard Operating Procedures (SOP)
- Working Documents provide the detailed steps to carry-out a specific task. Working documents can include:
 - Work Instructions
 - Test Methods
 - Product Specifications
 - Process Specifications
 - Raw Material Specifications

- Records are the documented results of completing the various tasks required by Procedures or Working documents. These can be manually recorded paper documents, a combination of manual and electronic data or electronic files.

SOP (standard operating procedure) is a commonly used acronym in many industries. Generally when someone refers to an SOP, they're talking about the detailed procedure on how to perform a task. SOPs could be referring to: plant procedure, work instruction, test method, laboratory protocol, etc.

B. Flowcharts

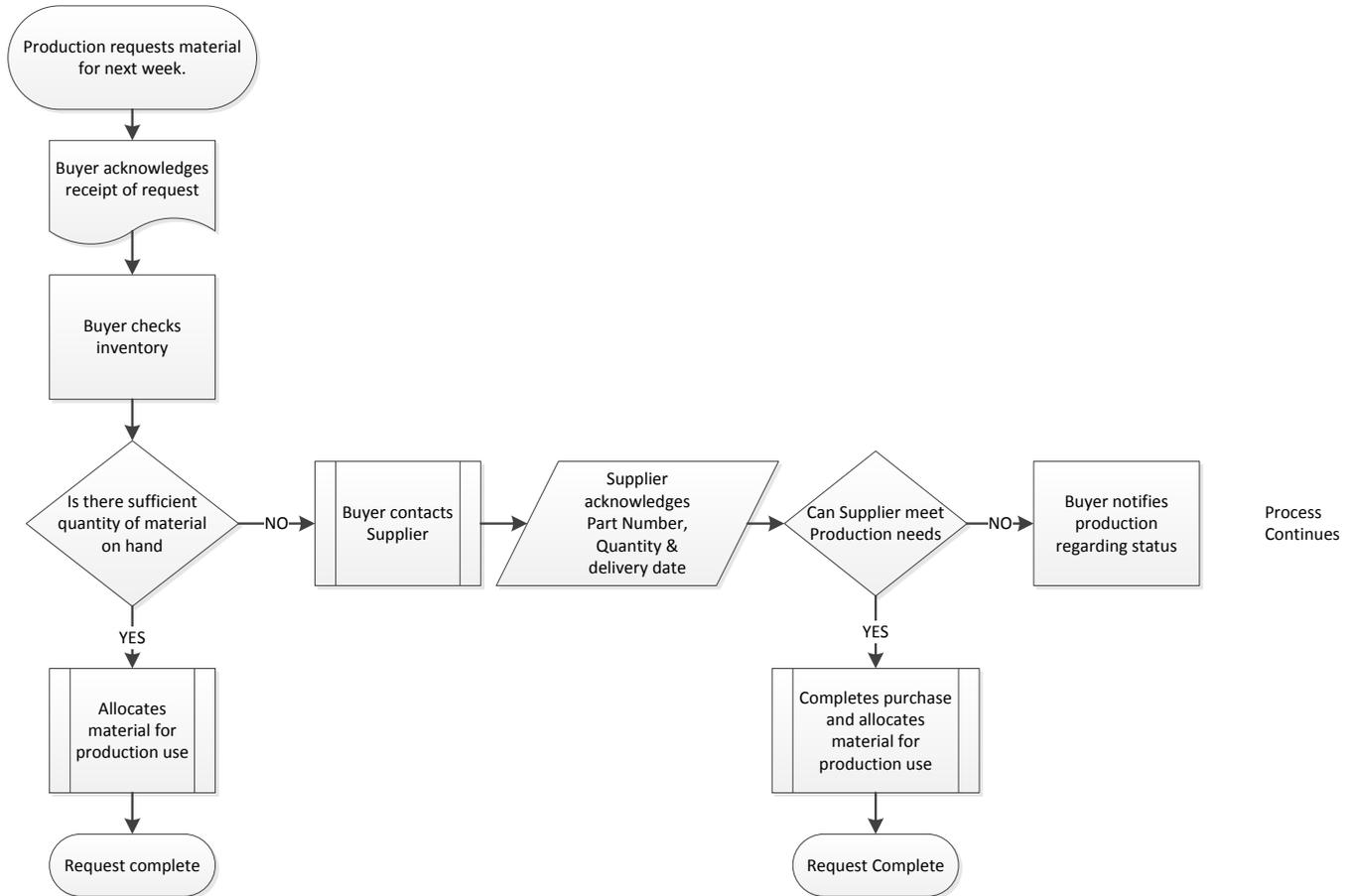
A flowchart is a picture of how the various steps/tasks in a process or operation are connected and the order in which they need to be completed. There are a variety of flow chart types, with specific symbols, used by industry. A quick internet search using the word "flow chart" can provide a guide to the various types available. For the purposes of this exercise we will be using the basic flowchart shapes (US units). See page 5 for an example flowchart depicting a purchasing process.



- Solid lines and arrows are used to connect the symbols and direct the user. Dotted lines may also sometimes be used. The difference between solid and dotted lines would be indicated on the flowchart. Only solid lines will be used in this exercise.
- Start/End: indicates the starting point and ending point of the task/operation/process being depicted.
- Process: indicates an action step in the operation being depicted.
- Document: indicates a document will be needed or a document will be created
- Decision: typically contains a question and directs the user based on the response
- Data: used to indicate what results are expected or what information may be needed.
- Subprocess: used when one of the action steps is the result of another process that is not included on the current flowchart.

Flowchart Example

The plant buyer needs to purchase raw material for production to use next week.



Name _____

LABORATORY EXERCISE #1
FLOWCHART – Shape Drawing

**NOTE: This template is provided as an example.
The document you create may not use all the sections (1-9) listed below.
A Microsoft Word template is available on blackboard.**

SOP (Standard Operating Procedure) TEMPLATE

| | | |
|--|---|------------------|
| Company Logo | Document Type (i.e. Policy, Standard Procedure, Work Instruction, Production Specification, etc.) | Revision: |
| Title: (i.e. Redrawing Triangle on Squares) | Effective Date: | Page of |

1.0 PURPOSE

[Provide a general description of what the procedure will cover.]

2.0 SCOPE

[This section is used to specify any limits to the procedure – example: used by only one department, or applicable to only one type of material, etc.]

3.0 BACKGROUND

[Provide any relevant history regarding the specific operation or procedure]

4.0 DEFINITIONS

[Any words with a unique definition specific to the operation(s) to be performed can be provided here.]

5.0 EQUIPMENT

[This section typically lists (describes) the equipment / machines that will be needed for the operation(s).]

6.0 MATERIALS

[This section typically lists the materials (i.e. plastic resins, laboratory chemicals, etc.) that will be needed for the procedure.]

7.0 GENERAL PROCEDURES

[Provide directions to the reader on how to perform the operation(s) covered by the procedure / work instruction]

8.0 QUALITY RECORD REQUIREMENTS

[List any forms that are needed to record the data from the operation; how to handle print-outs from automated machines, etc.]

9.0 REVISION HISTORY

| Revision | Date | Description of Change |
|----------|-------------|--|
| A | 05-Jan-2011 | Issue document |
| B | 11-Aug-2014 | Revised 6.1 to state “resins, assembly components, etc.) |

10.0 APPROVAL

Author: _____ Date: _____
Name (print & signature)

Department: _____ Date: _____
Representative Name (print & signature)

Debriefing Questions (to be answered after the exercise has been completed)

The questions below will be answered individually, followed by group discussion.

1. What document types were created in this exercise? _____

2. What records were created in this exercise? _____

3. Describe the experience of creating the flow chart. Did the flowchart help to organize your thoughts and the steps necessary to recreate the drawing?

4. Describe the experience of creating the work instruction.

Did you create the document starting at the beginning of the template and working toward the end?

Did you create the step-wise procedure first and then complete the other sections of the template?

Did you follow the flowchart you created? Was the flowchart modified as you created the work instruction?

5. How close was the re-created drawing to the original? circle one below

- 1. Not even close
- 2. Approximately 25% correct
- 3. Approximately 50% correct
- 4. Approximately 75% correct
- 5. Approximately 100% correct

Were the objected located in the proper place? _____

Were they the correct color? _____

Were they shaded correctly? _____

6. After reviewing the comments/questions added by the person who used your work instruction, if pictures or figures could have been used would this have been helpful? Why?

7. When you were using someone else's work instructions did you notice ideas that you want to incorporate into your work instruction? What?

