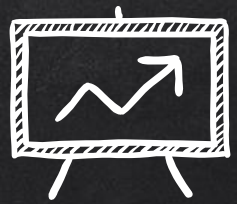


# TECHNICAL DESCRIPTIONS AND PROCESS ANALYSES

# Technical Descriptions

Technical description is a part-by-part depiction of the components of a mechanism, tool, or piece of equipment

- Important feature of component of technical communication


# Types of technical Description

Used in various documents

# Operation manuals

Operations manuals are part of mechanism, tool or a piece of equipment

Helps the user construct, install, operate and service the equipment

Includes technical descriptions

Includes:

- Details of components included
- Quality of components
- Function(s) of components
- Reordering (if any) of flawed components

# EXAMPLE

The Modern Electronics Tone Test Tracer, Model 77A, is housed in a yellow, high-impact plastic case that measures 1¼ inch { 2 inch { 2¼ inch, weighs 4 ounces, and is powered by a 1604 battery. Red and black test leads are provided. The 77A has a standard four-conductor cord, a three-position toggle switch, and an LED for line polarity testing. A tone selector switch located inside the test set provides either solid tone or dual alternating tone. The Tracer is compatible with the EXX, SetUp, and Crossbow models.

# Product Demand Specifications

Caters to company needs for a specific equipment that does not exist

Product demand *specifies* its exact needs

# EXAMPLE

Subject: Pricing for EDM Microdrills

Please provide us with pricing information for the construction of 50 EDM Microdrills capable of meeting the following specifications:

- Designed for high-speed, deep-hole drilling
- Capable of drilling to depths of 100 times the diameter using 0.012-inch to 0.030-inch diameter electrodes
- Able to produce a hole through a 1.000-inch-thick piece of AISI D2 or A6 tool steel in 1.5 minutes, using a 0.020-inch diameter electrode

We need your response by January 13, 2014.

# Study Reports Providing by Consulting Firms

- Consulting engineering firm to study a report and provide descriptive analysis
- Basis for a product demand specification requesting a solution to a problem

# EXAMPLE

The slab construction consists of a wearing slab over a ½-inch-thick waterproofing membrane. The wearing slab ranges in thickness from 3½ inches to 8½ inches, and several sections have been patched and replaced repeatedly in the past. The structural slab varies in thickness from 5½ inches to 9 inches with as little as 2 inches over the top of the steel beams. The removable slab section, which has been replaced since original construction, is badly deteriorated and should be replaced. Refer to Appendix A, Photo 9, and Appendix C for shoring installed to support the framing prior to replacement.

# Construction Design

- Legal technical description that details the **location and dimensions** of any architectural project
- Helps define property limits before construction
- Used for variety of purposes

City approval before construction
Requests for change of zoning, request for permits, re-platting of the site if a property line must be located

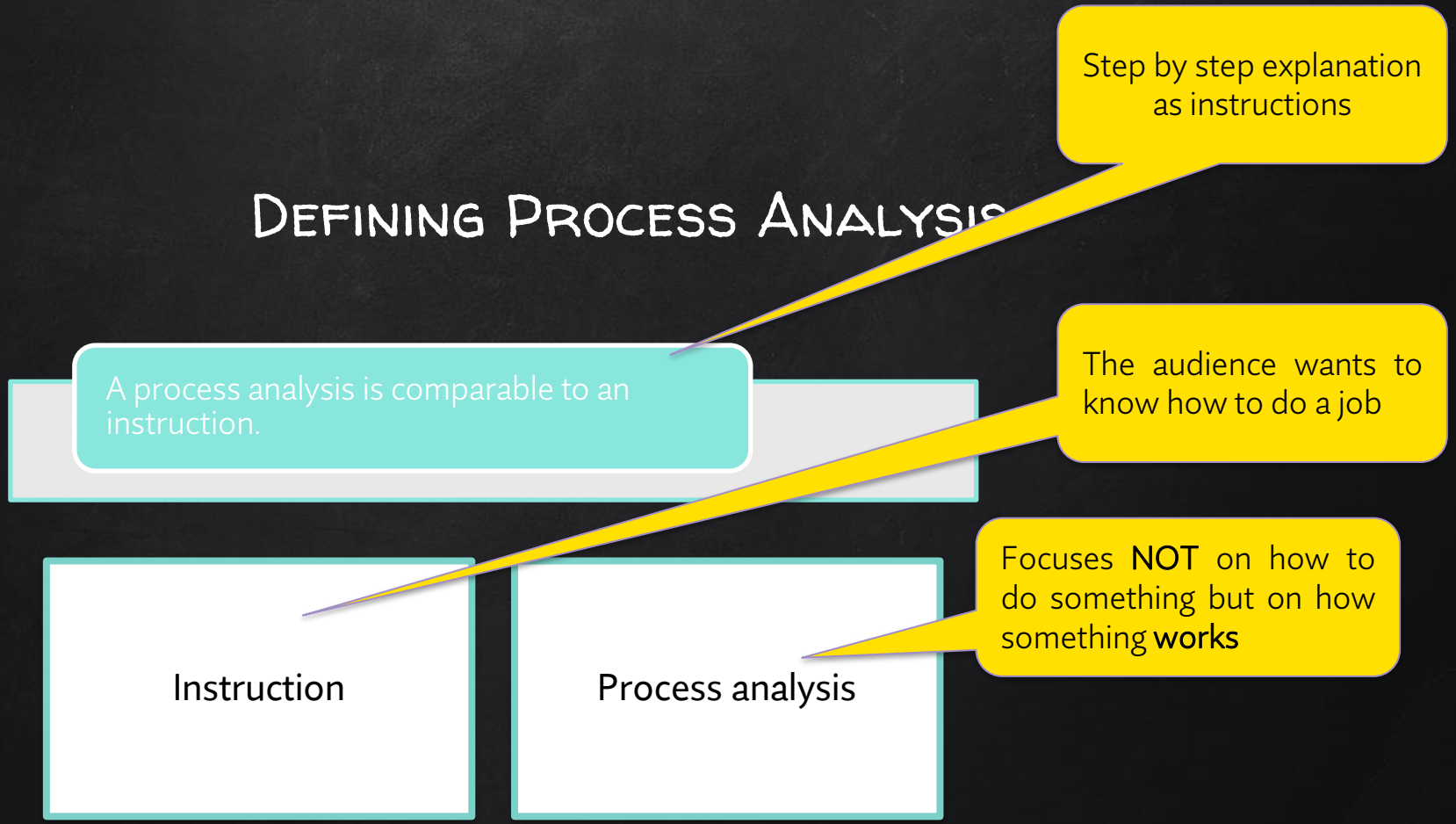
# Sales Literature

- Describe the product for marketing equipments or services
- Common in sales letters, proposals, and on Web sites


# Defining Process Analysis

What is it? Where is it used?

# Defining Process Analysis



# Examples of Process Analysis

Engineering

Automotive Sales

Biomedical Technology


# Components Of Technical Descriptions And Process ANALYSIS

Essential and Additional Components

# Criteria for Writing Technical Descriptions

Title

Overall Organization

Highlighting Techniques

# TITLE

Preface your text

Precisely state the topic

Include the name of mechanism, tool, piece of equipment, landform, product or service you are describing/analyzing

# Overall Organization

- Specify and define your topic
- Explain the topic's functions, capabilities and processes
- List components, parts or equipment involved

# Overall Organization

Introduction

Discussion

Conclusion

# EXAMPLE

Technical Description

The Apex Latch (#12004), a mechanism used to secure core sample containers, is composed of three parts: the hinge, the swing arm, and the fastener.

Technical Description and Process Analysis

The DX 56 DME (Distance Measuring Equipment) is a vital piece of aeronautical equipment. Designed for use at altitudes up to 30,000 feet, the DX 56 electronically converts elapsed time to distance by measuring the length of time between your transmission and the reply signal. The DX 56 DME contains the transmitter, receiver, power supply, and range and speed circuitry.

# Discussion

- Describe components
- How mechanism works (process)
- For ease of access focus on **details, word usage** and **organizational pattern**

This includes function and listing of components/equipments/tools

# Discussion

To develop your discussion, add weight, density, size, parts, shape etc.

- Describe components
- How mechanism works (process)
- For ease of access focus on **details, word usage** and **organizational pattern**

# Discussion

- Describe components
- How mechanism works (process)
- For ease of access focus on **details, word usage** and **organizational pattern**

Depends upon purpose
Factual/Objective ⇒ Photographic words
Subjective/Sales Oriented ⇒ impressionistic words

# Discussion

- Describe components
- How mechanism works (process)
- For ease of access focus on **details, word usage** and **organizational pattern**

Depends upon purpose
Photographic words ➡ denotative
impressionistic words ➡ connotative and vague

# Discussion

Itemize topic in discussion phase
Logical sequence

- Describe components
- How mechanism works (proce
- For ease of access focus on **details, word usage** and **organizational pattern**

# Discussion

Spatial organization for technical descriptions
Chronological organization for process analysis

- Describe components
- How mechanism works (proce
- For ease of access focus on **details, word usage** and **organizational pattern**

# EXAMPLE

| | | |
|---|---|---|
| Weight | Density | Make/model |
| Size (dimensions) | Parts | Texture |
| Color | Materials (composition) | Capacity |
| Shape | Identifying numbers | Procedural steps |

# EXAMPLE

**TABLE 1** Photographic versus Impressionistic Word Usage

| Photographic | Impressionistic |
|---|---|
| 6'9" | tall |
| 350 lb | heavy |
| gold | precious metal |
| 6,000 shares of United Can | major holdings |
| 700 lumens | bright |
| 0.030 mm | thin |
| 1966 XKE Jaguar | impressive classic car |

# Conclusion

Depends on your purpose

# EXAMPLE

| | | |
|---|---|---|
| **Sales**—"Implementation of this product will provide you and your company . . ." | **Guarantees**—"The product carries a 15-year warranty against parts and labor." | **Comparison/contrast**—"Compared to our largest competitor, this product is three times more weather resistant." . . . |
| **Uses**—"After implementation, you will be able to use this product to . . ." | **Testimony**—"Our satisfied customers include . . ." | **Reiteration of introductory comments**—"Thus, the product is composed of the above interchangeable parts and works according to the process explained." |

# Highlighting Techniques

Headings

Itemization

Graphics

# Highlighting Techniques

**Callouts** (labels identifying key components of a mechanism)

| | | |
|---|---|---|
| Line Drawings | Photographs | Architectural renderings |
| Clip art | Exploded views | Sectional cutaway view of topic |

# EXAMPLE

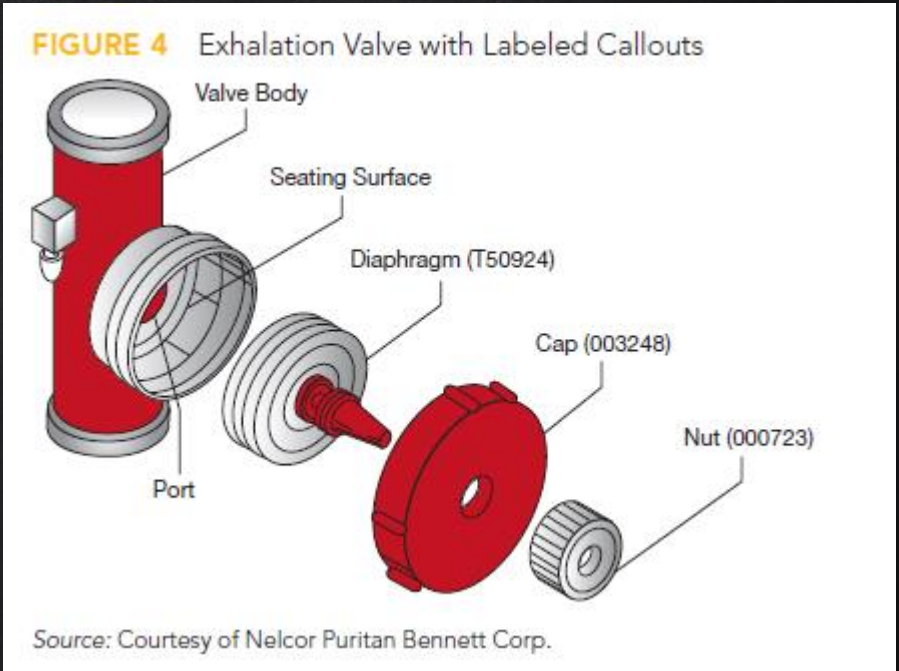


FIGURE 4 Exhalation Valve with Labeled Callouts
Valve Body
Seating Surface
Diaphragm (T50924)
Cap (003248)
Nut (000723)
Port
Source: Courtesy of Nelcor Puritan Bennett Corp.

The introduction explains what the topic is, why it is important, and were the mechanism is located

This technical description discusses the parts of the mechanism, the materials used, the location of these components, and the chemical compounds required for activation.

Here, providing the mechanism's process, the text explains how an air bag works. Note the specificity of detail: 150–250 mph and 1/20 of a second.

**FIGURE 3** Why, When, and How Does an Air Bag Inflate?

Air bags save lives. Driver and passenger air bags are designed to inflate in frontal or side crashes. Steering wheel, right front instrument panel, or side-panel air bags will not inflate on all occasions. If a car drives over a bump or if a crash is "minor," such as hitting an object while driving at a slow speed, an air bag will not deflate. However, when cars hit walls (or trucks or cars or trees), air bags inflate to minimize injury and to save people's lives.

### Before Inflation

How does the air bag detect whether the car has hit a bump versus being involved in a collision?

The airbag system's crash sensor can differentiate between head-on collisions and simple bumps in the road as follows:

1. A steel ball slides inside a smooth bored cylinder.
2. The ball is secured by a magnet or by a stiff spring. This inhibits the ball's motion when the car encounters minor motion changes, such as bumps or potholes.
3. If the car comes to a dramatic and rapid stop, a force equal to running into a brick wall at about 10 to 15 miles per hour, such as in a head-on crash, the ball quickly moves forward. This closes a contact and completes an electrical circuit, which initiates the process of inflating the airbag.

### Parts of an Air Bag

Air bag systems consist of the following:

- Air bag: made of thin nylon. A nontoxic powder (cornstarch or talcum powder) inside the air bag keeps it flexible and ensures the parts of the air bag do not stick together.
- Air bag holding compartment: the steering wheel, dashboard, seat, or door.
- Sensor: a device that tells the bag to inflate.
- Inflator canister: consisting of sodium azide ($NaN_3$), potassium nitrate ($KNO_3$), and silicon dioxide ($SiO_2$), which produce nitrogen gas ($N_2$).

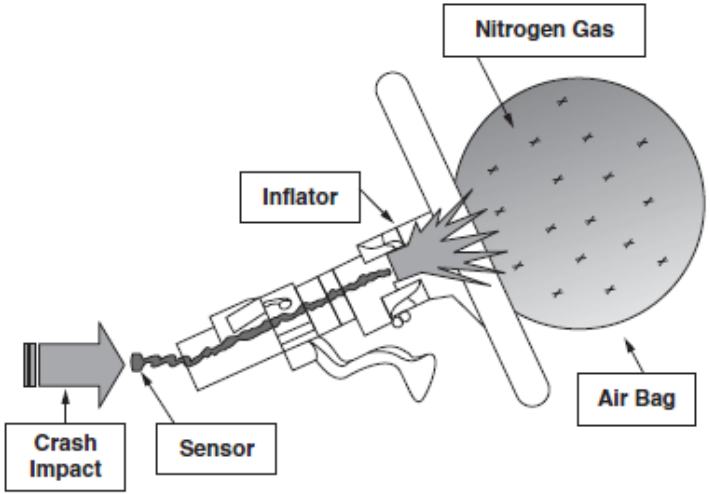
### During Inflation

In a severe impact, the air bag sensing system will deploy in milliseconds. The following occurs:

1. The air bag's crash sensor triggers a switch that energizes a wire, sending electricity into a heating element in the propellant that releases gas from the inflator canister.
2. A pellet of sodium azide ($NaN_3$) is ignited, generating nitrogen gas ($N_2$).
3. A nylon air bag, folded into the dashboard, steering wheel, and/or side panels of the door, inflates at a speed of 150–250 mph, taking only about 40 milliseconds (about 1/20 of a second) for the inflation to be complete.

This illustration graphically depicts the process in action. When the crash sensor is triggered, it activates the inflator. Nitrogen gas explodes, inflating the air bag.

4. The sodium azide inside the air bag produces sodium metal, which is highly reactive, potentially explosive, and harmful when in contact with eyes, nose, or mouth. To render this harmless, the sodium azide reacts with potassium nitrate ($KNO_3$) and silicon dioxide ($SiO_2$)—also inside the air bag—to produce silicate glass, a harmless and stable compound.




## After Inflation

Air bag vents, minute holes in the bag, allow the deployed air bags to deflate immediately after impact. This ensures that the car's inhabitants do not smother.

Though air bags were first used in 1973, they have only been mandatory in all cars since 1998. Have air bags made a difference? Absolutely! The National Highway Traffic Safety Administration says air bags saved an estimated 1,043 lives in 1998 alone.

The conclusion sums up the process analysis by quantifying the significance of air bags as a means of saving lives.

# Criteria for Writing Instructions

"Begin with the end in mind"

- Determine your goal is to complete a project or to learn a process

Consider the audience

Ethical Instructions

Identify the Constraints

# Purpose

Every manufactured product or service has instructions

Include instructions wherever audience needs to know how to

| | |
|---|---|
| Operate a mechanism | Collect lab specimens |
| Install equipment | Use an autoclave |
| Manufacture a product | Service equipment |
| Package a product | Troubleshoot a system |
| Perform lab experiments | Use software |
| Test components | Set up a product |
| Maintain equipment | Implement a procedure |
| Clean a product | Assemble a product |
| Draw blood | Repair a system |

# Audience Recognition

- Explaining components
- Specific detail and clarity for steps
- Enumerate steps along with components

# EXAMPLE

To overhaul the manual starter, proceed as follows: Remove the engine's top cover. Untie the starter rope at the anchor and allow the starter rope to slowly wind onto the pulley. Tie a knot on the end of the starter rope to prevent it from being pulled into the housing. Remove the pivot bolt and lift the manual starter assembly from the power head.

# Audience Recognition

- Do not assume anything about reader's knowledge
- Clarify details

# Ethical Instructions

Legalities in User Manuals

Misunderstood instructions can cause injuries and accidents

If there is a possibility or potential for harm, inform the reader

Set limits and expectations for a product

Practicalities in User Manuals

Satisfying customer's needs for up-to-date information

If its not met, it can lead too customer complaints, lost business and loss in money.

Revise the manuals

# Activity: Lead-In

We could not unfortunately cover the activity in today's class. Before next class, watch the video link below and prepare for a discussion on what specific problems did you notice in following the criteria for writing instructions by the kids in the video

https://youtu.be/cDA3_5982h8