Chapter 2
Design Project

PROBLEM DEFINITION

- Turbo Tap Company manufactures keg pumps. Our goal is to design a facilities layout that integrates all resources available to perform the required manufacturing operations in the most effective and efficient manner. A team work approach will be used.
OVERALL PROCESS

• PRODUCT DESIGN
• PROCESS PLANNING
• LAYOUT PLANNING
• PERSONNEL REQUIREMENTS
• OFFICE LAYOUT PLANNING
• PLANT & OFFICE LAYOUT

OVERALL PROCESS

Section I

• Production Drawings.
• Assembly Drawing.
• Parts List.
• Assembly Flow Chart.

Section II

• Production Routings.
• Machine Requirements and Costs Tables.
• Material Requirements and Costs Tables.
OVERALL PROCESS
(CONT)

Section III
- Layout Planning Charts.
- Initial Layout.
- Systematic Layout Planning & Computer
- Material Handling Requirements.
- Material Handling Costs.

Section IV
- Personnel Requirements and Costs (Direct and Indirect).
- Corporate Structure.
- Unit Cost.

OVERALL PROCESS
(CONT)

Section V
- Office Layout
  - Traditional.
  - Landscape.
  - Open-plan.

Section VI
- Final Plant Layout.
- Material Flow.
- Systematic Layout Planning & Computer
SECTION I

- Production Drawings (AutoCAD)
  - What is to be produced?
  - Type of operations required.
- Assembly Drawings
  - Relationship of individual parts in final assembly.

SECTION I (CONT)

- Parts List
  - Summary of all parts needed for an assembly.
  - Purchased and manufactured parts.
  - Quantity needed and special remarks.
**SECTION I**

(Cont)

- **Assembly Flow Chart**
  - Graphic representation of how to assemble the entire product.
  - Sub-assemblies.
  - Major assemblies.
  - Inspections.

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**SECTION II**

- **Production Routings**
  - Show sequential operations for a specific part.
  - Lot sizes (40 lbs).
  - Machine types.
  - Associated tools.
  - Helpful to determine machine and materials requirements and costs.
**SECTION II (CONT)**

- **Machine Requirements and Costs Table**
  - Types of machines.
  - Brands.
  - Models.
  - Space required.
  - Total annual machine costs.

- **Machine Types**
  - Vinyl injection molder.
  - Punch press.
  - Compression molder.
  - Rubber injection molder.
  - Vulcanizing oven.
  - Drill press.
  - Bandsaw.
  - Lathe.
  - Threading machine.

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**SECTION II (CONT)**

- **Material Requirements and Costs Table**
  - Amount considering scrap (weight basis).
  - Material cost also based on weight.
  - Material scrap ranges from 5% to 70%.
  - Recycling.
**SECTION II (CONT)**

- **Machine Drawings (AutoCAD)**
  - Pictorial example of how machines look like.
  - Drawings give a general idea of how the workstations will be laid out.

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**SECTION III**

- **Layout Planning Charts**
  
  **Heading**
  - Assembly no., material, production quantities and lot sizes.

  **Body**
  - Part routing, machine requirements, manpower requirements, and material handling requirements.
SECTION III (CONT)

- Material Handling Requirements
  - Bench carts.
  - Flat truck.
  - Pallets.
  - Trash container.
  - Trash container dolly.
  - Shipping dolly.
  - Storage racks.

SECTION III (CONT)

- Material Handling Costs
  - Shipping and handling charges.
  - Installation fees.
  - Associated costs.
SECTION III

(Cont)

- Initial Layout.
- Systematic Layout Planning.
- Computerized Procedure.

SECTION IV

- Personnel Requirements and Costs
  - Categories (Direct and Indirect).
  - Personnel positions.
  - Personnel required in each position.
  - Pay rate and annual salary for each position.
**SECTION IV**
(CONT)

- **Unit Costs**
  - Annual personnel costs (& benefits).
  - Annual non-personnel costs.
  - Add indirect costs not yet included.
  - Total annual costs.
  - Cost per unit.
  - Selling Price (includes profit).
  - Is this price **competitive**?

**SECTION V**

- **Office Layout**
  - Designed to provide the executives and support personnel a work area which would be functional and pleasant to work in.
SECTION VI

- Plant Layout
  - Optimizes parts flow.
  - Facilitates efficient material handling.
  - Designed for safe operation.

- Material Flow
- Computerized Procedure
- Systematic Layout Planning

CONCLUSIONS AND RECOMMENDATIONS