Shipyard Layout

Week 5

Sumitomo Oppama Shipyard
Mitsubishi Kyogi Shipyard

Plant Capacity

- Single shift capacity
- Overtime capacity
- Extra shift capacity
- Internal capacity
- Total capacity
- External capacity (subcontracting)
**Layout Logic**

1. Develop layout objectives
2. Determine capacity requirements
3. Locate structures on land site
4. Establish the type of layout necessary
   - Obtain building floor plans
   - Establish product work flow patterns
5. Locate major workstations and develop layout for each of them
6. Evaluate the proposed layout
   - Acceptable
   - Not acceptable

STOP

**Work Flow - Main Horizontal Work Flow Types**

- Flow (one flow)
- Flow
- Flow
- Flow
- Flow
- Flow
- Flow

Figure 5.1: Basic horizontal flow systems.

Figure 5.2: Diagrams of combinations of basic horizontal flow systems.


Work Flow - Main Vertical Work Flow Types

![Diagram of Main Vertical Work Flow Types](image)

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Work Flow - Linear

![Diagram of Linear Work Flow](image)

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- a: baştan doğrudan ayır
- b: alttaki grup ve çubuk
- c: alttaki boylama
- d: tepki aydınlatma
- e: tepki aydınlatma
- f: kamıkça doğrudan ayır

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Layout Alternatives - (9!)

Process Type

Figure 3. Layout by process
Product Type

Figure 8. Layout by product

Work Flow Layouts

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Product Type Layout

Process Type Layout
Mixed Type Layout

Comparison of Different Layouts
Work Flow - River Approach

Figure 7.5. A "river" convergent flow.

I, II, III, IV Production lines feeding the main assembly line
II/1, II/2 Sublines feeding II
IV/1, IV/2 Sublines feeding IV.
A, B, C Bought-out components or assemblies fed to assembly lines.
A, B, C Subassemblies produced consecutively in batches on line II.

Relationship Chart

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Layout Performance

CRITERIA
• Cost minimization
• Transport distance minimization
• Maximization of the volume of transported units
• Maximization of communication and control

CRITERIA SELECTION
• Physical attributes of the product
• Volume of units travelling amongst processes
• Frequency of transportation amongst processes
• Material handling cost (cost per movement x number of movements)

Shipyard Layout - Factors effecting the development of facilities

• Welded ships
• Block assembly
• Cranes
• Ship types
• Ship dimensions
• Dry docks
• Gantry cranes
• Cutting systems
• Panel & Web lines
• Automated welding systems
• Pre-outfitting
Shipyard Layout - Factors effecting the development

- Type and quantity of ships to be built
- Area requirement
- Existing area
- Degree of mechanization
- Material handling and transfer systems
- Production methods adopted
- NC processes
- Panel Lines
- Block and sub-assemblies
- Shotblast and painting
- Covered space
End of Week 5

Questions?