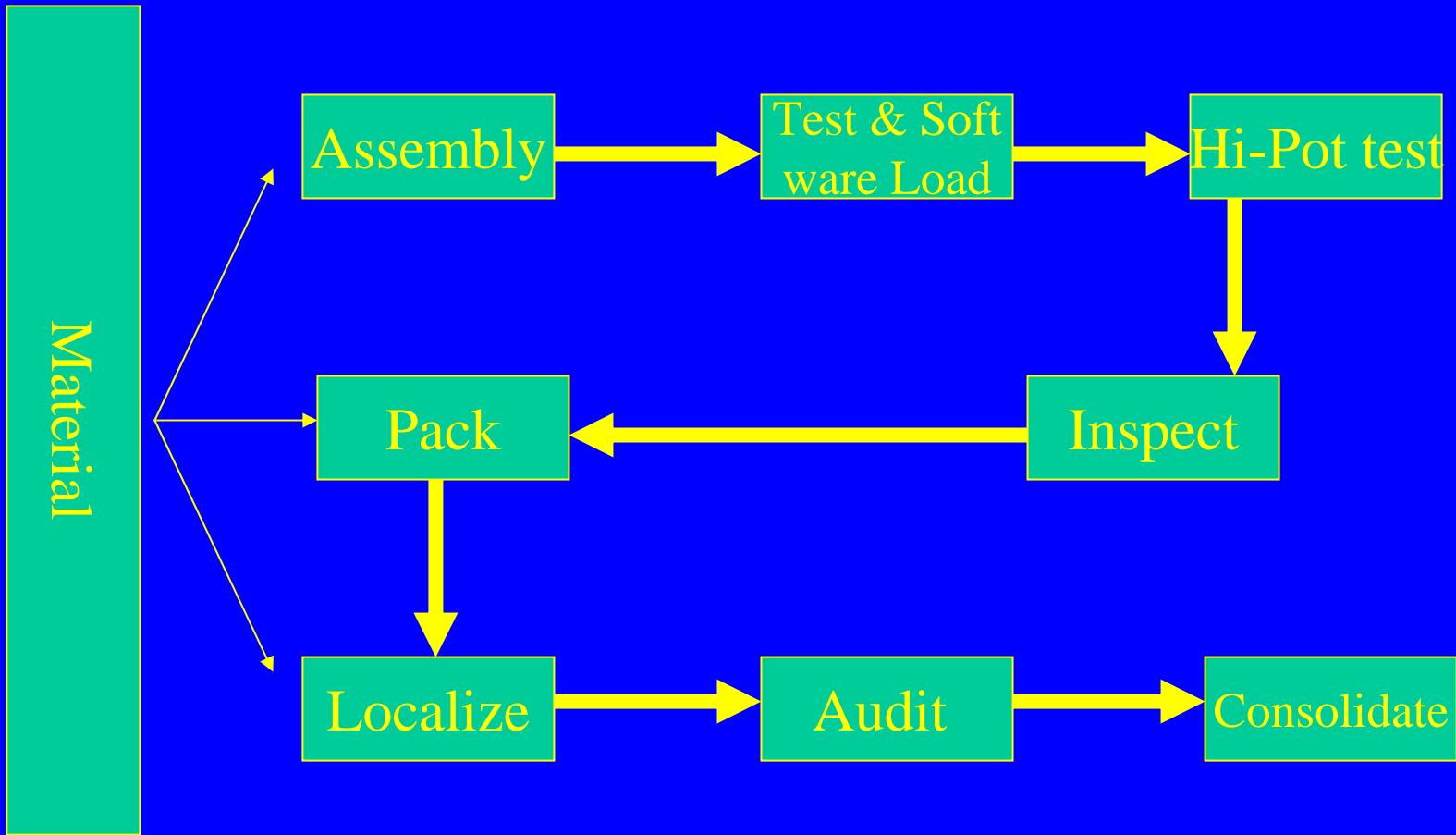


# Design of Manufacturing System

- **No general theory or frameworks:**
  - factory designs are infrequent
  - factory designs seem to be context specific
- **Case study for PC factory**
  - design process
  - design issues
- **Illustrative example: use of queuing concepts for design of medical tent**

# PC Factory



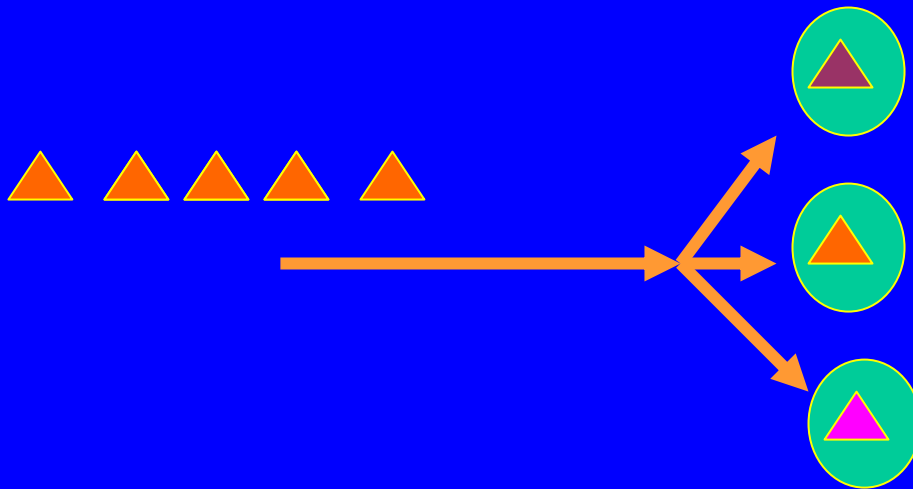
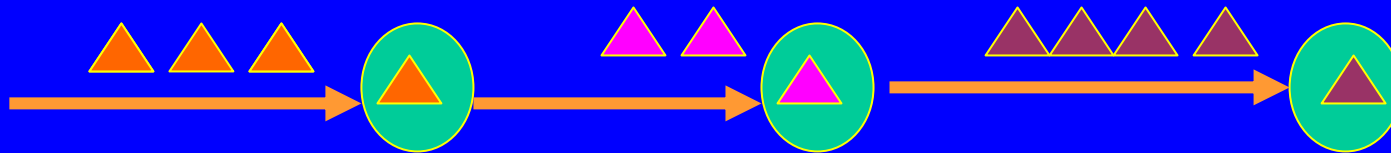
# Design Process

- **Benchmarking and best practices**
- **Development of design concept**
- **Development of design guidelines**
- **Detailed design process**
- **Development of personnel and material requirements**
- **Installation and verification of processes and procedures**

# Design Issues

- **Configuration for each stage: serial versus parallel stations**
- **Material positioning: kitting versus line-side stocking**
- **Capacity for each stage: where to locate the constraint**

# Serial vs. Parallel Stations



# Serial vs. Parallel Stations

- **Divisibility of process**
- **Unpredictable process variation**
- **Tooling and equipment**
- **Material positioning**
- **Task complexity**
- **Demand and mix variability**
- **Quality considerations**

# Kitting vs. Line-side stocking

- **Cost of picking vs. stocking**
- **Security and control**
- **Inventory requirements and inventory costs**
- **Scheduling complexity**

# Capacity: where to locate the constraint?

- **Cost of capacity**
- **Predictability of process**
- **Scheduling complexity**
- **Yield considerations**