



Cellular- Streamlined Flow – Lead-time Reduction

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Plant Layout uses a number of techniques to understand the current layout and its limitations and to design an improved layout. CAD (Computer Aided Design) systems help to facilitate documenting, reviewing and presenting options. Spaghetti diagrams, and cut and paste layout methods may be used to more effectively engage teams. Layouts may be evaluated using a weighted criteria matrix with team input. Material and information closeness / separation needs, extent of material transported, and distances traveled are significant criteria. Transition to the new layout requires specifying equipment needs (hookups, access, alignment...) and locations with effective move coordination to minimize downtime.

Plants are typically organized by functional groups of equipment and support staff. To effectively accomplish flow, these functional groupings must be broken down into cells or natural work-teams focused on product families. Equipment is positioned according to the sequence of operations. Work content must be distributed and balanced for line-balanced workflow within takt time, the “beat” of customer demand. Through creative design and material handling methods, lot-sizes can be reduced toward the ultimate goal of handling one piece at a time. The process must be stabilized with consistently high quality, well-maintained - reliable equipment, and predictable throughput times.

Lead-time may be improved by a number of techniques – moving operations closer together through cellular manufacturing, mixed model level load scheduling, controlling queues with kanban / pull systems or other limits, reducing lot-sizes with setup reduction, and better information sharing through such approaches as blanket purchase orders and e-commerce. Alleviating bottlenecks or other constraints improves flow and correspondingly reduces lead-times. Shorter, predictable lead-times improve delivery performance. Improvements must be driven into the supply chain working with customers and suppliers for optimum material flow, high quality, reliable delivery and effective coordination.

Key Benefits

- Layout arranged for optimal material flow and localized information
- Team involvement for better ideation, ownership and coordination
- Cellular manufacturing for responsiveness, optimum methods and quality at the source
- Reduced lead-times cashed through inventory reductions and increased sales from customers responding to newfound responsiveness and on-time delivery

Activities

- Define and redesign plant layout using AutoCAD software and cut and paste methods
- Facilitate teams to generate ideas and evaluate alternative layout solutions
- Call upon design and implementation expertise gained through extensive industrial engineering background and experience with major plant reconfigurations
- Plan, coordinate and support implementation to accomplish the layout change
- Use design concepts and best practices to accomplish lean cellular production and flow
- Apply several tools and breadth of experience to control queues, reduce lead-time and improve responsiveness

Do your products take a tour of the plant? Is the facility organized by functional, rather than product family groupings? Do customers complain about long waits or missed deliveries? If so, get help to effectively apply cellular manufacturing, streamlined flow and lead-time reduction.

Cellular Manufacturing Definition

Cellular manufacturing is an organized, flow-oriented process to produce a family of products within a single line of machines or work-stations with dedicated operators

Link manual and machine operations into the most efficient combination to maximize value-added content while minimizing waste

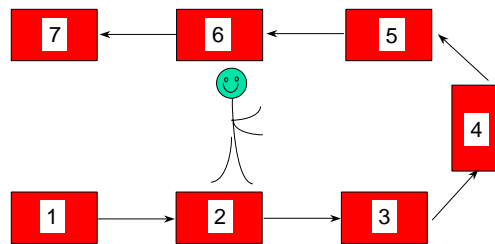
Cell Design Goals

- **Flexibility** – People, Process, Tools and Equipment
- **Lot Size of One** – small batch production
- **Point of Use Storage** - Spur / Flow Rack
- **Mixed Model** production scheduling
- **Visual Management** - Local Information Flow
- **Quality at the Source:** Process Control, Source Inspection, Mistake-proofing

Use Standard Work Tools

119

Process Flow - World Class



Multi-Skilled Operator(s)
Counter-clockwise - Cellular / Flow Arrangement

115

Cellular Flow – Plant Layout

U-Shaped Cells with Material In-Out from Central Aisle

