



EPICENTRAL

A Newsletter from Epicenter Development Group highlighting ideas that improve organizations

Welcome to Epicenter Development Group's newsletter, EPICentral. The purpose of this newsletter is to highlight fundamental ideas that have helped organizations develop and maintain great manufacturing and service operations. We hope that you find our EPICentral newsletter helpful, and we would welcome your comments on its content.

Balancing Operations to Meet Your Needs

During these slower economic times, many organizations are looking for ways to reduce their overall operating costs while becoming more "Lean" in their operations. One successful strategy is to develop flexible work environments where production output can be adjusted to better match customer demand. For these organizations, the staffing levels at an assembly line, work cell or work center can be adjusted, as needed, to best meet the daily or weekly production needs. The purpose of this article is to review **Line Balancing** - one of the key tools used to balance the labor to the production needs.

For our example, we will pretend that we have historically used ten people to produce 150 widgets per shift in the past; and we now want to determine the number of people required to produce only 80 widgets per shift.

Steps to Line Balancing

1. **Identify labor content and standards** - The first step in Line Balancing is to determine the labor content and time duration for completing all activities required to complete the task. For more information on how this is done, please refer to Epicenter's newsletter of October 2008 on Labor Standards.
 1. **Example:** We identify twenty steps to build a Widget which require 23.8 minutes of activity time.
2. **Determine the production rate** - This represents the rate for producing finished product and is calculated by: Time Available for Making Product/ Finished Production Required.
 1. **Example:** We have one shift (420 working minutes) in

Step	Activity	Duration (minutes)	Sub Total (minutes)
1	Activity 1	1.1	Subtotals must be less than 5.25
2	Activity 2	1.5	
3	Activity 3	2.1	
4	Activity 4	0.3	
5	Activity 5	2.8	5.0
6	Activity 6	2.3	5.1
7	Activity 7	0.5	
8	Activity 8	1.3	
9	Activity 9	0.7	
10	Activity 10	2.3	4.8
11	Activity 11	0.9	
12	Activity 12	0.4	
13	Activity 13	2.0	
14	Activity 14	0.9	
15	Activity 15	0.3	4.5
16	Activity 16	0.8	
17	Activity 17	1.2	
18	Activity 18	0.6	
19	Activity 19	1.1	
20	Activity 20	0.7	4.4

Total Time:

which to make 80 widgets = $420/80 = 5.25$ minutes per widget while running the line.

3. **Determine the "ideal" number of people required** - This is calculated by dividing the total amount of activity time (#1) by the production rate required (#2).
 1. **Example:** We need to make a widget (23.8 minutes of activity) every 5.25 minutes = $23.8/5.25 = 4.5$ people required.
4. **Assign tasks to people** - This final step is to assign specific activities to individuals so that their overall assignments are less than or equal to the required production rate.
 1. **Example:** After a review of the layout and activities, it was determined that five people would be required to meet the production needs; and the activities were assigned as shown on the table to the right.

Considerations:

- A key to flexible staffing levels is the use of visual tools, operator instruction sheets and a work force that is cross-trained to complete a variety of tasks.
- Part of the final step must include a consideration of the work station, work cell or assembly line layout.
- To allow for flexibility, many organizations create equipment layouts that are conducive to flexible staffing scenarios (U-shaped work cells, for example).
- A variable speed conveyor can sometimes be used to adjust the work pace for assembly line operations (at different staffing levels).
- There are a number of techniques that can be used to help maintain the work balance to handle unplanned disruptions within work cells. Please contact us if you would like more information concerning these methods.

Next Steps

If you would like more information on this topic or other similar types of tools, please contact Bill Proctor with your request at wproctor@epicentergroup.com or 216-702-0952. You can also find previous issues of EPICentral at [Newsletters](#).

Mr. Proctor also speaks on a variety of problem-solving and system design topics that can help companies significantly increase the success and profitability of their businesses. If you are interested in having Bill speak at one of your upcoming meetings/events or would like more information on any of the speaking topics, please visit [Speaker Services](#) or you can email sales@epicentergroup.com.

Epicenter Development Group is a unique consulting firm that seamlessly integrates the disciplines of Systems Engineering and Organizational Analysis & Development to

create practical design solutions to your toughest challenges. It is on the cutting edge of problem-solving solutions and the creator of a unique process called GreenRoom Engineering. This process adds greater value and cost savings for clients as compared to traditional engineering methods.

William Proctor, Epicenter's founder and president, has provided services around the country to more than 100 companies consisting of a variety of organizations; and Epicenter continues to grow as a resource for firms of all sizes.

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