e-Briefing on Productivity Improvement

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May 2016

Line Balancing for increasing productivity

To increase the productivity in garment manufacturing it is essential to balance the line. A line is sequence of process (and machines) in which cut fabric enters in one end and a sewn garment comes out at the other end. Therefore **Line balancing** of assembly line is a systematic process of balancing the efficiency and capacity of workstation to get maximum output from the assembly line.

Why line balancing?

1. Promotes one piece flow
2. Avoids excessive work load in some stages (overburden)
3. Minimizes wastes (over-processing, inventory, waiting, rework, transportation, motion)
4. Increased efficiency
5. Minimizes idle time

Factor that should be considered for line balancing:

1. Should have opportunities such as Machinery, guide, folder and attachment to be able to do the job
2. Material handling shoukd be convinient
3. Worker should have the capacity to do the job
4. Should have proper skill to do the job

Example of line balancing

The following table gives down the operational steps and machines required to make a back part of 5-pocket Jeans including standard minute value for each operation of unbalance line (UBL) and balance line (BL). Fig-1 shows the number of pieces that can be produced in each steps. As the line is unbalanced there will be always stock pile in any of the steps or operator will sit idle due to less production in previous steps, which is known as 'delay', which is 27% in this example.

Operation	Machine	SMV	UBL Man	BL Man
Back yoke join	Feed of the arm	0.25	1.00	1.00
Back rise join	Feed of the arm	0.23	1.00	1.00
Back pocket mouth rolling	Chain stitch	0.23	1.00	1.00
Back pocket Iron	Iron man	0.37	1.00	1.50
Back pocket position mark	Helper	0.33	1.00	1.50
Back pocket matching	Helper	0.23	1.00	1.00
Back pocket attach	Single Needle Lock Stitch	0.53	2.00	2.50
Back pocket 2 stitch	Single needle Lock stitch	0.35	1.00	1.50

These line can be balanced by adding two extra operators (Fig-2): pocket iron and pocket position mark and in pocket attachment and back pocket which will give a delay about 6%.

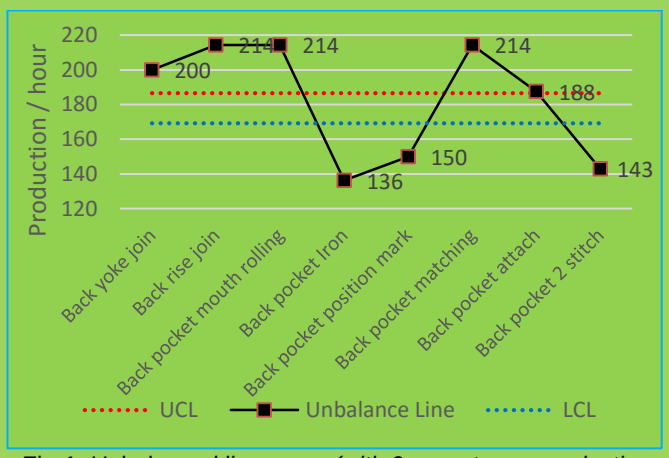

Fig-1: Unbalanced line curve (with 9 operators, prooduction 136 pcs/hr)

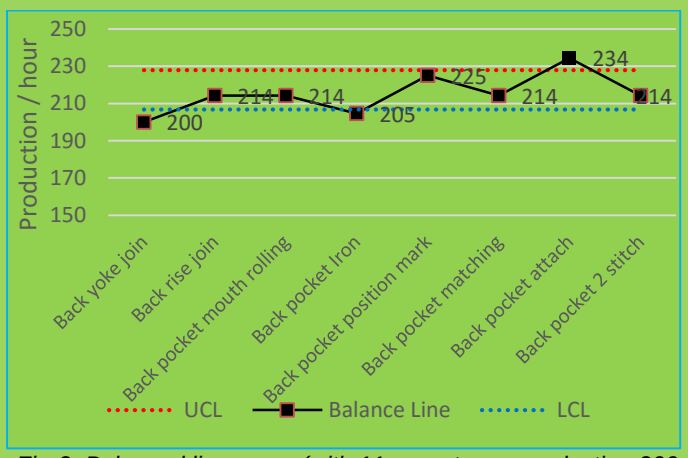

Fig-2: Balanced line curve (with 11 operators, prooduction 200 pcs/hr)

By optimum balancing of the line, the production can increase from 136 to 200 pcs per hour using 9 and 11 workers respectively. Hence the productivity will increase = (136/9)= 15 pcs/worker to (200/11)= 18 pcs/ worker i.e. 20% increase.

Reed Consulting Bangladesh Ltd. have been involved with Textile, Garment and Leather sector for the last 8 years. An initial walk-through gives an idea about the level of productivity in a current set-up which is then studied in details to find out the opportunities (of the utilization of man, machines and materials). For further information, please email to customercare@reedconsultingbd.org.