

## The Operating Behaviour of Unbalanced Unpaced Merging Assembly Lines

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**Abstract :** This paper reports on the performance of deliberately unbalanced, reliable, non-automated and assembly lines that merge, whose workstations differ in terms of their mean operation times. Simulations are carried out on 5- and 8-station lines with 1, 2 and 4 buffer capacity units, % degrees of line imbalance of 2, 5 and 12, and 24 different patterns of means imbalance. Data on two performance measures, namely throughput and average buffer level were gathered, statistically analysed and compared to a merging balanced line counterpart. It was found that the best configurations are a balanced line arrangement and a monotone decreasing order for each of the parallel merging lines, with the first generally resulting in a lower throughput and the second leading to a lower average buffer level than those of a balanced line.

**Keywords :** average buffer level, merging lines, simulation, throughput, unbalanced

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