

ABSTRACT

Production process is one step that is very important in manufacturing system. Accompanying many activities in there, production process are critical point to make product appropriate with demand. For that we need working guide which are systematic, effective, and efficient. Unfortunately to make that happen is not easy. One of problem that often occurs is the material have a queue to be process so it will be a bottleneck. Certainty with bottleneck will decrease another component utility such as machine and worker. PT. Dirgantara Indonesia is one corporation of plane manufacturing in Indonesia. High demand but low capacity causing many queue when process one part. One of solution to solve that problem is use TOC (Theory of Constraint) method, because it trying to solve a trouble as a heuristic and pressure on solve bottleneck with anything that limit a system attaining a goal was called a constraint.

In many research before, there have experimental evidence that TOC can reduce Lead Time until 69%, decrease inventory level over 50%, and improve due-date performance by 60% and higher throughput and revenue until 68% (Steven J. Balderstone in Steven J. Balderstone and Victoria J. Mabin, 2000). That is the background this research about Lead Time Optimization using bottleneck as a control point by Theory of Constraint method at PT. Dirgantara Indonesia.

This research begin with observation constraint in production floor, in this case bottleneck. Determining bottleneck by determine weekly load each operation in each location. The biggest weekly load became a bottleneck, bottleneck on Cnc U. Mach Deckel Maho. On that machine weekly load get 100.52%, so there are need improvement. On step solving bottleneck use TOC analysis based on thinking process. Result of analysis that one of method which can decrease the constraint by scheduling with OPT (Optimized Production Technology) Algorithm.

From result of Scheduling we have a sequence of job become a priority to do first there are Jid No. 1717019, 1717015, 1717020, 1717018, 1717026, 1717023, 1717022, 1717021, 1717014, 1717027, 1717024, 1717017. From output scheduling we do an evaluation and we found utility of bottleneck resource (machine) already become maximal utilization. In this research have three scenario suggestions that are do scheduling, adding a machine, do scheduling and adding machine. From that scenario we get with scheduling and adding machine the system will be better. Lead Time that we get is 164.50 hour or decrease until 25.4%.

Key Word: Bottleneck, Constraint, Theory of Constraint, Scheduling, Lead Time