

Building the B17 at Boeing

Boeing had to rush the production of the B17 bomber in 1940 at a time when they didn't even have a production facility. On top of that, the company had to manufacture the largest and most sophisticated bomber at the time with a workforce of 33,000 people one half of whom were made up of cowboys, wheat farmers, salmon fishermen, and lumberjacks. The other half were, for the most part, made up of Seattle-area housewives

With women workers doing direct work for the first time, Boeing engineers designed and constantly revised tools and processes to maximize worker productivity by minimizing strain and fatigue. System development was guided by a few principles:

- Keep tools and materials in line workers' hands
- Keep both direct processes and support systems very simple to avoid confusion, and
- Engineer the airplane for fast, efficient production

This in turn changed the roles of the supervisor who now had to solve problems fast in the workplace to keep production lines moving. With the pace of production and frequency of engineering changes, supervisors had to be on the shop floor checking and coaching constantly. Because they also had to show people how to do the work, supervisor training and knowledge of standard work instructions was doubly important.

Training Within Industry (TWI) was used to train supervisors on how to break down common industrial tasks into easily digested, easily mastered steps to train new people and also to cross-train employees to promote teamwork and for people to learn how to take on a broader responsibility within their work area. What effect did the combination of TWI and Lean have on the on the production of the B-17?

- 60% reduction in man hours per airplane.
- Fly-a way's went from the initial quote of 75/mo. in 1941 to a peak of 364, one every 1.6 hours in March 1944.
- Initial cost of \$242,000 per plane in 1940 was reduced to a final cost of \$139,254 in March 1944, 42.46% in 32 months