

## **57 years of manufacturing ----- Wayne Lundberg**

July 1958 I stuffed my sea bag on the USS O'Brien, DD725 and headed home to Ft. Collins, Colorado and a new way of civilian life by going to work second shift for Forney's. I started as assembler and over a year learned turret lathe, drill press, quality assurance and production quotas.

A blind fellow sat in a boxed in zone center to lathes and drill presses. His job was to make a sampling of parts and to reject the ones out of tolerance. He used his experienced fingers like today we would use a digital micrometer. 5 rejects out of a hundred was the established norm. The people in the production control booth would simply add 5% to the number of parts required for the number of units to be shipped.

In fact, this was the order of business in most US factories and we led the world in productivity as proven by the massive flood of stuff that enable us along with the Russians and French to defeat the nazi evil and the Hirohito war mania.

Around 1980 we started hearing about Deming, Juran, etc. as we slowly began shedding Taylor and Gilbreth, or at least changing the name of the new revolution such as continuous process Improvement, statistical process control.... Black belts and all.

Our professional association shifted gear from calling us Society of Tooling and Manufacturing Engineers, to simple SME, Society of Manufacturing Engineers. I still miss the old name as tooling really is the heart which pumps the required oxygenated blood to better, cheaper and more stuff for the buck at the checkouts station.

Our national power is driven by being able to mine what is wanted, processed into things people need or could use, and shipped by Amazon drone to your back yard landing pad. One percent of our population create all the foods and goods needed, plus endless streams of trucks and ships loaded with merchandise the world over. We could put the whole world into retirement while those of us in mining, manufacturing and logistics do all the work with the help of our tools and robots. Gladly!

What took a nimble fingerd lady 7.3 seconds to stuff a pc board in the 50's, now takes Zero time through the use of surface mount technology using robots capable of placing 'chips' on pre-screened solder, measured to the 'nth . Somebody at HP said "the cost of labor is no longer a line item in our P&L".

Along the way our blind hero inspecting lot sized samples has been replaced by process systems that don't 'produce a single bad part in over millions or samples. The competition across the oceans is still allowing rejects to get into the mix as they send their version of defective stuff to us, the consumer, who willingly toss it into the trash and simply buy another because it's cheaper to swap than to fix. Case in point speaker manufacturing late 1990:

Our overseas supplier of speaker components sat with us to openly discuss the issue. Mr. Taiwan insisted that in spite of the sometimes 20% rejects in their shipments to us in San Diego, we stood to make much more than our competition because his supply chain could easily absorb the cost our performing dock to stock procedures, such as 100% inspection.

In this case the problem was solved by creating several go-no go gates as the details moved from station to station to final inspection.

Today, 2015, standard operating procedure demands a robust process that does not allow a single failure. It may be impossible to achieve, but the effort must be made. Think of the number 4 cylinder of a diesel truck making cross country trips without it failing... ever.

The story goes that IBM placed an order for some components to Mitsubishi with a note that one from a million rejects would be acceptable. In due time when the shipment was received there was a single part packaged and attached to the palletized completed order with the note

**“Here’s your defective part.**

**No charge.**

**Should look good on your desk”**

Of course the most significant change was the ever increasing power of the unions which created the exodus of manufacturing to all places on earth .... But the USA.

Future blogs will focus on other interesting breakthroughs such as robotics, CAD/CAM, 3D printing (additive mfg) and so on.