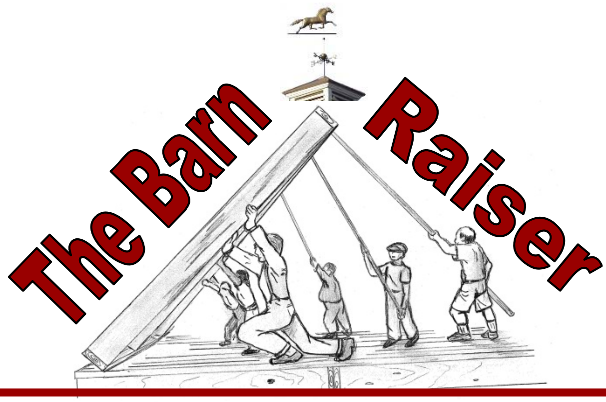

Mid-South Engineering Company

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Seven Quality Control Tools

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The purpose of this article is to outline and briefly explain the 7 primary quality control tools used in industry: the control chart, checksheet, pareto diagram, scatterplot, histogram, Ishikawa diagram, flow chart. A description of each quality control tool and a link with further information is provided:
http://en.wikipedia.org/wiki/Seven Basic Tools of Quality

Control Chart: The control chart is used to examine the variation of a run of production data. The average of the production run and the upper and lower 3-sigma control limits are plotted on a chart along with each value in the production run. The Western Electric Rules are used to interpret the control chart. If one or more of the four Western Electric Rules are violated, the production run is said to be "statistically out-of-control."

Checksheet: Checksheets are used to count different characteristics of an item as it is being manufactured—generally flaws or defects. The different flaws and defects are counted and monitored with the goal of improving the process and lowering the number of flaws and defects in the future.

Pareto Diagram: Pareto diagrams area graphical representation of the Pareto Principle which says that 80% of a problem in a system can be attributed to 20% of the problem's identified causes. The Pareto diagram is a plot of the number of observed instances of each cause that lead to a problem in the system and the cumulative percentage of those causes (totaling 100). This allows the user of the Pareto chart to focus on reducing or eliminating the "vital few" causes—which will lead to significantly fewer problems in the system.

Scatterplot: The scatter plot is used to determine the relationship between two sets of data. Positive, negative, and no relationship between the two sets of data can be determined from the plot. The user must be careful to understand that correlation does not imply causation when analyzing datasets, however.

Histogram: Histograms are used to analyze the variation in a set of data. The data is divided into different bins and each occurrence that falls within that bin is counted and plotted on the histogram. The bins are plotted on the x-axis and the number of occurrences for each bin is plotted on the y-axis. The histogram can be used to reduce the variation in production.

Ishikawa Diagram: Ishikawa diagrams are used to diagnose problems in a production process. The problem is listed the head and potential causes are listed on a line attached to the head. Sub-causes for each cause are listed to a line attached to each cause, etc. This tool forces users to work together to discuss the causes of problems and develop solutions.

Flow Chart: A flow chart is a tool used to document a process. Usually, processes are written down with a box drawn around them. The processes are connected by arrows which show the order of each process in the system. The flow chart is used to document the existing process, gain better understanding of the existing process, and see possible improvements to the existing process.

MSECO Corporate Social Responsibility Policy

At Mid-South Engineering, Corporate Social Responsibility means understanding the impact of our business on our stakeholders; our clients, our environment and community and our employees and their families.

To that end, Mid-South Engineering Company will dedicate the resources necessary to:

Maintain integrity with each of our **Clients** by providing diligent, responsive and ethical service in every decision we make.

Improve our **Environment** by reducing the local and global impact of our business operations and providing volunteer opportunities for our employees to demonstrate their environmental awareness and to reduce their carbon footprint

Strengthen our **Communities** by getting involved in local activities where we live and work and encouraging employee giving of time, talents, and financial resources.

Uphold the well-being of our **Employees** and their **Families** by investing in the management, development and reward of our people.

What's Been Going on in the Woods?

Perspective Contribution By: Peter Carter of New Zealand

Many of you have noticed the changes in design strengths of Southern Yellow Pine (SYP) dimension lumber, particularly those dealing with SYP lumber in the Southern United States. It was originally rumoured that the strength of SYP might see as much as a 25-30% reduction in assumed design strength of No2 2 x 4's as necessary to meet the average quality of the lumber currently being produced. The Southern Pine Inspection Bureau (SPIB) in the US has now submitted proposed design values for SYP of **visually graded lumber**. Those results are not as dramatically different as first feared, and many are actually encouraged by the better than anticipated table of values. Equally encouraging is that there is no change in the SYP's specific gravity value of 0.55, nor will the shear and compression design values change perpendicular to the grain.

But, how could this loss of strength come about? Well, it is well understood that as age of harvest reduces, so does the average strength of the logs and lumber coming from the woods. Increasing proportions of the current wood supply are coming from younger and younger stands so a reduction in strength perhaps comes as no surprise. Similarly, plantations in warmer climates allow for faster growth, especially with superior genetic seedlings, and that allows for larger growth rings and less strength.

Trends towards more intensive management of stands, relying on planting and silvicultural regimes with lower stockings than the previous naturally regenerated stands have compounded the strength effects. These changes were all well intentioned with the aim of increasing productivity and producing logs of equivalent diameter in shorter periods of time. Yet, some of the resulting wood quality has turned out to be lower in strength than was perhaps anticipated; resulting in the changes we are seeing in SYP lumber today. The simple act of the first thinning of a plantation stand will allow for the remaining trees to grow more quickly in diameter by opening up the area surrounding them. The remaining trees growth allows for the potential of lower strengths in the lumber produced from the second thinning.

Still, this is not the first place in the world where this has happened. Very similar changes occurred in New Zealand 10 years ago and there may be some "lessons" that can be taken from their experience. The industry in New Zealand has now largely realigned around Machine Stress Rating (MSR) which provides a proof tested lumber product of known performance to the construction sector, resolving the issue of unmeasured variability in strength of the visually graded product.

There are new tools designed for measuring wood strength. These enable the industry to simply measure and manage the strength of trees in the woods, logs on the landing, logs on a truck, at a log yard, on a merchandiser, and downstream on lumber in the sawmill.

Some folks used to think that "wood is just wood and it is all just the same" but to those peoples' surprise, in any truckload of logs, the strongest will likely be twice the strength of the weakest, even when they all look to be the same. Some will yield acceptable MSR strengths while others will not.

Machine Stress Rating or similar testing can be used regardless of the wood species and allows for grading and comparison of strengths to the standards of the government entity having authority.

It is best to measure the strengths so we can manage our products and to generate more revenue from our wood resources. Learning from other's experiences, like those in New Zealand, that you can't just visually determine the strength will speed the process of responding to what's going on in the woods!

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