



Quality Control as a Data Management Tool

by Tony Piek

**Attention truss plant managers:
Are you achieving your quality
control objectives?**

Successfully managing a truss plant is a tough order. Providing building products for a constantly changing housing market is difficult. Balancing costs of overhead and volatile raw material prices is not an easy charge. This is on top of your HR responsibilities (which itself is a full-time job).

It is easy to lose track of the specifics of the manufacturing process when you are consumed by the necessary day-to-day functions that are required to get products out the door. What if you had a data management tool or system that gave you the summarized benchmark information you need to maintain an intimate relationship with your manufacturing process without consuming any more of your precious time?

Being able to rely on data to make informed decisions in your plant is invaluable. Using a quality control program and collecting data from an inspection sampling can make or break your case for healthy quality assurance.

Ask yourself these questions: Can statistics help you run your plant, guide the operation of your plant, and increase confidence about your level of quality of manufacturing? If you said "yes" to these questions but are not satisfied with how you use data to manage your plant, I invite you to take the following quiz.

Answer each question on a scale of 1 - 10, with 1 being very little knowledge about the given production issue and 10 being a very great amount of knowledge.

at a glance

- Use this short quiz to help you determine how well you use your plant's production data to manage your operation.
- A quality control program that aids in measuring this data can help you make decisions based on more tangible information.
- Using the data from **In-Plant WTCA QC** inspections can give you the ability to analyze data based on the specific plant performance issue you would like to consider.

1. ____ I know that the presses are being checked regularly and are performing within the proper tolerances.
2. ____ I know that our plate embedment is without significant gaps.
3. ____ I know that the saws are making square cuts within tolerance.
4. ____ I know that the newest truss builders are being well trained by our staff.
5. ____ I know which new truss builders have the greatest long-term employment potential.
6. ____ I know which lumber mills provide me with lumber that minimizes waste costs.
7. ____ I know that the lumber pickers are accurately pulling lumber from inventory.
8. ____ I know that the proper and most cost effective lumber grades are used for each truss built.

9. ____ I know the concepts that the truss builders use to substitute lumber grades.
10. ____ I know that the correct plate sizes are used in every truss.
11. ____ I know the concepts that the truss builders use to substitute plates.
12. ____ I know that we are using the best plate inventories for our operation.
13. ____ In the event a that a smaller plate than required is used, I know the reason for the change.
14. ____ I know how often the trusses we build deviate from the truss design drawing.
15. ____ I know the tolerances to which we hold height, span, and heel to peak measurements.
16. ____ I know when machinery wear and tear affects manufacturing and quality performance.
17. ____ I know that blind side plating is within tolerance.
18. ____ I know that plate rotation is within tolerance.
19. ____ I know that member to member gaps are within tolerance.
20. ____ I know that our high strength plate embedment is within tolerance.
21. ____ I know how many defects end up in the plate area.
22. ____ I know which defect recurs most often.

What was your total score? ____

How close is it to 44? 110? 154? Was your scoring lower than you anticipated? Or did the answers verify your comfort level with your current understanding of the manufacturing quality at your plant?

Even if you had a high score, you are probably on the lookout for tools to help better manage your plant. Furthermore, being able to rely on data to make informed decisions in your plant is invaluable. Using a quality control program and collecting data from an inspection sampling can make or break your case for healthy quality assurance. Is it worth the effort of doing quality control inspections to put yourself in position to have access to

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*In September 2005, the Truss Plate Institute (TPI) officially endorsed **In-Plant WTCA QC** in a letter to its membership and third party inspectors. The endorsement was especially crucial in emphasizing the relationship between **In-Plant WTCA***

***QC** and TPI's third party inspection program and in encouraging component manufacturers to realize the importance of third party inspections. It also spoke of the organizations' spirit of team work and unification in the name of quality control.*

TPI Endorsement of In-Plant WTCA QC

Building departments nationwide are beginning to revise their codes to the most current version of the ICC's International Building and Residential Codes (IBC & IRC 2003). This is fostering building designers and building officials becoming more sophisticated, and they also now have more convenient access to a wide variety of information. Thus, each are increasingly asking more difficult questions. In this environment, our engineering design process and the quality of our manufactured product can quickly come under increased scrutiny. Couple this with the legal environment in which we operate and the spotlight can become more intense.

Our industry has long recognized the critical ties between the truss design process and the truss manufacturing process. This is displayed in the hard work we have undertaken to advance our industry's technical credibility through the ANSI/TPI-1 consensus process, while at the same time protecting our industry from those outside of our business that desire stiffer regulations. As our industry continues to grow and mature, we will be subjected to an increasing outside emphasis on having effective quality control procedures in place. TPI has worked closely with WTCA and the consensus body to create a standardized approach to quality that properly weighs the competing demands of efficient production and necessary structural quality.

WTCA has taken the quality control process one step further by creating a quality management system called **In-Plant WTCA QC**, which uses as its foundation the ANSI/TPI 1-2002 quality requirements. The goal of **In-Plant WTCA QC** is to provide our industry with a system that allows any component manufacturer to quickly obtain quality control data from manufacturing, determine conformance to the ANSI/TPI 1 standard, and use the data collected to better manage manufacturing trends over time and truss plant operations overall. For instance, the data collected has helped to find problem trends with machinery that could then be corrected early.

TPI endorses and is promoting the use of **In-Plant WTCA QC** as the best in-plant quality management system available to our industry. Additionally, TPI's third party inspection forms match the **In-Plant WTCA QC** formwork. This serves as a dual quality management benefit for those plants that use TPI as their third party inspection agency—they have data on the in-plant manufacturing processes and on the third party quality assurance process, while providing an efficient and paperless tracking system for upper management monitoring and action.

We encourage you to visit WTCA's web site to obtain more information on **In-Plant WTCA QC**. If you have any questions please call us, or WTCA.

Sincerely,

William Turnbull, President
TRUSS PLATE INSTITUTE

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that data? What type of data would help you more successfully manage your plant?

In-Plant WTCA QC is a program created by WTCA member component manufacturers who have worked long and hard on the QC Committee. It is a work in progress that is specifically built for component manufacturers to use to monitor and evaluate manufacturing quality control. To evaluate quality, you need data. And as they say, garbage in equals garbage out because the reports you generate are only as good as the accuracy of the data you record and enter in the system. Ideally, as a plant manager, you would want to use inspection data to get a quick snapshot of your quality and how your inspections are doing in terms of meeting the TPI quality standard. For example, using the data from **In-Plant WTCA QC** inspections can give you the ability to analyze data based on the specific plant performance issue you would like to consider. For example, you can manage:

- The overall inspection process in terms of meeting the ANSI TPI standard in all QC areas.
- A specific inspection criterion such as plate placement, lumber conformance, and dimensional tolerances.
- Crew performance.
- Several months of plant performance to make a variety of comparisons.

The goal of these reports is to give managers different ways to analyze data specific to how their plant is currently operating. Below are a few simple examples of how a plant manager can analyze QC data to quickly survey quality control issues and performance:

Concept 1: Summary

Figure 1 gives a quick snapshot of how many inspections were in and out of conformance with the ANSI/TPI 1 Chapter 3 quality standard for the first half of 2005. You can see that 450 inspections were conducted and 68 (15.1 percent) were out of conformance and required some type of remedial action to bring the truss into conformance.

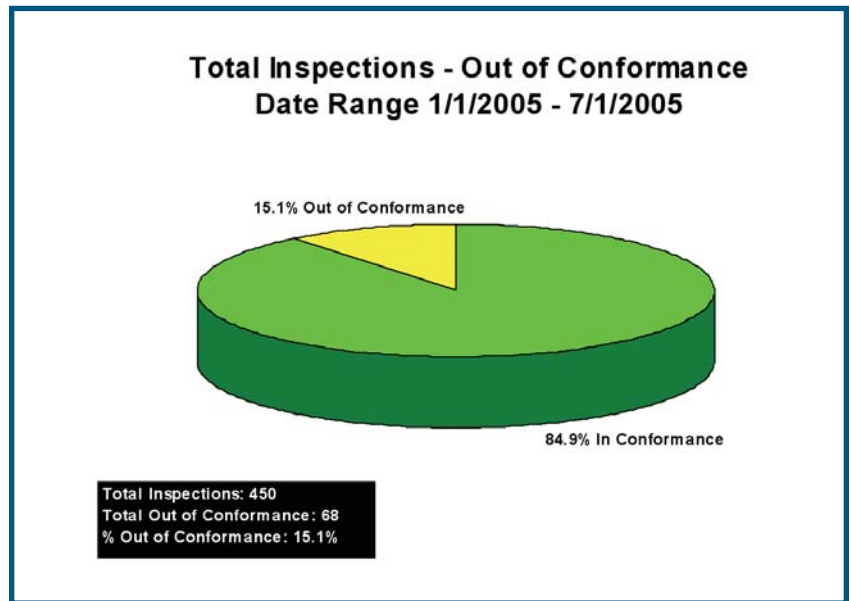


Figure 1.

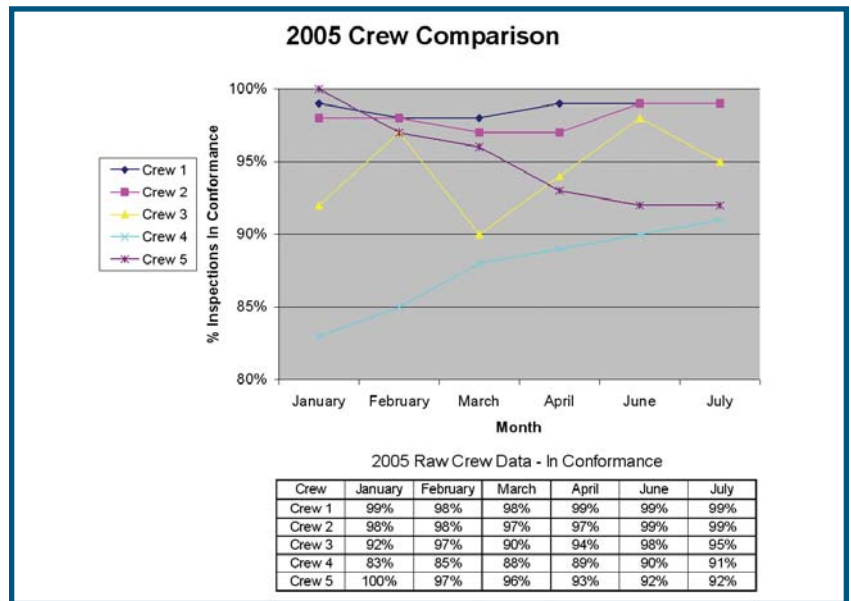


Figure 2.

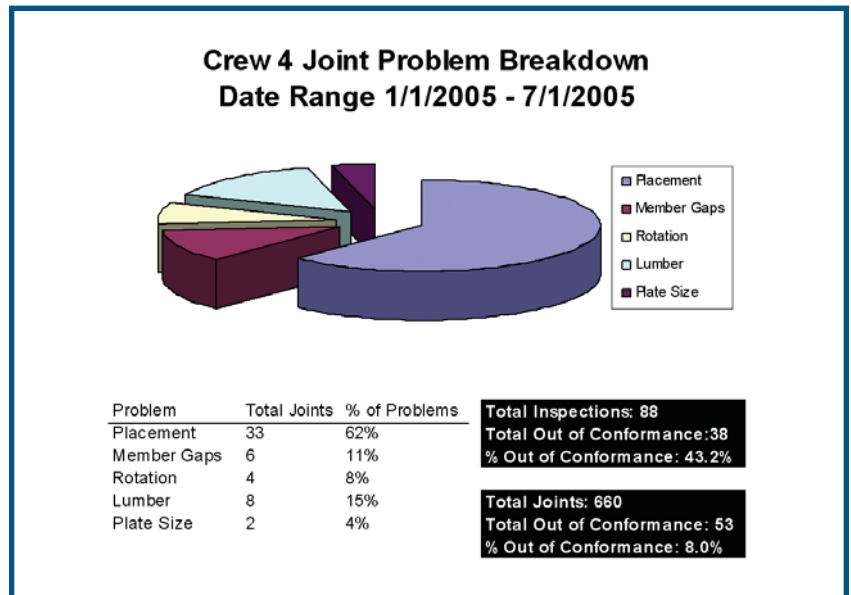


Figure 3.

The goal of these reports is to give managers different ways to analyze data specific to how their plant is currently operating.

Concept 2: Crew Breakdown

Figure 2 shows a quick graphical breakdown of manufacturing performance when comparing crews. Right away you can see there is a great deal of variation in Crew 3. Crew 4 is low but improving. Crew 5 is high but declining. You may be considering these questions:

- What is causing the variation between the performance of each crew, given that they all work within the same company and system?
- What is different about the crew that is consistently performing well?
- How can that performance be replicated?
- What is causing the decline in performance?
- What is causing the improvements in performance?
- What can we learn from the changing performance about operations?
- How can we replicate improvements in performance?
- Are there any machinery effects? If so, what maintenance should be performed and what improvements can be expected from those changes?

Below the graph is a sample of the data giving percentages of passing inspections per crew for the first six months of 2005.

Concept 3: Joint Problem Breakdown

In the previous set of data, it is clear that Crew 4 had by far the most manufacturing problems the last six months. One of the next graphs that can be produced allows you to hone in on Crew 4 to find out where there inspection problems were. The "Joint Problem Breakdown" graph can be used to determine this. In this example, it shows that by far the biggest problem was plate placement. At that point, the issue becomes understanding what is going wrong and providing training on how to accomplish good placement consistently.

What is your confidence level in your plant's manufacturing quality? What do you think you would find if you gathered

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QC data from your operations and compared it to your confidence level? If you think there could be discrepancies between these two evaluations, gathering quality control data may be a more powerful tool than you think to help you more successfully manage your plant, without consuming a great deal of your time. **SBC**

For more information about using quality control as a data management tool or the In-Plant WTCA QC program, contact Tony Piek (608/310-6713 or tpiek@qualtim.com) or Michael Oftedahl (608/310-6709 or moftedahl@qualtim.com). Or, visit www.woodtruss.com/wtcaqc.php.

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6300 Enterprise Lane • Suite 200 • Madison, WI 53719
608/310-6706 phone • 608/271-7006 fax
www.sbcmag.info • admgr@sbcmag.info