Viewpoint on Manufacturing:

So You Suddenly Have a Yield Problem …

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Your Go-To Company for Facilitation in Manufacturing Operations.

Yield

There are many ways of defining the Yield of a manufacturing process, but in the end they all indicate how many times you made a good product out of the number of times you tried. What is acceptable yield in your business is determined by the economics of your business, but almost always we want better yields. Sometimes, a yield problem develops suddenly. When this occurs, it can be catastrophic to your business. In either case it is useful to have a method to uncover and correct the cause or causes.

The Fishbone Diagram

If you have especially observant people running the process, they may be able to put their finger on the source of the problem immediately. But when this is not the case, how can you get a handle on the cause? One of the best ways to start towards uncovering the cause or causes of a yield problem is to first brainstorm the things that can contribute to the problem. These "things" are often broadly categorized as Materials, Method, Machine, Measurement, Mother Nature and People, called the 5 M's and a P. There are many methods used in brainstorming. The one I like is called the Fishbone Diagram. This diagram is also often called the Ishikawa diagram after by Kaoru Ishikawa who developed it in the 1960s while working at the Kawasaki shipyards.

A Fishbone Diagram starts with a question: "Why can X happen?" This question is placed at the head of the "Fish" and the categories are the bare bones of the fish as shown in Figure 1.

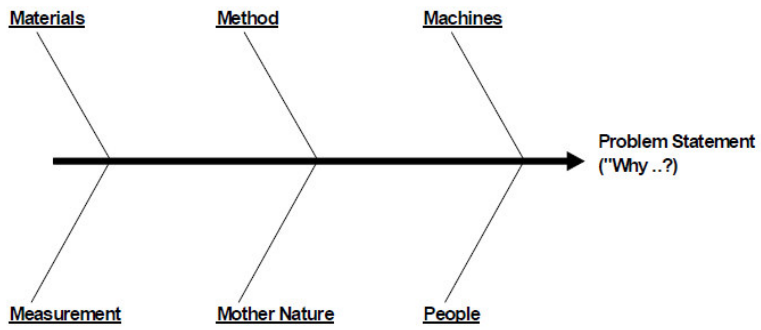

Figure 1: Barebones Fishbone Diagram

The idea is then to brainstorm possible contributors to the problem which then are placed on the appropriate "bone." More specific causes can even be hung off the more general causes first hung on the raw bones. This brainstorming is best done as a group which is made up of people who are observant and have knowledge of the problem area. These could be the

process operator, the maintenance person responsible for the equipment, the foreman and the engineer responsible for the operation, anyone who can contribute a good thought. An example of a fully populated diagram is shown in Figure 2.

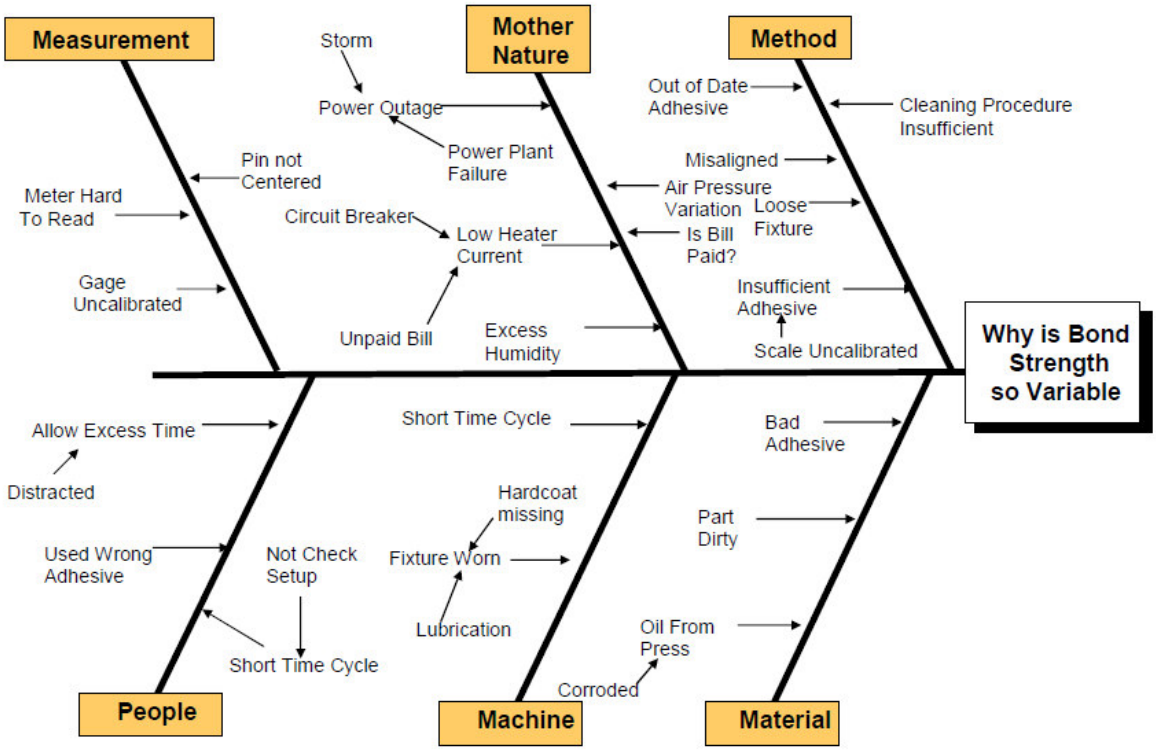

Figure 2: Completed Fishbone Diagram

As you can readily imagine, it would be impossible to investigate all the areas identified by brainstorming. In fact, in many cases it would be a waste of time. So the next step is for the group to sort through all the "bones" and agree on a few that from their observations and experience are worthy of investigation.

The investigation could even start with a more targeted Fishbone Diagram. For example from Figure 2, "Why is the Hardcoat missing?" But ultimately, it will come down to looking carefully at the selected possible causes. Then gathering and analyzing data to confirm or deny each as a source of the problem.

The Benefits of the Fishbone Diagram approach

Too often, when a problem suddenly develops, there is someone who says "This is what has happened." That person may be right! But that person may also be wrong. The Fishbone Diagram approach gets all the cards on the table and uses the combined knowledge of the group to set a direction for investigations and action. In doing so, it is more likely that the right direction will be amongst those selected for investigation, and false starts avoided.

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