DTI Training Consortium's

TALKING FROG

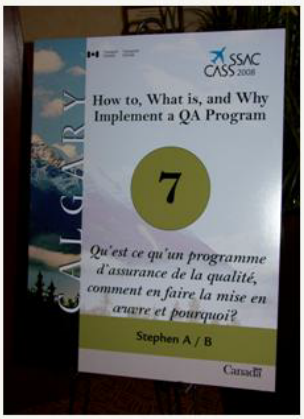
A NEWSLETTER FOR THE PROFESSIONALS WHO ASSURE QUALITY FOR US ALL

JUNE 2008 **VOLUME 1, ISSUE 1**

Dennis and Sol Speak at CASS

The brothers got to present their thoughts on the need for a Quality Assurance program to Canadian Government officials and Aviation companies alike recently at the Canadian Aviation Safety Seminar held in Calgary, AB.

Using their unique presentation style, Dennis and Sol delivered 3 hrs of workshop, exercises and not a little controversy.



DTI was invited to the CASS convention by Transport Canada after witnessing the straightforward delivery style of the team while they have been crossing Canada instructing Civil Aviation inspectors on their new QA roles under TC's Safety Management System.

The fireworks started when the boys were asked how Transport Canada could expect smaller aviation companies to install the new Quality Assurance requirements under SMS without technical help from experts in the field. Sol's response was that most of the certificate holders in Canada, as good businessmen, were probably already doing 80% of the requirement already. Dennis then emphasized that proper documentation was all that most companies would require and that QA is not some technical mystery. The mystique of the process was being created by outside parties wishing to create an anxiety among the certificate holders, thereby justifying huge consulting fees. All the certificate holders really required was a little education on how to generate what was expected of them.

EVERY MONTH IN OUR NEWSLETTER

- Tips and new innovations in the Quality Assurance Field.
- What's happening at DTI?
- Anecdotes and more
- Answers to your questions

This month's QA tip—Control Charts

Every process varies. If you write your name ten times, your signatures will be similar will all be similar, but no two signatures will be exactly alike. There is an inherent variation, but it varies between predictable limits. If, as you are signing your name, someone bumps your elbow, you get an unusual variation due to what is called a "special cause". If you are cutting diamonds, and someone bumps your elbow, the special cause can be expensive. For many, many processes, it is important to notice special causes of variation as soon as they occur.

There are also "common cause" variation. Consider a baseball pitcher. If he has good control, most of his pitches are going to be where he wants them. There will some variation, but not too much. If he is "wild", his pitches aren't going where he wants them; there's more variation. There may not be any special causes—no wind, no change in the ball—just more "common cause" variation. The result: more walks are issued, and there are more unintended fat pitches out over the plate where batters can hit them. In baseball, control wins ballgames. Likewise, in most processes, reducing common cause variation saves money.

Happily, there are easy to use charts which can make it easy to see both special and common cause variation in a process. (pg 2)

Where in the world is this statue? Send us an email if you know? Maybe this picture below will help.

Or maybe not!

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Talking Frog

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This month's pearl of wisdom from
Dennis and Sol

THE LOTTERY IS A TAX ON PEOPLE WHO DON'T UNDERSTAND STATISTICS!!

Statistics means never having to say your certain!

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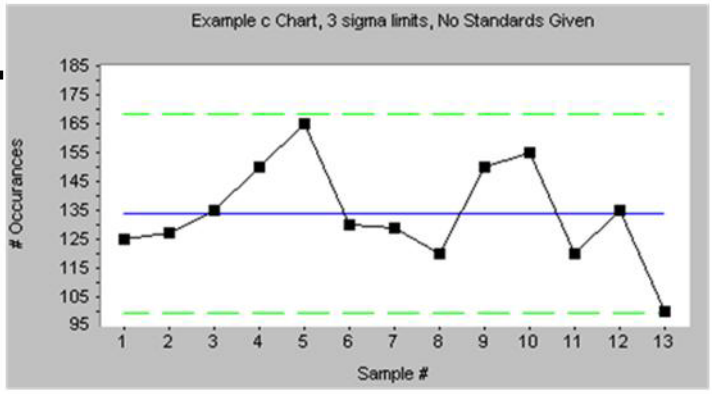
Control Charts (cont'd)



Happily, there are easy-to-use charts which make it easy see both special and common cause variation in a process. They are called control charts, or sometimes Shewhart charts, after their inventor, Walter Shewhart, of Bell Labs. There are many different subspecies of control charts which can be applied to the different types of process data which are typically available.

All control charts have three basic components:

- a centerline, usually the mathematical average of all the samples plotted.
- upper and lower statistical control limits that define the constraints of common cause variations.

performance data plotted over time.

Things to look for:

The point of making control charts is to look at variation, seeking special causes and tracking common causes. Special causes can be spotted using several tests:

- 1 data point falling outside the control limits
- 6 or more points in a row steadily increasing or decreasing
- 8 or more points in a row on one side of the centerline

14 or more points alternating up and down

In those charts that pair two charts together, you will want to look for these anomalies in both charts.

The simplest interpretation of the control chart is to use only the first test listed. The others may indeed be useful (and there are more not listed here), but be mindful that, as you apply more tests, your chances of making Type I errors, i.e. getting false positives, go up significantly.

Types of errors:

Control limits on a control chart are commonly drawn at 3s from the center line because 3-sigma limits are a good balance point between two types of errors:

- Type I or alpha errors occur when a point falls outside the control limits even though no special cause is operating. The result is a witch-hunt for special causes and adjustment of things here and there. The tampering usually distorts a stable process as well as wasting time and energy.

Type II or beta errors occur when you miss a special cause because the chart isn't sensitive enough to detect it. In this case, you will go along unaware that the problem exists and thus unable to root it out.

All process control is vulnerable to these two types of errors. The reason that 3-sigma control limits balance the risk of error is that, for normally distributed data, data points will fall inside 3-sigma limits 99.7% of the time when a process is in control. This makes the witch hunts infrequent but still makes it likely that unusual causes of variation will be detected.

How should you respond to special cause variation that is picked up by your control chart?

If your process is in control, is that good enough? No. You have to start by removing special causes, so that you have a stable process to work with. But then comes the real fun, and often the most substantial benefits: it is time to improve the process, so that even common cause variation is reduced