**NCC_BSL_DavisBalestracci_3_10292015_v**

Welcome back to my next lesson. In designing these mini-lessons I was only going to do three of them. But then I thought red, yellow, green is so prevalent, the traffic light data reporting, that I need to deal with it as a separate topic. The reason being a lot of you, I know, in your industry are held to percent compliance goals; and that's where they can especially be destructive. So coupling it with the Plotting the Dots message, let's take a look at red, yellow, green.

So I've already explained the first point. We've got to be very careful, especially when you're given a bunch of goals to meet, that it can be very misleading. And as you saw in the case of the falls data from last time, lots of action with no benefit. The other thing I realized too, especially with regard to percent compliance; percentage data has some unique traps that make it all too easy, once again, to treat common cause especially. In fact, W. Edwards Deming had a specific term for when you treat common cause as special; which as I've described is by far the most common thing done. He called that "tampering".

So as a result of this video I want you to be better prepared to understand the dangers of tampering inherent in traffic light tabular presentation of data. I want you to avoid the trap of always treating the difference between the actual performance and a goal giving it a color. Isn't that treating that difference as a special cause? And I want you to be able to react appropriately to percent compliance goals. Because you have a goal and everything is a process, you have to say given this goal what are we perfectly designed to get? As you're going to see, it has nothing to do with the goal, as does, as you will see in my next video, improving the situation. It has nothing to do with the goal. It's the process focus, not the goal focus. If you're not careful, especially given arbitrary goals, the goal becomes to meet the goal and not improve the process.

All right. I do this exercise with classes, and I wish I could with you but I can't. Envision a room of 75 people. And I do this exercise with them; I pass out coins and for 75 people I give them a goal. I say okay, I'm going to give you – we're going to generate a KPI (you all know what those are – key process indicators), and I'm giving you a goal. I want it to be greater than or equal to 25. So greater than or equal to 25 will be green; 20-24 will be yellow; and less than 20, which of course I don't want to see, is red. Now notice; is there a law that all goals must end in zero or five? That's how I sniff out an arbitrary goal. Something ends in zero or five, and all the red, yellow, green also end in zero or five.

So then I have the entire room flip the coin, and those who got heads I have them flip it again, and then I count the number of double heads. And I do this three times. So one class of 75 got 14; look at that, red. Then they got 25, they met the goal, I was very happy. Then look at that; they went down to 15, and I threw a magnificent tantrum.

So now a lot of places have quarterly reviews. And I said to the class, okay, you have a quarterly review tomorrow. Here are your three months' performance: 14, 25, 15. You've got to make a presentation to your executive team. Well if I have 75 people, I'm going to have 75 different explanations.

So they should have 3 x 25; they should have 75.  So they need to explain their pattern of 14, 25, 15 given this goal.  And you know what they're going to say: well, what's your trend?  So like I said: 75 people, 75 unique explanations treating all the variation as special. Here's my point: there's human variation here.  There is variation in how people perceive, analyze, react to, and interpret variation.  What if we could apply some of the principles I've been teaching to say there's only one way; and I could have that room – as you will see shortly, I'll have that room of 75 people on the same page within seconds.

So doing something similar to what I did last video, I can calculate the common cause.  And what I show is this 14, 25, 15 is between the common cause limits of 7 and 29.  So given that we have 75 people, we flip a coin twice, count the number of double heads; it is perfectly designed to come in between 7 and 29.  So really the 14, the 25 and the 15 are pretty much the same number and we do not treat this as – what do they call this, a downturn or something?  So it's not a special cause.  It shows they're perfectly designed not to meet the goal; although see this 25?  They met it once and I give them a goal they'll meet 10% of the time.

The other thing I want you to notice is that red, yellow and green are all between the common causes.  So you see the potential for tampering.  Once again, the fact that all three flips were between 7 and 29, there are no special causes and this process is perfectly designed not to meet the goal; it cannot meet the goal.

A lot of times you'll get this from executives when you do this – you tell them you're going to do this funny new statistical way; they go "that takes too much data."  Really?  In three data points I say we can't meet this goal, and it would take a common cause strategy to improve it.  Of course you know what's going to happen: special cause strategies abound. Now something else that's interesting; the odds of getting a double head are ¼: ½ x ½.  So if I have 75 people and I calculate on the average what I expect to get, it's between 18 and 19.  Now I want you to notice something.  Notice what our average is.  They got what they were perfectly designed to get.

Now here's a common cause; and the fact that those numbers are all between the common cause limits tells me that in essence this 14, this 25, this 15, are all 18 with random common cause added.  They're the same number.  We got what we were perfectly designed to get, and once again, the process is not capable; as it is currently designed and as we currently react to it, it is not capable of meeting the goal of 25.  It would take a common cause strategy.

So I'm willing to bet you've all seen something like this.  This is when I did some work for the NHS in England.  They wanted to improve their health care, so what did they do?  They set 50 arbitrary targets; what they felt people should attain.  Sound familiar?  And every week; now this is one of the targets and let me tell you, 20% of the targets account for 80% of the perspiration.  This was one of the biggest, and let me tell you, people lost jobs.  And what people had to do was report it every week.  So every vertical column is a week of performance for all, what were at the time 28, strategic health authorities.  So each health authority had to report out every week,

and at the end of the week it was reported up to the health ministry.  So these are all weekly results for the 28 strategic health authorities.

Now do you notice anything here about this particular week?  Yeah.  There's an awful lot of green there, isn't there?  Well let me explain.  This was the last week of the fiscal year, March 31st.  They were told in January that each health authority was going to get a rating of zero to three stars, and that rating would depend on their performance the last week of the fiscal year.

The moral of the story?  Frightened people are very clever.  There are three ways to get better results.  One is improve the process, and that's the one I highly recommend.  So what people did was they distorted the process.  Now this happened to be the time people waited in what's called an A&E, which is a cross between and Urgent Care and an Emergency Room. And a lot of the delay, and they wanted 90% of the patients to wait less than four hours.  And a lot of the delay was getting people beds.  So easily done; they canceled elective surgeries and met the goal.

That was one strategy; there are others.  Somebody said now the time starts when people come through the door, right?  Right.  They put a tent in the parking lot.  Frightened people are very clever.  Then what happens is the goal becomes to meet the goal.  Well, I'd rather improve the process.  Now when all else fails – so you can distort the process and when all else fails, fudge the numbers; or fudge the definition of the numbers.  So I would rather have you focus on the process.  Think about it.  How much of your effort becomes your goal is to meet the goal?

So this happens to be Strategic Health Authority Number 27; now there's a column of numbers.  And once I learned this I can never look at a column of numbers again, never.  That means nothing; I've got to plot it.  Here's the data, and every one is one week.  So there are about 23 weeks of data in a run chart.  I can ask you about 17 weeks.  What's changed in four months?  In other words do you see six successive increases or decreases?  Do you see eight in a row above the median; eight in a row below the median?  You see none of that.  What's changed in four months?  Nothing.  And I'm sure when they got these three yellows in a row; I bet you there was some heat from above, once again treating that as special cause when – well we don't know yet because I'm going to go ahead and get the process limits to see.

And you said but Davis, that first point; isn't that a special cause?  Yes it is, just wait.  So if we do the math on this like I taught you last video, notice the first week is outside the limits.  Of course it was a different process.  People were fudging the data or the situation.  So yes, it was a different process.  But aside from that, look at all the rest of the data.  It's all between the limits.  And you see these three yellows that someone wanted to treat as a special cause?  There's nothing special about them. Somebody might say oh good, look, look, we're trending up.  It's not a trend and it's between the limits.  But the most important thing of all, I think – well those are important too – is the average is 90.6.  So I'm going to give you a new definition of meeting the goal.  If the average is at the goal, you're meeting the goal.  These folks were meeting the goal the entire time, and yet half the weeks they were below the 90 and people weren't happy.  Well as far as I'm concerned they were meeting it.

See with red, yellow, green, your green is a number you must never, never, never, ever go below. Well my way of meeting the goal, that's not true; I just wanted to average that. Think about that. What is that costing people? What is reacting to all this common cause – see red, yellow, green, once again is between the common cause limits. What is that costing you in terms of meetings, time looking for explanations that don't exist without saying it's common cause? Oh, wait a minute. Why don't we take all the non-compliances for the periods between the limits and slice and dice them?

So you see with percentages, especially a percent compliance, how do we treat every non-compliance? As a special cause; when this says their process is perfectly designed to have 9.4% non-compliance. So when you're given a compliance goal you must assess your process's performance, vis-à-vis that goal. And yes, no special causes except for the first week. And by my definition it's been meeting the goal of 90%. Oh yes, and one more thing: one week can differ from the previous week by as much as 3.5% using the moving range calculation I showed you in the last video. So I find these, what is it, 17 data points? I find the moving ranges; find the median of them, multiply it by 3.865 and it turns out to be 3.5%.

So the traps we fall into with percentages are treating any deviation from the goal as special cause and assigning it a color. See? That's a special cause strategy. And if you must – if you must use a goal, then use the average for the goal reference; and use that and the common cause around is, if you're meeting the goal, then the average and the common cause around it is your green area. And probably one of the biggest aha's you will have in this video – we tend to treat any non-compliance as a special cause because they should comply. No! You're perfectly designed to have a certain percentage of non-compliances.

This is a true story. Someone, this was I think for physical therapy cancellations or no-shows or something. They asked her to set a tough goal, and it was tough; she set a tough one. And this was the year's performance, because this was the year-end review. And due to sheer, dumb, bad luck she happened to get a red result. Well you can guess where all the energy from that particular portion of the meeting is going to go.

Now let me show you want to do in the future when you're at one of these meetings. Because I think as you're guessing from these videos so far, what they're doing is a waste of time. But you know what you can do? You can find the 12 months of performance and sketch a run chart. Now it's only 12 data points, but it's all you've got. But now I hope you're getting used to looking at these things; you look at that and bat an eyelash. And I hope by now you're saying no; no six successive increases, decreases; no clump of eight above the median, below the median; what's changed this year? And I'm sure she was trying to meet that goal. What's changed? Nothing. I bet you they were analyzing a lot of the individual no-shows, cancellations. And what's the result been? No change.

Even further, let's now get the common cause limits. This is saying she's averaging ten percent by the way; she's meeting her goal! So it's perfectly designed for ten percent and to meet the

goal. Yet in any one month she will observe between 5 and 15, which is just statistical variation on ten. And one month can differ from the previous month by as much as 6.2.

Now here's where it gets interesting. I'm sure she got raked over the coals because of that red December, and what about all that effort, and look what's gone on, and this and that. Who knows? Maybe they set a tougher goal for the next year. Well I happen to have the next year's performance and I just tagged it onto this. There it is. What do you notice? Do you see any changes during this almost two-year period? Well, do you see six successive increases/decreases? No. Do you see eight in a row above the median/below the median? No. So she set a tougher goal and continued to perform to what she was perfectly designed to get.

So now I got really curious, and I said to them do you have any data before this? And they said yes; we have the previous year's data. Oh, let me emphasize too, so with this new data I recalculated the control limits. They were the same. A lot of classes teach you you need 20, you need 30. Listen, I'll tell you something. You can even have 6, 7, 8, 10 points; it's going to be pretty darn close. As you see, I did it with 12; I got the same things as when I did it with 21, 22. It's going to be pretty darn close.

But now here it gets interesting. When I asked for the previous year of data and there it is. What's changed in two and a half years? And I'm assuming no-shows and cancellations in PT is a huge cause. And I'm sure they've been doing things about it. But what does this tell you about the alternate result? And if the goal is ten percent, they've been meeting it for two and a half years. They certainly haven't improved it; they haven't gotten worse either. And let's get the limits, common cause limits. Well I'll be darned; it's five, or almost five to fifteen percent again.

So was all this red, yellow, green drama really necessary? And what have all their efforts yielded? Who knows; they may have benchmarked somewhat. Well, what good has that done? You're perfectly designed to get what you're getting. Find out what you're perfectly designed to get. And all this would say is if, even if I wanted to, I could take every cancellation for the last two and a half years – and that's going to be a lot of them – and slice and dice them. And that's going to get me a better result than any benchmarking, and yet another arbitrary target where the goal becomes to meet the target. What did I tell you about frightened people?

So once again my – I guess I'll call this my improvement equation. You take a vague problem, plot some data over time, and have a data sanity aha; we're going to go a long way toward solving the right problem.

So as I hope these three lessons have told you; that plotting the dots, and that's run and control charts, and then understanding the inherent common cause. What you're perfectly designed to get, whether you like it or not. But understanding leads to more appropriate action on a situation as opposed to reacting to tabular red, yellow, green data presentations; which is strictly a special cause strategy.

You will also see that I have created a common language; and you will create a common language because as I put those graphs up I don't think there would be any disagreement as to what was going on. So here we are; and I've done this. I've had a room of 200 people agree on a situation within seconds, which leads to a new conversation, most of the time which will be we need to apply a common cause strategy, what should we do? And I am now focusing your brains where they should be.

So the other important thing too is a process can be perfectly designed to have a certain percent non-compliance to a goal. Treating every non-compliance as a special cause is usually not a productive strategy. Let's take a bunch of them and put them together. So common cause strategies exist; it's just that they're not that well known, and that's what my next video will be about.

Thank you. You know how to find me. I would be delighted now to help each of you plot your first dot. Thanks again.