General Notes about Statistical Process Control:

For a process running under control the three-sigma rule, states that almost all values (99.7%) will lie within three standard deviations of the mean. Therefore one must look at several factors to determine which sample data to include in analysis. First, determine if the data comes from a process under control. The data needs to correlate to a process, which is making product in customer specifications. Second the sampling must be representative of the population. Therefore if high variability is initially noticed a larger sample population is looked at so as to smooth that variablity. The level of variability between data points should impact your required sample size. The less variable the data is, the smaller sample size that is required to achieve the same level of accuracy. For example, there is a large degree of variability between speeds traveled in a car, but a relatively small amount of variation between the numbers of cars that a person owns. Hence a driving speed analysis would need a larger sample size to achieve the same accuracy as an analysis of the number of cars.

Analysis for Ventilation Study:

Analysis was performed in the following areas:

I generally prefer a sample of 400 or larger because a sample size of 400 gives a statistical accuracy of plus or minus 5%.

Sinter Plant Combination Flow – Random samples were taken from 5-minute records stored on Sinter Plant PLC system of known process control periods. After an initial analysis I realized there was a difference between running and non-running data points. I therefore split the analysis into two categories. I also noticed a high level of variability in the data point of each set. Therefore I expanded the sample size to over 2000 for each data set. A sample size greater than 2000 provides a statistical accuracy of plus or minus 1.7%

6 Bag House Amps - Initial samples taken were a random daily observation taken from operator logs from April 1st 2008 to March 25th 2009. I also included 5-minute observations taken from PLC unit during the March 15th and 16th of 2009 to verify that the original sample population provides representative variability. A sample size greater than 800 provides statistical accuracy of plus or minus 3.5%.

7 Bag House Amps – Samples taken were a random daily observation taken from operator logs from April 1st 2008 to March 25th 2009. Bag House was in control during this period and low variability was noticed therefore a sample size of over 400 sufficed.

8 Bag House Amps – Samples taken were a random daily observation taken from operator logs from April 1st 2008 to March 25th 2009. Bag House was in control during this period and low variability was noticed therefore a sample size of over 400 sufficed.

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