Lean Six Sigma Project Week #2

Due: Feb. 13th before class starts.

Process base line data (Measure phase).

a. Look over the deliverables given by the teams in Week #1. Verify that it matches what was suspected, give feedback on their correctly identifying the problem, evaluate and give a score for the define phase.
b. Distribute process data, cost data for per unit change in the relevant process variables for mean shift.
c. Assumptions about the process and the costs of resetting the mean of the process:

   Assumptions:

   1. Assume that the plant works for 260 days per year.
   2. It is required that you keep your new process variable mean to be such that the process capability is maximized.
   3. By changing the process mean, you will not be affecting the process standard deviation.
   4. Standard deviation of the process in a given facility can be estimated from the data given, only if the mean of the process has not shifted or drifted during the 6 months for which data is provided. "Mean drift" means, mean is slowly increasing or decreasing. "Mean shift" means, mean has suddenly changed on a particular date or during a few days clustered together. If the mean has shifted or drifted, you should plot the process mean against time to recognize the drift or shift and use only "non-drift and non-shift" data to estimate the process s.d.

   Costs of resetting the mean (It is the same for both old and new facility):

   i. Viscosity: For every unit increase in the average viscosity, cost per year will be $2500.
   ii. Bake time: For a more accurate control of the bake time, which would result in your ability to change the bake time. One time cost per year is $10000.
   iii. Baking Temperature: By instituting additional controls, the mean temperature could be more accurately set so that it does not change. One time cost per year is $15,000.
   iv. Cookie weight: Increasing the mean Cookie weight by 1.0 gram will cost $20000 per year.

d. Team deliverables:
   i. The two facilities, though producing the same final product, are physically different and they must be analyzed separately. You may use the data from one to compare against the other, but should not mix the data.

ii. Based on the process data distributed, analyze the problem in depth. For example, using the ranges (given in the column heading) as the USL and LSL, and calculating the process mean and s.d. (re-read *assumption 4* above to determine the appropriate s.d.) for each of the variables (such as temperature, viscosity, baking time, weight etc.) for each facility. You can calculate the process capability for each variable in each facility. This will first help you identify which facility has any issues/problems. Further, this can help you identify which process variable/s, if any, is/are to be changed (increase or decrease the process variable mean) and which variables/s should not be changed and. See relevant costs given earlier.

iii. Recommend suggested New Mean for the process variables that you want to reset. List all the process variables that you do not want to change. Give your complete data analysis and justification for your recommendation..

iv. Estimate the improvement in sales per shift you would expect by changing the process variable that you recommended to change. Also report on the cost of these changes. Assuming 260 days per year and 2 shifts per day, estimate the additional sales – cost per year.

What is to be expected after you turn in your recommendations?

I will run the system with your suggested changes and give you a feedback on how the old and new facility will be running after you make the changes and what will be the estimated sales and all other relevant data. The project will continue with more opportunities for change, more variables come into play and you will make more changes as needed.