



Assignment A1  
Statistical Quality Control

**Introduction**

In evaluation of the Bayfield Mud Company operations, we have studied the bag weight problem and conducted the necessary analysis. Accordingly, based on our findings, we have discussed the following points in our report and subsequently recommended the appropriate procedures in order to maintain proper quality control:

* How did the quality problem at Bayfield occur and who is responsible?
* Recommendations on improving or maintaining proper quality control in order to avoid its recurrences in the future.
* Various control charts and other relevant data to support our analysis as well as Quality Control Limits for the Sample Means.

To measure the process, we have analyzed the samples statistics doing the following calculations:

**Desired mean:**

mean ( x) = 50.0

standard deviation (σ) = 1.2

**Sample size**= 6

The following information was extracted from the table:

Upper Range (D4) =2.004

Lower Range (D3) = 0

Mean Range(R-bar) = 3.7

Sigma X = 0.489

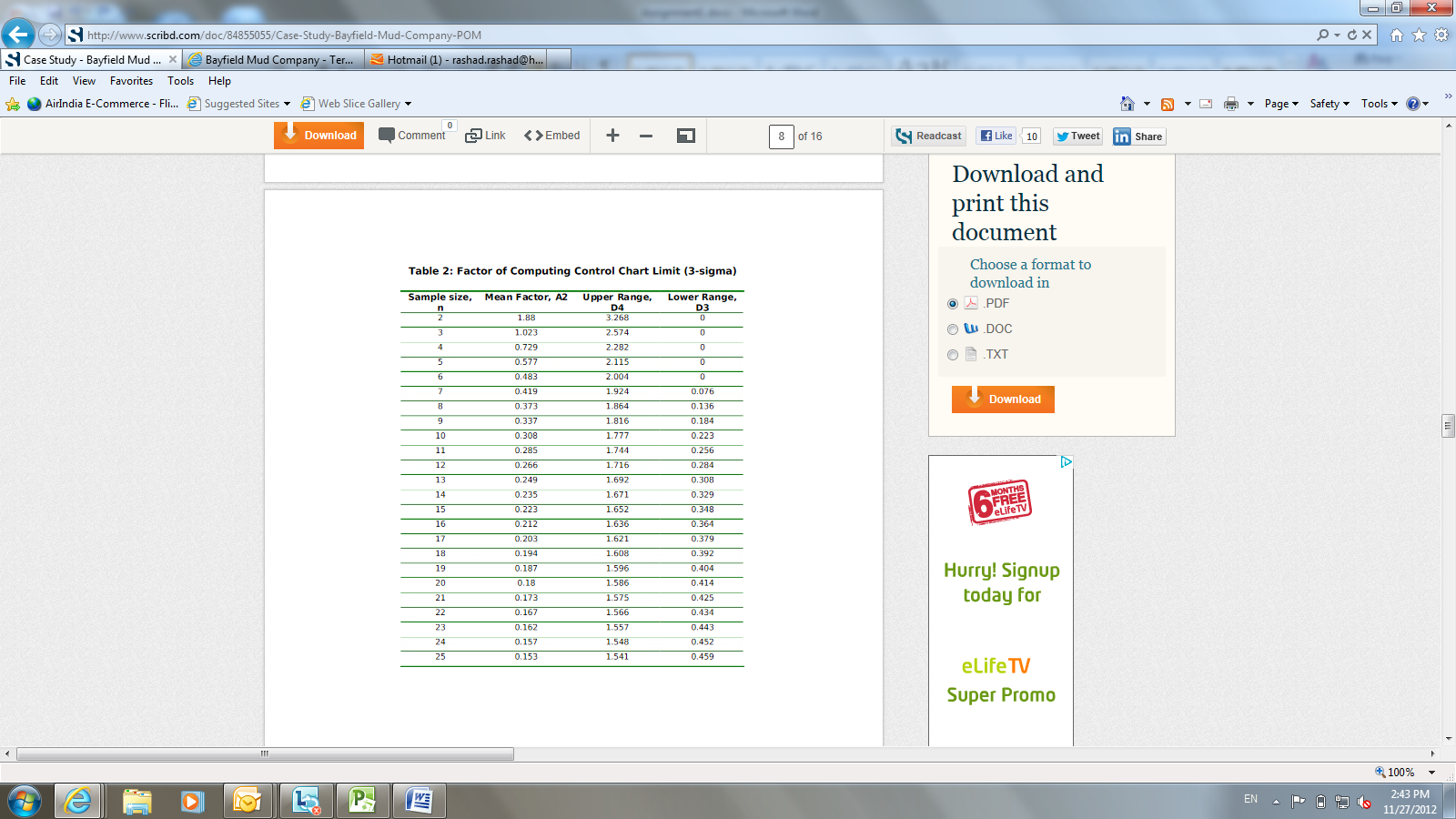
At 99.73 – Z=3

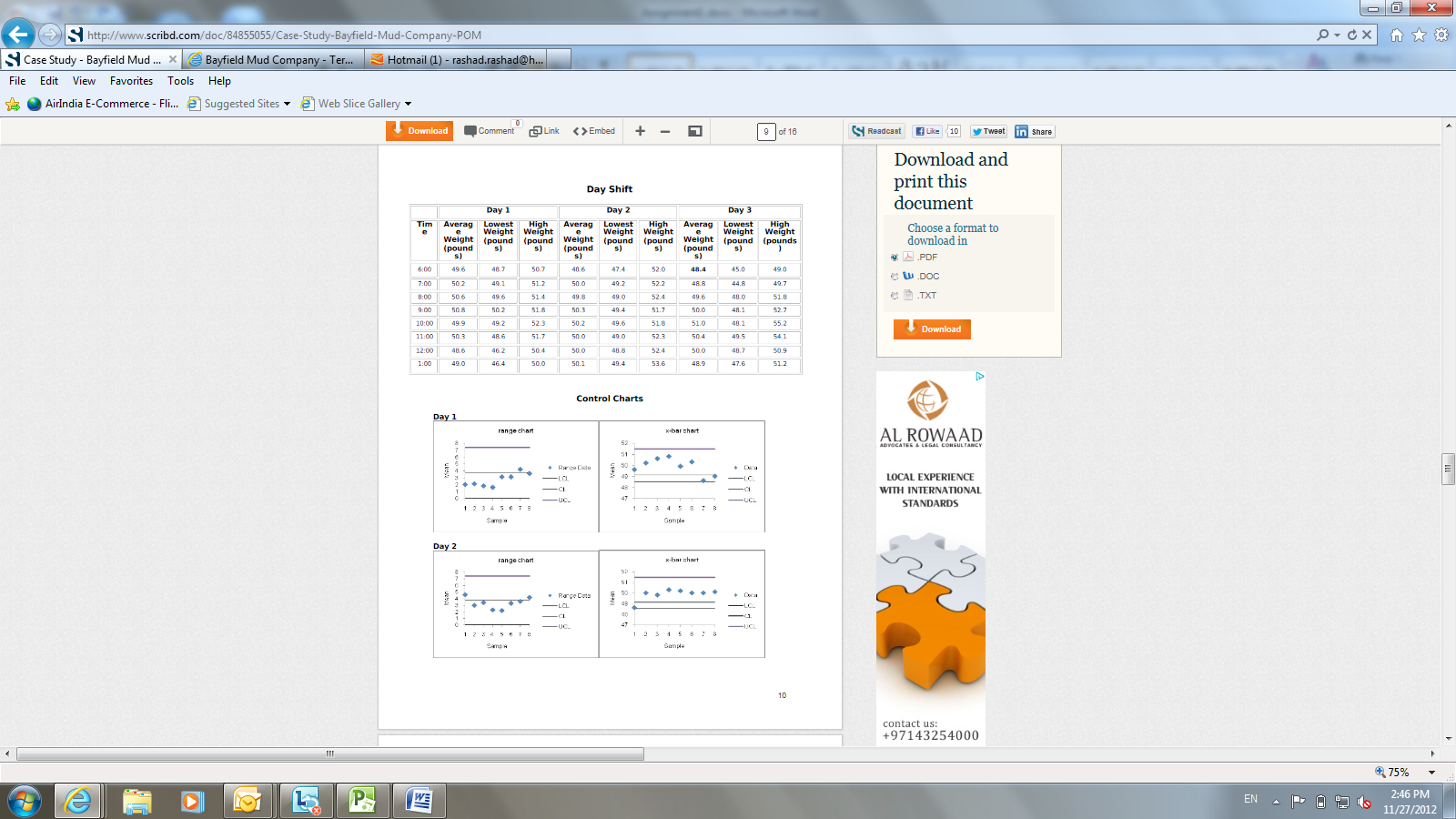
**X Chart Limits**

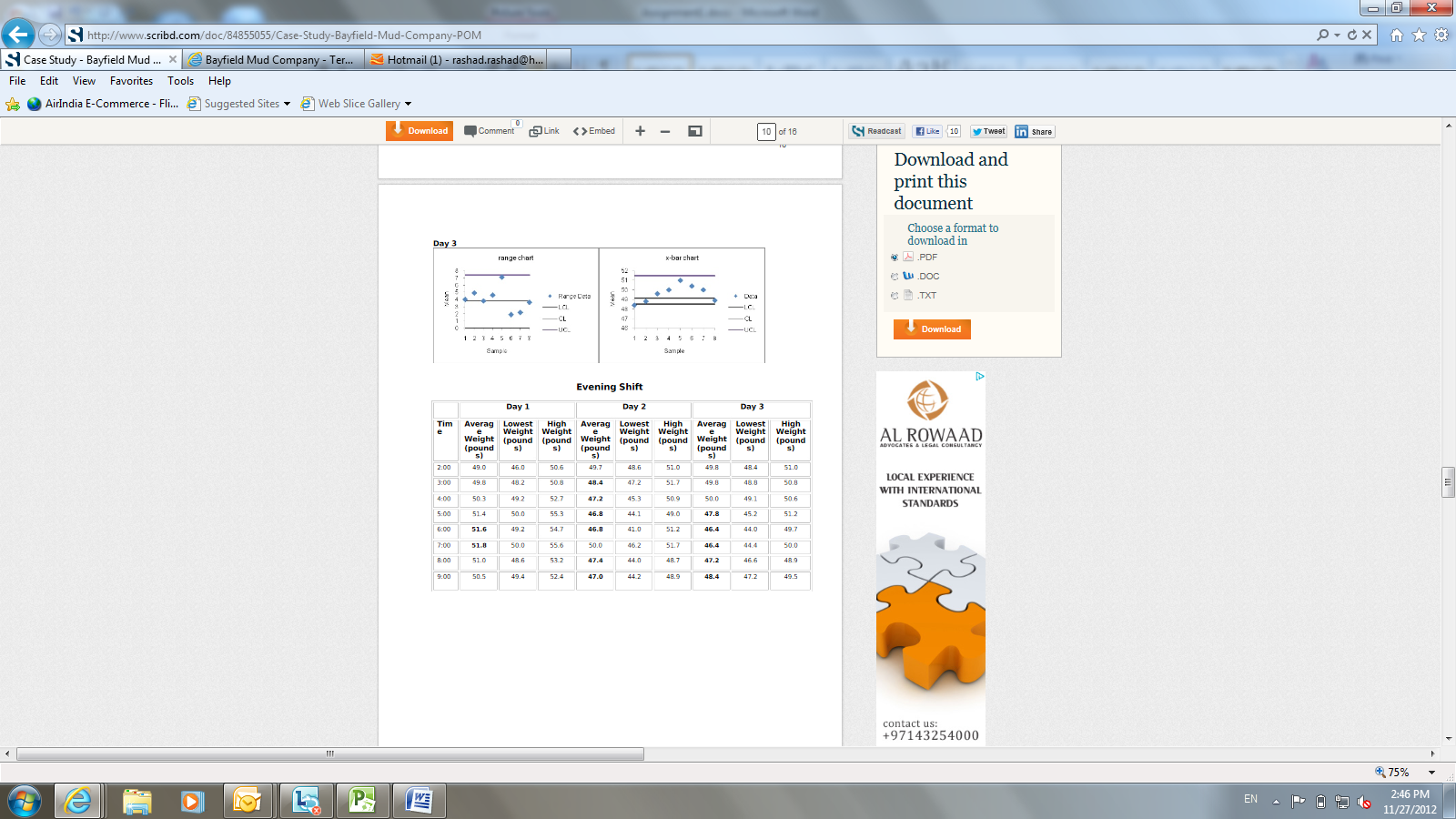
UCL for X = 51.47

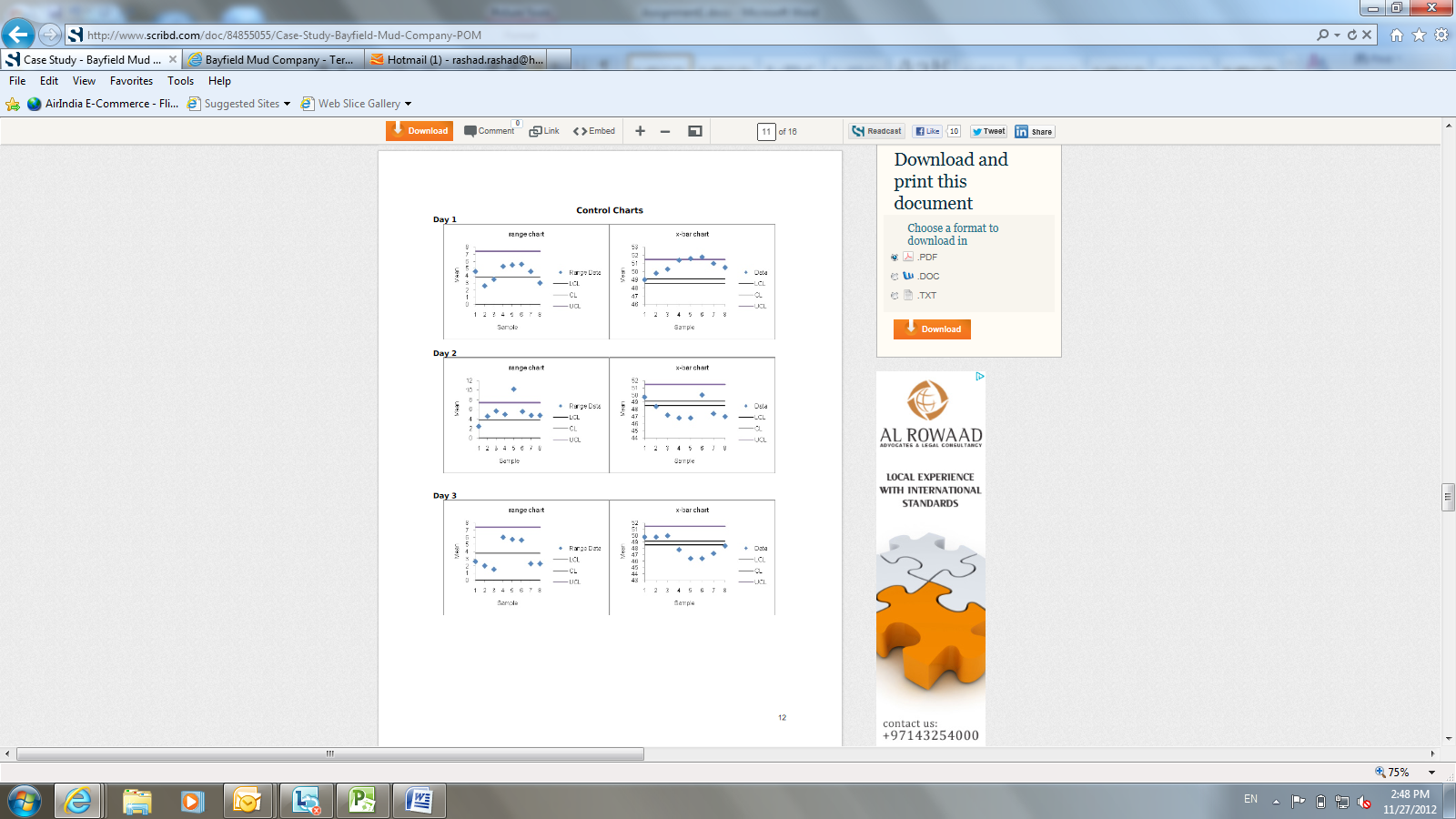
LCL for X = 48.53

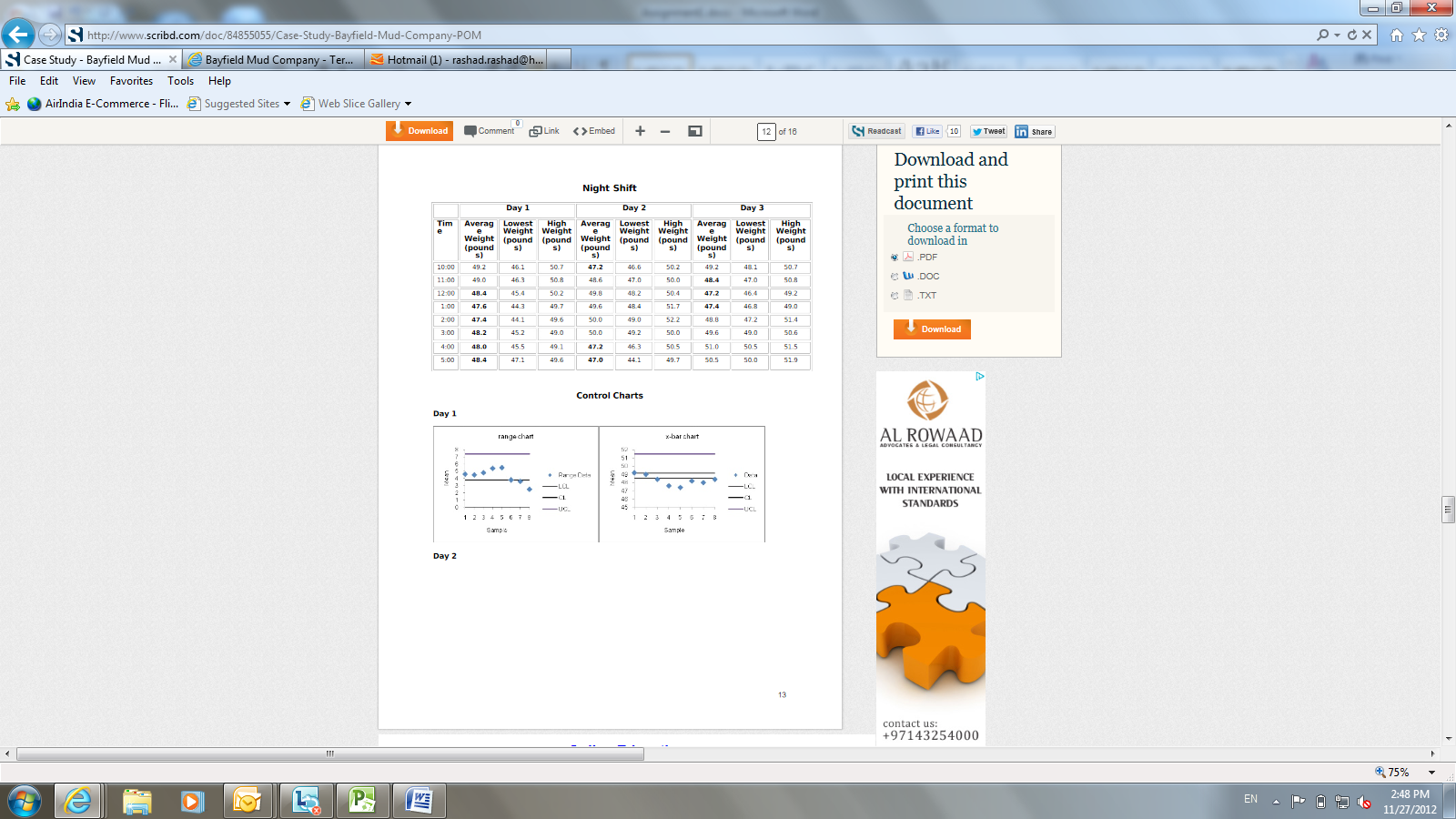
Therefore, the upper and lower control limits for the Range are: UCL = (2.004) \* (3.7) = 7.4148LCL = (0) \* (3.7) = 0

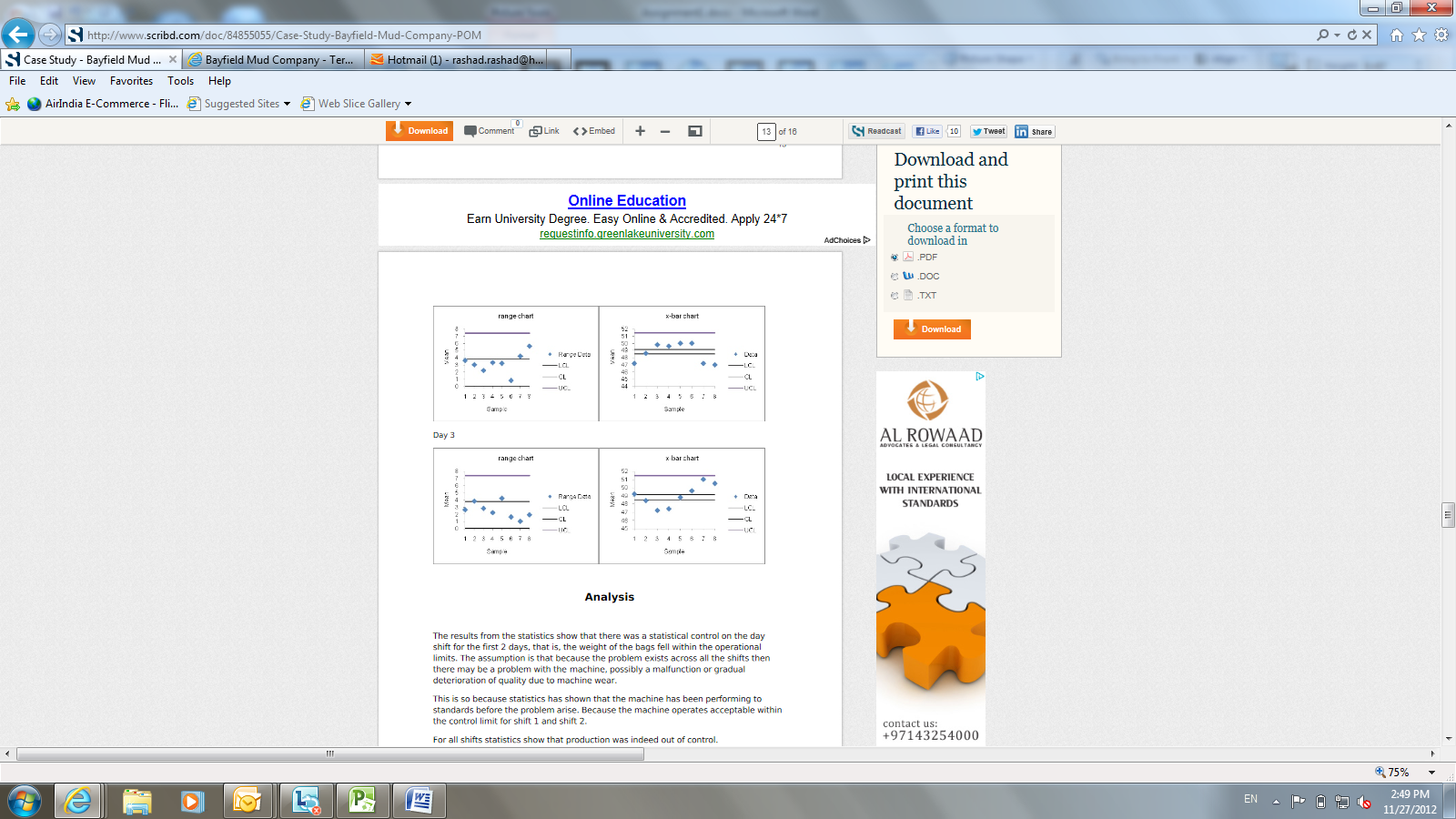












**I. What is your Analysis of the bag-weight problem?**

In the given case, Quality control analysis has been done via X-charts and R-charts.

X-chart is to control the central tendency of the process. In this case, we refer to the weight of 50-pound bags of treating agents.

R-chart is to control the dispersion of the process. In this case, we refer to the range of weight or difference between maximum weight and minimum weight of the bag.

Upon the analysis of problems, based on the calculations taken from all three shifts over three days, we can observe that the average weights, ranges, upper and lower limits have been out of control.

The results from the statistics show that there was statistical control on the dayshift for the first 2 days, that is, the weight of the bags fell within the operational limits. However, since the problem exists across all the shifts, it is presumed that there might be a problem with the machine itself; possibly a malfunction or gradual deterioration of quality due to machine wear.

**2.** **What procedures would you recommend to maintain proper quality control?**

Below are our recommendations in order to maintain the proper quality control:

Since we understand from the case, that the added night shift was staffed by all new employees who focused only on increasing outputs to meet ever-increasing demand, the first thing we recommend is that Bayfield Mud company should educate all staff to understand that the consistent quality of production is as important as the quantity. High output with high quality should come together.

The company should arrange technical and operation training more frequently in order to ensure that the staff operate efficiently.

Instead of assigning only new staff on night shifts, experienced staffs should be mixed up with them in order to help smooth operation with desired quality in all three shifts.

Also, we recommend setting up monitoring process by most experienced foremen to review and control the quality of product during production.

Moreover, the company should offer extra incentives for the staff that produce every product within control limit of standard weight of bags- 50 pounds. This can be considered as another way to reflect staff performance.