Answer the following questions:

This extra credit problem will require a little research. You must read the hints to solve it and attached relevant documents.

The next five questions refer to the following situation. Bill 3 was passed in November 1989 in the province of Manitoba, Canada. Bill 3 was among the most stringent drinking-and-driving legislation ever enacted in North America. Its proponents pointed to the decrease in alcohol-related traffic fatalities in the year following the passage of Bill 3. Its critics, however, maintained that the decrease in alcohol-related fatalities was due simply to random chance. The following data represent the proportion of total traffic fatalities that were alcohol-related for 1973 to 1990 time period. For the sake of simplicity, assume that there was a constant 250 traffic fatalities per year for the period in question. They collected data over a period of 18 years and saved a data file *arf.xls* that is found on the instructor’s web-site. The average subgroup is size is $n=537.787$.

*(hint: see the following web-sites:)*
http://www.itl.nist.gov/div898/handbook/pmc/section3/pmc31.htm and
http://www.itl.nist.gov/div898/handbook/pmc/section3/pmc332.htm

(+6) 1. What is the theory of Control Charts?
2. What equations would you use to obtain the upper control limit (UCL) and lower control limit (LCL) for the $p$ Chart? (You may want to include a copy of this chart.)

3. What is the average proportion of success?

4. What is the UCL and LCL?

5. Do agree the proponents of Bill 3 that the legislation was successful in significantly reducing alcohol-related traffic fatalities? (What is the correct interpretation of the control chart?)