As a UT Nuclear Engineering research assistant this past semester, I have had the opportunity to work on the Nuclear Energy University Program (NEUP) Project with Southern Nuclear Company. The project includes analyzing, cleaning and modeling data from Southern Nuclear Company gathered with virtual sensors for nuclear power applications. Before the data had been released to the project team, I had to prepare myself by making sure I had all of the necessary Matlab toolboxes downloaded to enable all of the data analysis features of the Process and Equipment Monitoring (PEM) toolbox. After doing so, I worked through the Matlab PEM tutorials by making sure the Matlab code found in the tutorials still ran efficiently without causing any errors or problems. A couple weeks before the data arrived, I read sections of Volume II in "Technical Review of On-Line Monitoring Techniques for Performance Assessment" by the Nuclear Regulatory Company (NRC) in order to gain a firmer understanding and knowledge of how the data analysis and monitoring techniques will work once the data arrives.

When the Southern Nuclear Company data was released to the team, I plotted each of the four data sets of flow rate vs. time. After plotting, I could further visualize what the data is displaying. Therefore, I made observations of any visible abnormalities or outliers in the graphs that the team may want to research further. In addition, I also calculated the noise variance and correlation coefficients which did not show a drastic difference between the data sets. Furthermore, I also plotted the noise for each of the six sensors for the last two data sets to see if there was anything interesting that could not be seen from the noise variance values and data plots.

For future and additional research with this Southern Nuclear Company data, one may consider additional data analysis that may include further anomaly detection as well as data analysis Matlab functions. These functions include standard deviation, mean, mean-centered unit variance and other quantitative parameters. In closing, I have enjoyed working on this research project and I am looking forward to future research opportunities.