There are two widely used process control techniques for the reduction of process output variability. The first technique is automatic process control (APC) that adjusts the process using information about its current level or deviation from a desired target. The APC actions for process adjustments are achieved by the minimum mean square estimate (MMSE) controller or proportional, integral and derivative (PID) controller which minimize the output deviations from the quality target. The MMSE controller is optimal in terms of minimizing mean squared residual errors when the model and its parameters are exactly known. Whereas the PID controller is very efficient and also robust against non-stationarity due to the fact that it can continuously adjust the process whenever the data is auto-correlated. The second technique is statistical process control (SPC) which utilizes control charts. The goal of SPC for improving quality is to monitor and detect process variability, so that the special causes of the process shifting are investigated. While SPC has been successfully used in industry for identifying and eliminating the assignable cause of variations, APC techniques are widely employed in the continuous process industry to reduce common cause variations. For an improved performance of the process for the industry practitioner, both the monitoring and the adjustments of process are needed to receive the full benefit of each approach. Recently, integration of APC and SPC successfully resulted in the reduction of process output variability and improved process efficiency. In this paper, we integrate SPC and APC for various types of industries including liquefied natural gas (LNG) processes. By applying both the statistical process control and the advanced process control to a process we can dramatically improve the quality of process output. Both statistical process control and automatic process control techniques have been widely applied in industry to detect causes of variability by monitoring the key variables in the process. We investigate both techniques, their integration and methods for shift detection in the process for the monitoring of a process.