Control Valves

Automatic control systems were primarily established over two thousand years ago. The ancient water clock of Ktesibios in Alexandria Egypt dating to the third century B.C. is believed to be the very first feedback control equipment on record. This particular clock kept time by regulating the water level within a vessel and the water flow from the vessel. A common style, this successful machine was being made in a similar fashion in Baghdad when the Mongols captured the city in 1258 A.D.

Through history, a variety of automatic machines have been utilized to be able to simply entertain or to accomplish specific tasks. A common European style during the seventeenth and eighteenth centuries was the automata. This device was an example of "open-loop" control, comprising dancing figures which will repeat the same job over and over.

Feedback or otherwise known as "closed-loop" automatic control tools consist of the temperature regulator found on a furnace. This was actually developed in 1620 and attributed to Drebbel. Another example is the centrifugal fly ball governor developed during the year 1788 by James Watt and used for regulating the speed of steam engines.

J.C. Maxwell, who discovered the Maxwell electromagnetic field equations, wrote a paper in the year 1868 "On Governors," which was able to describe the instabilities demonstrated by the fly ball governor. He made use of differential equations in order to describe the control system. This paper exhibited the usefulness and importance of mathematical methods and models in relation to understanding complicated phenomena. It even signaled the start of mathematical control and systems theory. Previous elements of control theory had appeared earlier by not as convincingly and as dramatically as in Maxwell's analysis.

In the next one hundred years control theory made huge strides. New developments in mathematical methods made it feasible to more accurately control considerably more dynamic systems as opposed to the original fly ball governor. These updated methods consist of different developments in optimal control in the 1950s and 1960s, followed by development in robust, stochastic, adaptive and optimal control techniques in the 1970s and the 1980s.

New technology and applications of control methodology has helped produce cleaner engines, with cleaner and more efficient methods helped make communication satellites and even traveling in space possible.

Originally, control engineering was practiced as just a part of mechanical engineering. Control theories were initially studied with electrical engineering for the reason that electrical circuits could simply be explained with control theory methods. Now, control engineering has emerged as a unique practice.

The first control partnerships had a current output that was represented with a voltage control input. For the reason that the right technology in order to implement electrical control systems was unavailable at that moment, designers left with the alternative of slow responding mechanical systems and less efficient systems. The governor is a really effective mechanical controller that is still normally utilized by some hydro factories. Eventually, process control systems became obtainable before modern power electronics. These process controls systems were normally utilized in industrial applications and were devised by mechanical engineers utilizing hydraulic and pneumatic control machines, a lot of which are still being utilized nowadays.