Control Valves

The earliest mechanized control systems were being used more that two thousand years ago. In Alexandria Egypt, the ancient Ktesibios water clock constructed in the 3rd century is considered to be the first feedback control device 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 tool was being made in the same manner in Baghdad when the Mongols captured the city in 1258 A.D.

A variety of automatic devices throughout history, have been utilized to complete particular tasks. A popular style used through the seventeenth and eighteenth centuries in Europe, was the automata. This tool was an example of "open-loop" control, comprising dancing figures which would repeat the same job repeatedly.

Closed loop or also called feedback controlled machines consist of the temperature regulator common on furnaces. This was developed in 1620 and attributed to Drebbel. Another example is the centrifugal fly ball governor developed in 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 could describe the instabilities exhibited by the fly ball governor. He used differential equations so as to describe the control system. This paper demonstrated the usefulness and importance of mathematical methods and models in relation to understanding complicated phenomena. It likewise signaled the start of systems theory and mathematical control. Previous elements of control theory had appeared before by not as dramatically and as convincingly as in Maxwell's analysis.

New control theories and new developments in mathematical techniques made it possible to more accurately control more dynamic systems compared to the first model fly ball governor. These updated techniques include various developments in optimal control during the 1950s and 1960s, followed by development in stochastic, robust, adaptive and optimal control methods during the 1970s and the 1980s.

New technology and applications of control methodology have helped produce cleaner auto engines, cleaner and more efficient chemical methods and have helped make space travel and communication satellites possible.

Originally, control engineering was practiced as just a part of mechanical engineering. Control theories were originally studied with electrical engineering in view of the fact that electrical circuits could simply be explained with control theory techniques. Now, control engineering has emerged as a unique discipline.

The first control relationships had a current output which was represented with a voltage control input. In view of the fact that the correct technology in order to implement electrical control systems was unavailable then, designers left with the choice of slow responding mechanical systems and less efficient systems. The governor is a really effective mechanical controller which is still normally used by several hydro factories. Eventually, process control systems became available prior to modern power electronics. These process controls systems were often used in industrial applications and were devised by mechanical engineers utilizing pneumatic and hydraulic control devices, many of which are still being used nowadays.