Basic principles of process control systems and automation – Automation systems

Your Objectives:

At the end of this lesson, you should be able to justify automation systems.

What is automation?

Historically speaking, automation meant those processes of mechanization of work and production which were significantly modernized by the industrial revolution. Today, however, automation goes well beyond mechanization as it involves, not solely the execution of tasks, but also quality-control and regulatory tasks taken on by artificial systems insofar as the entire process now involves the use of machines, control systems, etc., in order to optimize production processes in the production of goods.

Modern automation systems used in biotechnology consist of made-to-measure, highly precise hardware and software components. They are employed throughout, from single steps to complete processes, including management, regulation and control. Because of the good cost-performance ratio and the flexibility, platform solutions that can be adapted to certain requirements by both manufacturer and user have become very popular.

At Biogen, the primary automated system used for process control is the Delta V Distributed Control System (DCS)®. It would be inane to address the complexities of such a computer system within these few pages. But briefly…

Delta V Distributed Control System®

Delta V was designed to apply automation to process industries. While the components of the system are based on industry standards and use PC hardware and standard network configuration, each Delta V System is customized to the user's needs. At Biogen's manufacturing locations, the appearance and functionality of Delta V, as well as the version implemented on premises, will largely vary according to the equipment and processes in place.

Network Architecture

Delta V is set up using a standard local area network (LAN) configuration. In such a network, various devices are connected to a hub or switch. Each device occupies a position, or node, on the network. By connecting the devices to a network configuration, data can be transmitted to and from each device.

In the case of Delta V, the network is comprised of workstations (operating terminals), as well as electronic input/output cards (I/O cards) that provide a network interface for various valves, motors, pumps, and machines within the manufacturing environment.

The Delta V network is closed, which means that connectivity to the network is restricted, and so access to the workstations and devices on that network is restricted to authorized personnel.