

Understanding Control System Validation

Operations must adopt and accurately implement validation procedures for their digital control systems to maximise the benefit of advanced computerised automation. A fundamental understanding of control system validation is the first step.

The objective of control system validation is to make sure the equipment is operating correctly under both typical and irregular conditions. Validating processes helps to assure product safety, process reliability, and compliance requirements.

By using strict validation rules and procedures, operations can benefit economically by reducing the number of processing failures and malfunctions. An effective validating process lowers the possibility of defects that lead to extra expenses, including repairs and product recalls, therefore, proving beneficial to the bottom line.

Validating anticipates safety hazards and reduces the risks. Conversely, ineffective, or lacking validation can lead to substantial economic losses, safety hazards, or physical harm to personnel. Control system failures can cause events that create dangers for operators and end-users of a product produced in a faulty system.

There are four main areas to Control Systems Validation, including:

Hardware Validation

Hardware validation concerns the functioning and delivery of accurate data by physical equipment. Issues of concern include sensor selection, signal conditioning, and I/O device interfacing.

Software Validation

Software validation is a complex process of designing, implementing, and testing control system software products, operating systems, and communication protocols, along with any specific integration software. Software validation includes monitoring during operation and maintenance phases and documentation to ensure operations are meeting standards.

System Validation

The entire system is an integrated and complete unit combining hardware and software needs for validating. System validation includes environmental analysis to consider temperatures, humidity, static and electromagnetic interference, Signal corruption issues, communication transmitting, power supply, backup systems, and record-keeping procedures.

Validation Management

Managing the control system validation can be categorised as prospective, retrospective, real-time, and lifecycle. Understanding each approach provides insight into how to undertake validation.

For more information on Control System Validation and our services at Triple i, contact us today!
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About Triple i

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