1 Scope

This standard on procedure automation for continuous process operations defines models, styles, strategies, philosophies, and the lifecycle for automation of procedures in the continuous process industries. Terminology is included that helps explain the relationships between these elements and terms. For background on the models and styles, refer to ISA-TR106.00.01-2013. For background on the lifecycle management strategy and procedure automation strategy, refer to ISA-TR106.00.02-2017.

Procedures for continuous process operations include situations of startup, shutdown, abnormal situations, hold step, and transitions of process feed/output. These procedures might exist in manual form, probably written, prior to automation. The goals are to increase uniformity and consistency of procedure automation and reduce the risk, cost, and errors associated with automating procedures.

This standard addresses automated procedures that primarily reside on systems within the supervisory control, monitoring, and automated process control section (as defined by ISA-95 functional levels 1 and 2) of a production process (as defined by ISA-95 functional level 0). This standard does not address procedure execution at the operations management functional level (as defined by defined by ANSI/ISA-95 level 3). The interaction with manual procedures is within the scope, but manual procedures are outside the scope of this standard. Manual procedures include manual operations by the operator using the control systems.

This standard applies to continuous processes. The automation of procedures for batch process operations is outside the scope of this standard.

This standard applies to automated procedures that reside in any such control system in levels 0, 1, and 2 of ANSI/ISA-95.00.01-2010, including the basic process control system (BPCS) but excluding any systems performing safety instrumented functions (SIF) with a claimed safety integrity level (SIL) ≥ 1.

This standard also applies to the interfaces of such procedures with a safety instrumented system (SIS). However, automated procedures that are implemented within a safety instrumented system are outside of the scope of this standard.

All normative clauses of this standard are separated from informative clauses by highlighting with a heading that begins with the word “Requirement.” Each such normative clause identifies the party responsible for implementing the requirement. The list of such parties is defined in Table 11.

Two automation styles are defined in the Automation Style clause of this standard: state-based control (SBC) and sequence-based control (SqBC). These styles are very similar but have their documented advantages. The utilization of these styles depends on a company’s procedure automation philosophy and selected BPCS capabilities. A state-based control automation style is used if there are not multiple steps active at the same time within a single module and the selected process automation design encompasses its procedural automation from startup to run to shutdown and then back to startup. Therefore, this style enables the operator to operate a selected process automatically. The sequenced-based control is a direct translation of a set of commands to sequentially change the state of devices using standard operating procedure (SOP).

2 References

The following normative documents contain provisions which, through reference in this text, constitute provisions of this standard. At the time of publication, the editions indicated were valid. All normative documents are subject to revision, and parties to agreements based on this standard are encouraged to investigate the possibility of applying the most recent editions of the normative documents indicated below. ISA, American National Standards Institute (ANSI), International Electrotechnical Commission (IEC), and International Organization for Standardization (ISO)