

ANSI/ISA-98.00.01-2002



Qualifications and Certification of Control System Technicians

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Qualifications and Certification of Control System Technicians

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1 Scope

This standard identifies the recommended criteria for certification of control system technicians. These criteria address qualifications based on education, experience, training, and job performance.

2 Purpose

The purpose of this standard is to provide industry with basis for certifying the qualifications of control systems technicians who work on facility equipment that is important to safe and efficient operations, in order to help reduce the possibility that unqualified personnel could perform improper maintenance on such equipment. It is intended solely as a recommendation for functional organization, and offers a structured basis for certification of control system technicians in each specific facility where they may be used.

The standard describes three (3) technician categories or levels, which are intended as functional descriptions of typical skill proficiency and competency levels identified at numerous facilities as well as empirically in job analysis. These are essentially points of reference for application of this standard to a specific facility situation. No specific number of categories, levels, or classifications are required by this standard since each facility has its own organizational structure and the information contained in this standard is not intended to change existing organizational arrangements.

This standard also recognizes that each facility or company needs a certification program, procedure, and/ or plan to cross-reference the relationship between the facility job descriptions/categories and the three (3) functional levels. The key to this cross-reference is the existence of a good representative job description of each type of technician at a facility.

This standard can be used independently in circumstances where no equivalent, formally accredited program exists, although formal accreditation by a recognised and reliable accreditor is strongly recommended. It is not intended, however, to set forth qualifications, which differ according to the individual job descriptions in each organization. For example, the "Typical knowledge and skills list" included as Annex A is meant to be a guideline only.

3 Definitions

3.1 control system:

a system in which deliberate guidance or manipulation is used to achieve a prescribed value of a variable (see ANSI/ISA-51.1-1979 [R1993]).

3.2 device:

an apparatus for performing a prescribed function (see ANSI/ISA-51.1-1979 [R1993]).

3.3 direction:

"management, supervision or guidance of an action" (American Heritage College Dictionary, 3rd ed.); performance of a task or operation under the guidance of a qualified individual (oversight may be in person or via direct communication).

3.4 experience:

applicable work in design, construction, commissioning activities, operation, maintenance, on-site activities, or technical services. Observation of others performing work in the above areas is not experience. This experience can be obtained during start-up or operations in industry, or in the military.

3.5 group leader:

the person in the highest level of functional supervision whose responsibilities are oriented solely toward instrumentation and control.

3.6 important to safety:

those structures, systems, and components that provide reasonable assurance that the facility can be operated without undue risk to the health and safety of the public (see 10 CFR, Part 50, Annex A).

3.7 instrumentation:

a collection of instruments or their application for the purpose of observation, measurement, or control (see ANSI/ISA-51.1-1979 [R1993]).

3.8 knowledge:

familiarity with theory and concepts, and detailed understanding of job-related topics.

3.9 loop:

three or more devices or functions processing a single variable that may provide an input signal to a control system.

3.10 may:

an auxiliary term that is used to express permission, but does not indicate a requirement or recommendation.

3.11 shall:

an auxiliary term that is used to express a requirement.

3.12 should:

an auxiliary term that is used to express a recommendation.

3.13 skill:

the ability to demonstrate the practical application of knowledge.

3.14 technical supervision:

providing guidance, as needed, to a subordinate in the performance of an assigned task.

4 Technician Categories

This clause describes three (3) technician categories or levels that are meant to be functional descriptions. No specific number of categories, levels, or classifications are required.

The terms "Technician I", "Technician II", and "Technician III", need not be used as job titles and job descriptions, and shall be correlated with the terms below in the facility certification program.

4.1 Technician I

Shall be a person who performs calibration, loop checking, troubleshooting, and start-up with appropriate direction on devices that perform basic functions such as temperature, pressure, flow, level, and analytical measurements.

4.1.1 Shall be a person who can perform Technician II level tasks under the direction of a Technician II.

4.1.2 Shall be a person who can provide technical assistance or instruction, or both, during on-the-job training to a Technician I.

4.2 Technician II

4.2.1 Shall be a person who can perform the tasks of a Technician I. The technician shall also be capable of performing maintenance, repair, or organizing tasks without direction.



4.2.2 Shall be a person who can perform Technician III level tasks under the direction of a Technician III.

4.2.3 Shall be a person who can provide technical assistance or instruction, or both, during on-the-job training to a Technician I or Technician II.

4.3 Technician III

4.3.1 Shall be a person who can perform the tasks of a Technician I and Technician II, and can perform complex troubleshooting, calibration, and repair without direction on instrumentation, control systems, or equipment.

4.3.2 Shall be a person who can perform Technician III level tasks under the direction of a Technician III.

4.3.3 Shall be a person who can perform technical assistance or instruction, or both, during on-the-job training to a Technician I and a Technician II.

4.3.4 Shall be a person who can perform project organization tasks.

5 General Criteria

5.1 Group Leaders

A facility's maintenance or operations-based Instrumentation and Control (I&C) Group shall consist of a Group Leader and one or more persons who are certified in the categories of Technician I, Technician II, and Technician III. The Group Leader may also be a Technician III. Personnel who are not qualified in one of the above categories may be a part of the I&C Group, provided they do not work on equipment important to safety without direction.

5.2 Non-facility specific qualifications

A program to certify the knowledge and skills qualifications that are not facility-specific shall be instituted by the employer of personnel in the technician categories. A program to certify the knowledge and skills qualifications that are facility-specific shall be instituted by the facility operator in which personnel in the technician categories work. The facility operator has ultimate responsibility for ensuring that every technician performing work on facility equipment is properly certified at the appropriate level.

The program requirements are specified in Clause 6. For example, a contractor providing the technician would certify the contractor's technician in facility-specific items only. The facility operator would certify its own technician in both non-facility-specific and facility-specific items. The qualifications for each technician category shall be based upon the job description of each category in a specific facility. The job description shall be a list that may not be complete, but shall clearly identify the types of tasks that each level of technician can perform without direction.

5.3 Minimum experience requirements

In addition to the knowledge and skills items, there shall be minimum experience requirements for each technician category. Individual programs shall specify the type and duration of experience required for participation in that program. Suggested minimum requirements are specified in Clause 7.

6 Certification of Qualifications

6.1 Technician testing

Each technician shall be tested on at least a representative sample of the knowledge and skills items from the job description of the category for which the technician is to be certified.

6.2 Knowledge proficiency

Knowledge proficiency shall be demonstrated and documented by written examination.

6.3 Skill proficiency

Skill proficiency shall be demonstrated and documented by direct observation of the technician's performance of actual or simulated tasks by a technician possessing at least the next higher certification, or by an individual designated by management.

6.4 Performing tasks of higher technicians

A technician may be certified to individually perform tasks of the next higher technician category by successful completion of the knowledge and/or skills proficiency examination(s) directly related to those tasks.

6.5 Documenting and Evaluating Technicians

The facility operator shall maintain documentation, in accordance with existing facility and personnel procedures, on each technician to show the following items:

- a) Name of employer and certifying agency
- b) Name of certified individual
- c) Level of technician certification
- d) Dates of effective period of certification
- e) Signature of employer's or certifying agency's designated representative
- f) Training records to support certification
- g) Education and experience from outside sources
- h) Evaluation by the immediate supervisor

6.6 Documenting Skill Proficiency, Written and Oral Examinations

The facility operator shall maintain documentation, in accordance with existing facility and personnel procedures, on skill proficiency and written and oral examinations to show the following:

- a) Name of technician
- b) Name of evaluator
- c) Date of examination