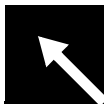
# REFERENCES FOR CSE EXAMINATION



The following pages list reference books that may be useful in preparing for and taking the PE examination in CSE. The list has been organized into the same topic areas as the exam. Where possible, several books have been listed for each topic, and excerpts from the tables of contents are included to assist candidates in comparing these books with other similar references.

It is NOT suggested that candidates should be familiar with or own all of the following books, because there are substantial overlaps in coverage of the exam content in the listed books. Instead, candidates should review these books and other similar books, select a limited number of references covering the major areas of the CSE exam, and study the selected references to learn where particular topics are covered.

Some of the listed references may be out of print or unavailable. However, their coverage of basic principles may still be valid and useful. Some older references may have been replaced by newer editions, so be alert to this possibility.

> ISA offers a wide range of books, standards, electronic media products, and training courses on control systems engineering, some of which are abstracted in this section. A free catalog can be obtained by contacting ISA at P.O. Box 12277, Research Triangle Park, NC 27709; phone (919) 549-8411, FAX (919) 549-8288.

*No representation is made or intended that mastery of the content of the listed references is sufficient to assure passing the CSE exam.*

## GENERAL REFERENCES

The following references cover more than one of the areas included in the CSE exam:

- C.L. Albert and D.A. Coggan (Eds.), FUNDAMENTALS OF INDUSTRIAL CONTROL, ISA, 1991. [Sensors; analyzers; process control; final elements; computer technology; control theory; analog and digital control devices; telemetry; distributed control systems; programmable controllers; ergonomics, human factors and safety; applications; engineering practices]

- W. G. Andrew and H. B. Williams, APPLIED INSTRUMENTATION IN THE PROCESS INDUSTRIES - Vol. 2 (2nd Ed.), Gulf Publishing Company, Houston, TX, 1980. [Design criteria; selecting measurement methods; control valve selection and sizing; pressure relief systems; application guidelines for analytical systems; control panels; instrument air systems; slurry service; accuracies and errors; digital and computer control systems.]

- W. G. Andrew and H. B. Williams, APPLIED INSTRUMENTATION IN THE PROCESS INDUSTRIES - Vol. 3 (3rd Ed.), Gulf Publishing Company, Houston, TX, 1993. [Fluid flow; engineering graphical symbols; charts; tables; nomographs; formulas; typical installation details; typical calculations.]

- N. E. Battikha, CONDENSED HANDBOOK OF MEASUREMENT AND CONTROL (2nd Ed.), ISA, 2004. [Symbols; instrument and control valve selection; control loops; conversion factors; and other reference material.]

- P.G. Friedmann and T.P. Stoltenberg (Eds.), CONTINUOUS PROCESS CONTROL, ISA, 1996. [Measurements, final elements, controllers, and control systems; control techniques; applications to Various Processes.]

- B. G. Liptak, INSTRUMENT ENGINEERS' HANDBOOK - PROCESS CONTROL, 3rd Ed., ISA, 2002 [Control theory; controller, transmitters, converters and relays; control centers, panels and displays; control valves, on-off and throttling; regulators; PLCs and other logic devices; DCS and computer-based systems; process control systems]

- C.L. Nachtigal (Ed.), INSTRUMENTATION AND CONTROL - FUNDAMENTALS AND APPLICATIONS, John Wiley & Sons, New York, NY, 1985. [Definitions; system engineering concepts; dynamic system analysis; instrument statics; input-output characteristics; electronic devices; data conversion; grounding and cabling; bridge transducers; position, velocity and acceleration; force, torque and pressure; temperature and flow; signal processing and transmission; closed-loop system analysis; control system performance modification; actuators; controllers; general-purpose control devices and PLCs; state-space analysis and design]

## Specific Knowledge Areas

The following references cover one or more knowledge areas of the CSE exam identified in the exam specification (Appendix A).

### I. Measurement

- B. G. Liptak, INSTRUMENT ENGINEERS' HANDBOOK - Process Measurement and Analysis (3rd Ed.), ISA, 2002. [Instrument symbols,

performance, and terminology; measurement of flow, level, temperature, pressure and density; safety, weight and miscellaneous sensors; analytical instrumentation]

- C. H. Cho, MEASUREMENT AND CONTROL OF LIQUID LEVEL, ISA, 1982. [Basics; measurement techniques; level control systems]

- D. R. Gillum, INDUSTRIAL PRESSURE, LEVEL AND DENSITY MEASUREMENT, ISA, 1995. [Fluid properties; gauges, transmitters and transducers; level measurement theory; hydrostatic head; electrical level measurements; liquid density measurement.]

- T. W. Kerlin and R. L. Shepard, INDUSTRIAL TEMPERATURE MEASUREMENT, ISA, 1982. [Temperature scales; calibration and accuracy; steady-state and transient heat transfer; response time; thermocouples; resistance thermometers; thermistors; other thermometers; radiation pyrometry; thermowells and protection tubes]

- E.C. Magison, TEMPERATURE MEASUREMENT IN INDUSTRY, ISA, 1990. [Principles and fundamentals; thermocouples; resistance thermometers; filled systems; radiation thermometers; others.]

- D.W. Spitzer (Ed.), FLOW MEASUREMENT (2nd Ed.), ISA, 2001. [Fundamentals; linearization, compensation, totalization; calibration; flowmeter types - differential pressure, open channel, magnetic, mass, positive displacement, target, thermal, turbine, ultrasonic, variable area, insertion, by-pass; factors; data requirements; mixed-phase flow; piping effects; flow conditioning; selection procedures; installation and maintenance]

- ----------, "Flow of Fluids through Valves, Fittings and Pipe", Technical Paper No. 410, 1969, Crane Company, 4100 S. Kedzie Avenue, Chicago, IL 60632

- ----------, "Cameron Hydraulic Data", Ingersoll Rand Company, Woodruff Lake, NJ 07675

- R.W. Miller, FLOW MEASUREMENT ENGINEERING HANDBOOK (3rd Ed.), Gulf Publishing Company, Houston, TX, 1996. [Fluid properties; measurement; flowmeters; equations; design; installation.]

- G.K. McMillan, pH MEASUREMENT AND CONTROL (2nd Ed.), ISA, 1994. [pH chemistry; titration curves; pH measurement; mixing equipment; control valves; control systems; controller tuning; checkout and troubleshooting.]

- K. J. Clevett, PROCESS ANALYZER TECHNOLOGY, John Wiley & Sons, New York, NY, 1986.

- G.D. Nichols, ON-LINE PROCESS ANALYZERS, John Wiley & Sons, New York, NY, 1988.

- R.E. Sherman, ANALYTICAL INSTRUMENTATION, ISA, 1996.

- R.H. Dieck, MEASUREMENT UNCERTAINTY (3rd Ed.), ISA, 2002. [Basics; use of correlation; curve-fitting problems; probability plotting; combining different test methods; calibration errors; propagation of uncertainties]

### II. Signals and Transmission

- D.T. Miklovic, REAL-TIME CONTROL NETWORKS, ISA, 1994. [Communications models; transmission media; networks.]

- L. M. Thompson, INDUSTRIAL DATA COMMUNICATIONS (3nd Ed.), ISA, 2002. [Introduction; history; signals and codings; modems; serial and parallel communications; 100 MBps and 1000 MBps Ethernet; RIP and OSPF router technologies; OLE for Process Control (OPC); Active X, DCOM, virtual private networks; protocols and security]

- E. C. Magison, INTRINSIC SAFETY, ISA, 1984. [Area classification; hazard reduction principles; electric ignition of gases and vapors; intrinsic safety; installation, inspection and maintenance; dust hazards]

- P. S. Marshall, INDUSTRIAL ETHERNET: A Pocket Guide, ISA, 2002. [Basics of common Ethernet-based networks including Modbus/TCP, EtherNet/IP, ProfiNet, Foundation Fieldbus HSE, IDA and wireless Ethernet; installation, maintenance, troubleshooting, and security tips]

- I. Verhappen and A. Pereira, FOUNDATION FIELDBUS; A Pocket Guide, ISA, 2002. [Foundation Fieldbus H1 protocol; installation tips; rules for cabling length; documentation; commissioning checklist; system sizing formulas; integrating with other systems]

- J. Berge, FIELDBUSES FOR PROCESS CONTROL, ISA, 2002. [HART, FOUNDATION Fieldbus, AND PROFIBUS-PA; Field-level and Ethernet-based host-level networking; capabilities; interoperability, integration and migration; availability and safety; benefits]

### III. Final Control Elements

- Guy Borden (Ed.), CONTROL VALVES, ISA, 1998. [Control valves, body assemblies, actuators and accessories; design and construction; applications; safety; troubleshooting; maintenance; testing; standards; valve-related computer programs; regulators]

- B. Fitzgerald, CONTROL VALVES FOR THE CHEMICAL PROCESS INDUSTRIES, Gulf Publishing Company, Houston, TX, 1995. [Basic types; design and material considerations; valve and actuator sizing; valve performance, installation and calibration; typical applications; loop tuning]

- H. D. Baumann, CONTROL VALVE PRIMER (3rd Ed.), ISA, 1998. [Control valves and control loops; selection and sizing; fail safety; flow characteristics; positioners; actuators; stem forces; installation; materials; environmental concerns; electric vs. pneumatic actuators]

- L. R. Driskell, CONTROL VALVE SELECTION AND SIZING, ISA, 1983. [Basic concepts; safety; flow through valves; cavitation; flashing; non-turbulent and mixed-phase flow; velocity, vibration and noise; materials; selection; applications; installation]

- ----------, CONTROL VALVE HANDBOOK (3rd Ed.), Fisher Controls, Marshalltown, IA, 1989.

- ----------, SAFETY RELIEF VALVE SIZING, Catalog, Consolidated.

- W. Ulanski, VALVE & ACTUATOR TECHNOLOGY, McGraw-Hill, NY, 1991.

- D. W. Spitzer, VARIABLE SPEED DRIVES: PRINCIPLES AND APPLICATIONS (2nd Ed.), ISA, 1990. [Basics; utilities and costs; applications of control valves; alternate final control elements; variable-frequency drives; control valves vs. variable-speed drive applications; economics; applications]

- D. Polka, MOTORS AND DRIVES, ISA, 2002. [Principles of DC and variable frequency AC drive technology; DC and AC motor and drive operations; step motors; AC vector motors; brushless servo motors; linear stepper and servo motors; tachometers, resolvers and encoders; drive system control methods; maintenance and troubleshooting]

Also see standards ANSI/ISA-75.01.01-2002–FLOW EQUATIONS FOR SIZING CONTROL VALVES and ANSI/ISA-75.05.01-2000–CONTROL VALVE TERMINOLOGY, as well as ASME VIII, BOILER AND PRESSURE VESSEL CODE.

### IV. Control System Analysis

- R. D. Mulley, APPLIED INSTRUMENTATION SYMBOLS AND IDENTIFICATION, ISA, 1992. [Process flow diagrams; detailed flow sheets; logic symbols; loop diagrams; ladder diagrams, isometrics; installation details; location diagrams; document numbering.]

Also see pertinent standards and recommended practices (such as ANSI/ISA S5.1-5 for instrumentation symbols, loop and logic diagrams).

- P.S. Buckley, TECHNIQUES OF PROCESS CONTROL, John Wiley, NY, 1964. [Mathematics for process control; Laplace transforms; frequency response; block diagrams; stability; compensation; sample-data control; process control functions; applications]

- D. R. Coughanowr and L. B. Koppel, PROCESS SYSTEMS ANALYSIS AND CONTROL, McGraw-Hill, New York, NY, 1965. [Introductory example; Laplace transforms; linear open- and closed-loop systems; root-locus and frequency-response methods; process applications; nonlinear analysis methods; analog simulation]

- J.J. DiStefano et al, FEEDBACK AND CONTROL SYSTEMS, Schaum's Outline Series, McGraw-Hill, NY, 1967. [Terminology; linear systems and differential equations; Laplace transform; stability; transfer functions; block diagram algebra and signal flow diagrams; error constants; analysis and design objectives and methods; frequency response; root locus; advanced topics. 680 solved problems]

- P.W. Murrill, FUNDAMENTALS OF PROCESS CONTROL THEORY (3rd Ed.), ISA, 2000. [Basic concepts; control loops; block diagrams; sensors and data transmission; typical measurements; controllers; control valves; process dynamics; controller tuning; cascade, feedforward and multivariable control; ratio, override and split-range control; dead-time control; nonlinear and adaptive control; direct digital control, supervisory, distributed and sequential or batch control; new directions; graphic symbols; glossary]

- F.G. Shinskey, PROCESS CONTROL SYSTEMS, McGraw-Hill, NY, 1988. [Dynamic elements; process characteristics; common loops; linear and non-linear controllers; cascade control; feedforward; multi-loop systems; applications to energy transfer and conversion, chemical reactors, mass transfer operations, and batch processes; problems with solutions.]

- W. S. Levine, THE CONTROL HANDBOOK, CRC Press, Boca Raton, FL, 1996. [Mathematical foundations; dynamic models; analysis and design methods for continuous systems; digital control; nonlinear systems; analysis and design software; advanced control methods; identification; applications]

- D.E. Seborg et al, PROCESS DYNAMICS AND CONTROL, John Wiley, New York, NY, 1989. [Covers theory for analog, advanced and digital control, both classical and modern; modeling]

### V. Control System Implementation

- J. M. Bacon, INSTRUMENT INSTALLATION PROJECT MANAGEMENT SYSTEM, ISA, 1989. [Introduction; preliminary engineering and design; final bidding package; contracting;

construction; commissioning; start-up; project wrap-up; standards; instrument symbols and terminology standards; forms; references]

- N.E. Battikha, MANAGEMENT OF CONTROL SYSTEMS: JUSTIFICATION AND TECHNICAL AUDITING, ISA, 1992. [Purposes of control systems justification; benefits; plant needs; system specification and vendor selection; costs; auditing; engineering records; maintenance; alarm and trip systems.]

- L.T. Amy, AUTOMATION SYSTEMS FOR CONTROL AND DATA ACQUISITION, ISA, 1992. [Introduction to digital systems; project execution; defining system requirements; selection; configuration; installation and startup; multi-vendor integration; input/output signal criteria]

- W. E. Gilmore et al, THE USER-COMPUTER INTERFACE IN PROCESS CONTROL: A HUMAN FACTORS ENGINEERING HANDBOOK, Academic Press, Boston, MA, 1991.

- G.K. McMillan, DISTRIBUTED CONTROL SYSTEMS; SELECTION, IMPLEMENTATION AND MAXIMIZATION, ISA, 1991. [Selection of a DCS; advanced configuration tools; software engineering; application examples]

- S. M. Herb, UNDERSTANDING DISTRIBUTED PROCESS SYSTEMS FOR CONTROL, ISA, 1999. [Introduction; evolution of plant-wide process control; computing devices; controller hardware and software structures; controller redundancy; user interfaces; alarms; networks, physical and logical structures; open communications standards; plant information; continuous and batch processes; system security; reliability, failures and faults; safety systems; control system implementation, justification, specification, vendor selection, testing and installation; importance of distributed control; future trends; glossary of terms and acronyms]

- B. G. Liptak, INSTRUMENT ENGINEERS' HANDBOOK - Process Software and Digital Networks (3rd Ed.), ISA, 2002. [Overall plant design; designing a safe plant; control center, workstation and logic design; buses and networks; software packages for control loop optimization, data reconciliation, and event-sequence recorders; batch control; plantwide control; miscellaneous data tables]

- P.S. Buckley, PROCESS CONTROL STRATEGY AND PROFITABILITY, ISA, 1992. [Process control objectives and design strategy; material balance control; product quality control; constraints and safety.]

- P. B. Deshpande and R. H. Ash, COMPUTER PROCESS CONTROL WITH ADVANCED CONTROL APPLICATIONS (2nd Ed.), ISA, 1988. [Hardware and software; single-loop computer control; mathematics of sampling process; z-transform; pulse transfer functions; data holds;

sample-data control systems; modeling and identification; adaptive, self-tuning, feedforward, cascade and multivariable systems]

- K.J. Astrom and T. Hagglund, PID CONTROLLERS: THEORY, DESIGN AND TUNING (2nd Ed.), ISA, 1995. [Process models; PID control; controller design and adaptation; automatic tuning]

- A. B. Corripio, TUNING OF INDUSTRIAL CONTROL SYSTEMS, ISA, 1990. [Feedback controllers and tuning; open-loop process dynamics; selection of controller modes; tuning feedback controllers; feedforward, ratio, multivariable, adaptive and self-tuning control; tuning cascade control systems]

- D.W. Spitzer, REGULATORY AND ADVANCED REGULATORY CONTROL: APPLICATION TECHNIQUES, ISA, 1993. [Manual control; field devices; controllers; PID control; controller tuning; loop pairing; advanced regulatory control]

- H.L. Wade, REGULATORY AND ADVANCED REGULATORY CONTROL: SYSTEM DEVELOPMENT, ISA, 1994. [Mathematical review; symbols and terminology; process characteristics; types of control loops; standard and modified PID control; tuning; ratio, cascade, feedforward, and selector control; interacting loops; model-based control]

- G.K. McMillan, CONTINUOUS CONTROL TECHNIQUES FOR DISTRIBUTED CONTROL SYSTEMS, ISA, 1989. [Advanced control modes override, feedforward; signal gain characterization; multiple valve manipulation; automated startup and shutdown; noise and error reduction]

- G. K. McMillan, TUNING AND CONTROL LOOP PERFORMANCE (2nd Ed.), ISA, 1990. [Fundamentals; performance problems and criteria; effects of process, controller, measurement, valve and disturbance dynamics; nonlinearities, interactions and advanced control algorithms; summary; appendices]

- C.L. Phillips and H.T. Nagle, Jr., DIGITAL CONTROL SYSTEM ANALYSIS AND DESIGN (Rev.), Prentice Hall, Englewood Cliffs, NJ, 1995. [Discrete-time systems; Z transform; sampling and reconstruction; open-loop controller design; optimal control; filters; case studies]

- T. A. Hughes, PROGRAMMABLE CONTROLLERS (3nd Ed.), ISA, 2001. [Introduction; numbering systems and codes; logic system fundamentals; electrical design; input/output system; memory and storage; basic and high-level programming languages; data communication systems; applications; installation and maintenance]

- A. E. Nisenfeld (Ed.), BATCH CONTROL, ISA, 1996. [History; fundamentals; methods; designing a batch control system; logic documentation; production scheduling; fault detection and analysis; specification of a control system for batch processes; implementation of general recipe; supervisory control; equipment selection; configuration; safety; operator role; advanced control; modeling and simulation; applications]

- T. G. Fisher, BATCH CONTROL SYSTEMS: DESIGN, APPLICATION AND IMPLEMENTATION, ISA, 1990. [Terminology; characteristics; architecture; communications; data base management; general requirements; safety interlock systems; regulatory and sequence control; scheduling; recipes; design approach; system hardware; reliability/availability; costs, benefits and justification]

- T. G. Fisher, ALARM AND INTERLOCK SYSTEMS, ISA, 1984. [Introduction; number systems; codes; logic elements; electronic devices; relay and solid-state logic; programmable controllers; combinational and sequential logic circuits; annunciators; system design and documentation]

- T. G. Fisher (Ed.), SAFETY CONTROL SYSTEMS, ISA, 1991. [Basic concepts; evolution of protective systems; diagnostics for distributed control systems; use of programmable controllers; high-risk safety systems; qualitative and quantitative analysis of safety systems; triple-redundant system; fault-tolerant techniques; markov models]

- W. M. Goble, CONTROL SYSTEM SAFETY EVALUATION & RELIABILITY (2nd Ed.), ISA, 1998. [Analytical tools including Fault Tree Analysis (FTA), Reliability Block Diagrams (RBD), Failure Modes and Effects Analysis (FMEA), Markov modeling; component failure modes; on-line diagnostics; common cause; software reliability; operational safety; design rules]

- P. Gruhn and H. L. Cheddie, SAFETY SHUTDOWN SYSTEMS: Design, Analysis and Justification, ISA, 2002. [Design life cycle; risk; process vs. safety control; protection layers; developing requirement specifications per ISA S84.01; safety integrity level; choosing a technology; initial system evaluation; field device issues; hardware and management considerations; installation; testing; changes; justification; design checklist; case study]

- E. M. Marszal and E. W. Scharpf, SAFETY INTEGRITY LEVEL SELECTION, ISA, 2002. [Selecting safety integrity levels for safety instrumented systems (SIS), accounting for existing layers of protection; quantitative risk analysis]

- E. C. Magison and W. Calder, ELECTRICAL SAFETY IN HAZARDOUS LOCATIONS, ISA, 1983. [Area and material classification; hazard reduction; ignition of gases and vapors; intrinsic

safety; explosion-proof housings; pressurization; standards; inspection, maintenance, testing and calibration; testing laboratory certification; dust hazards]

- K.C. Kapur and L.R. Lamberson, RELIABILITY IN ENGINEERING DESIGN, John Wiley, New York, NY, 1977.

- P.D.T. O'Connor, PRACTICAL RELIABILITY ENGINEERING (3rd Ed.), Gulf Publishing Company, Houston, TX, 1996. [Introduction; reliability mathematics; design for reliability; reliability of mechanical and electrical systems; software reliability; testing; analyzing reliability data; maintainability]

### VI. Codes and Standards

The following material lists codes and standards relevant to the practice of CSE. The source, number and title of the codes or standards are given.

Because there are so many applicable codes and standards, it is not expected that CSEs will memorize all their provisions, or bring copies of all of them to the exam. When feasible, if exam problems call for details of a code or standard, the needed information will be supplied as part of the problem statement.

**ISA—The Instrumentation, Systems and Automation Society**
P.O. Box 12277
Research Triangle Park, NC 27709 (919) 549-8411

- ISA-5.1-1984 (R1992) - INSTRUMENTATION SYMBOLS AND IDENTIFICATION

- ISA-5.2-1976 (R1992) - BINARY LOGIC DIAGRAMS FOR PROCESS OPERATIONS

- ISA-5.3-1983 - GRAPHIC SYMBOLS FOR DISTRIBUTED CONTROL/ SHARED DISPLAY INSTRUMENTATION, LOGIC, AND COMPUTER SYSTEMS

- ISA-5.4-1991 - STANDARD INSTRUMENT LOOP DIAGRAMS

- ANSI/ISA-12.00.01-2002 - ELECTRICAL APPARATUS FOR USE IN CLASS I, ZONE 0, 1, & 2 HAZARDOUS (CLASSIFIED) LOCATIONS

- ISA-RP12.4-1996 - PRESSURIZED ENCLOSURES

- ANSI/ISA-RP12.06.01-1995 (R2002) - WIRING PRACTICES FOR HAZARDOUS (CLASSIFIED) LOCATIONS INSTRUMENTATINO PART 1: INTRINSIC SAFETY

- ANSI/ISA-18.1-1979 (R1992) - ANNUNCIATOR SEQUENCES AND SPECIFICATIONS
- ANSI/ISA-51.1-1979 (R1993) - PROCESS INSTRUMENTATION TERMINOLOGY
- ANSI/ISA-75.01.01-1985 - FLOW EQUATIONS FOR SIZING CONTROL VALVES
- ANSI/ISA-75.11.01-1985 (R2002) - INHERENT FLOW CHARACTERISTICS AND RANGEABILITY OF CONTROL VALVES
- ANSI/ISA-84.01-1996 - APPLICATION OF SAFETY INSTRUMENTED SYSTEMS FOR THE PROCESS INDUSTRY
- ISA-MC96.1-1982 - TEMPERATURE MEASUREMENT AND THERMOCOUPLES
- ANSI/ISA-RP55.1-1975 (R1983) - HARDWARE TESTING OF DIGITAL PROCESS COMPUTERS
- ISA-RP60.3-1985 - HUMAN ENGINEERING FOR CONTROL CENTERS

**ANSI American National Standards Institute**
25 W 43rd Street
New York, NY 10036 (212) 642-4900

- PTC19.1-85 - MEASUREMENT UNCERTAINTY - INSTRUMENTS AND APPARATUS
- PTC19.2-87 - PRESSURE MEASURING INSTRUMENTS AND APPARATUS
- PTC19.3-74 - TEMPERATURE MEASURING INSTRUMENTS AND APPARATUS
- PTC19.22-86 - DIGITAL SYSTEMS - TECHNIQUES, INSTRUMENTS AND APPARATUS

**NFPA National Fire Protection Association**
1 Batterymarch Park
Quincy, MA 02269-9101 (617) 770-3000

- No. 70 - NATIONAL ELECTRICAL CODE
- No. 85 - BOILER & COMBUSTION SYSTEM HAZARDS
- No. 493 - INTRINSICALLY SAFE APPARATUS

- No. 496 - PURGED & PRESSURIZED ENCLOSURES FOR ELECTRICAL EQUIPMENT IN HAZARDOUS LOCATIONS

- No. 497 - CLASSIFICATION OF FLAMMABLE LIQUIDS, GASES AND VAPORS AND OF HAZARDOUS LOCATIONS FOR ELECTRICAL INSTALLATIONS IN CHEMICAL PROCESS AREAS

**NEMA National Electrical Manufacturers Association**
Suite 1847
1300 North 17th Street
Rosslyn, VA 22209 (703) 841-3200

- ICS6(R2001) - ENCLOSURE REQUIREMENTS FOR INDUSTRIAL CONTROL DEVICES IN HAZARDOUS AND NON-HAZARDOUS LOCATIONS

**IEEE Institute of Electrical & Electronics Engineers**
445 Hoes Lane
Piscataway, NJ 08854-1331 (732) 981-0060

- S315A-1986 - GRAPHIC SYMBOLS FOR ELECTRICAL AND ELECTRONICS DIAGRAMS

- S488 - STANDARD DIGITAL INTERFACE FOR PROGRAMMABLE INSTRUMENTATION

- S802.1-16 - STANDARDS FOR LOCAL AND METROPOLITAN AREA NETWORKS

- S991-1986 - STANDARD FOR LOGIC CIRCUIT DIAGRAMS

**OSHA Occupational Safety & Health Administration**
200 Constitution Avenue NW
Washington, DC 20210 (202) 693-2000

- 1910 GUIDE TO OSHA REGULATIONS

Readers of this booklet are urged to submit information (name of author(s), title, edition, publisher's name and address, date of publication, and description of contents) for other pertinent references, codes or standards to:

ISA, P.O. Box 12277
Research Triangle Park, NC 27709
Phone: (919) 549-8411 FAX: (919) 549-8288

so they can be included in future editions of the CSE Study Guide.