

**COMPETENCY MODEL FOR
INSTRUMENT MECHANIC
CLASS CODE 3843**

The following competencies have been identified as those that best separate superior from satisfactory job performance in the class of **INSTRUMENT MECHANIC** (Numbers refers to the order of competencies in the Competency Bank.)

1. Reading Comprehension
4. Analytical Ability
5. Learning Ability
8. Safety Focus
20. Job Knowledge
21. Technology Application
24. Mechanical Aptitude
26. Electrical Understanding

On the following pages are descriptions of each competency, including a definition, the level of the competency required for the class (*italicized*, **bolded**, and underlined), examples of behavioral indicators, and satisfactory and superior performance levels.

1. READING COMPREHENSION – Comprehends and correctly applies information presented in written form. Makes correct inferences; draws accurate conclusions.

Level of Competency Required by Job:

- Level 1: Concrete, specific job-related information (work orders; instructions; material/equipment labels)
- Level 2: **General information related to field of work and assignments; (articles in trade publications; technical/instructional manuals; memos; letters; e-mails; reports)**
- Level 3: Abstract/complex information (highly technical articles/ reports in specialized area; legal or other regulatory material)

Examples of Behavioral Indicators:

- Follows written instructions correctly.
- Learns information presented in writing.
- Identifies relevant written information.
- Interprets written legal regulatory material accurately.

Performance Levels:

Satisfactory

Reads instructions correctly. Learns from manual and other printed material.

Superior

Learns from manual and may answer others' questions. Explains information presented in written form to others.

4. ANALYTICAL ABILITY – Identifies, obtains, and evaluates relevant information to establish relationships or patterns, cite causes, and reach logical conclusions.

Level of Competency Required by Job:

- Level 1: Recognize similarities/differences in current situation to those previously encountered and is guided accordingly. Apply existing policies correctly. Ask pertinent questions or otherwise seek additional information to formulate appropriate response.
- Level 2: **Consider multiple, varied factors when evaluating a situation or issue. Seek additional information to provide further insight. Reach conclusions that logically follow from the information obtained.**
- Level 3: Consider a multitude of diverse factors, their interrelationships, the perspectives of others, alternative courses of action and their likely ramifications when evaluating information to reach a conclusion.

Examples of Behavioral Indicators:

- Obtains the necessary amount of relevant information.
- Recognizes the impact of each type of information on conclusions.
- Evaluates the quality/source of information when considering it.
- States the shortcomings of the information and, therefore, the analysis.

Performance Levels:

Satisfactory

Recognizes available relevant information, seeks additional information to consider, and reaches a conclusion. Provides sound, convincing justification for conclusions, citing relevant data and facts.

Superior

Uses a great deal of existing and obtained information and data to develop and evaluate alternatives and arrive at a final conclusion. Provides compelling arguments in support of conclusions.

5. LEARNING ABILITY – Readily acquires and applies new information.

Level of Competency Required by Job:

- Level 1: Learn job-related information, rules, and procedures, and apply them correctly.
- Level 2: Learn and apply extensive job-related information correctly. Make reasonable inferences when specific information needed in a given instance was not presented.
- Level 3: **Access new job-related information via print or electronic media, in educational/training programs, and/or by speaking with others, and apply it correctly to the job.**

Examples of Behavioral Indicators:

- Recalls information presented in educational/training programs.
- Recognizes how to apply newly acquired information to the job.
- Applies new information to the job in a way that increases productivity.
- Applies “lessons learned” from prior work experiences to current work.
- Answers questions/coaches others who received the same instruction.

Performance Levels:

Satisfactory

Learns new information and applies it appropriately to situations/issues.

Superior

Readily acquires new information, makes appropriate inferences based on it, and integrates it with prior learning and experience to maximize its use in a variety of situations or with respect to a variety of issues.

8. SAFETY FOCUS – Performs work in a way that minimizes risk of injury to self or others.

Level of Competency Required by Job:

- Level 1: Maintain awareness of unsafe conditions and actions to avoid injury.
- Level 2: Follow safety rules/procedures; avoid known hazards in the work environment.
- Level 3: **Carefully follow safety rules and procedures and consistently use all necessary safety equipment.**

Examples of Behavioral Indicators:

- Wears seat belt.
- Ensures safe physical work environment by taking actions such as eliminating unstable stacks of materials, closing drawers so filing cabinets will not tip over, and keeping pathways clear of tripping hazards.
- Reviews safety procedures before beginning each job with known hazards.
- Follows safety procedures while performing work even when it takes more time.
- Uses safety equipment such as goggles, gloves, and earplugs as required or warranted.
- Frequently checks safety equipment for proper condition and operation.

Performance Levels:

Satisfactory

Maintains awareness of personal safety to avoid injury or property damage during all work activities.

Superior

“Safety first.” Places avoidance of injury or property damage above all other job requirements. Mentions the need to follow safe work practices to co-workers. Actively seeks ways to avoid injury.

20. JOB KNOWLEDGE – Knows information required to perform a specific job. Includes both widely available courses of study (for example, chemistry, human resources management, graphic arts) and City-specific information (parking regulation and ticketing practices; purchasing procedures; provisions of the City Charter).

Level of Competency Required by Job:

- Level 1: Knowledge is concrete, factual, and/or procedural and may be defined by the organization. Situations in which it is applied are quite consistent.
- Level 2: **Knowledge is substantive and may be defined by an external trade, field, or profession. Situations in which it is applied vary and, as such, require breadth and depth of understanding.**
- Level 3: Knowledge is abstract, conceptual, and/or complex and may be supported by a well-defined academic discipline or authoritative sources (e.g., laws, ordinances, government guidelines/regulations/codes). Situations in which it is applied may vary greatly or be novel.

Examples of Behavioral Indicators:

- Performs work correctly/avoids technical (job content related) errors.
- Answers technical questions about work accurately.
- Asks few technical questions about the performance of routine work activities.
- Offers advice (“coaching”) to new employees regarding their work.
- Develops training programs for other employees.
- Sought out as a source of information by others.

Performance Levels:

Satisfactory

Sufficient job knowledge to perform work correctly independently. Answers technical questions about work correctly.

Superior

Expertise in technical job information sufficient to serve as a resource to others. May develop training manuals/ programs and/or give internal and/or external presentations related to work.

Job Knowledge Areas

1. Knowledge of electrical and mechanical principles upon which electrical, electronic, mechanical, pneumatic, and hydraulic instruments and control devices operate sufficient to inspect, maintain, calibrate, troubleshoot, and repair the function of their component parts.
2. Knowledge of hand and power tools, methods, and techniques, including testing, calibration, and repair procedures, sufficient to disassemble, service, adjust, repair, test, calibrate, and assemble electronic, computerized automatic controls, and indicating and recording instruments.
3. Knowledge of the properties of various materials such as steel, brass, and copper sufficient to fabricate instrument parts.
4. Knowledge of principles for analyzing instruments and control systems' characteristics such as those related to steam generating plant equipment, building heat, ventilation and air conditioning equipment, wastewater treatment and water purification plant equipment sufficient to test, calibrate, and repair.
5. Knowledge of the safety regulations such as CAL/OSHA regulations relating to plant safety, rigging and scaffolding, and the Safety Data Sheets related to the safe use of chemicals.
6. Knowledge of computer applications such as Programmable Logic Controllers (PLC's), Human Machine Interfaces (HMI), Building Automation Control System, and Distributed Control Systems (DCS) used for instrument control systems sufficient to maintain, troubleshoot, interface with various equipment, and document results.
7. Knowledge of symbols and notation standards such as those found in piping and instrumentation drawing (P&ID), diagrams, and schematics relating to instrument repair sufficient to read and interpret instructions and plans.
8. Knowledge of mathematics such as algebra, geometry, and trigonometry sufficient to compute mathematical calculations.
9. Knowledge of the principles of operations of analog, digital and microprocessor based instrumentation such as digital transmitters, recorders, meters, and distributed control systems sufficient to interface with process control computers and other applications.
10. Knowledge of physics and chemistry such as those relating to devices used to measure pressure, temperature, flow, pH, conductivity, and other properties sufficient to test and inspect various automatic controls and indicating and recording instruments and devices.

11. Knowledge of regulatory and compliance rules and regulations such as Environmental Protection Agency (EPA) and South Coast Air Quality Management District (SCAQMD) sufficient to ensure compliance.

21. TECHNOLOGY APPLICATION – Correctly applies technology as required on the job; conceptualizes improvements in work

through introducing and/or enhancing use of technology.

Level of Competency Required by Job:

- Level 1: Expert in the use of technology required for own job. May identify additional applications for currently used technology to enhance own work and/or work of others.
- Level 2: **Identify additional technology to be applied to improve own work and/or work of others and/or enhanced use of current technology to improve the operations of an entire function or department.**
- Level 3: Identify new technology application to improve/enhance work of an entire function, department, or organization.

Examples of Behavioral Indicators:

- Demonstrates mastery of technical applications required for current work.
- Suggests additional applications of existing technology that improve productivity.
- Identifies new technology that can be applied to improve existing operations.
- Provides convincing justification for investment in new technology versus anticipated benefits.
- Presents compelling arguments to justify purchase of existing software (with or without modification) versus in-house development.

Performance Levels:

Satisfactory

Knows and correctly applies current technology as required on the job. Extends use of current technology to improve efficiency of accomplishing additional tasks.

Superior

Recognizes opportunities to apply technology to improve work processes in a function, department, or the entire organization. Identifies and justifies specific technology for specific uses.

24. MECHANICAL APTITUDE – Accurately predicts the impact of forces on objects and assesses the behavior of other physical phenomena (e.g., volume, weight, velocity). Readily learns work involving the application of mechanical principles.

Level of Competency Required by Job:

- Level 1: Maintain a safe work environment by ensuring objects in it are stable, tools and equipment are properly used.
- Level 2: **Know the physical properties of objects in the work environment and correctly anticipate the action of forces upon them; performs work accordingly (correctly and safely).**
- Level 3: In-depth understanding of mechanical and physical phenomena sufficient to design and/or oversee the construction of systems.

Examples of Behavioral Indicators:

- Recognizes the impact of an earthquake on objects in the work environment and re-arranges them as possible to avoid possible damage or destruction and potential to cause injury.
- Uses tools properly to accomplish work correctly and safely.
- Recognizes the effects of various actions on objects and performs only those actions that will accomplish intended result and will not cause property damage or injury.
- Systems designed and/or for which construction is overseen operate as intended upon completion.

Performance Levels:

Satisfactory

Recognizes the operation of mechanical/physical phenomena sufficient to readily learn and perform work of a mechanical nature.

Superior

Displays exceptional insight into the operation of mechanical phenomena, and makes correct inferences regarding it. Promptly and accurately troubleshoots problems.

26. ELECTRICAL UNDERSTANDING – Comprehends the concept and the operation of flow of electrical current.

Level of Competency Required by Job:

- Level 1: Know the properties of electricity relevant to the work environment and work to be performed in order to correctly perform work and recognize hazards that will be created by the failure to do so.
- Level 2: **Sufficient understanding of electricity to recognize problems and determine repair needed to prevent disaster/restore operation.**
- Level 3: In-depth understanding of electrical principles and phenomena sufficient to design and/or oversee the installation of complex electrical systems.

Examples of Behavioral Indicators:

- Ensures safe physical work environment by taking actions such as eliminating exposed electrical wire, faulty connections, empty sockets, and overloaded circuits.
- Recognizes the danger of fire from faulty electrical installations.
- Uses tools, equipment, and instruments properly to accomplish electrical work correctly and safely.
- Systems designed and/or for which installation is overseen perform as intended upon completion.

Performance Levels:

Satisfactory

Understands the operation of electricity sufficient to readily learn and perform electrical work.

Superior

Displays exceptional insight into the operation of electrical systems, and makes correct inferences regarding them. Promptly and accurately troubleshoots problem.