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**INSTRUMENTATION TECHNICIAN
CERTIFICATION PROGRAM**



QUALITY SYSTEM MANUAL

FOREWORD

In today's competitive environment, all industrial facilities have to consider the critical issue of plant maintenance as a key factor in predicting their major expenses and the continued productivity of their operations. Instrumentation maintenance in particular including repair and replacement, must be a major focus for electric utilities, oil refineries, manufacturing plants, paper mills and chemical plants.

The United Association (UA) has addressed industry needs by developing an extensive program for skilled and experienced UA Journeymen in the proper calibration maintenance and repair of the numerous types of instrumentation devices found in industrial piping applications today. The UA Instrumentation Technician Certification Program has been designed to ensure that UA Journeymen are able to take on any Instrumentation repair problem they may encounter. This specialized training comes at no cost to contractors or plant owners.

The UA Instrumentation-training program is an intensive course of study that includes classroom and hands-on instruction using the latest materials, calibration equipment and instrumentation. UA Journeymen are instructed in the proper techniques of disassembly, inspection and repair for the different types of instrumentation equipment in use at industrial facilities. In the process, these craftsmen become skilled in the application of sensitive calibration equipment.

The high standards of the UA Instrumentation-training program are uniform throughout the United States and Canada, yet each individual Local Union can tailor the Instrumentation Technician-training course differently to focus specifically on the industry requirement of their particular region. In fact, contractors and owners are encouraged to review the UA Instrumentation-training program and make recommendations that will help modify the program to meet their specific individual needs.

The United Association together with the Electrical Power Research Institute (EPRI) have established an examination/certification program that provides an outstanding tool for determining individual's capabilities and competences and ensures their on-going training needs are provided for and validated in a structured environment. The UA/EPRI certification program provides an assurance to industry that UA Instrumentation Technicians have the necessary skills not only to do the job right but also to do the job right the first time.

The Electric Power Research Institute, Inc. (EPRI) conducts research and development relating to the generation, delivery and use of electricity for the benefit of the public. An independent, nonprofit organization, EPRI brings together its scientists and engineers as well as experts from academia and industry to help address challenges in electricity, including reliability, efficiency, health, safety and the environment. EPRI's members represent more than 90 percent of the electricity generated and delivered in the United States, and international participation extends to 40 countries.

It is our goal to provide highly trained UA craftsmen with detailed knowledge and experience that will improve their job performance and contribute to lower plant operating costs. In fact, many utilities and other industrial facilities throughout the United States and Canada have already established completion of the UA Instrumentation Technician Certification Program as a necessary hiring requirement.

Without a doubt, the United Association boasts the premier training program available in the pipe trades industry today. The UA's joint union-management training programs are now valued at a half billion dollars in equipment and real estate. Moreover, about \$140 million is spent annually in operation of these programs, a significant investment involving over 100,000 Apprentices and Journeymen. The UA has approximately 314 Local union Training Facilities across the United States and Canada.

For a contractor or plant owner choosing Certified Instrumentation Technicians from the United Association is an assurance that the quality of craftsmanship is the highest you can find in the industry today.

UA COMMITMENT TO EXCELLENCE

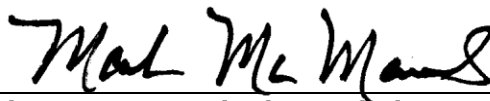
The UA Instrumentation Technician Certification Program has no parallel in industry today. Developed under the leadership of the United Association's General President and Administrative Staff, the program is designed to help meet the growing need for Certified Instrumentation Technicians. The program provides trained, experienced, certified and immediately available Journeymen Instrumentation Technicians throughout the United States and Canada at no cost to the contractors and their clients (owners and users). The United Association underwrites the cost of training and qualifying its Instrumentation Technicians utilizing certified Instructors, auditors and other third parties involved in the program's success.

OBJECTIVES OF THE PROGRAM

- ❖ Promote uniform administration and enforcement of UA Instrumentation Technician qualifications and certifications.
- ❖ Promote a level of qualification standard, which will support safety, quality, and economical instrumentation maintenance and repair.
- ❖ Provide industry with a qualification that is complete, accurate, consistent, reliable and current to comply with the required applications.
- ❖ Commit each UA Instrumentation Technician to performance that includes quality, safety and cost effectiveness for the required qualifications.
- ❖ Enable all UA Instrumentation Technicians to recognize their individual commitment to the integrity of the UA Instrumentation Technician Certification Program.
- ❖ Provide all UA Instrumentation Technicians the opportunity to enhance the quality of their work and life and to emanate goodwill among the United Association, its members, the employing contractors and their clients (owners and users).

"THE ADOPTION OF THIS INSTRUMENTATION TECHNICIAN CERTIFICATION PROGRAM IS A CONTINUATION OF THE UNITED ASSOCIATION'S COMMITMENT TO ASSURE THAT THE BEST QUALIFIED PERSONNEL ARE AVAILABLE FOR ALL FUTURE INSTRUMENTATION MAINTENANCE AND REPAIR REQUIREMENTS. THIS PROGRAM IS BEING RECOGNIZED AS A SIGNIFICANT AND PROGRESSIVE STEP IN DEVELOPING AND ENSURING QUALIFIED INSTRUMENTATION TECHNICIANS IN OUR INDUSTRY."

Confirmation Signature:



Mark McManus - United Association General President

UA STAFF AND COMMITTEE PERSONNEL

UA GENERAL ADMINISTRATION

Mark McManus
General President

Christopher A. Haslinger
Director of Education and Training

Phillip F. Martin
Administrator of Certification Programs

INSTRUMENTATION TECHNICIAN TECHNICAL COMMITTEE

James P. Pavesic
Assistant to the Director of Training

Buster Perry
Local Union 184

William Boyd
Local Union 597

THE UA ACKNOWLEDGES THE COOPERATION OF THE FOLLOWING ORGANIZATIONS:

The Electrical Power Research Institute
Mechanical Contractors Association of America, Inc.
National Association of Plumbing-Heating-Cooling Contractors
Pipe Fabrication Institute
Canadian Standards Association

UA QUALITY SYSTEM MANUAL

The Administrator of Certification Programs is responsible for maintaining this Quality System Manual. The Manual shall be revised when necessary to improve existing procedures, when work methods or organizational changes occur, or to keep the Manual current with industry requirements. The Administrator of Certification Programs shall approve new or revised parts of the Manual; his approval is indicated on the Table of Contents Page by signature and date.

The UA Instrumentation Technician Certification Program Quality System Manual is maintained by the Certification Department located in the UA Headquarters Building, Three Park Place, Annapolis, MD 21401.

Upon approval by the Administrator of Certification Programs, the Quality System Manual and its subsequent revisions are posted on the UA Intranet. The electronic version of the Manual is considered the only controlled version of the Quality System Manual and as such is password protected with only the Administrator of Certification Programs and designated Administrative Staff having editing capabilities. Printed out pages of the Manual are considered uncontrolled and are for informational purposes only. All UA Local Union Training Facilities are provided access to the UA Intranet.

Uncontrolled printed copies of the Manual may be issued to others upon request to the Administrator of Certification Programs. Uncontrolled copies are current at time of issue only and will not be issued to UA personnel.

Periodically, revisions are made to the Quality System Manual, when this occurs the changes will be described on the Summary of Changes page of the Manual. Each approved revision is issued with revised Table of Contents and Summary of Changes page. When there are significant revisions throughout the entire Manual, a new Edition may be issued. The Manual revision date and Edition number are identified on the Table of Contents page. Manual revisions become mandatory ninety (90) days after the revision date indicated on the Table of Contents page.

This Quality System Manual contains mandatory requirements and non-mandatory guidance for Instrumentation technician certification activities. The Manual does not address all aspects of these activities and those aspects that are not specifically addressed should not be considered prohibited. It is the responsibility of the Administrator of Certification Programs and members of the Technical Committee using sound technical judgment to provide guidance and a course of action in such matters.

All recipients of this Quality System Manual and related documents are trusted for their physical condition, intended use and maintenance. Violations of this trust, brought to the attention of the Administrator of Certification Programs, would support the withdrawal of all such documents.

SUMMARY OF CHANGES

Third Edition: August 2015

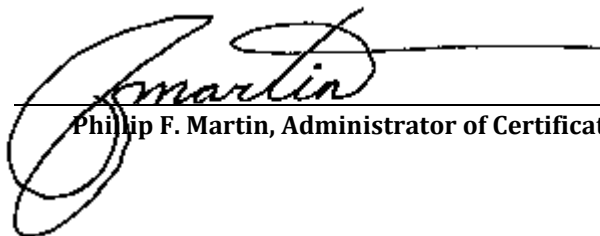
Added paragraph 3.4 (e) to address the expiration and renewal of Level I & Level II certifications

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SECOND EDITION

| <u>Section Number and Name</u> | <u>Revision Date</u> |
|---|-----------------------------|
| 1: Organizational Leadership | August 2015 |
| 2: Instrumentation Training Program | August 2015 |
| 3: Instrumentation Technician Qualification | August 2015 |

Approval Signature:

A handwritten signature in black ink, appearing to read "P. Martin", written over a horizontal line. The signature is stylized with a large loop at the beginning and a long horizontal stroke extending to the right.

Phillip F. Martin, Administrator of Certification Programs

SECTION 1: ORGANIZATIONAL LEADERSHIP

1.1 Scope

- a) The objective of the United Association Instrumentation Technician Certification Program is to provide highly qualified Instrumentation Technicians to fulfill the quality and workmanship requirements governing instrumentation maintenance and repair activities.
- b) The implementation and maintenance of this calibration certification program is conducted in accordance with this Quality System Manual.

1.2 UA General Administration Responsibilities and Authority

- a) **General President** - has the authority and responsibility for the overall operations of the United Association and ensures that sufficient funding and manpower is available to properly administer the program.
- b) **Director of Training** - has the authority and responsibility for the UA training program for all members, including journeymen, apprentices and instructors, along with seminars conducted for personnel throughout the UA.
- c) **Administrator of Certification Programs** - has the overall authority and responsibility for Instrumentation Technician Certification Program operations.
- d) **Exam Proctor:** - an individual who has been appointed by the local management responsible for receiving the Level I Written (Cognitive) Exams from the UA, overseeing the written exam process and returning the exams to the UA for scoring.
- e) **Exam Administrator** –an individual who has been appointed by the local management to oversee the Level II performance exam at their local. This individual will have been given the Level II exam by a member of the UA/IBEW Instrumentation Certification Committee, and attended an 8-hour certification course on the administering of the Level II UA/IBEW/EPRI Instrumentation Exam.

1.3 Program Resources

- a) The resources for support of the Instrumentation Technician Certification Program consists of the following:
 - The International Training Fund underwrites funding for this Instrumentation Technician Certification Program.
 - The execution of the Instrumentation Technician Certification Program Examinations.
 - Control of documents and records, including document issue, maintenance and storage.
 - There are more than 320 training schools owned and/or supported by the UA. These schools may be used as an Instrumentation Technician Training Facility, subject to the related requirements of this Instrumentation Technician Certification Program.

SECTION 2: INSTRUMENTATION TRAINING PROGRAM

2.1 Training

- a)** The training program consists of both classroom training and hands-on instrumentation practical exercises.
- b)** Copies of instrumentation training books are available from the IPT Bookstore for individuals use during the instrumentation training programs.
- c)** Following completion of the training program a UA Certification Examination is provided. Trainees are not allowed to take the UA Instrumentation Technician Certification Examination without fully completing the training course, including the required hands-on practical exercises.
- d)** As an alternative to the above, individuals who can provide evidence that shows extensive work experience in instrumentation maintenance, may take the UA Instrumentation Technician Certification Examination without completing the training program.

2.2 Hands-On Practical Exercises

- a)** In addition to classroom training, hands-on instrumentation practical exercises are required to be completed by each trainee.
- b)** In order to ensure consistent and adequate training, the practical exercises shall be as structured and regimented as the classroom sessions. Instructors shall provide each training group with a description of the practice activities and a general overview on items such as class conduct and safety.
- c)** Instrumentation practical exercises shall be staged using equipment that provides the necessary framework and safety for instrumentation maintenance activities; this adds to the realism of the training and is especially effective for instrumentation courses.
- d)** At the completion of the practical exercise, the Instructor shall note the satisfactory or unsatisfactory performance for each trainee. Instructors should not indicate satisfactory performance unless they are confident that each trainee has mastered the necessary skills.

2.3 Level I Written (Cognitive) Exam

- a)** The Level I Written (Cognitive) Exam format consists of a 200 multiple choice question, 3-1/2 hour exam. The exam is an open book exam and multiple references may be used during the exam. A calculator capable of being programmed to perform algorithms used to compute exam questions as a programming function of the calculator may not be used for the exam. In addition, calculators capable of storing and recalling exam formatted type questions may not be used. The Exam Proctor is the final authority on calculator eligibility and use during the exam based upon above stated requirements.
- b)** The passing score for the Level I Written (Cognitive) Exam is set at 75%, or 150 or more correct answers per exam. A participant who has successfully completed the exam will receive a letter detailing their success and a certification credential consisting of an Instrument Certification card upon which their Name will be displayed. The certification card also contains the individual's certification status, certification period and renewal date.

- c) A participant who has not successfully met the minimum score of 75% will receive a letter stating their failure status and a detailed list of learning objectives identified as needing improvement. This list of learning objectives and the related deficiencies and weaknesses also provide a method for the student to determine the areas in which he or she needs to seek additional training or remediation. An individual may not take the Level I Written (Cognitive) Exam more than once within a six month period.
- d) A Test Participant may submit a challenge to a test question by providing a written description of the reasons why a question should not be allowed for scoring purposes. The written challenge to an exam question must be submitted at the time of the exam and challenges will not be accepted at a later date. A form is included in the Proctor's Test Administration Packet. The written challenge is collected by the exam proctor and submitted to the UA with the exams for consideration and scoring.

2.3 Level II Performance Exam

- a) The Level II Performance Exam is a performance based assessment tool. Participants will be asked Discussion questions related to performance tasks and asked to calibrate three (3) of five (5) devices selected at random by the Exam Administrator. There is a three hour time period allowed for the Level II Performance Exam.
- b) Local Unions are required to maintain current calibration certificates for all equipment used in the Level II Performance Exam. Current certificates of calibration are required before Level II exams are considered to be valid by the UA/IBEW Exam Committee.
- c) A calculator capable of being programmed to perform algorithms used to compute exam questions as a programming function of the calculator may not be used for the exam. In addition, calculators capable of storing and recalling exam formatted type questions may not be used. The Local Union hosting the examination is the final authority on calculator eligibility and use during the exam based upon above stated requirements. The Exam Administrator is the final authority on calculator eligibility and use during the exam based upon above stated requirements.
- d) Scoring of the exam is performed by the Exam Administrator. At the completion of the exam the participants will be notified whether he or she has passed or failed the exam. The Level II Performance Exam is a Pass or Fail Assessment based upon performance criteria observed by the Exam Administrator and specified on the Level II Performance Exam.
- e) All exams are to be returned to the UA at the completion of the scheduled exam period. Scores are not finalized and registered until the UA has received the completed exams and awarded credentialing.
- f) A participant who has successfully completed the exam will receive a certification credential consisting of an Instrument Certification card upon which their Name will be displayed. The certification card also contains the individual's certification status, certification period and the renewal dates for these respective exams.
- g) Challenges may be submitted for review to the UA/IBEW Exam Committee for review. At the completion of the Level II Performance Exam, challenges must be written and provided to the Exam Administrator on the same day the performance exam is administered. Challenges will not be accepted after the exam date.

2.4 Calibration Equipment and Device Requirements

- a) Local unions are required to provide the following Calibration Equipment for use in the Level II Performance Exam.

| Name/Vendor | Transcat Number | Special Requirements |
|--|-----------------|---|
| Transmation PneuXal IV | DK24454P | With Transcat certified calibration With all leads & Documentation |
| Fluke Pressure Module 700P06 | DK700P05 | With Transcat certified calibration With all leads & Documentation |
| Fluke 744 Documenting Process Calibrator | DK744E | With Transcat certified calibration With all leads & Documentation |
| Transcat 23232E dc power supply | DK23232E | With Transcat certified calibration With all leads & Documentation |
| Fluke 87 | DK3451E-3 | With Transcat certified calibration With all leads & Documentation |
| Altek milliamp calibrator 334A | DK4353E | With Transcat certified calibration With all leads & Documentation |
| Altek Tech Chek 820 Calibrator | DK820E | With Transcat certified calibration With all leads & Documentation |
| Highway Addressable Remote Transmission (HART) communicator, Rosemount 275 | DK275D9EI5D0000 | With all leads & Documentation |
| Transmation 6215P Pressure Pump Kit | DK5905P | With all attachments |

- b) Local Unions are required to provide the following devices for use in the Level II Performance Exam.

- Rosemount Differential Pressure Transmitter, Model #1151DP5E52,
Cal Range = 0.0 - 750" H₂O
- Rosemount Pressure Transmitter, Model # CD2A52A1A,
Cal Range = 0.0 - 250" H₂O
- Rosemount Temperature Transmitter, Model # 3144P D1A1NA,
Cal Range = 0.0 - 100.0 deg C
- Rosemount Current to Pressure (I/P) Transducer, Model # 840
- ASCO Pressure Switch, Cat # HB20A214, 0-100 PSIG, adjustable trip setting.

- c) Local Unions may request substitutions for any of the above devices and calibration equipment providing:

- Name, Vendor, Model Number and Specification Sheets (cut sheets) of Substituted Device or equipment is supplied to the UA Administrator of Certification Programs in advance of the next scheduled Level II exam.
- Substituted devices and calibration equipment must receive approval from the Instrument Certification Exam Committee.

SECTION 3: INSTRUMENTATION TECHNICIAN QUALIFICATION

3.1 Responsibility

- a) The Administrator of Certification Programs is responsible for the evaluation of UA Instrumentation Technician candidates. Upon completion of a satisfactory evaluation of the candidate's qualifications and examination results, the Administrator of Certification Programs issues the individual UA/EPRI Instrumentation Technician credentials, valid for a three-year period.
- b) An individual's period of certification is displayed on their respective credentials. It is the individual's responsibility to keep his or her certification current.

3.2 Level I Qualification Requirements

- a) In order to obtain credentials as Level I Instrumentation Technician individuals must complete the UA Instrumentation Training Program as outlined in Section 2 of this Manual.
- b) In lieu of paragraph a) above individual may pre-qualify as Level I by holding a Level II ISA certification and have a minimum of five (5) years of instrumentation calibration experience.
- c) Once pre-qualified, those seeking certification must sit for the Level I Written (Cognitive) Exam. There is no "Grand-fathering" for Instrumentation Technician certification.

3.3 Level II Qualification Requirements

- a) Once an individual has experience performing work as a Level I Instrumentation Technician, they are eligible to take the Level II Performance Exam. The Performance Exam is a hands-on proficiency test. Participants will be required to perform various calibrations and documentations on an assortment of different instruments using the test and calibration equipment provided. This portion of the exam is performed on a one-on-one basis with a Test Administrator. The Test Administrator will be observing and validating the process that is used to ensure that the procedures are performed according to recognized industry standards. There is no "Grand-fathering" for the Level II Performance Exam.
- b) The Level II Performance Exam contains two types of steps: discussion (D) or performance (P). Discussion steps are administered to the examinee simply by asking them the appropriate questions written in the exercise. Performance steps are administered by having the examinee actually perform the steps using the necessary tools and equipment.
- c) The Level II Performance Exam is a pass/fail test. Several types of calibration equipment and instrumentation will be provided for the test. Individuals will be expected to select the appropriate test equipment when performing a calibration on the transmitters and field equipment during the exam. Applicants will be required to perform all calibrations correctly, including filling out complete and correct calibration sheets, to pass. This exam is strictly an evaluation of the calibration process and does not cover the mounting or installation of the devices.

3.4 Recertification

- a) All recertification efforts must be complete before an individual's present certification status expires. A certified individual may renew certification by taking the Level I Exam to become recertified within a period of one year of the present certification expiration date specified on credentialing card. The individual's certification period will be updated and displayed on a new credentialing certification card provided to the successful renewal candidate by the UA.
- b) Individuals may also continue to maintain their certification status by pursuing the Level II exam. The Level II Performance Exam is a "hands-on" exam which tests your ability to perform the steps needed to achieve a valid calibration of a measuring device. Successful completion of the Level II Exam renews your certification status with a new certification period set by the date of the Level II Exam.
- c) An individual that becomes Instrument Certified, as issued by the UA and the IBEW, has successfully completed the Level I and Level II exams. The Level I expiration dates are updated to reflect a current certification period coinciding with the Level II completion date. An individual who is presently instrument certified and is seeking to renew their certification may submit the appropriate documentation, as spelled out under "Recertification Options" shown below, to the UA Certification Department for approval. The UA Certification Department will review all documentation submitted including the Certification Renewal Form (see sample form on page 14) to determine if re-certification is issued. Upon approval by the UA Certification Department, a new certification card will be issued for a three year period.

Recertification options:

- A work history requirement of 1200 hours minimum within the current three year certification period is required in order to renew certification based upon work experience. Each applicant must fill out a Certification Renewal Form listing work experiences, employers and hours worked. After approval, a Level II Instrument Certification is issued for a period of three years beginning with the previous certification's expiration date.
 - A current Instrument Certified participant may also seek to renew their certification by taking the Level II exam successfully. New credentials will be issued with the latest exam date as the beginning date for a three year period.
- d) Level II Exam Administrators are required to renew Level II status but not required to renew administration credentials. Administration credentials are required to be updated when determined by the UA/IBEW Exam Committee.
 - e) **Individuals that allow their Level I or Level II credentials to expire must receive update training at their local union and retake the examination applicable to their expired certification. As an option an individual with expired Level I certification may complete the Level II exam that will renew their certification status as a Level II Instrument Technician with a new 3 year certification period.**

UNITED ASSOCIATION
of Journeymen and Apprentices
of the Plumbing and Pipefitting Industry
of the United States and Canada

UA Level II Technician Recertification Form

NAME:(Please Print) _____ **UA Card Number:** _____

Document your employment throughout your three-year certification period. Start with your most recent position and account for all employment as an Instrument Technician (or related experience). If necessary make additional copies so that you can give a **detailed and descriptive narrative of your job duties.**

| Dates of Employment | | | | Total Time Yr. Mo. and total number of man hours worked | For each position, list: (a) Name, address and phone number of employer, (b) Title of your position, (c) Name and title of your IMMEDIATE SUPERVISOR, and signature, if available and (d) Description of your duties. Be factual and detailed. Lack of sufficient detail will delay recertification. |
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I certify that all information on this form is correct and complete.
Any misrepresentation will result in the removal of certification status
(NOTE: form will not be accepted without a signature and date.)

Signature _____

Date _____