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Todd Stafford, Executive Director

Broadcast Memo

Upcoming Instrumentation Changes

As many of you are aware, the *electrical training ALLIANCE* has been updating the instrumentation curriculum over the last few years. The new textbook, *Applied Science of Instrumentation*, has been written and is currently in the queue to be printed. Along with the new textbook, two additional courses will join the Introduction to Instrumentation Module 1 within the LMS. These courses represent the first 14 chapters of the new textbook which comprises the knowledge needed to become an instrumentation technician. These courses present the conventional questions and answers, as the former workbooks did, while adding an assortment of animations and video clips of actual classes to assist the student in their studies. Watch for a Train-The-Trainer (T-T-T) course related solely to this new text at NTI or at a regional session to be announced in the coming months. Additionally, a training class is being added at NTI to demonstrate a variety of methods to instruct a hands-on instrumentation class.

With these updates and additions, the relationship with Electric Power Research Institute (EPRI) has also been undergoing some updates. Due to modifications in EPRI standards and requirements, the written exam will go through a number of changes in the coming months. The first round of changes will begin April 1, 2017 and include: 1) increasing the passing score for the written exam from 75 to 80%, 2) increasing the allotted time for completion of the written test from 3 ¹/₂ to 4 hours, and 3) changing the exam to a **CLOSED-BOOK EXAM**. However, the new written exam will have reference documents that may be used in place of the former

open-book policy. This document, which is basically a collection of information (tables, charts, symbols, etc.) from the existing textbook, will be provided with the exams when they are ordered. A preview of the reference document may be supplied to instructors for training purposes.

For questions about these changes, or to request a preview copy of the resource document, please contact Jason Lunardini at 301.715.2312 or via email at jlunardini@electricaltrainingalliance.org.

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Technical Proficiency Examination Test Administration Guidelines September 2015 (Version 3.0)

The following document contains the Technical Proficiency Examination Test Administration Guidelines as adopted by the International Brotherhood of Electrical Workers (IBEW) and The United Association of Plumbers and Pipefitters (UA) Manual of Guidelines for Instrument Certification.

Purpose

The Test administration Guidelines defined in this manual are intended to provide information for an IBEW affiliated facility to offer the Instrument Certification program as implemented by the Electrical Training ALLIANCE. The following guidelines optimize the quality and the effectiveness of the IBEW/UA Instrumentation Certification program by providing a reference guide path for facilities to offer and host the exams.

Applicability

These guidelines are intended to apply to the following IBEW facilities:

1. A Local Joint Apprenticeship or Area Apprenticeship and Training Committee.
2. IBEW Local Unions.
3. IBEW signatory contractors.

The following guidelines are intended for Instrument Certification when utilizing the EPRI Technical Proficiency Examination (TPE) process ONLY and should not replace or alter existing polices or procedures such as (but not limited to): Contract Language, Equal Employment Opportunity (EEOC) or The Americans with Disabilities Act (ADA), or other applicable processes and/or procedures.

The Electric Power Research Institute (EPRI)

The Electric Power Research Institute (EPRI), with major offices in Palo Alto, California, and Charlotte, North Carolina, was established in 1973 as an independent, nonprofit center for public interest energy and environmental research. EPRI brings together power industry members, interested parties, EPRI scientists and engineers, and other leading experts to work collaboratively on solutions to the challenges encountered in the electric power generation and distribution industries. These solutions span nearly every area of electricity generation, delivery, and use, including health, safety, and environment. EPRI's members represent over 90% of the electricity generated and distributed in the United States. International participation represents nearly 15% of EPRI's total research, development, and demonstration program.

As applicable to the IBEW/UA Instrument Certification program, EPRI provides the oversight process to enable the IBEW and the UA to offer open, manageable certification exams.

For purposes of clarification, the written exam will be referred to as Part A and the hands on performance exam will be referenced as Part B. Previously, the exams have been referred to as Level 1 and Level 2. To properly implement the exam process and coincide with the requirements as specified by the EPRI TPE process, the exams have been relabeled as Part A and Part B.

An individual must successfully complete the Cognitive (Written) Exam, Part A, and the Performance (Hands-On) Exam, Part B, for EPRI to list an individual as proficient in the tasks associated with General Instrument Calibration process as defined by the TPE utilizing TPE IC04.01 – General Instrument, Calibration. IC04.01 provides the Task Analysis associated with General Instrument Calibration, defining both the knowledge and skills required to perform these tasks.

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1.0 Part A Certification, The Written (Cognitive) Exam.

1.1 The Exam

1.1.1 **Exam Format:** The Part A Exam Format consists of a 200 multiple choice question, 3-1/2 hour exam. See Section 5.0, Certification Exam, Task Analysis, Cognitive Enabling Objectives. For each question on the exam, the participant is asked to clearly indicate the correct choice on a “Scantron” answer sheet that is provided as part of the test packet. The exam is an open book exam. PUBLISHED ONLY multiple references may be used during the exam (no hand written notes). Each participant is to bring with them for the exam a #2 pencil (one or more) sharpened for use and a calculator. 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 Host Facility is responsible for communicating to the participants the calculator requirements. The Host Facility is the final authority on calculator eligibility and use during the exam based upon above stated requirements.

1.1.2 **Scoring:** Scoring of the exam is performed by the Electrical Training ALLIANCE utilizing LXR and Scantron based software. The passing score, as defined for passing by the IBEW and UA, is set at 75%, or 150 or more correct answers per exam. Upon completion of the scoring process, each participant is contacted directly via mail with the results of the exam by the Electrical Training ALLIANCE.

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 (Part A and/or Part B), certification period and renewal date.

A participant who has not successfully met the minimum score of 75% will receive a letter stating their exam score and a detailed list of learning objectives identified as needing improvement as identified by the LXR/Scantron scoring process from the Electrical Training ALLIANCE. This list of learning objectives (Section 5.0) 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.

The Host Facility will receive, after Part A Exam Participants have been notified, a report stating the success or failure of all participants for the exam. The report details how each participant performed upon each learning objective (Section 5.0) tested upon for the exam.

1.1.2.1 Exam Question Challenges: 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 Electrical Training ALLIANCE with the exams for consideration and scoring.

1.1.3 Scheduling: To schedule an exam, a facility must fill out and submit to the Electrical Training ALLIANCE a "Test Host Request Form". The Electrical Training ALLIANCE requires a minimum of 30 days between the receipt of the Test Host Request Form and the exam date being scheduled. The exam date, location, and Host Facility contact information will be displayed for public viewing on the Electrical Training ALLIANCE website.

The form can be obtained by downloading it under the Schedule a Test tab from the Electrical Training ALLIANCE website at: <http://www.electricaltrainingalliance.org/training/instrumentationcertification>.

A form may also be obtained by calling the Electrical Training ALLIANCE and requesting a form be faxed to the sponsoring location. Contact Ruth Peacock at 301-715-2320 for more information.

1.1.4 Americans with Disabilities Act (ADA) Issues: Disability Request and Accommodation. All disability requests are reviewed by the Host Facility prior to the test date. Any necessary special accommodations are arranged by the host facility ahead of time with the assistance of the Electrical Training ALLIANCE. If a participant arrives and requests special accommodation on the day of the test, the Host Facility can not grant accommodation for the individual requesting accommodation for the test being administered on that day. All requests for accommodation must be submitted in writing for review and consideration prior to the test date.

Should an individual show up on the day of the test and request accommodation, two options are available to the Host Facility. The individual can submit the request along with substantiation for the requested accommodation and, after review by the Host Facility and the Electrical Training ALLIANCE, be scheduled for a test at a later date or the individual can sit for the test without special accommodation.

Arrangements for persons with disabilities will be provided upon request, in accordance with the Americans with Disabilities Act (ADA).

Professional documentation in support of requests for accommodation must be submitted to the host facility prior to the scheduled test date. No special requests for special accommodation can be addressed on the test day.

Applications must be accompanied by documentation of the disability and an explanation of the need for the accommodation(s). A letter from an appropriate professional (e.g., physician, psychologist, occupation therapist, educational specialist) or evidence of prior diagnosis or accommodation (e.g., special education services) may be included.

Previous school records may also be submitted to document the disability. Any professional providing documentation should have knowledge of the disability, have diagnosed and/or evaluated the candidate, or have provided accommodation previously.

The letter must be on official stationery and include the following information:

- Identification of the specific disability/diagnosis.
- The approximate date when the disability was first diagnosed/identified.
- A brief history of the disability.
- Identification of the test/protocols used to confirm the diagnosis.
- A brief description of the disability.
- A description of past accommodations made for the disability.
- An explanation of the need for the testing accommodation(s).
- Signature and title of the professional.

Requests for special accommodations will be reviewed by the Host Facility.

If a candidate has already been granted accommodation, and the disability remains the same for a second examination, you need not submit documentation again, however notification must be provided by the test participant to the Host Facility that accommodation is necessary must be made prior to the test date. This will allow for the Host Facility to review the necessary documentation and provide the appropriate accommodation as required.

1.2 Exam Facilities

1.2.1 **Eligibility:** Any Local or Area JATC, Local Union, or IBEW signatory contractor may schedule and host a Part A, Written Exam, at their respective facility.

1.2.2 **Exam Facility Requirements:** Each Host Facility must have adequate seating space arranged to accommodate all participants for the exam. The Exam Proctor has the right to assign seating and/or request additional room for participants. A single proctor may administer the exam for up to 50 participants.

The testing room must be an indoor facility suitable for testing, to include the following attributes:

- Quiet, well-lit, properly ventilated with a comfortable temperature and free from distractions to candidates.
- Accessible to candidates with special needs.
- A head table or podium at the front of the room.
- A registration table.
- Easy access to unlocked rest rooms with sufficient supplies.
- Easy access to water fountain.
- Large signs prominently posted making candidates aware of the location of the test.
- A clock visible to all candidates, preferably at the front of the room so that candidates can see it without turning their heads.

There should be sufficient tables and space for the number of candidates registered. The following are recommended guidelines for seating candidates according to the listed table sizes/types:

- 6-foot tables: No more than two candidates per table.
- 8-foot tables: No more than three candidates per table.
- Round tables: No more than one candidate per table. These may be used, but are inefficient due to the requirement of only one candidate per table.

— Desks: No more than one candidate per desk. Desks may be used only if their surface area is large enough to hold both the test booklet and answer sheet. They should accommodate both left-handed and right-handed candidates with equal comfort.

The tables should have smooth writing surfaces and adequate space to accommodate examination booklets and answer sheets without crowding.

There must be an adequate supply of extra #2 sharpened pencils for candidates to use on test day.

The chairs should be comfortable, with the chair height being appropriate in relation to the tables used. Chairs with backs are preferable to stools or benches without backs.

Rest rooms should be located near examination rooms and should be easy to find. Post directional signs if necessary.

Room acoustics must be good. If the room is large, make sure that a microphone is available and that it works well. Candidates in the back of the room must be able to hear all verbal instructions clearly.

There must be adequate space for the proctor(s) to observe candidates easily.

- 1.2.3 **Electrical Training ALLIANCE Auditing:** The Electrical Training ALLIANCE reserves the right to visit and inspect any Host Facility before, during and after the examination date and time. The Electrical Training ALLIANCE also will perform and maintain a random auditing procedure to visit and review selected host facilities before, during, and after the exams.

1.3 Participant Eligibility, A candidate must provide identification (such as a driver's license) on the day of the exam as proof of identification before becoming eligible to sit for the exam.

- 1.3.1 **Training:** An applicant may provide proof of attending and completing the Electrical Training ALLIANCE course "Fundamentals of Instrumentation ... and More". Successful completion of the course must be determined by the Host Facility. Successful completion of the Electrical Training ALLIANCE course, which provides instructional material on specified learning objectives, is the only training method that will qualify an individual to take the Instrument Certification, Part A Exam. An

equivalent training course offered by the UA, for members of the UA, is sufficient for qualifications of UA members.

- 1.3.2 **Work Experience:** An individual will also qualify to sit for the Part A Exam if they can demonstrate a minimum five years practical work history in **Instrument Calibration**. Calibration experience is the only experience accepted as a work history related qualification. The host facility determines (see 1.6.1) the validity of an applicant's work history. The Host Facility must verify and deem this documentation submitted as acceptable in qualifying an individual under this method of qualification.
- 1.3.3 **Other Methods:** The Host Facility has the right to accept applications to sit for the exam from applicants not within the IBEW organizational structure. The Host Facility must determine the acceptance or rejection of non IBEW test applicants based upon procedures developed and implemented by the Host Facility. The Host Facility must determine and establish what procedures are acceptable for this review process and implement those procedures in a uniform manner to all exam applicants.

A member of the United Association has the approval to attend any exam session provided qualifications to sit for the exam are met and necessary documentation is provided to the Host Facility. Typically, this documentation would be provided by the local UA organization. Members of any IBEW Local Union may attend any offered exam regardless of local union jurisdiction; provided the necessary qualifications to sit for the exam are met and necessary documentation is provided to the Host Facility.

Training Courses other than the one specified by the Electrical Training ALLIANCE may substitute for the training requirements specified; provided: a detailed outline, complete copy of course materials, lab exercises, and a breakdown of learning objectives are provided to the Electrical Training ALLIANCE for review. Upon completion of the review by the Electrical Training ALLIANCE the Host Facility will be notified if the course submitted for review as a substitute training course has been accepted as a means of qualifying an individual.

- 1.3.4 **Multiple Test Offerings:** An individual may not apply nor take the Part A Exam more than once within a six month period.

1.4 Exam Proctor

- 1.4.1 **Responsibilities:** The exam proctor will be obtained through the use of an independent contractor by the Electrical Training ALLIANCE. The proctor may not be someone affiliated with the IBEW. The proctor may have affiliation or previous partnership with the United Association and/or EPRI.

The Exam Proctor will receive the exams from the Electrical Training ALLIANCE, oversee the exam process and return the exams to the Electrical Training ALLIANCE for scoring.

Included in the Exam Proctor's packet are specific instructions about administering the test. These instructions include specific directions that are provided as a script that is to be read out loud to the test participants. This script method ensures that all test participants are receiving the exact same instructions.

1.5 Exam Fees

- 1.5.1 **Exam Proctor Fees:** The proctor is paid a salary for services as agreed by the Electrical Training ALLIANCE and the National Institute for Testing and Certification (NITC). The Electrical Training ALLIANCE will invoice the Host Facility for services rendered for proctoring the test to the Host Facility.
- 1.5.2 **Individual Fees:** Individuals may or may not be charged an exam fee as per Host Facility procedure.
- 1.5.3 **Exam Fees:** For each exam returned to the Electrical Training ALLIANCE that has been opened, a fee of \$20.00 will be assessed. The Host Facility will be invoiced for all opened exams that have been returned to the Electrical Training ALLIANCE.

1.6 Records Database

- 1.6.1 **Local Requirements:** Host Facilities are required to maintain all records which are submitted to the Host Facility by individual test participants. Records submitted may consist of an applicant's work history and/or training experience(s) to qualify an individual to sit for the exam. Additional records are to be collected and maintained by the Host Facility as to update and keep accurate records of the Part A, Host Facility responsibilities. The Host Facility may be asked to provide the documentation used to qualify an individual during an auditing procedure. An audit may be conducted by a member of the Exam Committee at any time.

1.6.2 **Electrical Training ALLIANCE Requirements:** The Electrical Training ALLIANCE will maintain a database showing the present status of all individuals who participated in the examination process. A public viewable database will be maintained by the Electrical Training ALLIANCE via the Electrical Training ALLIANCE website at <http://www.electricaltrainingalliance.org/training/instrumentationcertification>. The Electrical Training ALLIANCE website will be used to list individuals who have successfully completed the Part A Exam.

1.7 **Exam Revisions:** Exam revisions are created and submitted for the exam process by the Electrical Training ALLIANCE and the UA. EPRI maintains a record of the current exam in use which is available for the Electrical Training ALLIANCE and the UA to alter or revise as determined by all parties. The Electrical Training ALLIANCE is responsible to update and adapt the scoring procedures to reflect current exam revisions. All modifications to exam questions are submitted to EPRI for updating of the master question database.

1.8 Certification Renewal

1.8.1 **Facility Renewal:** Facilities are not required to submit for renewal to offer the Part A Exam. Additional, specific requirements may be added to the Part A Host Facility responsibilities at any time. When additional requirements, not listed in current Manual of Guidelines, are required of a Host Facility the additional requirements will be specified at the time a Host Facility submits a Test Host Request Form. The Electrical Training ALLIANCE will coordinate with all Host Facilities, as soon as possible, of the need to change the Host Facility requirements.

1.8.2 **Individual Renewal:** 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. An individual that holds a current certification for the Part A Exam may recertify at the Part A level. For individual recertification at Part A, see Section 4.0.

Individuals that hold an expired credential for the Part A may also recertify at the Part A level provided their expired certification period ending date and the current date has not exceeded a time period of more than two years.

There will be an assessment of \$20.00 for each recertification.

1.9 Remediation

- 1.9.1 **Facility Requirements:** Host Facilities are encouraged to review the reports supplied by the Electrical Training ALLIANCE that detail the performance of exam participants. Reports can be reviewed to determine concentrated areas of subject matter needed for individuals to successfully complete the Part A Exam. Training courses should be scheduled periodically by the Host Facility to provide a path for an applicant to have received instruction based upon the learning objectives tested for in the Part A Exam.
- 1.9.2 **Individual Requirements:** Individuals are encouraged to participate in training courses offered by or through the Host Facility. For Part A Exam participants that were not successful, it is encouraged for additional training to be attended within the six month minimal waiting period between exam participation.

2.0 Part B Certification, The Performance Exam.

2.1 The Exam

- 2.1.1 **Exam Format:** The Part B 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 Part B Exam.

Each participant is to bring with them a #2 pencil (one or more) sharpened for use and a calculator for the exam. No calculator capable of being programmed to perform algorithms used to compute exam questions, as a programming function of the calculator, may be used for the exam. In addition, calculators capable of storing and recalling exam formatted type questions may not be used. The Host Facility is responsible for communicating to the participants the calculator requirements. The Exam Administrator is the final authority on calculator eligibility and use during the exam based upon above stated requirements.

- 2.1.2 **Scoring:** 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 Part B Exam is a Pass or Fail Assessment based upon performance criteria observed by the Exam Administrator and specified on the Part B Exam.

All exams are to be returned to the Electrical Training ALLIANCE at the completion of the scheduled exam period. Scores are not finalized and registered until the Electrical Training ALLIANCE has received the completed exams and awarded credentialing.

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 (Part A and/or Part B), certification period and the renewal dates for these respective exams.

2.1.2.1 Challenges: Challenges may be submitted for review to the IBEW/UA exam committee for review. At the completion of the Part B 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.

2.1.3 Scheduling: To schedule an exam, a facility must fill out and submit to the Electrical Training ALLIANCE a "Test Host Request Form". Test dates must be requested a minimum of 30 days in advance. The Electrical Training ALLIANCE will not approve test dates that are scheduled inside of the 30-day window, based on the day that the Electrical Training ALLIANCE receives the "Test Host Request Form". The exam date, location, and Hosting Facility contact information will be displayed for public viewing on the Electrical Training ALLIANCE website.

The form can be obtained by downloading it under the Schedule a Test tab from the Electrical Training ALLIANCE website at: <http://www.electricaltrainingalliance.org/training/instrumentationcertification>.

A form may also be obtained by calling the Electrical Training ALLIANCE and requesting a form to be faxed to you. For more information, contact Ruth Peacock at 301-715-2320.

Exams may be administered to test participants by the Host Facility "By Appointment Only". Scheduling exams by appointment allows for multiple exams and participants based on an "as needed" requirement by the Host Facility.

2.1.4 **Americans with Disabilities Act (ADA) Issues:** Disability Request and Accommodation. All disability requests are reviewed by the Host Facility prior to the test date. Any necessary special accommodations are arranged by the host facility ahead of time with the assistance of the Electrical Training ALLIANCE. If a participant arrives and requests special accommodation on the day of the test, the Host Facility can not grant accommodation for the individual requesting accommodation for the test being administered on that day. All requests for accommodation must be submitted in writing for review and consideration prior to the test date.

Should an individual show up on the day of the test and request accommodation, two options are available to the Host Facility. The individual can submit the request along with substantiation for the requested accommodation and, after review by the Host Facility and the Electrical Training ALLIANCE, be scheduled for a test at a later date or the individual can sit for the test without special accommodation.

Arrangements for persons with disabilities will be provided upon request, in accordance with the Americans with Disabilities Act (ADA).

Professional documentation in support of requests for accommodation must be submitted to the host facility prior to the scheduled test date. No special requests for special accommodation can be addressed on the test day.

Applications must be accompanied by documentation of the disability and an explanation of the need for the accommodation(s). A letter from an appropriate professional (e.g., physician, psychologist, occupation therapist, educational specialist) or evidence of prior diagnosis or accommodation (e.g., special education services) may be included.

Previous school records may also be submitted to document the disability. Any professional providing documentation should have knowledge of the disability, have diagnosed and/or evaluated the candidate, or have provided accommodation previously.

The letter must be on official stationery and include the following information:

- Identification of the specific disability/diagnosis.
- The approximate date when the disability was first diagnosed/identified.

- A brief history of the disability.
- Identification of the test/protocols used to confirm the diagnosis.
- A brief description of the disability.
- A description of past accommodations made for the disability.
- An explanation of the need for the testing accommodation(s).
- Signature and title of the professional.

Requests for special accommodations will be reviewed by the host facility.

If a candidate has already been granted accommodation, and the disability remains the same for a second examination, you need not submit documentation again, however notification must be provided by the test participant to the Host Facility that accommodation is necessary must be made prior to the test date. This will allow for the Host Facility to review the necessary documentation and provide the appropriate accommodation as required.

2.2 Exam Facilities: Any Local or Area JATC, Local Union, or IBEW signatory contractor may schedule and host a Part B, Performance Exam, at their respective facility provided the following criteria is established.

2.2.1 Exam Facility Requirements: Each facility that desires to host the exam must have ample space for the “hands-on” exam (approximately 100 ft² for each examinee test station). Only one examinee will be tested at any test station at any given time. The exam administrator has the right to arrange the equipment as he or she determines to allow for sufficient work space required. The exam will be issued to a single examinee at one time. Each examinee will be directly monitored by a test administrator.

The testing room must be an indoor facility suitable for the exam candidates, and shall include:

- A quiet, well-lit, properly ventilated area with a comfortable temperature and free from distractions to candidates.
- Easy access to candidates with special needs.
- Easy access to unlocked rest rooms, with sufficient supplies.
- Easy access to water fountain.
- A large signs prominently posted making candidates aware of the location of the test.
- A clock visible to all candidates, preferably at the front of the room so that candidates can see it without turning their heads.

There must be an adequate supply of sharpened #2 pencils for candidates to use on test day, should an additional pencil, should an additional pencil be needed by the examinee.

Rest rooms should be located near examination rooms and should be easy to find. Post directional signs if necessary.

There must be adequate space for the Exam Administrator to observe participants easily and without obstruction.

2.2.1.1 Facilities Requirements: Facilities must have present and available for use the devices and equipment specified in Section 3.0 of this Manual of Guidelines.

2.2.2 Electrical Training ALLIANCE Auditing: The Electrical Training ALLIANCE reserves the right to visit and inspect any hosting facility before, during and after the examination date and time. The Electrical Training ALLIANCE will perform and maintain a random auditing procedure to visit and review selected host facilities before, during, and after the exams.

The Electrical Training ALLIANCE is also required to supply an Auditor for the first exam administered at every Host Facility. The Auditor will be a member of the UA or the Electrical Training ALLIANCE and is scheduled when the Test Host Request Form is submitted. The Host Facility is responsible for all expenses incurred by the Exam Auditor. This is a one time visit per Host Facility.

The IBEW/UA exam committee reserves the right to schedule and re-test individuals who were successful taking the Part B exam administered at Host Facilities.

2.3 Participant Eligibility, A candidate must provide identification (such as a driver's license) on the day of the exam as proof of identification before becoming eligible to sit for the exam.

2.3.1 Individual Eligibility: A participant is eligible to take the Part B Exam upon successful completion of the Part A Exam. Failure to successfully complete the Part A Exam will deem the examinee ineligible relative to taking the Part B Exam. A participant that has successfully completed the Part A Exam is not required to wait a time period before becoming eligible to take the Part B Exam.

2.3.2 **Other Methods:** The Host Facility has the right to accept applications to sit for the exam from applicants not within the IBEW organizational structure. The Host Facility is charged with determining the acceptance or rejection of non IBEW applicants based upon the validity of the documentation provided by the examinee to the Host Facility. The Host Facility must determine and establish what procedures are acceptable for this review process and implement those procedures in a uniform manner to all exam applicants.

A member of the United Association has the approval to attend any exam session provided qualifications to sit for the exam are met and necessary documentation is provided to the Host Facility. Members of any IBEW Local Union may attend any offered exam, regardless of jurisdiction, provided qualifications to sit for the exam are met and necessary documentation is provided to the Host Facility.

2.4 **Exam Administrator:** There must be an approved Exam Administrator for all Part B exams administered. The Exam Administrator must meet the following requirements.

- 2.4.1 The Exam Administrator will be evaluated and trained by the IBEW/UA Exam committee.
- 2.4.2 The Exam Administrator must have successfully completed the Part A Exam.
- 2.4.3 The Exam Administrator must have successfully completed the Part B Exam.
- 2.4.4 The Exam Administrator must have completed the Exam Administrator Training Course as Instructed by a member of the IBEW/UA Exam Committee.
- 2.4.5 Successful completion of the Electrical Power Research Institute (EPRI) Test Administrator Program. This program is administered by the Master Test Administrators provided by the Electrical Training ALLIANCE.
- 2.4.6 Provided sufficient knowledge and working performance of all devices and equipment used (See 3.0) to gain the approval of the IBEW/UA Exam Committee. As the Exam Administrator will be evaluating individuals coming to the exam with various backgrounds, the Exam Administrator must be a Subject Matter Expert (SME). Part of the Test Administrator certification process is designed to determine the level of expertise of these individuals.

The Exam Administrator will receive the exams from the Electrical Training ALLIANCE, oversee the exam process and return the exams to the Electrical Training ALLIANCE for awarding of credentials and records keeping. It is the responsibility of the Exam Administrator to provide all necessary precautions to prevent compromising the Exam process.

2.5 Exam Fees

- 2.5.1 **Exam Administrator Fees:** There are no required fees due to the Electrical Training ALLIANCE for Exam Administrators.
- 2.5.1 **Individual Fees:** Individuals may or may not be charged an exam fee as per Host Facility procedure.
- 2.5.3 **Certification Fee:** There is a \$20.00 fee per completed exam. The Host Facility is invoiced by the Electrical Training ALLIANCE when completed exams are received and recorded by the Electrical Training ALLIANCE.

2.6 Records Database

- 2.6.1 **Local Requirements:** Host Facilities are required to maintain all records which are submitted to the Host Facility by examinees. Records for the Part B Exam should include appropriate eligibility requirements to sit for the Part B Exam. Records are to be permanently maintained and updated. The Host Facility may be asked to provide the documentation used to qualify an individual for the Part B exam during an Audit procedure. An audit will be conducted by a member of the Instrument Exam Committee.
- 2.6.2 **Electrical Training ALLIANCE Requirements:** The Electrical Training ALLIANCE will maintain a database showing the present status of all individuals who participated in the examination process. A public viewable database will be maintained by the Electrical Training ALLIANCE via the Electrical Training ALLIANCE website at <http://www.electricaltrainingalliance.org/training/instrumentationcertification>. The Electrical Training ALLIANCE website will be used to list individuals who have successfully completed the Part B Exam.

2.7 **Exam Revisions:** Exam revisions are created and submitted for the exam process by the Electrical Training ALLIANCE and the UA. EPRI maintains a record of the current exam in use for the Electrical Training ALLIANCE and the UA to alter or change as determined by all parties. The Electrical Training ALLIANCE is responsible to update and adapt testing procedures to reflect current exam revision. All revisions are provided to EPRI for revision of the master test database.

If additional calibration equipment and devices are added to the exam procedure, all Host Facilities will be notified in advance. Host Facility Exam Administrators will be responsible for updating the Host Facility requirements and providing all necessary documentation requests to the Electrical Training ALLIANCE. Additional Exam Administrator training may or may not be required as determined by the Instrument Exam Certification Committee.

2.8 Certification Renewal

2.8.1 **Facility Renewal:** Host Facilities are required to maintain current calibration certificates for all equipment used in the Part B exam. Current certificates of calibration are required before Part B exams are considered to be valid by the Exam Committee. When additional requirements, not listed in current Manual of Guidelines section 3.0, are required of a Host Facility the additional requirements will be specified by the Electrical Training ALLIANCE. There will be an attempt to coordinate with the Host Facility a time period to transfer between the existing Part B Exam and any revised Part B Exam. The Host Facility and Exam Administrator should provide the necessary information to certified individuals on how to renew certification when individual's certification are due for renewal.

2.8.2 **Individual Renewal:** An individual that becomes Instrument Certified, as awarded by the IBEW and the UA, has successfully completed the Part A and Part B exams. The Part A expiration dates are updated to reflect a current certification period coinciding with the Part B completion date.

An individual who is presently instrument certified and is seeking to renew their certification should submit the appropriate documentation, (see 4.0 Certification Renewal Form) to the facility where they completed the Part B Exam (Performance Based Exam) for approval.

Host Facilities will review all documentation submitted including the Certification Renewal form to determine if re-certification is awarded. Upon approval by the Host Facility, the request is made

in writing to the Electrical Training ALLIANCE for a new certification period to be awarded to the applicant. The Electrical Training ALLIANCE will provide the credentialing card reflecting the renewed certification period. A charge of \$20.00 will be invoiced the Host Facility for each Certification Card issued.

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. An Instrument Certification is awarded 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 Part B Exam successfully. New credentials will be awarded with the latest exam date as the beginning date for a new three year time period.

Part B Exam Administrators are not required to renew administration credentials. Administration credentials are required to be updated when determined by the IBEW/UA Exam Committee.

If an individual's certification period has expired, the individual may re-certify at Part B by taking the Part B Exam successfully. The Part B Exam must be challenged and passed within two years of the date of expiration stated on the individuals certification credential.

2.9 Remediation

2.9.1 **Facility Requirements:** Host Facilities are encouraged to review the exam process and results as administered by the Exam Administrator with the individual examinees at the completion or termination of an exam session. The review will help the individual improve his or her skills in areas needing improvement. Host Facilities are encouraged to review and adjust training courses to reflect needed performance criteria to satisfy the exam requirements.

2.9.2 **Individual Requirements:** Individuals are encouraged to participate in training courses offered by or through the Host Facility. For Part B Exam participants that were not successful, it is encouraged for additional training to be attended that identifies correctional Performance Steps. A Part B applicant can retake the Part B exam within a one week of a previous attempt.

3.0 Host Facility Calibration Equipment and Device Requirements

3.1 **Calibration Equipment:** Host Facilities are required to provide the following Calibration Equipment for use in the Part B Exam.

Name / Vendor	Model Number	Notes
1. Altek 334A milliamp calibrator	4353E	with Certified Calibration with all Leads and User's Guide
2. Altek Tech Chek 820 Process Calibrator or Practical Instrument Electronics 820 Process Calibrator	820E PIE 820	with Certified Calibration with all Leads and User's Guide with Certified Calibration with all Leads and User's Guide
3. Fluke 744 Documenting Process Calibrator or Fluke 754 Documenting Process Calibrator	744 754	with Certified Calibration with all Leads and User's Guide with Certified Calibration with all Leads and User's Guide
4. Fluke 700P06 100 psi Pressure Module	700P06	with Certified Calibration with User's Guide
5. Fluke 87V digital multi-meter	Fluke 87-5	with Certified Calibration with User's Guide
6. Transcat 23232E DC Power Supply or B&K Precision 1735A DC Power Supply	23232E 1735A	with Certified Calibration with User's Guide with Certified Calibration with all Leads and User's Guide
7. Transmation PneuCal IVB Pneumatic Calibrator	24454P	with Certified Calibration with all Leads and User's Guide
8. Transmation 6215P Pressure Pump	6215P	with all Attachments with User's Guide

3.2 Device Requirements: Host Facilities are required to provide the following devices for use in the Part B Exam.

Name / Vendor / Model Number

1. Rosemount Differential Pressure Transmitter
1151DP5Exx Calibration Range: 0.0 to 750 in. H₂O
with User's Guide

2. Rosemount Pressure Transmitter
3051S 2CD2AxxxxAxx Calibration Range: -250 to 250 in. H₂O
with User's Guide

3. Rosemount Current to Pressure Transducer (I/P)
0846 DS1Jxxx Features: 4 to 20 mA in / 3 to 15 psig out
with User's Guide

4. Rosemount Temperature Transmitter
3144P xxA1xx Calibration Range: 0.0 to 100.0 degrees C
with User's Guide

5. ASCO Pressure Switch
HB20A214 adjustable trip setting: 20 to 50 psig
(general purpose enclosure)
with User's Guide

- or
 ASCO Pressure Switch
HB26A214 adjustable trip setting: 20 to 50 psig
(open frame-no enclosure)
with User's Guide

6. HART Communicator as follows:
 Rosemount 275
 275xxxxxxxxxxx with all Leads and User's Guide
 or
 Rosemount 375
 375xxxxxxxxxxx with all Leads and User's Guide
 or
 Emerson 475
 475xxxxxxxxxxx with all Leads and User's Guide

3.3 Substitutions: Host Facilities may request substitutions for any of the above devices and calibration equipment providing:

- 3.3.1 Name, Vendor, Model Number and Specification Sheets (cut sheets) of Substituted Device or equipment is supplied to the Electrical Training ALLIANCE in advance of the next scheduled Part B exam.
- 3.3.2 Substituted devices and calibration equipment must receive approval from the Instrument Certification Exam Committee.
- 3.3.3 Calibration equipment and devices may be substituted to meet the requirements for a specific customer as requested by the customer. Customer requests are in addition to the present revision and issue of the Part B exam. An Instrument Certification is awarded for the successful completion of the Part B Exam only as specified in parts 1.0 - 3.2 of the Manual of Guidelines. The Instrument Exam Committee requests that additional testing should be reported to the Electrical Training ALLIANCE to facilitate standardization of the issuing, reporting, and documentation of the customer requests.

4.0 Instrument Certification Renewal

4.1 Part A Renewal: The Electrical Training ALLIANCE must receive the following form that has been completed to process a recertification credential. The following form must be completed and submitted to the Host Facility for signature approval before submission to the Electrical Training ALLIANCE. An individual's Local JATC may also submit signature for approval.

Form Part A: Electrical Training ALLIANCE must receive the following information.

Name: _____

Address: _____

Phone Number: _____

Email: _____

Social Security Number: _____

Card Number: _____

Certification Expiration Date: _____

Current Date: _____*

*- A maximum difference of two years between Current Date and Certification Expiration Date is allowed for Part A recertification.

IBEW Local: _____

Please provide the name and location of the facility and the date of your Part A Exam.

Host Facility or Training Director of local JATC approval:

Submit to:

Ruth Peacock, Electrical Training ALLIANCE
5001 Howerton Way, Suite N, Bowie, MD 20715

\$20.00 renewal fee applies, make check payable to the Electrical Training ALLIANCE.

4.2 Part B Renewal: The Electrical Training ALLIANCE must receive the following form that has been completed to process a recertification credential. The following form must be completed and submitted to the Host Facility for signature approval before submission to the Electrical Training ALLIANCE. An individual's Local JATC may also submit signature for approval.

Form Part B: Electrical Training ALLIANCE must receive the following information.

Name: _____

Address: _____

Phone Number: _____

Email: _____

Social Security Number: _____

Card Number: _____

Certification Expiration Date: _____

Current Date: _____ *

*- A maximum difference of two years between Current Date and Certification Expiration Date is allowed for Part B recertification.

IBEW Local: _____

Please provide the name and location of the facility and the date of your Part B Exam.

Please supply a record of work history totaling no less than 1200 hours within your certification period. Attach necessary reports and records as needed. Include employer contact information for all applicable employers within the certification period. Submit this form with all attached documents to the Host Facility where you completed your Part B Exam (Performance Exam) or to your local JATC for review. Supply a copy of your current certification card.

Host Facility or Training Director of local JATC approval:

Submit to: electrical training ALLIANCE

Ruth Peacock, 5001 Howerton Way, Suite N, Bowie, MD 20715

\$20 renewal fee applies, make check payable to the electrical training ALLIANCE

5.0 Certification Exam, Task Analysis

Task: IC04.01 - Calibrate General Instrumentation

Sponsor: United Association (UA) / International Brotherhood of Electrical Workers (IBEW)

References: UA/NJATC (IBEW) Training Materials, N.I.S.T. Standards, and EPRI MPE Databases.

Tools, Equipment, Job Aids: Selected Hand Tools, Test Equipment and Field Instruments

Safety Considerations: Use of Personal Protective Equipment, Work Area Cleanliness, Engineering Controls and Work Practices.

Conditions: Work Documents Reviewed and Applicable Pre-Job Brief Conducted prior to Evaluation.

Initiating Cue: Authorization to Work by Department Management.

Terminating Conditions: Successful Completion of Evaluation.

Consequences of Inadequate performance: Non-Compliance with Procedural and /or Site Requirements.

Subject Matter Expert (SME): Mike Arndt - UA, Todd Stafford - IBEW

Knowledge	/	Skills
1. Instrument Types		1. Identify Various Instruments
2. Procedure Requirements		2. Interpret Procedure Requirements
3. Calibration Documentation		3. Implement Documentation Process
4. Personal Protective Equipment (PPE)		4. Use Personal Protective Equipment
5. Lockout-Tag out Requirements		5. Discuss Lockout-Tagout Requirements
6. Hand Tools		6. Select and Use Hand Tools
7. Inspection Criteria		7. Inspect Instrument Components
8. Electrical Wiring Diagrams		8. Interpret Electrical Wiring Diagrams
9. Test Equipment		9. Set-up and Use Test Equipment
10. Safe Work Practices		10. Work in a Safe Workmanlike Manner
11. Electrical/Electronic Theory		11. Calculate Circuit Performance
12. Science and Terminology of Calibration		12. Discuss and Apply Calibration Techniques
13. Vendor Documentation		13. Interpret Vendor Documentation
14. Isolation Requirements		14. Isolate Components/Equipment
15. Troubleshooting Techniques		15. Demonstrate Troubleshooting Concepts
16. Instrument Systems Documentation		16. Interpret P&ID and Loop Drawings
17. General Instrumentation Systems		17. Discuss the Operation of Instrument Systems

Terminal Objective: Given access to test equipment, tools, prints/schematics, calibration sheets, and instrumentation components, calibrate instrumentation in accordance with site documentation.

Cognitive Enabling Objectives

Describe General Electrical/Electronic Theories
Comprehend Workplace Safety Processes
Calculate Electrical/Electronic Circuit Performance
Identify Electrical/Electronic Symbols
Discuss Lockout-Tagout Procedures
Identify Various Instrument Loop Components
Define Instrumentation Terminology
Calculate Instrument Inputs/Outputs
Evaluate Instrument Calibrations
Explain the Science of Instrument Calibration
Use Instrument Calibration and Test Equipment
Interpret Instrument Calibration Formulas
Describe Component Safety
Identify Instrumentation Symbols and Identification Letters
Interpret P&IDs and Loop Diagrams
Prepare Instrumentation Calibration Documentation
Describe the Operation of the Components of an Instrument loop
Diagnose Instrument Loop Malfunctions
Discuss the Operation of Analytical Instrumentation

Performance Objectives

Comply with Documentation Process
Select PPE
Practice Safe Working Procedures
Select Hand Tools
Select Test Equipment
Demonstrate Understanding of Test Equipment
Install, Adjust and Use Test Equipment
Interpret Vendor Documentation
Prepare Component for Testing
Perform As-Found Sequence and Documentation
Calibrate Component per Specifications
Perform As-Left Sequence and Document
Disconnect Test Equipment
Restore Component Ready for Operation
Store Maintenance and Test Equipment
Verify and Complete Documentation

ELEMENTS		CRITERIA (STANDARDS)
1	Assess Work Process Requirements	Tools, Equipment, and Maintenance Practices Identified In Accordance With (IAW) Procedure and/or Site Requirements
2	Access Required Documentation	P&ID's, Procedures, Data Sheet, Calibration Sheet, and Operation/Maintenance Manuals Acquired and Reviewed.
3	Utilize Personal Protection Equipment (PPE)	PPE Acquired and Applied IAW Regulatory and/or Site Requirements
4	Lockout-Tagout Energy Sources	Energy Sources Evaluated, Secured and Lockout-Tagout Initiated IAW Regulatory and/or Site Requirements
5	Document Preliminary Data	Test Equipment and Instrument Information Entered onto Data Sheet
6	Operate Hand Tools	Correct Hand Tools Selected and Safely Applied IAW Manufacturers and/or Site Requirements
7	Prepare Component for Calibration	Fasteners Removed, Housing Cover Removed, and Safely Stored IAW Site Requirements
8	Connect Test Equipment	Correct Test Equipment Selected and Safely Applied to Test Points IAW Manufacturers and/or Site Requirements
9	Set Calibrator to Correct Source Range	Range Set IAW Calibration Sheet
10	Operate Calibrator and Record As-Found Condition Data	Input Increased to % of Scale <u>as required</u> IAW Calibration Sheet and Output Data Recorded
11	Document Test Data Cardinal Point(s)	Calibration Sheet Data Correctly Entered
12	Perform a Zero Calibration	Input Reduced to 0% and Output Adjusted to Specification <u>as required</u>
13	<i>For Discrete Devices only,</i> Perform a Set-Point Calibration	Input Signal Increased or Decreased as specified to Set-Point and Output Adjusted to Specification <u>as required</u>
14	<i>For Transmitters and Transducers only,</i> Perform a Span Calibration	Input Increased to 100% and Output Adjusted to Specification <u>as required</u>
15	<i>For Transmitters and Transducers only,</i> Perform a Five Point Calibration Check	Input Signal Adjusted to 0-100%
16	<i>For Transmitters and Transducers only,</i> Record 0-100% Calibration Points	0%, 25%, 50%, 75%, and 100% Steps Recorded Correctly on Calibration Data Record
17	Reduce Input Signal to 0% and Disconnect Test Equipment	Input Signal Reduced to 0% and Test Equipment Correctly Disconnected IAW Manufacturers and Site Requirements
18	Restore Component to Original Configuration	Cover Installed, Fasteners Torqued, Piping Reinstalled, and Calibration Sticker Applied

COGNITIVE ENABLING OBJECTIVES

Objective #	Objective Text	Cognitive Level (Knowledge, Comprehension or Application)	Weighting (# of Questions of a 40 Question Exam for this Objective)
1	Describe General Electrical/Electronic Theories	Comprehension	21 of 200
2	Comprehend Workplace Safety Processes	Comprehension	18 of 200
3	Calculate Electrical/Electronic Circuit Performance	Application	10 of 200
4	Identify Electrical/Electronic Symbols	Knowledge	12 of 200
5	Discuss Lockout-Tagout Procedures	Comprehension	3 of 200
6	Identify Various Instrument Loop Components	Knowledge	15 of 200
7	Define Instrumentation Terminology	Knowledge	21 of 200
8	Calculate Instrument Inputs/Outputs	Application	7 of 200
9	Evaluate Instrument Calibrations	Analysis	11 of 200
10	Explain the Science of Instrument Calibration	Application	24 of 200
11	Use Instrument Calibration and Test Equipment	Application	6 of 200
12	Interpret Instrument Calibration Formulas	Application	4 of 200
13	Describe Component Safety	Comprehension	2 of 200
14	Identify Instrumentation Symbols and Identification Letters	Knowledge	15 of 200
15	Interpret P&IDs and Loop Diagrams	Application	7 of 200
16	Prepare Instrumentation Calibration Documentation	Application	6 of 200
17	Describe the Operation of the Components of an Instrument loop	Comprehension	13 of 200
18	Diagnose Instrument Loop Malfunctions	Analysis	2 of 200
19	Discuss the Operation of Analytical Instrumentation	Comprehension	3 of 200

Knowledge	63
Comprehension	60
Application	64
Analysis	13
Synthesis	0
Evaluation	0
Total= 200	

6.0 Electrical Training ALLIANCE Audit Forms:

The Electrical Training ALLIANCE Audit procedure is to complete the following forms following this page. A total of three (3) forms will be utilized.

Approval List for IBEW/UA Instrument Certification, Part B is to be completed thereby documenting the Calibration Equipment and Devices used for the Performance Exam. This form is also used to document the Host Facility requirement to verify Participant eligibility to participate in the Part B Exam.

Part A Audit Form Checklist is to document:

- Exam Offerings,
- Exam participants, and
- Qualification method(s),

Part A facility Recommendations Checklist is used to document the exam facilities conformance to recommended standards.