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Symbols: DSNIP/FDK		<u>Action:</u> Immediate

**PURPOSE:** The purpose of this Bulletin is to inform Office of Apprenticeship Training, Employer and Labor Services (OATELS), Bureau of Apprenticeship and Training (BAT) staff of the New National Guideline Standards, Affirmative Action Plan and Selection Procedures for the NSCA.

**BACKGROUND:** These National Guideline Standards submitted by the NSCA were certified by the OATELS Administrator on June 18, 2002. These National Guideline Standards are a model for developing local apprenticeship programs registered with the Bureau of Apprenticeship and Training or State Apprenticeship Agency/Council for the occupation of Electronic Systems Technician.

A copy of the standards is attached for your information.

If you have any additional questions please contact (202) 693-3813.

**ACTION:** OATELS/BAT staff should familiarize themselves with the attached National Guidelines for Apprenticeship Standards.

Attachment

**NOTE:** This Bulletin is being sent via Electronic Mail(e-mail).

**NATIONAL  
GUIDELINES FOR  
APPRENTICESHIP STANDARDS**

developed by

**NATIONAL SYSTEMS CONTRACTORS ASSOCIATION**

for the occupation of

**ELECTRONIC SYSTEMS TECHNICIAN**

DEVELOPED IN COOPERATION WITH THE  
UNITED STATES DEPARTMENT OF LABOR  
BUREAU OF APPRENTICESHIP AND TRAINING

APPROVED AND CERTIFIED BY THE  
UNITED STATES DEPARTMENT OF LABOR  
OFFICE OF APPRENTICESHIP TRAINING, EMPLOYER AND LABOR SERVICES

BY: /s/ ANTHONY SWOOPE  
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OFFICE OF APPRENTICESHIP TRAINING, EMPLOYER AND LABOR SERVICES

CERTIFICATION DATE: June 18, 2002

CERTIFICATION NUMBER: C - 2002-01

## **FOREWORD**

The National Systems Contractors Association (NSCA) recognizes the need for structured training programs to maintain the high level of skill and competence demanded in the occupation of Electronic Systems Technician. Registered apprenticeship is the most practical and sound training system available to meet that need, to develop individuals into skilled journeyworkers, and to ensure industry an adequate supply of skilled workers.

Title 29, Code of Federal Regulations, Part 29, outlines the requirements for registration of acceptable apprenticeship programs for Federal purposes, and sets forth labor standards that safeguard the welfare of apprentices. Such registration may be by the Bureau of Apprenticeship and Training, U. S. Department of Labor, or by a State Apprenticeship Agency/Council recognized by the Bureau as the appropriate body in that State for approval of local apprenticeship programs for Federal purposes. Title 29, Code of Federal Regulations, Part 30 sets forth the requirements for equal employment opportunity in apprenticeship to which all registered apprenticeship programs must adhere.

The purpose of these National Guideline Standards is to provide policy and guidance to employers, employer associations and their local affiliates in developing Standards of Apprenticeship for local approval and registration. These National Guideline Standards developed by the NSCA and its Workforce Development Task Force are certified by the Office of Apprenticeship Training, Employer and Labor Services, U. S. Department of Labor, as substantially conforming to the requirements of Title 29, CFR Parts 29 and 30. State Apprenticeship Agency/Councils recognized by the Bureau of Apprenticeship and Training to register local programs, and/or local laws and regulations, may impose additional requirements that must be addressed in the local apprenticeship standards.

Local Standards of Apprenticeship must be developed and registered by each employer, employer association and/or their local affiliates that undertake to carry out an apprenticeship training program. The local Standards of Apprenticeship will be the written plan outlining all terms and conditions for the recruitment, selection, employment, training, and supervision of apprentices as defined by the NSCA and its Workforce Development Task Force, and must meet all the requirements of the local Registration Agency.

## **THE NATIONAL APPRENTICESHIP AND TRAINING COMMITTEE (NATC)**

The National Systems Contractors Association (NSCA) and its Workforce Development Task Force are responsible for the development of National Guideline Standards and having them certified by the Office of Apprenticeship Training, Employer and Labor Services, U.S. Department of Labor for use by employer, employer associations and their local affiliates.

The NATC shall consist of members of the NSCA appointed by the NSCA Education Steering Committee chairperson. The NATC to the extent authorized, is the advisory body for National Guideline Standards and, as such shall establish rules and regulations governing its procedures as may be required.

### **Duties of the Workforce Development Task Force**

The Task Force Will Endeavor to:

- a. Encourage association members to establish local apprenticeship programs in accordance with these National Guideline Standards.
- b. Cooperate with the NSCA and its affiliates in all areas of training.
- c. Make an annual report to the NSCA on progress made in apprenticeship.
- d. Cooperate with the NSCA and its affiliates on the development and use of related instruction material.
- e. Transfer an apprentice from one registered apprenticeship program to another where such transfer is justified and is agreeable to the apprentice and both employers affected.

### **DEVELOPMENT OF AFFIRMATIVE ACTION PLAN AND SELECTION PROCEDURES**

Equal employment opportunity is required of every registered apprenticeship program. Such requirements apply to the recruitment, selection, employment, and training of apprentices throughout their apprenticeship.

Those programs with five or more apprentices, or where there is a likelihood of five or more apprentices, must have a written Affirmative Action Plan and Selection Procedure that is approved by the Registration Agency as part of the Standards of Apprenticeship.

A sample Affirmative Action Plan and Selection Procedure are attached.

Representatives of the Registration Agency are available to assist the program sponsor in developing Standards of Apprenticeship, Affirmative Action Plan and Selection Procedure using the sample provided. Once developed, the Standards of Apprenticeship, as well as the Affirmative Action Plan and Selection Procedure must be submitted to the Registration Agency for approval and registration.

**OFFICIAL ADOPTION OF NATIONAL GUIDELINES FOR  
APPRENTICESHIP STANDARDS:**

The National Systems Contractors Association and The Workforce Development Task Force hereby officially adopt these National Guidelines for Apprenticeship Standards on this \_\_\_\_ day of \_\_\_\_\_, 2002.

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**CHARLES R. WILSON**  
**Executive Director of NSCA**

**SAMPLE**

**STANDARDS OF APPRENTICESHIP**

**DEVELOPED BY**

***(NAME OF SPONSOR)***

**FOR THE OCCUPATION OF**

**ELECTRONIC SYSTEMS TECHNICIAN**

**APPROVED BY**

***(REGISTRATION AGENCY)***

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## **FOREWORD**

The (Insert Name of Sponsor) recognizes the need for structured training to maintain the high level of skill and competence demanded in the Electronic Systems Industry.

Registered apprenticeship provides the most practical and sound method to meet that need, to prepare individuals to be skilled Electronic Systems Technicians, and to ensure industry an adequate supply of skilled workers.

In furtherance of those goals (Insert the Name of the Sponsor) has established these Standards of Apprenticeship outlining all terms and conditions for the recruitment, selection, employment and training of apprentices in the occupation(s) listed in these Standards.

## **DEFINITIONS**

**APPRENTICE:** Any individual meeting the qualifications described in the Standards of Apprenticeship who has signed an Apprenticeship Agreement with the Employer/ Sponsor providing training and related instruction under the Standards, and who is registered with the Registration Agency.

**APPRENTICESHIP AGREEMENT:** The written agreement between the apprentice and the Employer/Sponsor setting forth the responsibilities and obligations of all parties to the Agreement with respect to the Apprentice=s employment and training under the Standards. Each Apprenticeship Agreement must be registered with the Registration Agency.

**CERTIFICATE OF COMPLETION:** The Certificate of Completion issued by the Registration Agency to those registered apprentices certified and documented as successfully completing the apprentice training requirements outlined in the Standards of Apprenticeship.

**DICTIONARY OF OCCUPATIONAL TITLES (D.O.T.):** Provides basic occupational information including job definitions, detailed tasks to be performed, and a number indicating a range of time to prepare for average performance in the occupation. The last update to the DOT was completed in 1991. Much of the data in the DOT was collected much earlier than that, during the 1970's, which does not accommodate the needs of today=s labor market. An Advisory Panel on the Dictionary of Occupational Titles was convened in 1990 and published a report in 1993 that laid the basis for the development of the Occupational Information Network, or O\*NET.

**DIRECT SUPERVISION:** All apprentices shall perform their on-the-job duties under the



Direct Supervision of an experienced technician. Direct Supervision shall consist of, on average, at least two (2) hours of time spent daily working side by side with an experienced supervisor or technician learning the trade skills as listed in the accompanying work process schedule.

**ELECTRONIC SYSTEMS TECHNICIAN:** An individual who has sufficient skill and knowledge of this occupation, either through formal apprenticeship or through practical on-the-job experience, and is recognized by a State or Federal registration agency and this industry as being fully qualified to perform the work of the occupation.

**NATIONAL SYSTEMS CONTRACTORS ASSOCIATION WORKFORCE DEVELOPMENT TASK FORCE:** The Workforce Development Task Force shall consist of members of the NSCA appointed by the NSCA Education Steering Committee chairperson. The workforce Development Task Force, to the extent authorized, is the advisory body for the national apprenticeship guideline standards and, as such, shall establish rules and regulations governing its procedures as may be required.

**O\*NET-SOC CODE:** The Occupational Information Network (O\*NET) codes and titles are based on the new Standard Occupational Classification (SOC) system mandated by the federal Office of Management and Budget for use in collecting statistical information on occupations. The O\*NET classification, **which replaces the DOT**, uses an 8-digit O\*NET-SOC code. Use of the SOC classification as a basis for the O\*NET codes ensures that O\*NET information can be readily linked to labor market information such as occupational employment and wage data at the national, State, and local levels.

**PROGRAM SPONSOR:** The Employer or Employer Association in whose name the Standards of Apprenticeship will be registered, and which will have the full responsibility for administration and operation of the apprenticeship program.

**REGISTRATION AGENCY:** (Insert name of Registration Agency, either the Bureau of Apprenticeship and Training, U. S. Department of Labor, or your State Apprenticeship Agency/Council recognized by the Bureau)

**REGISTERED APPRENTICESHIP INFORMATION SYSTEM (RAIS):** The Federal system which provides for the automated collection, retention, updating, retrieval and summarization of information related to apprentices and apprenticeship programs.

**STANDARDS OF APPRENTICESHIP:** This entire document including all appendices and attachments hereto, and any future modifications or additions approved by the Registration Agency.

## **SECTION I. - EQUAL OPPORTUNITY PLEDGE - 29.5(b)(20)**

The recruitment, selection, employment, and training of apprentices during their apprenticeship, shall be without discrimination because of race, color, religion, national origin, or sex. The Sponsor will take affirmative action to provide equal opportunity in apprenticeship and will operate the apprenticeship program as required under Title 29 of the Code of Federal Regulations, Part 30, as amended (insert applicable state regulations here, if applicable).

## **SECTION II. - AFFIRMATIVE ACTION PLAN - 29.5(b)**

If the Sponsor employs five or more apprentices, the Sponsor will adopt an Affirmative Action Plan and Selection Procedure as required under Title 29, CFR Part 30. A sample Affirmative Action Plan and Selection Procedure are included in this document attached as Attachment C for guidance in development of local plans and procedures.

## **SECTION III. - QUALIFICATIONS FOR APPRENTICESHIP - 29.5(b)(10)**

Applicants shall meet the following minimum qualifications:

### A. Age

An applicant, who is sixteen (16) years of age and is participating in a school-to-work program or equivalent and who otherwise meets all qualifications may be rated, ranked and placed on the list of eligible applicants. Such an applicant must be eighteen (18) years of age prior to being accepted into the apprenticeship program.

### **EXAMPLES:**

### B. Education

A high school diploma or GED equivalency is required. Applicant must provide an official transcript(s) for high school and post high school education and training. All GED records must be submitted if applicable.

Applicants must submit a copy of their DD-214 to verify military training and/or experience if they are a veteran and wish to receive consideration for such training/experience.

### C. Physical

Applicants shall be physically capable of performing the essential functions of the apprenticeship program without posing a direct threat to the health and safety of the individual or others.

Qualified applicants may be subject to a physical examination or drug screening or both on acceptance into the program and prior to being employed. The cost of the examination and/or drug screening shall be the responsibility of the Sponsor or the Employer.

#### **SECTION IV. - RATIO OF APPRENTICES TO JOURNEYWORKERS- 29.5(b)(7)**

The ratio of apprentices to journey workers shall be consistent with proper Direct Supervision, training, safety, and continuity of employment throughout the apprenticeship.

This ratio of apprentices to Electronic Systems Technician shall be one (1) apprentice to one (1) Electronic Systems Technician.

#### **SECTION V. - TERM OF APPRENTICESHIP – 29.5(b)(2)**

The term of apprenticeship shall be a period of reasonably continuous employment, including the probationary period, as stated on the Occupation Schedule (Attachment A).

An apprentice who, by exceptional aptitude or as a result of past education and/or practical experience, achieves the desired level of competency in a phase of the apprenticeship program in less than the time designated, may be advanced to the next phase. However, in no event shall a Completion Certificate be issued until the apprentice has completed 8,000 hours of on-the-job training and demonstrated technical competency in those areas covered by the related theoretical instruction portion of this document.

#### **SECTION VI. - PROBATIONARY PERIOD - 29.5(b)(8), (b)(19)**

All applicants selected for apprenticeship shall serve a probationary period of 6 months (approximately 1000 hours) of on-the-job training.

During the probationary period either the apprentice or the Sponsor may terminate the Apprenticeship Agreement, without stated cause, by notifying the other party in writing. The records for each probationary apprentice shall be reviewed prior to the end of the probationary period. Records shall consist of periodic reports regarding progression made in both the on-the- job training and related theoretical instruction, and any disciplinary action taken during the probationary period.

Any probationary apprentice considered to be unsatisfactory after a review of the probationary period shall have his/her Apprenticeship Agreement canceled before the expiration of the probationary period, by means of written notice to the apprentice and to the Registration Agency.

Each probationary apprentice evaluated as satisfactory after a review of the probationary period shall be given full credit for the probationary period and continue in the program.

After the probationary period the apprenticeship agreement may be canceled at the request of the apprentice, or may be suspended or canceled by the Sponsor for reasonable cause after documented due notice to the apprentice and a reasonable opportunity for corrective action. In such cases, the Sponsor will provide written notice

to the apprentice and to the Registration Agency of the final action taken.

**SECTION VII. - APPRENTICESHIP AGREEMENT - 29.5(b)(11)**

After an applicant for apprenticeship has been selected, but before employment as an apprentice or enrollment in related theoretical instruction, the apprentice shall be covered by a written apprenticeship agreement (Attachment B) signed by the Sponsor and the apprentice and approved by and registered with the Registration Agency. Such agreement shall contain a statement making the terms and conditions of these standards a part of the agreement as though expressly written therein. A copy of each Agreement shall be furnished to the apprentice, the Registration Agency, the Sponsor and the Veterans Agency (if Applicable).

Prior to signing the Apprenticeship Agreement, each selected applicant shall be given an opportunity to read and review these Standards, the Sponsor's written rules and policies, and the Apprenticeship Agreement.

The Registration Agency will be advised promptly of the execution of each Apprenticeship Agreement and will be given all the information required for registering the apprentice.

**SECTION VIII. - HOURS OF WORK**

Apprentices shall generally work the same hours as a skilled Electronic Systems Technician except that no apprentice shall be allowed to work overtime if it interferes with attendance/participation in related theoretical instruction.

Apprentices who do not complete the required hours of on-the-job training during a given segment may have the term of that segment extended until the required number of hours of training are accrued.

**SECTION IX. - APPRENTICE WAGE PROGRESSION - 29.5(b)(5)**

Apprentices shall be paid a progressively increasing schedule of wages during their apprenticeship based on the acquisition of increased skill and competence on the job and in related theoretical instruction. Before an apprentice is advanced to the next segment of training or to a skilled Electronic Systems Technician status, the Sponsor shall evaluate all progress to determine whether advancement has been earned by satisfactory on-the-job training and in related theoretical instruction. In determining whether satisfactory progress has been made, the Sponsor shall be guided by the work experience and related theoretical instruction records and reports.

The progressive wage schedule shall be an increasing percentage of the skilled Electronic Systems Technician wage rate as established by the Attachment A. The percentages that will be applied to the applicable skilled Electronic Systems Technician wage rate are shown on the attached Occupational Schedule (Attachment A). In no case will the starting

wages of apprentices be less than that required by any minimum wage law which may be applicable.

### **SECTION X. - CREDIT FOR PREVIOUS EXPERIENCE - 29.5(b)(12)**

The sponsor may grant credit towards the term of apprenticeship to new apprentices who demonstrate previous acquisition of skills or knowledge equivalent to that which would be received under these Standards of Apprenticeship.

Apprentice applicants seeking credit for previous experience gained outside the supervision of the Sponsor must submit the request at the time of application and furnish such records, affidavits, etc to substantiate the claim.

An apprentice granted credit shall be advanced to the wage rate designated for the period to which such credit accrues.

The granting of advanced standing will be uniformly applied to all apprentices.

#### **Sample Process:**

Applicants requesting such credit who are selected into the apprenticeship program shall start at the beginning wage rate. The request for credit will be evaluated and a determination made by the Sponsor during the probationary period when actual on-the-job and related theoretical instruction performance can be examined. Prior to completion of the probationary period, the amount of credit to be awarded will be determined after review of the apprentice's previous work and training/education record and evaluation of the apprentice's performance and demonstrated skill and knowledge during the probationary period.

### **SECTION XI. - WORK EXPERIENCE - 29.5(b)(3)**

During the apprenticeship each apprentice shall receive such on-the-job training and related theoretical instruction in all phases of the occupation necessary to develop the skill and proficiency of a skilled Electronic Systems Technician. The on-the-job training shall be under the direction and guidance of the qualified Electronic Systems Technician.

The Work Process(es) for each occupation is covered in the attached Occupational Schedule(s) (Attachment A).

### **SECTION XII. – RELATED THEORETICAL INSTRUCTION - 29.5(b)(4)**

During each segment of training each apprentice is required to participate in related theoretical instruction in subjects related to the job as outlined in Attachment A. For each occupation, the recommended term of apprenticeship will include no less than 144 hours of related theoretical instruction for the Electronic Systems Technician for each year of the apprenticeship. Apprentices agree to take such subjects as the Sponsor advises. The

Sponsor shall secure the instructional aids and equipment it deems necessary to provide quality instruction. Apprentices (*the Sponsor inserts A will@ or A will not@*) be paid for hours spent attending related instruction classes.

The Sponsor is encouraged to inform each apprentice of the availability of college credit where available through the **[insert the names of educational institutions which will offer college credit where applicable]**.

To the extent possible, related theoretical instruction shall be closely correlated with the practical experience and training received on the job. The Sponsor shall monitor and document the apprentice=s progress in related theoretical instruction.

### **Sample Process**

Any apprentice who is absent from related theoretical instruction, unless officially excused, shall satisfactorily complete all class work missed before being advanced to the next period of training. In cases of failure of an apprentice to fulfill the obligations regarding related theoretical instruction or on-the-job training without due cause, the Sponsor shall take appropriate disciplinary action and may terminate the Apprenticeship Agreement after due notice to the apprentice and opportunity for corrective action.

The Sponsor is encouraged to secure competent instructors whose knowledge, experience, and ability to teach will be carefully examined and monitored by the Sponsor.

### **SECTION XIII. - SAFETY AND HEALTH TRAINING - 29.5(b)(9)**

All apprentices shall receive instruction in safe and healthful work practices both on-the-job and in related theoretical instruction that are in compliance with the Occupational Safety and Health Standards promulgated by the Secretary of Labor under Public Law 91-596, dated December 29, 1970, and subsequent amendments to the Public Law, or State Standards that have been found to be at least as effective as the Federal Standards.

Apprentices shall be taught that accident prevention is very largely a matter of education, vigilance, and cooperation and that they should strive at all times to conduct themselves in their work in such manner as to ensure their own safety and that of their fellow workers.

### **SECTION XIV. - SUPERVISION OF APPRENTICES - 29.5(b)(14)**

The Sponsor shall be responsible for the training of the apprentice on the job training. The Supervisor of the apprentice(s) (if one is available) designated by the employer shall be responsible for the apprentice's work assignment ensuring the apprentice is working under the supervision of a skilled Electronic Systems Technician, evaluation of work performance, and completion and submittal of progress reports to the Sponsor.

All apprentices shall perform their on-the-job duties under the Direct Supervision of an experienced technician. Direct Supervision shall consist of, on average, at least two (2) hours of time spent daily working side by side with an experienced supervisor or technician learning their trade skills in the accompanying work process schedule.





## **SECTION XV. - RECORDS AND EXAMINATIONS - 29.5(b)(6)**

Apprentices may be responsible for maintaining a record of their work experience/training on the job and in related theoretical instruction and for having this record verified by their supervisor at the end of each week. The apprentice shall authorize an effective release of their completed related theoretical instruction records from the local school authorities to the Sponsor if necessary. The record cards and all data pertaining to the apprenticeship will be the property of the Sponsor and will be included in each apprentice=s record file maintained by the Sponsor.

Before each period of advancement, or at any other time when conditions warrant, the Sponsor shall evaluate the apprentice=s record to determine whether he/she has made satisfactory progress. If an apprentice=s related theoretical instruction or on-the-job progress is found to be unsatisfactory, the Sponsor may determine whether the apprentice will continue in a probationary status, or require the apprentice to repeat a process or series of processes before advancing to the next wage classification. In such cases, the Sponsor should initiate a performance improvement plan with the apprentice.

Should it be found that the apprentice does not have the ability or desire to continue the training to become a skilled Electronic Systems Technician, the Sponsor will, after the apprentice has been given adequate assistance and opportunity for corrective action, terminate the Apprenticeship Agreement.

Written records of progress evaluations and corrective and final actions shall be maintained by the Sponsor.

## **SECTION XVI. - MAINTENANCE OF RECORDS - 29.5(b)(22)**

The Sponsor shall maintain for a period of not less five (5) years from the date of last action, all records relating to apprentice applications (whether selected or not), the employment and training of apprentices, and any other information relevant to the operation of the program. This includes, but is not limited to, records on the recruitment, application and selection of apprentices, job assignments, promotions, demotions, layoffs, terminations, rate of pay, or other forms of compensation, hours of work and training, evaluations, and other relevant data. The records shall permit identification of minority and female (minority and non-minority) participants. The records shall be made available on request to the Registration Agency.

## **SECTION XVII. - CERTIFICATE OF COMPLETION - 29.5(b)(15)**

Upon satisfactory completion of the requirements of the apprenticeship program as established in these Standards, the Sponsor shall so certify in writing to the Registration Agency and request that a Certificate of Completion of Apprenticeship be awarded to the completing apprentice(s). Such requests shall be accompanied by the appropriate

documentation for both the on-the-job training and the related theoretical instruction as required by the Registration Agency.

**SECTION XVIII. - NOTICE TO REGISTRATION AGENCY - 29.5(b)(18)**

The Registration Agency shall be notified promptly of all new apprentices to be registered, credit granted, suspensions for any reason, reinstatements, extensions, completions, and cancellations.

**SECTION XIX. - CANCELLATION AND DEREGISTRATION - 29.5(b)(17)**

These Apprenticeship Standards will, upon adoption by the Sponsor, be submitted to the Registration Agency for approval. Such approval will be acquired before implementation of the program.

The Sponsor reserves the right to discontinue at any time the apprenticeship program set forth herein. The Registration Agency shall be notified promptly of any decision to cancel the program.

Deregistration of these Standards of Apprenticeship may be initiated by the Registration Agency for failure of the Sponsor to abide by the provisions herein. Such deregistration will be in accordance with the Registration Agency's regulations and procedures.

Within fifteen (15) days of cancellation of the apprenticeship program (whether voluntary or involuntary), the Sponsor will notify each apprentice of the cancellation and the effect of same. This notification will conform to the requirements of Title 29, CFR Part 29.7.

**SECTION XX. - AMENDMENTS OR MODIFICATIONS - 29.5(b)(17)**

These Standards of Apprenticeship may be amended or modified at any time by the Sponsor provided that no amendment or modification adopted shall alter any Apprenticeship Agreement in force at the time without the consent of all parties to the Agreement. Such amendment or modification shall be submitted to the Registration Agency for approval and registration prior to being placed in effect. A copy of each amendment or modification adopted will be furnished to each apprentice to whom the amendment or modification applies.

**SECTION XXI. - ADJUSTING DIFFERENCES/COMPLAINT PROCEDURE - Title 29 CFR 29.5(b)(21), Title 29 CFR 29.30(11)**

The Sponsor shall have full authority to supervise the enforcement of these Apprenticeship Standards. Its decision will be final and binding on the employer and the apprentice, unless otherwise noted below.

If an applicant or an apprentice believes an issue exists that adversely affects his/her participation in the apprenticeship program or violates the provisions of the Apprenticeship Agreement or Standards, relief may be sought through one or more of the following avenues, based on the nature of the issue:

**Title 29 CFR 29.5 (b)(21)**

The Sponsor shall hear and resolve all complaints of violations concerning the Apprenticeship Agreement and the registered Apprenticeship Standards, for which written notification is received within fifteen (15) days of violations. The Sponsor shall make such rulings as it deems necessary in each individual case and within thirty (30) days of receiving the written notification. Either party to the Apprenticeship Agreement may consult with the Registration Agency for an interpretation of any provision of the Standards over which differences occur. The name and address of the appropriate authority to receive, process and make disposition of complaints is: (Sponsor should insert applicable information).

**Title 29 CFR 30.11**

Any apprentice or applicant for apprenticeship who believes that he or she has been discriminated against on the basis of race, color, religion, national origin, or sex, with regard to apprenticeship or that the equal opportunity standards with respect to his or her selection have not been followed in the operation of an apprenticeship program, may personally or through an authorized representative, file a complaint with the U. S. Department of Labor or, at the apprentice or applicant's election, with the private review body established by the Sponsor (if applicable).

The complaint shall be in writing and shall be signed by the complainant. It must include the name, address, and telephone number of the person allegedly discriminated against, the sponsor involved, and a brief description of the circumstances of the failure to apply equal opportunity standards.

The complaint must be filed not later than one hundred eighty (180) days from the date of the alleged discrimination or specified failure to follow the equal opportunity standards, and, in the case of complaints filed directly with the review body designated by the program Sponsor to review such complaints, any referral of such complaint by the complainant to the U.S. Department of Labor must occur within the time limitation stated above or thirty (30) days from the final decision of such review body, whichever is later. The time may be extended by the U.S. Department of Labor for good cause shown. Complaints of sexual harassment in the workplace may be filed and processed under Title 29, CFR Part 30, and the procedures as set forth above.

The Sponsor will provide written notice of their complaint procedure to all applicants for apprenticeship and all apprentices.

## **SECTION XXII. - TRANSFER OF TRAINING OBLIGATION 29.5(13)**

The Sponsor may transfer an apprentice from one employer to another to provide continuous employment and to assure the apprentice more complete on-the-job training experience in all aspects of the occupation.

If a work site, or contract employer is unable to fulfill its training obligation under these Standards due to lack of work or failure to conform to these Standards of Apprenticeship, the Sponsor may, subject to the consent of the apprentice, move the affected apprentice(s) to other participating work sites or contract employers.

## **SECTION XXIII. - RESPONSIBILITIES OF THE APPRENTICE “EXAMPLE”**

Apprentices, having read the Standards formulated by the Sponsor and signed an Apprenticeship Agreement, agree to all the terms and conditions contained herein. Apprentices agree to abide by the Sponsor's rules and policies, including any amendments, serve such time, perform such manual training, and study such subjects as the Sponsor may deem necessary to become an Electronic Systems Technician.

In signing the Apprenticeship Agreement, apprentices assume the following responsibilities and obligations under the apprenticeship program:

- A. Perform diligently and faithfully the work of an Electronic Systems Technician and other pertinent duties assigned by the Sponsor in accordance with the provisions of the Standards.
- B. Attend and satisfactorily complete the required hours of on-the-job training and in related theoretical instruction in subjects related to the occupation as provided under these standards.
- C. Maintain and make available such records of work experience and training received on the job and in related theoretical instruction as may be required by the Sponsor.
- D. Develop and practice safe working habits and work in such a manner as to assure his/her personal safety and that of other workers.

## **SECTION XXIV. - SELECTION OF APPRENTICES**

Selection into the apprenticeship program will be in accordance with the selection procedures made a part of these standards. (Attachment C)

## **SECTION XXV. - CONSULTANTS**

Advice and assistance in the successful operation of this apprenticeship program will be

available at any time, upon request by the Sponsor, from representatives of the Registration Agency.

**SECTION XXVI. - EMPLOYER ACCEPTANCE AGREEMENT**

The written agreement whereby the Employer agrees to the terms and conditions set forth in these Standards of Apprenticeship registered by the Sponsor. (Attachment D)

**SECTION XXVII. - CONFORMANCE WITH STATE AND FEDERAL LAWS**

No section of these Standards of Apprenticeship shall be construed as permitting violation of applicable State or Federal law.

**SECTION XXVIII. - OFFICIAL ADOPTION OF APPRENTICESHIP STANDARDS:**

The *(Name of Sponsor)* hereby adopts these Standards for Apprenticeship on this \_\_\_\_\_ Day of \_\_\_\_\_, (INSERT YEAR).

REPRESENTING THE *(Name of the Sponsor)*:

\_\_\_\_\_  
Signature of Sponsor

\_\_\_\_\_  
Printed Name

## Attachment A

### **OCCUPATION SCHEDULE FOR: ELECTRONIC SYSTEMS TECHNICIAN O\*NET/SOC CODE: 49-2022.03 RAIS CODE: 0169**

This occupation schedule is attached to and a part of the Apprenticeship Standards for the above identified occupation.

**1. TERM OF APPRENTICESHIP**

The term of the occupation shall be 4 years with an OJT attainment of approximately 8000 hours supplemented by the required hours of related theoretical instruction.

**2. RATIO OF APPRENTICES TO SKILLED ELECTRONIC SYSTEMS TECHNICIAN**

The ratio of apprentices to Electronic Systems Technicians shall be one (1) apprentice to one (1) Electronic Systems Technician.

**3. APPRENTICE WAGE SCHEDULE**

Apprentices shall be paid a progressively increasing schedule of wages based on a percentage of the current Electronic Systems Technician wage rate.

**4 Year Term Example: (THIS IS ONLY A SAMPLE-ADJUST HOURS AS APPROPRIATE)**

1 <sup>st</sup> 6 months + hours = ____	5 <sup>th</sup> 6 months + hours = ____
2 <sup>nd</sup> 6 months + hours = ____	6 <sup>th</sup> 6 months + hours = ____
3 <sup>rd</sup> 6 months + hours = ____	7 <sup>th</sup> 6 months + hours = ____
4 <sup>th</sup> 6 months + hours = ____	8 <sup>th</sup> 6 months + hours = ____

**4. SCHEDULE OF WORK EXPERIENCE (See attached Occupation Schedule)**

The Sponsor may adjust the work processes to conform to local practice prior to submitting these Standards to the appropriate Registration Agency for approval.

**5. SCHEDULE OF RELATED THEORETICAL INSTRUCTION**

(See attached Course Outline)

**WORK PROCESS SCHEDULE  
ELECTRONIC SYSTEMS TECHNICIAN  
ONET Code: 49-2022.03 RAIS CODE: 0169**

**Description:** An Electronic Systems Technician is an individual whose primary occupation is the design and/or integration, installation and field maintenance/service of:

- cabling infrastructure and products that transport low voltage (less than 100 volts) voice, video, audio and data signals in a commercial or residential premises;
- products that capture and display or otherwise annunciate signals;
- products that control signals; and
- products that use signals to control mechanical and electrical apparatus.

**On- The -Job Training**

The apprentice will practice the following work processes, demonstrating competency in them over the course of the four years of the program. This constitutes the on-the-job training portion of the apprenticeship. Each general work process is further broken down into specific constituent processes for clarification.

Work Processes	Approx. Hours
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**Prepare for System Installation**

**800**

- Review & understand electronic system requirements & documentation (blueprints, etc)
- Perform site survey
- Develop overall job plan
- Organize technical work plan
- Complete pre-assemblies & fabrication of sub systems
- Gather inventory/parts
- Pre-test components
- Inventory tools



<b>Wire Buildings</b>	<b>800</b>
<ul style="list-style-type: none"> <li>▪ Use documentation to lay out components</li> <li>▪ Secure area – drop cloths- safety cones, etc.</li> <li>▪ Rough in device component locations</li> <li>▪ Install cable support structure or drill wire paths</li> <li>▪ Pull &amp; secure wire</li> <li>▪ Label tag wire /cable per documentation</li> </ul>	
<b>Trim</b>	<b>1500</b>
<ul style="list-style-type: none"> <li>▪ Pre-termination functions <ul style="list-style-type: none"> <li>- Prepare cable ends</li> <li>- Route cable</li> </ul> </li> <li>▪ Connect passive devices <ul style="list-style-type: none"> <li>- Connectors</li> <li>- Outlets</li> <li>- Patch panels</li> </ul> </li> <li>▪ Splicing</li> <li>▪ Intermediate termination</li> </ul>	
<b>Install Components 1</b>	<b>500</b>
<ul style="list-style-type: none"> <li>▪ Remote location components</li> <li>▪ Central /main location</li> </ul>	
<b>Configure- Program</b>	<b>500</b>
<ul style="list-style-type: none"> <li>▪ Calibrate &amp; align electronically and physically</li> <li>▪ Install or enter control programs, if applicable (complex)</li> <li>▪ Setup system instructions labels, etc (simple)</li> </ul>	
<b>Test, Troubleshooting, Debug</b>	<b>800</b>
<ul style="list-style-type: none"> <li>▪ Power up</li> <li>▪ Operate and test functions</li> <li>▪ Evaluate performance</li> <li>▪ Identify problems, errors, discrepancies</li> <li>▪ Diagnose causes of problems</li> <li>▪ Take remedial action</li> <li>▪ Document actions (See documentation section)</li> </ul>	

<b>Train Users</b>	<b>500</b>
<ul style="list-style-type: none"> <li>▪ Review user documentation manuals &amp; instructions</li> <li>▪ Identify training objectives</li> <li>▪ Confirm actual users and their requirements</li> <li>▪ Procure – develop training &amp; user aids manuals tip sheets</li> <li>▪ Demonstrate system function- guide user through system</li> <li>▪ Observe user using the system- have customer demonstrate knowledge of system</li> <li>▪ Communicate results of training back to all relevant parties</li> </ul>	
<b>Documentation</b>	<b>800</b>
<ul style="list-style-type: none"> <li>▪ Review final blueprints, wiring diagrams, and hookup instructions</li> <li>▪ Complete work reports and time sheets</li> <li>▪ Provide/prepare/deliver system documentation <ul style="list-style-type: none"> <li>- User manual and training materials</li> <li>- As built drawings</li> <li>- Zone diagrams</li> <li>- Equipment lists</li> <li>- Warranty paperwork</li> </ul> </li> </ul>	
<b>Maintenance &amp; Repair</b>	<b>800</b>
<ul style="list-style-type: none"> <li>▪ Maintenance <ul style="list-style-type: none"> <li>- Perform scheduled preventive maintenance</li> </ul> </li> <li>▪ Repair <ul style="list-style-type: none"> <li>- Diagnose problems</li> </ul> </li> <li>▪ Read documentation</li> </ul>	
<b>TOTAL HOURS</b>	<b>8000</b>

## RELATED THEORETICAL INSTRUCTION OUTLINE

The instructional portion of these EST apprenticeship standards is designed to employ the "Electronic Systems Technician" program in the "Wheels of Learning" series of publications and materials developed by the Consortium for Electronic Systems Technician Training and the National Center for Construction Education & Research (NCCER). There are four levels of instructional materials, including a trainee guide and an instructor guide for each level.

<u>1<sup>st</sup> Year</u>	<u>Approx. Hours</u>
Introduction to the Trade Reviews the purpose and scope of the electronic systems industry. Explains the technician's role in the industry. States the rules for professional and ethical conduct. Describes the importance of codes and standards and explains how they affect the work of an EST (Electronic Systems Technician).	10 hours
Basic Safety Provides a comprehensive overview of safety rules and precautions for working on construction job sites.	15 hours
Basic Math Provides refresher practice in addition, subtraction, multiplication, and division of whole, decimal, and fractional numbers.	15 hours
Introduction to Hand Tools Explains the selection, inspection, use and maintenance of common hand tools.	10 hours
Introduction to Power Tools Explains the selection, inspection, use and maintenance of common power tools.	5 hours
Introduction to Blueprints Reviews the basic components of blueprints, including title blocks, lines, symbols, and revision symbols.	7.5 hours
Basic Rigging Explains rigging safety, allows for practice. Reviews types of rigging equipment, inspection procedures. Reviews crane hand signals, types of derricks and cranes. How to tie different types of knots. How to estimate size, weight, and center of gravity.	20 hours
Construction Materials & Methods Covers the uses and composition of common types of residential and commercial building materials. Reviews the major structural components of residential and commercial buildings and common methods of construction, including suspended ceilings, cable raceways. Explains how to select the appropriate drills, bits, and cutting tools for making openings in various types of construction materials. Explains how to install plywood on a gypsum board wall.	15 hours
Pathways and Spaces Orients apprentice to various types of cable trays, raceways, fittings, and provides strategies for selecting the appropriate size and type for a given application. Reviews methods used to install raceways. Reviews NEC® raceway requirements. Reviews procedures for installing and leveling D-rings and mushrooms, making a conduit-to-box connection, selecting cable support hardware for a given application, and installing an outlet box in drywall.	15 hours

Fasteners & Anchors 5 hours  
Reviews and explains the use of threaded and non-threaded fasteners, anchors. Reviews the correct application of fasteners and anchors and how to install them.

Hand Bending of Conduit 7.5 hours  
Reviews the various methods of hand-bending and installing conduit. Reviews how to use math formulas to determine conduit bends. Provides practice in making various kinds of conduit bends, and cutting, reaming, and threading of conduit.

Electrical Theory One 7.5 hours  
Covers atomic structure as it related to electricity. Reviews the definition of voltage and the ways in which it can be produced. Reviews the difference between conductors and insulators. Defines the units of measurement that are used to measure the properties of electricity. Explains how voltage, current, and resistance are inter-related. Reviews Ohm's Law and describes how to calculate an unknown value. Reviews the different types of meters used to measure voltage, current, and resistance. Describes how to use the power formula and calculate the amount of power used by a circuit.

Electrical Safety 12.5 hours  
Reviews safe working procedures in a construction environment. Explains the purpose of OSHA and how it promotes safety on the job. Reviews electrical hazards and how to avoid or minimize them in the workplace. Explains safety issues concerning lockout/tagout procedures, personal protection using assured grounding and isolation programs, confined space entry, respiratory protection, and fall protection systems.

Low-Voltage Cabling 20 hours  
Explains the various sizes and gauges of wire in accordance with the American Wire Gauge (AWG) standards and describes how to determine the proper gauge for an application. Reviews how to read and identify markings on conductors and cables. Describes the different materials from which conductors are made. Describes the different types of conductor insulation. Describes the color-coding of insulation. Reviews selected NEC low-voltage cable classifications. Reviews procedures to plan and set up for a cable pull. Explains how to properly install a pull line for a cable pulling operation. Explains how to prepare the ends of conductors for pulling and safely pull cable through conduit in vertical and horizontal pathways. Reviews how to wrap, tie, fasten, label, and protect cable, and explains the importance of maintaining the proper slack. Describes the installation of cables in cable trays. Reviews the restrictions imposed by the NEC® on the uses of various types of cable.

1<sup>st</sup> Year Instructional Hours Sub Total 165

2<sup>nd</sup> Year 

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Approx. hours

Craft-Related Mathematics 7.5 Hours  
This instruction expands on the knowledge gained in the Basic Math module. Emphasis is placed on the metric system, including how to convert between corresponding English and Metric system units. Also covered are the use of scientific notation, powers and roots, and the basic concepts of algebra, geometry, and right-angle trigonometry.

Electrical Theory II	12.5 Hours
Introduces series, parallel, and series-parallel DC circuits. Covers Kirchoff's Voltage and Current Laws, and circuit analysis. Also provides an introduction AC theory, components, and circuits.	
Basic Electronics	10 Hours
Covers the principles of electronics and provides an introduction to semiconductor theory, components, and applications.	
Electrical Test Equipment	15 hours
Covers selection, inspection, use, and maintenance of common electrical test equipment, including meters, oscilloscopes, meggers, wattmeters, frequency meters, time domain reflectometers, continuity testers, recording instruments, and RF analyzers.	
Power Quality and Grounding	20 hours
Covers the purpose for grounding and bonding of electrical systems. NEC regulations pertaining to grounding and bonding are thoroughly covered. Equipment and devices used for grounding and bonding are covered including their methods of installation. Also introduced in this module is an explanation of power quality, along with the causes and effects of poor power quality. Equipment and devices used to maintain good power quality are covered.	
Introduction to Electrical Blueprints	7.5 hours
Covers electrical prints, drawings, and symbols. Apprentices learn the types of information they can find on schematics, one-line drawings, and wiring diagrams.	
Voice and Data Systems	25 hours
Presents background information for the installation and termination of telephone and data systems. Emphasis is placed on the different schemes used for premises wiring of these systems. Cables, cabling terminating devices, installation guidelines, and troubleshooting methods used with voice and data system cabling are also introduced.	
Switching Devices and Timers	10 hours
Presents the principles of operation and describes the different types and configurations of switches, relays, timers, and photoelectric devices. Guidelines for the selection of appropriate devices using specification sheets are also covered.	
Terminating Conductors	15 hours
Provides information and detailed instructions for selecting, installing, and testing connectors and other terminating devices on the various cables used in low-voltage work, including telecommunications, video and audio, and fiber optic.	
Introduction to Codes and Standards	10 hours
This module describes the scope and content of the major codes and standards that apply to the telecommunications, life safety, security, and other low-voltage systems. Emphasis is placed on the familiarization and use of the National Electrical Code® (NEC®).	

### Computer Applications

20 hours

Reviews common terms related to computers and computer networks. Reviews the components of a personal computer and explains the function of each. Reviews the procedures for uploading and downloading files to security, lighting control, or fire systems. Explains how to build and test a null modem cable. Describes how to set up and configure a personal computer. Steps trainee through procedure for loading of application software on a computer and on to using the computer to perform a task. Explains the function of each level of the open systems interconnection (OSI) reference model for data communication. Describes the characteristics of and uses for various types of data transmission media. Describes the function of the internet as it relates to network protocols.

2nd Year Instructional Hours Sub-Total

152.5

### 3<sup>rd</sup> Year

Approx. Hours

#### Cable Selection

15 hours

Covers the selection of cables for specific applications. Explains how to calculate voltage drop for various applications. Explains how to interpret and apply NEC regulations governing conductors and cables. Explains how to size cable conductors for a given load. Practice in applying various formulas and charts for load calculations.

#### Busses and Networks

25 hours

Explains the function of each level of the open systems interconnection (OSI) reference model for data communication. Describes the characteristics of and uses for various types of data transmission media. Explains how communication devices are connected to a transmission medium. Explains the methods of providing access control. Explains the operating principles of network topologies and how information is transferred using them. Describes the functional interrelationship between the OSI model layers and the network protocol. Describes the function of the Internet as it relates to network protocols. Explains the composition of microcomputer-based local area networks (LANs). Describes the various proprietary control networks. Describes the functions of bridges, routers, and gateways. Reviews the protocols used with wide area networks (WANs).

#### Fiber Optics

20 hours

Explains the basic principles of fiber optic technology, including: fundamentals, benefits, and applications of a fiber optic system; operational considerations of a fiber optic system; construction of an optical fiber; and various types of fiber optic cable. Reviews the design, operation, and performance of a fiber optic transmitter and receiver. Reviews the types and construction of fiber optic detectors. Explains the desirable features and connector losses of a fiber optic connector or splice. Explains the and demonstrates the installation of fiber optic cabling and support equipment, the applications and types of fiber optic splicing/termination, and testing procedures for fiber optic systems.

#### Maintenance and Repair

15 hours

Explains the difference between maintenance and repair. Describes the general approach to troubleshooting a problem. Reviews the common causes of system and equipment failures. Reviews procedures for isolating common problems in a system or software and common faults in wiring and equipment. Reviews common preventive maintenance measures and the method used to determine the frequency and extent of preventive maintenance.

Wireless Communication 15 hours  
Describes the fundamental principles of wireless RF communication and wireless personal communication. Reviews the basic components used in wireless systems and explains the function of each. Explains the basic operating principles of infrared systems and reviews the various types of devices used in those systems. Explains the operating principles and applications of power line carrier (PLC) systems, wireless computer networks, and satellite communication systems. Reviews the test equipment used in testing and troubleshooting wireless communications systems and the purpose of each piece of equipment. Covers the procedure for installing and testing an RF or IR wireless communication system and antennas.

Video Systems 15 hours  
Describes the basic components of a cable television system, including coaxial cable. Reviews the advantages and disadvantages of a flat transmission line. Reviews the requirements for impedance matching of cables, including standing wave ratio and signal-to-noise ratio. Explains the power and signal loss calculations for coax cable distribution systems. Describes the operation of equipment for signal analysis and level measurement. Describes the operation of satellite television systems, broadcast television antenna systems, closed-circuit television (CCTV) systems, master antenna and satellite master antenna television systems, and system grounding for interference suppression.

Audio Systems 20 hours  
Describes audio system components including sources, amplification equipment, signal processing devices and reproduction devices. Describes fundamental technical audio issues such as room acoustics, background noise, free space attenuation and echoes. Explains power requirements, cabling options, system configurations and basic design considerations. Covers standard procedures for system installation from a building code perspective and best practices for system testing and troubleshooting. Reviews the common test equipment used during installation and troubleshooting.

Media Management Systems 10 hours  
Explains the basic principles behind shared media resources and access to them via a computer network or hardware application. Describes media types used for origination sources both on an analog and digital platform including optical storage devices. Explains cabling options including fiber optic interfaces, broadband and baseband systems and twisted pair topologies. Describes user interfaces and software commonly used for this application. Reviews installation practices, common testing and troubleshooting procedures and user training techniques.

Rack Assembly 15 hours  
Describes best practices for assembling electronic system enclosures including power sequencing, grounding, weight distribution and heat dissipation. Explains cable routing based on signal levels being transmitted within the rack. Describes structural requirements and seismic considerations for various environments and applications. Explains electrical power distribution and load calculation for equipment being housed within the rack. Covers electrical inspectors expectations for power and connection to the building grounding system.

User Training & System Commissioning 15 hours  
Describes the industry's best practices for project close-out and end-user required training. Explains documentation and owners manuals that are required. Describes levels of training required based on owners personnel ranging from system operators to facility managers. Covers the basics in final testing and close-out procedures on typical systems and how to build this in as part of the overall project. Describes customer satisfaction levels and expectations on what materials need to be turned over during the cut-over phase of the project.

3rd Year Instructional Hours Sub-Total

165

**Site Survey, Project Planning, and Documentation**

15 hours

Describes the general procedure and steps involved when estimating a job for the purpose of submitting a bid, and the steps required to properly plan and complete a job once a contract for the job has been awarded. Reviews how to interpret contractual documents, working drawings, and specifications pertaining to a job to determine the requirements and scope of the work. Explains how to perform a site survey in order to establish or confirm the installed locations of new and/or existing equipment and the routing of the related cabling. Reviews how to develop a schedule for accomplishing a job or task from start to finish that efficiently accomplishes the work and is also compatible with the work performed by other trades. Describes the general procedures for accomplishing a job, including those that apply to assuring compliance with codes and standards and the control of materials, tools, and equipment.

**Introduction to Supervision**

15 hours

Describes the role of the supervisor in the construction industry. Defines an organization chart and explains why it is important to know where you fit in. Describes the personal qualities and various traits of an effective leader/supervisor. Explains how to communicate effectively. Describes motivational techniques and how they are used to get other to perform. Explains the various elements of leadership and how these are used by the supervisor on the job site. Describes the systematic problem-solving technique when dealing with personnel problems. Reviews some of the major construction documents, describes their purposes, and explains how certain documents affect the role of the supervisor. Describes how a job is closed out and how to staff a job. Explains how to develop a training program and orient a new employee to the company and job. Reviews scheduling and several types of project schedules. Describes the role the supervisor plays in job site safety.

**Fire Alarm Systems**

40 hours

Reviews the components of a fire alarm system. Explains how to calculate battery standby and total system load. Describes how to calculate voltage drop of a notification appliance circuit (NAC). Explains the difference between photo/ion/hear, multi, and uv/iv sensors. Demonstrates how to draw a 2-wire/4-wire initiating device circuit (IDC). Explains how to install and troubleshoot a 4-wire initiating device circuit. Covers how to use the National Fire Alarm Code to lay out the proper smoke detector location for a door-holder application. Covers how to use the NFA Code to determine the locations and number of detectors required in a newly-constructed residential dwelling.



Security Systems 30 hours  
Reviews the types of services security systems provide, including burglar alarm (BA), Hold-up alarm (HUA), Access control, CCTV, and local vs. monitored services. Reviews the various types of sensors, their applications and connection methods—including hardwire (zone), multiplex (point), and wireless (point). Reviews the standard types of indicating devices (bells, sirens). Describes the various types of control panels. Explains the various types of wiring methods. Describes primary and standby power requirements. Reviews basic system design concerns, including detector location, UL requirements, and false alarm prevention. Reviews systems programming options (entry/exit delays). Covers procedures for testing and maintenance of security systems.

Nurse Call & Signaling Systems 15 hours  
Covers basic emergency call and duress system requirements based on facility type. Explains the different system configurations and wiring schemes based on system type. Describes the installation procedures based on facility types and the U.L. and other building code specifications that dictate the use of these systems. Explains the connectivity options to auxiliary devices such as remote signaling systems, PBX and pagers, electronic beds and other systems. Describes the requirements for proper grounding and static discharge tolerance on the components. Covers system troubleshooting and testing procedures along with code compliance.

CCTV Systems 15 hours  
Describes the basics for installation and configurations of closed circuit TV equipment. Explains system components such as cameras, remote-positioning devices, sequential switches and monitors. Explains building code and laws governing the use of these systems and the basics on integration to graphic user interfaces. Covers the test equipment and procedures for testing and troubleshooting. Explains cabling options and the interfaces used for media conversion.

Broadband (MATV) Systems 15 hours  
Describes the major elements of head-end design and installation including antenna or satellite options, receivers and modulators, and amplification and distribution devices. Explains coaxial and optical fiber distribution methods and the function of all devices used to distribute signals for an internal or external system. Covers proper signal levels, cable attenuation, insertion loss and acceptable carrier-to-noise levels. Explains the common test equipment and troubleshooting procedures.

Systems Integration 20 hours  
Presents the big picture concepts for connecting two or more stand-alone systems together that will improve the capabilities of each system. Describes the best practices for interoperability and system performance. Explains the various interconnection options and protocols commonly used for integration. Covers network configurations used, wiring schemes and fault-tolerant procedures designed for system redundancy. Covers graphic user interfaces and custom application-driven solutions commonly used in today's high tech building automation systems.

4th Year Instructional Hours Sub-Total

165

**APPRENTICESHIP AGREEMENT**  
*(Insert Sample)*

**Attachment C**

**SAMPLE**

**AFFIRMATIVE ACTION PLAN**

**ADOPTED BY**

***(INSERT NAME OF SPONSOR)***

**AS REQUIRED UNDER TITLE 29, CODE OF FEDERAL REGULATIONS, PART 30  
AMENDED MAY 12, 1978**

**DEVELOPED IN COOPERATION WITH THE  
BUREAU OF APPRENTICESHIP AND TRAINING  
U. S. DEPARTMENT OF LABOR**

**APPROVED BY \_\_\_\_\_  
REGISTRATION AGENCY**

**DATE APPROVED: \_\_\_\_\_**

Each Registered Apprenticeship Program Sponsor who employs five or more apprentices must prepare and submit to the Registration Agency for approval, an Affirmative Action Plan (AAP) and Selection Procedure (SP) which substantially addresses the content of the following samples (Attachments C and D).

Each sponsor may submit an existing, AAP and SP for approval or use the attached samples as guides in developing their Plans.

Assistance is available through their local Registration Agency office.

### **SECTION I - INTRODUCTION**

The Sponsor enters this Plan with good faith for the purpose of promoting equality of opportunity into its registered apprenticeship program. The Sponsor seeks to increase the recruitment of qualified women and minorities for possible selection into the apprenticeship program in the event females and/or minorities are underutilized in the apprenticeship program. The Sponsor hereby adopts the following nondiscriminatory pledge and Affirmative Action Plan.

This Plan is a supplement to the Apprenticeship Standards. Any changes made by the sponsor shall become part of this written Plan, once approved by the Bureau of Apprenticeship and Training, U. S. Department of Labor.

### **SECTION II - EQUAL OPPORTUNITY PLEDGE**

The Sponsor commits to the following Equal Opportunity Pledge:

The recruitment, selection, employment, and training of apprentices during their apprenticeship, shall be without discrimination because of race, color, religion, national origin, or sex. The Sponsor will take affirmative action to provide equal opportunity in apprenticeship and will operate the apprenticeship program as required under Title 29 of the Code of Federal Regulations, Part 30.0.

### **SECTION III - UTILIZATION AND ANALYSIS, GOALS AND TIMETABLES**

In order to allow positive recruitment and full utilization of minorities and women in the apprenticeship program the Sponsor pledges to identify outreach efforts under Section IV which will be undertaken. The purpose of the analysis is to determine the minority and women=s labor force in the Sponsor=s labor market area. Once the labor force is determined, the sponsor can determine if deficiencies exist in terms of underutilization of minorities and/or women in the occupations registered with the Registration Agency. (Affirmative Action Plan Workforce Analysis form is attached).

### **SECTION IV - OUTREACH AND POSITIVE RECRUITMENT**

The Sponsor's affirmative action plan includes the following checked outreach and positive recruitment efforts that would reasonably be expected to increase minority and women=s participation in apprenticeship by expanding the opportunity of minorities and women to become eligible for apprenticeship selection. **Once those efforts have been checked, the sponsor shall set forth the specific steps they intend to take under each identified effort.** The Sponsor will identify **a significant number of activities** in order to enable it to meet its obligation under Title 29,CFR Part 30.4(c).

- A. An announcement of apprenticeship openings must be disseminated thirty (30) days in advance of the earliest date for application at each interval to the following agencies/organizations:

- Registration Agency
- Women=s Organizations/Centers
- Local Schools
- Employment Service Centers
- One Stop Centers
- Vocational Education Schools
- Other Organizations/Centers (which can effectively reach minorities and women)
- Newspapers (which are circulated in the minority community and among women)

The announcement shall include the nature of the apprenticeship, requirements for admission to apprenticeship, availability of apprenticeship opportunities, sources of apprenticeship applications, and the Sponsor=s equal opportunity policy. Applications will be taken for no less than a two (2) week period.

- B. Participation in annual workshops conducted by employment service agencies for the purpose of familiarizing school, employment service and other appropriate personnel with the apprenticeship program and current opportunities.
- C. Cooperation with school boards and vocational educational systems to develop programs for preparing students to meet the standards and criteria required to qualify for entry into the apprenticeship program.
- D. Internal communication of the Sponsor=s equal opportunity policy should be conducted in such a manner to foster understanding, acceptance, and support among the Sponsor=s various officers, supervisors, employees, and members, and to encourage such persons to take the necessary action to aid in meeting its obligation under Title 29, CFR Part 30.
- E. Engaging in programs such as outreach for the positive recruitment and preparation of potential applicants for apprenticeships; where appropriate and feasible, such programs shall provide for pre-testing experience and training. In initiating and conducting these programs, the Sponsor may be required to work with other Sponsors and appropriate community organizations. The Sponsor shall also initiate programs to prepare women and encourage women to enter traditionally male programs.
- F. Encouraging the establishment and utilization of programs of pre-apprenticeship, preparatory occupational training, or others designed to afford related work experience or prepare candidates for apprenticeship. The Sponsor shall make appropriate provisions in its affirmative action plan to assure that those who complete such programs are afforded full and equal opportunity for admission into the apprenticeship program.
- G. Utilizing skilled Electronic Systems Technicians to assist in the implementation of affirmative action in the apprenticeship program.
- H. Granting advance standing or credit on the basis of previously acquired experience, training, skills, or aptitude for all applicants equally.
- I. Other appropriate action to ensure that the recruitment, selection, employment, and training of apprentices during their apprenticeship shall be without discrimination because of race, color, religion, national origin, or sex (e.g., general publication of apprenticeship opportunities and advantages in advertisements, industry reports,

articles, etc., use of present minority and female apprentices and skilled Electronic Systems Technicians as recruiters; career counseling; development of reasonable procedures to ensure employment opportunity, including reporting systems, on-site reviews, briefing sessions)

**(Identify Action:)**

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**FOR EACH BOX CHECKED IN SECTION IV, LIST EACH SPECIFIC STEP THAT THE SPONSOR WILL UNDERTAKE TO FULFILL THAT OUTREACH AND RECRUITMENT STEP**

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**SECTION V - ANNUAL REVIEW OF AFFIRMATIVE ACTION PLAN**

The Sponsor will make an annual review of its current Affirmative Action Plan and its overall effectiveness and institute any revisions or modifications warranted. The review shall analyze (independently and collectively) the affirmative action steps taken by the Sponsor for evaluating the positive impact, as well as the adverse impact in the areas of outreach and recruitment, selection, employment, and training. The Sponsor will work diligently to identify the cause and effect that results from their affirmative action measures. The Sponsor will continually monitor these processes in order to identify the need for a new affirmative action effort and/or deletion of ineffective existing activity(ies). All changes to the Affirmative Action Plan must be submitted to the Registration Agency for registration. The Sponsor will continually monitor the participation rates of minorities and women in the apprenticeship program in an effort to identify any type of underutilization. If underutilization exists, corrective action will be immediately implemented. The goals and timetables also will be reviewed annually and updated where necessary.

**SECTION VI - OFFICIAL ADOPTION**

The *(Insert Name of Sponsor)* hereby officially adopts this Affirmative Action Plan on this \_\_\_\_\_ day of \_\_\_\_\_, (INSERT YEAR).

\_\_\_\_\_  
SIGNATURE OF (SPONSOR PROVIDES TITLE)

\_\_\_\_\_  
PRINTED NAME

**AFFIRMATIVE ACTION PLAN  
WORKFORCE ANALYSIS**

FOR RAIS CODE: \_\_\_\_\_ OCCUPATIONAL TITLE: \_\_\_\_\_

Sponsor: \_\_\_\_\_ RAIS # \_\_\_\_\_

Address: \_\_\_\_\_ Phone# \_\_\_\_\_

City: \_\_\_\_\_ State: \_\_\_\_\_ Zip: \_\_\_\_\_

Type of selection method used: \_\_\_\_\_

Labor Market

Area: \_\_\_\_\_

**STATISTICAL AREA LABOR FORCE ANALYSIS**

Total Work Force:

Women: \_\_\_\_\_ (    %) of Work Force

Minority: \_\_\_\_\_ (    %) of Work Force

**SPONSOR'S STATISTICAL DATA**

**Skilled Electronic Systems Technicians**

Total Skilled Electronic Systems Technicians

Women: \_\_\_\_\_ (    %) of Journeyworkers

Minority: \_\_\_\_\_ (    %) of Journeyworkers

**Apprentices:**

Total Apprentices:

Women: \_\_\_\_\_ (    %) of Apprentices

Minority: \_\_\_\_\_ (    %) of Apprentices

**DETERMINATION OF UTILIZATION**

Minority Underutilization Yes \_\_\_\_\_ No \_\_\_\_\_

Female Underutilization Yes \_\_\_\_\_ No \_\_\_\_\_

**SPONSOR'S GOALS:**

The Sponsor agrees to take affirmative action with the goal of selecting \_\_\_\_\_ % Minorities and \_\_\_\_\_ % Women during the next year or hiring period.

Estimated Number of New Apprentices to be hired during the next year: \_\_\_\_\_.

\_\_\_\_\_  
Sponsor's Signature

\_\_\_\_\_  
Approved by Agency

\_\_\_\_\_  
Title

\_\_\_\_\_  
Title

\_\_\_\_\_  
Date

\_\_\_\_\_  
Date



**SAMPLE**

**QUALIFICATIONS AND SELECTION  
PROCEDURES**

**ADOPTED BY**

***(INSERT NAME OF SPONSOR)***

**DEVELOPED IN COOPERATION WITH THE  
BUREAU OF APPRENTICESHIP AND TRAINING  
U. S. DEPARTMENT OF LABOR**

**APPROVED BY \_\_\_\_\_  
REGISTRATION AGENCY**

**DATE APPROVED: \_\_\_\_\_**

**The certification of this selection procedure is not a determination that, when implemented, the selection procedure meets the requirements of the Uniform Guidelines on Employee Selection Procedures (41 CFR part 60-3) or Title 29 CFR Part 30.**

**SECTION I - MINIMUM QUALIFICATIONS**

Applicants shall meet the following minimum qualifications:

- A. Age  
An applicant, who is sixteen (16) years of age and is participating in a school-to-work program or equivalent and who otherwise meets all qualifications may be rated, ranked and

placed on the list of eligible applicants. Such an applicant must be eighteen (18) years of age prior to being accepted into the apprenticeship program.

**“EXAMPLES”**

B. Education

A high school diploma or GED equivalency is required. Applicant must provide an official transcript(s) for high school and post high school education and training. All GED records must be submitted if applicable.

Applicants must submit a DD-214 to verify military training and/or experience if they are a veteran and wish to receive consideration for such training/experience.

C. Physical

Shall be physically capable of performing the essential functions of the apprenticeship program without posing a direct threat to the health and safety of the individual or others.

Qualified applicants may be subject to a physical examination or drug screening or both on acceptance into the program and prior to being employed. The cost of the examination and/or drug screening shall be the responsibility of the Sponsor.

**SECTION II - APPLICATION PROCEDURES “EXAMPLES”**

- A. Applicants shall be accepted throughout the year. All persons requesting an application shall have one made available upon signing the applicant log.
- B. All applications shall be identical in form and requirements. The application form shall be numbered in sequence corresponding with the number appearing on the applicant log so that all applications can be accounted for. Columns will be provided on the applicant log to show race/ethnic and sex identification and the progress by dates and final disposition of each application.
- C. Before completing the application, each applicant will be required to review the Apprenticeship Standards and will be provided information about the program. If the applicant has any additional questions on the qualifications or needs additional information to complete the application, it will be provided by the Sponsor.
- D. Receipt of the properly completed application form, along with required supporting documents (proof of age – driver=s license, birth certificate or other acceptable documentation; copy of high school diploma, GED Certificate or other acceptable documentation) will constitute the completed application.
- E. Completed applications will be checked for minimum qualifications. Applicants deficient in one or more qualifications or requirements or making false statements on their application will be notified in writing of their disqualification. The applicant will also be notified of the appeals right available to them. No further processing of the application will be taken.
- F. Applicants meeting the minimum qualifications and submitting the required documents will be notified where and when to appear for the interview.

### **SECTION III - SELECTION PROCEDURES “EXAMPLES”**

- A. The Sponsor shall schedule the interview and evaluation session. All applicants who have met the minimum qualifications and have submitted the required documents must be notified of the date, time, and place to appear.
- B. The interviewer(s) will rate each applicant during the interview on each of the factors on the Applicant Rating Form taking into account the information on the application, required documents, if applicable, and the judgment derived from the interview.
- C. After completing the interview and evaluation of the applicants, the individual rating scores of the interviewer(s) will be added together and averaged to determine the applicant=s final rating.
- D. Applicants will be placed on a ranking List@ according to their scores at the evaluation session, with the applicant having the highest score being at the top of the list, and all applicants then listed in descending order based on score.
- E. As openings for the registration of new apprentices occur, the highest ranked applicant will be notified of selection by telephone. It shall be the responsibility of the applicant to keep the Sponsor informed of their current mailing address and telephone number.
- F. Selected applicants must respond to the notice of selection within forty-eight (48) hours of notice. If applicants cannot be reached by telephone, their names will be passed and notice sent to their address by A Certified Mail-Return Receipt Requested,@ to determine if the applicants are still interested. If no response is received in fifteen (15) working days from the written notice, the applicants= name will be removed from the list. Only one certified notice will be mailed.
- G. Qualified applicants remaining on a preceding ranking list will automatically be carried forward on the new ranking list and slotted in wherever their rating score placed them for a period of two (2) years, unless the applicant has been removed from the list by their own written request or following failure to respond to an apprentice opening. Applicants who were not placed during the two (2) year period they were on the ranking list, will be required to reapply.
- H. During the two-year period, applicants who feel that their qualifications have improved since their original rating may submit documented evidence of such additional experience or training and request reevaluation and rating at the next regular processing cycle.
- I. Youth who complete a Job Corps training program in the occupation of Electronic Systems Technician, who meet the minimum qualifications of the apprenticeship program, may be admitted directly into the program, or if no apprentice opening is available, the Job Corps graduate may be placed at the top of the current applicant ranking list and given first opportunity for placement. The Sponsor shall evaluate the Job Corps training received for granting appropriate credit on the term of apprenticeship. Entry of Job Corps graduates shall be done without regard to race, color, religion, national origin, or gender. ***(Note: This is a method of direct entry into the apprenticeship program,)***
- J. Veterans who completed military technical training school and participated in a registered apprenticeship program while in the military in the Electronic Systems Technician occupation may be given direct entry into the apprenticeship program. The Sponsor shall evaluate the military training received for granting appropriate credit on the term of apprenticeship and the appropriate wage rate. The Sponsor will determine what training requirements they need to

meet to ensure that they receive all necessary training for completion of the apprenticeship program. Entry of military veterans shall be done without regard to race, color, religion, national origin, or sex.

#### **SECTION IV - COMPLAINT PROCEDURE**

- A. Any apprentice or applicant for apprenticeship who believes that he or she has been discriminated against on the basis of race, color, religion, national origin, or sex, with regard to apprenticeship or that the equal opportunity standards with respect to his or her selection have not been followed in the operation of an apprenticeship program, may personally or through an authorized representative, file a complaint with the U.S. Department of Labor or, at the apprentice or applicant's election, with the private review body established by the sponsor (if applicable).
- B. The complaint shall be in writing and shall be signed by the complainant. It must include the name, address, and telephone number of the person allegedly discriminated against, the Sponsor involved, and a brief description of the circumstances of the failure to apply equal opportunity standards.
- C. The complaint must be filed not later than 180 days from the date of the alleged discrimination or specified failure to follow the equal opportunity standards, and, in the case of complaints filed directly with the review bodies designated by the Sponsor to review such complaints, any referral of such complaint by the complainant to the Department must occur within the time limitation stated above or 30 days from the final decision of such review body, whichever is later. The time may be extended by the Department for good cause shown.
- D. Complaints of sexual harassment in the workplace may be filed and processed under Title 29, CFR Part 30, and the procedures as set forth above.
- E. The Sponsor will provide written notice of their complaint procedure to all applicants for apprenticeship and all apprentices.

#### **SECTION V - MAINTENANCE OF RECORDS**

The Sponsor will keep adequate records including a summary of the qualifications of each applicant, the basis for evaluation and for selection or rejection of each applicant, the records pertaining to interviews of applicants and the original application for each applicant. The records pertaining to individual applicants, selected or rejected, shall be maintained in such manner as to permit the identification of minority and female (minority and nonminority) participants.

In addition to the above requirements, adequate records shall include a brief summary of each interview (if applicable) and the conclusions on each of the specific factors, e.g., motivation, ambition, and willingness to accept direction which are part of the total

judgment. Records of applicant selections shall be maintained for not less than 5 years and made available upon request to the Department of Labor or other authorized representative.

**SECTION VI - OFFICIAL ADOPTION OF SELECTION PROCEDURES**

The *(Insert Name of Sponsor)* hereby officially adopts these Selection Procedures on this \_\_\_\_\_ day of \_\_\_\_\_, (INSERT YEAR).

\_\_\_\_\_  
SIGNATURE OF (SPONSOR TO PROVIDE TITLE)

\_\_\_\_\_  
PRINTED NAME

\_\_\_\_\_  
SIGNATURE OF (SPONSOR TO PROVIDE TITLE)

\_\_\_\_\_  
PRINTED NAME

**ATTACHMENT D**

**SAMPLE EMPLOYER ACCEPTANCE AGREEMENT**

The following hereby agrees to comply with the provisions of the Apprenticeship Standards (Program Number: \_\_\_\_\_ formulated by the **(Insert Name of Organization)**. I hereby agree to carry out the intent and purpose of the said Standards and to abide by the rules and decisions of the Apprenticeship Committee established under these Standards. I have been furnished a true copy of these Apprenticeship Standards, and have read and understand them and hereby request certification to train Apprentices in the occupation classification identified under the provisions of these Standards, with all attendant rights and benefits thereof, until canceled voluntarily or revoked for good cause by the Registration Agency.

\_\_\_\_\_  
(Name of Employer)

\_\_\_\_\_  
(Address of Employer)

\_\_\_\_\_  
(City, State and Zip Code)

\_\_\_\_\_  
(Area Code and Telephone Number)

\_\_\_\_\_  
(Name and Title of Representative)

\_\_\_\_\_  
(Signature of Representative)

**Note: EACH PARTICIPATING EMPLOYER SHALL COMPLETE THIS FORM AND FILE WITH THE PROGRAM SPONSOR. AN ADDITIONAL COPY WILL BE FORWARDED TO THE REGISTRATION AGENCY THEIR RECORDS, IN ACCORDANCE WITH REGISTRATION AGENCY POLICY.**