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**AFSC 3E1X1  
HEATING, VENTILATION, AIR CONDITIONING AND REFRIGERATION  
CAREER FIELD EDUCATION AND TRAINING PLAN**

Compliance with AFI 36-2201, other training policies/documentation, and publication policies is required. CFETP 3E1X1, 15 January 2017, is changed as follows:

1. The following change was made to Part II.

<u>Item</u>	<u>Page</u>	<u>Para</u>	<u>Action</u>
1.	50	4. A (1)	13.7 remove "2b (I)" (dashed)

2. After necessary actions, file this change in the back of the CFETP.

BY ORDER OF THE SECRETARY OF THE AIR FORCE

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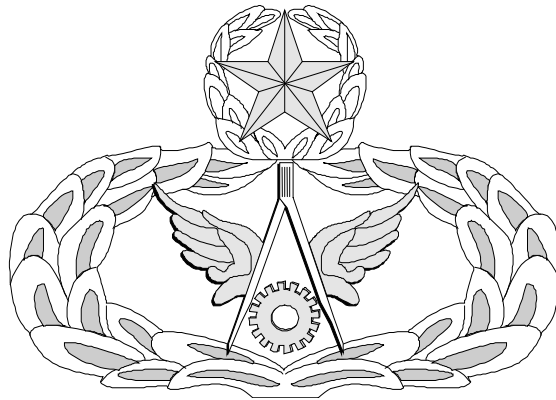
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**DEPARTMENT OF THE AIR FORCE**  
**Headquarter US Air Force**  
**Washington DC 20330-5000**

**CFETP 3E1X1**  
**Part I and II**  
**15 JAN 2017**  
**(Incorporated Change 1**  
**Dated 16 July 2019)**

**Air Force Specialty Code (AFSC) 3E1X1**

**HEATING, VENTILATION, AIR CONDITIONING  
AND REFRIGERATION (HVAC/R)**



**MASTER**



**BASIC**



**SENIOR**

**CAREER FIELD EDUCATION AND TRAINING PLAN**

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**CAREER FIELD EDUCATION AND TRAINING PLAN  
HEATING, VENTILATION, AIR CONDITIONING AND  
REFRIGERATION (HVAC/R) SPECIALTY**

**TABLE OF CONTENTS**

**PREFACE**.....4

**ABBREVIATIONS/TERMS EXPLAINED** .....5

**PART I**.....9

**SECTION A - GENERAL INFORMATION** .....9

A1. Purpose.....9

A2. Uses .....9

A3. Coordination and Approval.....10

**SECTION B - CAREER FIELD PROGRESSION AND INFORMATION** .....11

B1. Specialty Descriptions .....11

B2. Skill and Career Progression .....13

B3. Training Decisions .....15

B4. Community College of the Air Force (CCAF) Academic Programs .....16

B5. CCAF Degree Completion Requirements .....17

B6. Civil Engineer Career Field Path .....21

B7. Enlisted Training Path.....22

B8. Enlisted Professional Military Education (EPME) .....24

**SECTION C - SKILL LEVEL TRAINING REQUIREMENTS** .....25

C1. Purpose.....25

C2. Speciality Qualification.....25

**SECTION D - RESOURCE CONSTRAINTS** .....31

D1. Purpose.....31

D2. Apprentice (3-Level) Training.....31

D3. Journeyman (5-Level) Training .....31

D4. Craftsman (7-Level) Training .....31

D5. Superintendent (9-Level) Training.....31

**SECTION E – TRANSITIONAL TRAINING GUIDE** .....32

**PART II**.....33

**SECTION A - SPECIALTY TRAINING STANDARD**.....33

A1. Implementation. ....33

A2. Purpose.....33

A3. Recommendations.....36

**SECTION B - COURSE OBJECTIVE LIST (COL) .....37**  
 B1. Measurement .....37  
 B2. Standard.....37  
 B3. Proficiency Level. ....37  
 B4. Course Objective List.....37

**SECTION C - SUPPORT MATERIAL.....38**  
 C1. Air Force Qualification Training Packages.....38  
 C2. AFQTP Assessment for Civil Engineer CDCs .....38

**SECTION D – EDUCATION AND TRAINING COURSE INDEX .....39**  
 D1. Purpose.....39  
 D2. Air Force In-Residence Courses/Mobile Training Team (MTT) Courses.....39  
 D3. Air Force Career Development Academy (AFCDA). ....39  
 D4. Exportable/Web-based Courses/Information.....39  
 D5. Courses/CDCs Under Development/Revision .....40

**SECTION E – MAJCOM UNIQUE REQUIREMENTS .....41**

**SECTION F - HOME STATION TRAINING.....42**  
 F1. Purpose .....42  
 F2. Home Station Training (HST). ....42  
 F3. Combat Skills Training (CST).....42  
 F4. Mission Essential Equipment Training (MEET) .....42  
 F5. AF Expeditionary (ES) Training Requirement.....42  
 F6. Training References.....42

**Attachments**  
 Attachment 1 – Qualitative Requirements (Proficiency Code Key).....44  
 Attachment 2 – 3E1X1 Specialty Training Standard.....45  
 Attachment 3 – 3E1X1 AFQTP Documentation Record.....54

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OPR: HAF/A4C  
 Certified by: CMSgt John A. Wilde  
 Supersedes: CFETP 3E1X1, 7 May 2007  
     Change 1, 1 Feb 2011  
     Change 2, 1 Apr 2014

Pages: 56

## PREFACE

This Career Field Education and Training Plan (CFETP) is a comprehensive education and training document that identifies life-cycle education/training requirements and training support resources for the Heating, Ventilation, Air Conditioning and Refrigeration (HVAC/R) specialty. The CFETP will provide our personnel with a clear career path to success and instill rigor in all aspects of our career field training.

***Note: Civilian occupying associated positions may use Part II as a guide to support duty position qualification training.***

The CFETP consists of two parts used by the supervisor to plan, manage, and control training within the career field.

Part I provides information necessary for overall management of the specialty.

- Section A provides general information about how the CFETP will be used.
- Section B identifies career field progression information, duties and responsibilities, training strategies, and the career field path.
- Section C associates each skill-level with specialty qualifications (knowledge, education, and training).
- Section D indicates resource constraints.
- Section E identifies transition training guide requirements for SSgt through MSgt.

Part II includes the following:

- Section A identifies the Specialty Training Standard (STS) to include duties, tasks, and technical references to support Air Education and Training Command (AETC) conducted training, wartime course, and correspondence course requirements.
- Section B contains the course objective list and training standards supervisors will use to determine if an Airman has satisfied training requirements.
- Section C identifies available support materials.
- Section D identifies a training course index supervisors can use to determine resources available to support training. Included here are both mandatory and optional courses, and exportable courseware.
- Section E identifies MAJCOM-unique training requirements supervisors can use to determine additional training required for the associated qualification needs.
- Section F identifies home station training references and courses material required for this specialty in support of contingency/wartime training.

***Note: At unit level, supervisors and trainers must use Part II to identify, plan, and conduct training commensurate with the overall goals of this guide.***

Using guidance provided in the CFETP will ensure individuals in this specialty receive effective and efficient training at the appropriate point in their careers. This plan will enable us to train today's work force for tomorrow's jobs. At the unit level, supervisors and trainers will use Part II to identify, plan, and conduct training commensurate with the overall goals of this guide.

## ABBREVIATIONS/TERMS EXPLAINED

**Advanced Distributive Learning (ADL).** Anytime, anyplace learning within DoD consisting of instructional modules comprised of sharable content objectives in an Internet/Intranet environment.

**Advanced Training (AT).** A formal course training toward a technical or supervisor level Air Force Specialty (AFS). Training is for selected career Airmen in the advanced technology level of the AFS. Graduates are not awarded a new AFSC.

**Air Force Career Field Manager (AFCFM).** An individual on the Air Staff charged with the responsibility for overseeing all training and career field management aspects of an Air Force specialty or group of specialties.

**Air Force Enlisted Classification Directory (AFECD)** – The Official directory for all military enlisted classification descriptions, codes, and identifiers. The specialty descriptions and codes will be used to identify each Air Force job (valid requirements) and describes the minimum mandatory qualifications of personnel to fill these jobs. The updated AFECD is available at AF Personnel Center's web site located at <http://ask.afpc.randolph.af.mil/> under the military classification menu.

**Air Force Civil Engineer Center (AFCEC).** Formally, Air Force Civil Engineer Support Agency (AFCESA), the focal point for all Civil Engineer training development. All individual AFSC Force Development Managers (FDM) are located at AFCEC.

**Air Force Credentialing Opportunities On-Line (AF COOL) Program.** AF COOL replaced the CCAF Credentialing and Education Research Tool (CERT). The AF COOL Program can be accessed through the AF Virtual Education Center (AFVEC). The site provides a research tool designed to increase an Airman's awareness of national professional credentialing and CCAF education opportunities available for all Air Force occupational specialties.

**Air Force Institute of Technology (AFIT).** Provides vital, relevant, and connected education that enables Airmen to be ready engineers and great leaders who know how to build sustainable installations to last while leading the change for the Civil Engineer career field. Course list can be accessed at <http://www.afit.edu/cess/index.cfm>.

**Air Force Training Record (AFTR).** Electronic training data base to document training and access is located at the [Civil Engineer Virtual Learning Center \(CE-VLC\)](#).

**Air Force Job Qualification Standard/Command Job Qualification Standard (AFJQS/CJQS).** A comprehensive task list that describes a particular job type or duty position. Used by supervisors to document task qualifications. The tasks on the AFJQS/CJQS are common to all persons serving in the described duty position.

**Air Force Qualification Training Package (AFQTP).** A required instructional package designed for use at the unit to qualify, or aid qualification, in a duty position or program, or on a piece of equipment. AFQTPs identify the Air Force's standardized method for performing the task. The AFQTP may be printed (paper-based), computer-based, in other audiovisual media formats, or all three. If determined by the AFCFM, a paper-based; along with a computer-based product may be needed to satisfy a particular training requirement.

**Career Field Education and Training Plan (CFETP).** A comprehensive, multipurpose document encapsulating the entire spectrum of education and training for a career field. It outlines a logical growth plan that includes training resources and is designed to make career field training identifiable, to eliminate duplication, and to ensure this training is budget defensible.

**Chief, Civil Engineer Force Development (CCEFD).** Located at AFCEC, this individual is responsible for all force development education and training associated within the 3E0 to 3E6 AFSCs.

**Civil Engineer Virtual Learning Center (CE-VLC).** Anytime, anyplace learning within the Civil Engineer Community consisting of instructional modules and skill-level awarding course material specific to the AFSC.

**Commercial off The Shelf (COTS).** Commercially-procured training products.

**Computer-Based Training (CBT).** A self-paced stand-alone computer product used to deliver interactive subject and task knowledge.

**Core Tasks (\*).** Mandatory tasks which the AFCFM has identified as a minimum qualification requirement within an Air Force specialty or duty position. These tasks exemplify the essence of the career field.

**Critical Tasks.** Tasks that have been identified by the work center supervisor as having a detrimental effect on mission accomplishment if not performed correctly. Critical tasks may or may not be the same as core tasks but are mandatory if identified as 'critical' to the individual's position by the supervisor or work center.

**Diamond Tasks (◆).** Diamond tasks are extremely important to the career field. Diamond tasks are the same as core tasks with one exception--equipment shortfalls at most locations have created problems with the actual **hands-on** training/certification of these tasks. In instances where required equipment is not available for instruction, completion of the task's AFQTP is all that is required for upgrade and qualification training. Hands-on certification will be accomplished at the first opportunity when equipment is available.

**Distance Learning (DL).** Includes Video Tele-seminar (VTS), Video Tele-training (VTT), and CBT. Formal courses that a training wing or a contractor develops for export to a field location (in place of resident training) for trainees to complete without the on-site support of the formal school instructor. For instance, courses are offered by Air Force Institute of Technology, Air University, and Training Detachment.



**Duty Position Tasks.** The tasks assigned to an individual for the position currently held. These include as a minimum all core tasks, diamond tasks, critical tasks and any other tasks assigned by the supervisor.

**Enlisted Professional Military Education (EPME).** EPME is an Air Force time in service (TIS) based model. EPME requirements are developed in three phases. EPME ensures a target delivery of institutional competencies (ICs) throughout the Continuum of Learning across an enlisted airman's career.

**Expeditionary Combat Support-Training Certification Center (ECS-TCC).** Total Force training center managed by the Air Force Reserve Command.

**Force Development Manager (FDM).** An individual assigned to the Air Force Civil Engineer Center (AFCEC) charged with the responsibility for overseeing all training and career field management aspects of a specific Air Force Civil Engineer specialty.

**Initial Skills Training.** AFS-specific training an individual receives upon entry into the Air Force or upon retraining into this specialty for award of the 3-skill level. Normally, this training is conducted by AETC at one of the technical training wings.

**Just-in-Time (JIT) Training** – Training required just prior to a selected deployment or tasking that delivers training necessary for mission accomplishment. It is typically predicated on hard-to-obtain contingency skills.

**MAJCOM Functional Managers (MFMs).** Senior leaders, designated by the appropriate functional authority (FA) who provide day-to-day management and responsibility over specific functional communities at the MAJCOM, FOA, DRU, or ARC level. While they should maintain and institutional focus in regards to resource deployment and distribution, MFMs are responsible for ensuring their specialties are equipped, developed, and sustained to meet future needs of the total Air Force mission.

**Occupational Analysis Report (OAR).** A detailed report showing the results of an occupational survey of tasks performed within a particular AFS. The information collected from this survey is used to make changes to upgrade training and Weighted Airman Promotion Exams.

**On-the-Job Training (OJT).** Hands-on, over-the-shoulder training conducted to certify personnel in both upgrade (skill-level award) and job qualification (duty position certification) training.

**Proficiency Training.** Additional training, either in-residence, advanced/supplemental training courses, or on-the-job training provided to personnel to increase their skills and knowledge beyond the minimum required for upgrade.

**Qualification Training (QT).** Actual hands-on task performance training designed to qualify an individual in a specific duty position. This portion of the dual channel on-the-job training program occurs both during and after the upgrade training process. It is designed to provide the performance skills required to do the job.

**Regional Training Site (RTS).** Total Force training centers managed by the Air National Guard.

**Resource Constraints.** Resource deficiencies, such as money, facilities, time, manpower, or equipment that precludes desired training from being delivered.

**Specialty Training.** A mix of formal training (technical school) and informal training (on-the-job) to qualify and upgrade airmen in the award of a skill level.

**Specialty Training Standard (STS).** Describes skills and knowledge that airmen in a particular AFS need on the job. It further serves as a contract between the Air Education and Training Command (AETC) and the user to show the overall training requirements for an AFS taught in the resident and nonresident courses.

**Specialty Training Requirements Team (STRT)** – Subject Matter Experts from each MAJCOM conduct research prior to Utilization and Training Workshop (U&TW), develops training, recommends delivery methods and determines if a full fledged U&TW is required. The team finalizes the CFETP, specialty description and develops a standard for all courses.

**Subject Matter Expert (SME)** – An individual with expertise in a particular subject matter, tasked to represent the subject matter to an individual or group for technical accuracy.

**Supplemental Training.** A formal course which provides individuals who are qualified in one or more positions of their Air Force Specialty (AFS) with additional skills/knowledge to enhance their expertise in the career field. Training is for selected career airmen at the advanced level of the AFS.

**Total Force.** All collective Air Force components (Active Duty, Reserve, Guard, and Civilian elements) of the United States Air Force.

**Upgrade Training (UGT).** Identifies the mandatory courses, task qualification requirements, and correspondence course completion requirements for award of the 5-, 7-, and 9-skill levels.

**Utilization and Training Workshop (U&TW).** An executive decision meeting to vote on funding for instructor authorizations, equipment and facilities needed to support any new or revised training coming from the STRT. This workshop will determine which organizations will furnish resources and establish commitment and delivery dates in writing, document equipment availability dates and any problems and establish training delivery dates.

**Vectored Positions.** They are key Senior Noncommission Officer (SNCO) positions in your career field. To learn more about vectored positions go to <https://afvec.langley.af.mil/myvector>.

**PART I****SECTION A - GENERAL INFORMATION**

**A1. Purpose:** This CFETP provides information necessary for the AFCFMs, MAJCOM functional managers (MFMs), commanders, education and training managers, supervisors/trainers, and certifiers to plan, develop, manage, and conduct an effective career field training program. This plan outlines the training personnel in an AFS require to develop and progress throughout their careers. It identifies initial skills, upgrade, qualification, advanced, and proficiency training.

**A1.1. Initial Skills Training** is the AFS-specific training an individual receives upon entry into the Air Force or upon retraining into this specialty for award of the 3-skill level. For our career field, this training is provided by AETC at the 366 TRS, Sheppard AFB, Texas.

**A1.2. Upgrade Training.** Identifies the mandatory courses, task qualification requirements, and correspondence course completion requirements for award of the 5-, 7-, and 9-skill levels.

**A1.3. Qualification Training.** Hands-on task performance training designed to qualify an Airman in a specific duty position. This training program occurs both during and after the upgrade training process. It is designed to provide the performance skills/knowledge training required to do the job.

**A1.4. Advanced Training.** A formal course for training personnel towards a technical or supervisory level in an AFS. Training is for selected career Airmen in the advanced technology of the AFSs. Graduates are not awarded a new AFSC.

**A1.5. Proficiency Training.** Additional training either in-residence, exportable advanced training courses, or on-the-job training, provided to people to increase their skills and knowledge beyond the minimum required for upgrade.

**A1.6.** The CFETP has several purposes – some are:

**A1.6.1.** Serves as a management tool to plan, manage, conduct, and evaluate a career field training program. It is used to help supervisors identify training at the appropriate point in an individual's career.

**A1.6.2.** Identifies task and knowledge training requirements for each skill level in this specialty and recommends education/training throughout each phase of an individual's career.

**A1.6.3.** Lists training courses available in this specialty and identifies sources of training and the delivery methods.

**A1.6.4.** Identifies major resource constraints that impact full implementation of the desired career field training process.

**A2. Uses.** MFMs and supervisors will use the plan at all levels to ensure comprehensive and cohesive training programs are available for each individual in the specialty.

**PART I**

A2.1. AETC training personnel will develop/revise formal resident, non-resident, field, and exportable training based on requirements established by the users and documented in Part II of the CFETP. They will also work with the AFCFM and Air Force Civil Engineer Center Force Development Division (HQ AFCEC/COF) to develop acquisition strategies for obtaining resources needed to provide the identified training.

A2.2. MFMs will ensure their training programs complement the CFETP mandatory initial, upgrade, qualification, and proficiency training requirements and identify requirements that can be satisfied by OJT, resident training, contract training, or exportable courses. MAJCOM-developed training to support this AFS must be identified for inclusion into the plan.

A2.3. Unit Education and Training Managers and supervisors must ensure each individual completes the mandatory training requirements (including MAJCOM supplemental requirements if applicable) for the upgrade training specified in this plan.

A2.4. Each individual will complete mandatory training requirements specified in this plan. The list of courses in Part II of this CFETP will be used as a reference to support training.

**A3. Coordination and Approval.** The AFCFM is the approval authority for the CFETP. Also, the AFCFM will initiate an annual review of this document to ensure currency and accuracy. MAJCOM representatives and AETC personnel will identify and coordinate on the career field training requirements. Using the list of courses in Part II, they will eliminate duplicate training.

**PART I****SECTION B - CAREER FIELD PROGRESSION AND INFORMATION**

**B1. Specialty Descriptions.** Heating, Ventilation, Air Conditioning and Refrigeration Apprentice, Journeyman, Craftsman and Superintendent.

B1.1. Specialty Summary. Apprentice (3E131), Journeyman (3E151), and Craftsman (3E171). Installs, operates, maintains, and repairs heating, ventilation, air conditioning and refrigeration (HVAC/R) systems, combustion equipment, and industrial air compressors. Manages HVAC/R fuel emissions and refrigerant handling programs and activities. Related DoD Occupational Subgroup: 172000.

B1.1.1. Duties and Responsibilities for Apprentice (3E131), Journeyman (3E151), and Craftsman (3E171).

B1.1.2. Installs and operates HVAC/R systems and equipment. Interprets mechanical and electrical system drawings and schematics, and installs HVAC/R components. Installs, repairs, fabricates, and tests piping and tubing systems. Installs, connects, troubleshoots, and maintains HVAC/R controls. Tests HVAC/R equipment for proper operation. Balances air and water in HVAC/R systems. Monitors system operation to ensure efficiency and compliance with technical orders, manufacturer handbooks, state and local procedures, codes, directives, and Environmental Protection Agency regulations. Evaluates water treatment for heating and cooling systems. Ensures compliance with safety and environmental regulations for fuels, refrigerants, and hazardous materials.

B1.1.3. Maintains, and repairs HVAC/R equipment and systems. Performs scheduled preventive maintenance and seasonal overhaul on systems and components. Uses drawings and schematics to analyze and isolate system malfunctions. Troubleshoots malfunctions. Repairs or replaces components. Modifies equipment for specific missions or to increase efficiency.

B1.1.4. Maintains hand and powered tools and equipment. Maintains shop tools and equipment.

B1.1.5. Advises on problems with installation and repairs to HVAC/R equipment and systems. Solves maintenance problems by studying layout drawings, wiring and schematic drawings, and analyzing construction and operating characteristics. Develops and establishes operation and maintenance procedures to ensure maximum efficiency.

B1.1.6. Performs planning activities. Performs facility surveys. Surveys proposed work to determine resource requirements. Prepares cost estimates for in-service work. Applies engineered performance standards to plan and estimate jobs. Coordinates plans and other activities.

B1.2. Duties and Responsibilities for Superintendent (3E490).

**PART I**

B1.2.1. Specialty Summary. Superintendent (3E490). Manages and directs facility and infrastructure systems, daily activities devoted to water, wastewater, fuel, heating, cooling, ventilation, combustion equipment, industrial air compressors, natural gas, refrigeration, liquid fuels distribution, interior plumbing, fire suppression, sprinkler, irrigation systems, pest management, chemical application processes, and associated operations and non-electric kitchen equipment such as grease traps and other miscellaneous collection systems. Related DoD Occupational Subgroup: 172000.

B1.2.2. Plans and organizes installation, maintenance, and repair of all career field systems and components to include both in-garrison and specialized training requirements. Investigates proposed work sites to determine resource requirements. Prepares cost estimates for in-service work requirements. Applies engineered performance standards in planning and estimating jobs. Coordinates measured and direct schedule work order requirements during approval, processing, and completion stages. Recommends method of accomplishment based on existing capabilities. Develops, monitors, and maintains work order priority program. Monitors work costs to ensure compliance with legal limits or support agreements and recapitalization process. Coordinates Work Order Review Board processes and provides agenda as required.

B1.2.3. Directs all daily activities and supervisory functions in utilities, liquid fuels maintenance, pest management, and heating, ventilation, air-conditioning, and refrigeration elements. Directs installation, maintenance and repair activities to include distribution, collection, plumbing, natural gas, liquid fuel, heating and cooling, and pest management activities and applications. Identifies and controls supply requisitioning of infrastructure systems, parts, fuels systems components, lubricants, refrigerants, bench stock, and technical publications. Analyzes productivity and work quality. Ensures compliance with environmental and safety regulations and practices.

B1.2.4. Advises on problems installing and repairing utilities and HVAC/R equipment and systems. Solves maintenance problems by studying layout drawings, wiring and schematic drawings, and analyzing construction and operating characteristics. Develops and establishes operation and maintenance procedures to ensure maximum efficiency.

B1.2.5. Performs planning activities and conducts facility surveys. Surveys proposed work to determine resource requirements. Obtains certifications, special tools, and equipment for assigned personnel. Ensures compliance with all safety and environmental regulations to include confined space programs.

B1.2.6. Coordinates, monitors, and executes contingency and Prime BEEF training requirements and associated deployment preparation programs and duties. Ensures personnel are in a constant ready state to meet deployment commitments.

B1.2.7. Coordinates, monitors, and executes contract quality assurance functions as required.

**PART I**

**B2. Skill and Career Progression.** Adequate training and timely progression from the apprentice to the superintendent level play an important role in the Air Force's ability to accomplish its mission. It is essential that everyone involved in training must do his or her part to plan, manage, and conduct an effective training program. The guidance provided in this part of the CFETP will ensure each individual receives viable training at appropriate points in their career.

**B2.1. Apprentice (AFSC 3E131 – AB, AMN, A1C).**

B2.1.1. Upon completion of initial skills training, a trainee will work with a trainer to enhance their knowledge and skills to progress to the 5-level.

B2.1.2. Utilize the CDC, Air Force Qualification Training Packages (AFQTP) and web-based courses for subject and task fundamentals in the career field.

B2.1.3. Once trained and task certified, a trainee may perform the task unsupervised.

B2.1.4. After all upgrade training requirements are completed, supervisors and Unit Training Managers (UTMs) coordinate upgrade procedures.

**B2.2. Journeyman (AFSC 3E151 – SrA, SSgt).**

B2.2.1. A journeyman may be assigned job positions such as team leader, shift supervisor, and task trainer.

B2.2.2. Complete Civil Engineer (CE) 5-Level Core Concepts Course located on the [CE-VLC](#) prior to ordering Career Development Courses (CDCs).

B2.2.3. Completion of 5-level CDCs, 100% 5-level core and diamond tasks are basic prerequisites for five skill level award.

B2.2.4. Must complete, at a **minimum**, twelve months OJT before award of the 5-level (nine months for re-trainees that were awarded a five level in a previous AFSC).

B2.2.5. Active duty Air Force personnel must attend the Phase 1 Resident Airman Leadership School (ALS) in their time in service (TIS) window. Air Reserve Component (ARC) personnel may accomplish ALS by using distance learning (DL) and/or the resident or satellite program. Airmen must complete Phase 1 to be eligible to enroll in Phase 2 Enlisted Professional Military Education (EPME).

B2.2.6. Enter into continuation training to broaden technical experience base.

B2.2.7. Use CDCs and other reference material to prepare for Weighted Airman Performance System (WAPS) testing.

B2.2.8. Continue pursuing a Community College of the Air Force (CCAF) degree.

**PART I**

B2.2.9. After all upgrade training requirements are completed, supervisors and UTMs coordinate upgrade procedures.

**B2.3. Craftsman (AFSC 3E171 – SSgt, TSgt, and MSgt).**

B2.3.1. A craftsman can expect to fill various supervisory and management positions such as shift leader, team chief, supervisor, or task certifier.

B2.3.2. Completion of CE 7-Level Core Concepts Course located on the [CE-VLC](#) and 100% core/diamond tasks are basic prerequisites for seven skill level award.

B2.3.3. Must complete, as a **minimum**, twelve months OJT before award of the 7-level (six months for re-trainees that were awarded a seven level in a previous AFSC).

B2.3.4. Must complete Phase 2 Enlisted Professional Military Education (EPME). All active duty and ARC personnel must enroll within the TIS window.

B2.3.5. Must complete Phase 3 EPME DL. All active duty and ARC personnel must enroll within the TIS window.

B2.3.6. Should take continuation training courses to broaden technical knowledge or management of resources and personnel.

B2.3.7. Use CDCs and other reference material to prepare for Weighted Airman Performance System (WAPS) testing.

B2.3.8. Continue academic education through CCAF and higher degree programs is encouraged.

B2.3.9. After all upgrade training requirements are completed, supervisors and UTMs coordinate upgrade procedures.

**B2.4. Superintendent. (AFSC 3E490 - SMSgt)**

B2.4.1. A superintendent can be expected to fill positions such as Flight Chief, Section Chief, Superintendent, and various staff positions.

B2.4.2. Completion of Civil Engineer Superintendent Course (AFIT WMGT 570) is mandatory for Active Duty and Air Force Reserve SMSgts. This course is highly encouraged for Air National Guard SMSgt's and mandatory to be promoted to CMSgt.

**Note:** This is not a skill level awarding course.

B2.4.3. Must complete Phase 3 EPME DL between the 12 to 18 year TIS window. All active duty and ARC personnel must enroll within the TIS window.



## PART I

B2.4.3.1 Active duty personnel failing to enroll, complete, and pass EPME Phase 3 within one (1) year of enrollment are ineligible to reenlist and compete for promotion until the requirement is met. ARC determines the consequences for their personnel failing to complete the required EPME Phase 3 DL within the established timeframe.

B2.4.4. Should take continuation training course to increase knowledge of budget, manpower, resources, and personnel management.

B2.4.5. Continue academic development through higher education is recommended.

B2.4.6. Must be a SMSgt for award of the 9-skill level.

### **B2.5. Chief Enlisted Manager (CEM) (3E000 - CMSgt).**

B2.5.1. CEMs work in a variety of similar jobs and functional areas where general managerial and supervisory abilities can be most effectively used and challenged.

B2.5.2. Must be selected for CMSgt and possess qualifications in a feeder specialty (3E090, 3E290, 3E490, 3E591, or 3E691).

B2.5.3. AFRC CMSgt selects must attend the Reserve Component Chief Orientation Course (COC) prior to assuming the higher grade.

**B3. Training Decisions.** The CFETP uses a building block approach (simple to complex) to encompass the entire spectrum of training requirements for the HVAC/R career field. The spectrum includes a strategy for when, where, and how to meet the training requirements. The strategy must be apparent and affordable to reduce duplication of training and eliminate a disjointed approach to training. The following decisions were made by a career field Specialty Training Requirements Team (STRT) held at Sheppard AFB, TX on 4 to 7 of March 2014.

**B3.1. Initials Skills Training.** The initial skill course was reviewed for content. Additions, deletions, and modifications were made to the course. Wartime training tasks were identified and validated.

**B3.2. Five Level Upgrade Training Requirements.** Existing CDCs were reviewed and updated to ensure only current material remained and new technology information was added.

**B3.3. Seven Level Upgrade Training Requirements.** Seven-level training requirements were reviewed and validated. All STS tasks associated must be completed; to include, successfully complete the 10-day in-residence Craftsman Course at Sheppard AFB, TX.

**B3.4. Proficiency Training.** Any additional knowledge and skill requirements that were not taught through initial skills or upgrade training are assigned as continuation training. Purpose of continuation training is to provide training exceeding minimum upgrade training requirements with emphasis on present and future duty positions. MAJCOMs must develop a continuation-training program that ensures personnel in the HVAC/R career field receive the necessary training at the appropriate point in their careers. The training program will identify both mandatory and optional training requirements.

**PART I**

**B4. Community College of the Air Force (CCAF) Academic Programs.** Airmen are automatically enrolled in CCAF upon completion of basic military training. CCAF is one of several federally chartered degree-granting institutions; however, it's the only 2-year institution exclusively serving military enlisted personnel. The college is regionally accredited through Air University by the Southern Association of Colleges and Schools Commission on Colleges (SACSCOC) to award Associate of Applied Science (AAS) degrees designed for specific Air Force occupational specialties and is the largest multi-campus community college in the world. Upon completion of basic military training and assignment to an AF career field, all enlisted personnel are registered in a CCAF degree program and are afforded the opportunity to obtain an AAS degree. In order to be awarded, degree requirements must be successfully completed before the Airman separates/retires from the Air Force or is commissioned as an officer. See the CCAF website: <http://www.au.af.mil/au/barnes/ccaf/> for details regarding the AAS degree programs: In addition to its Associates degree program, CCAF offers the following programs. Complete details can be found at <http://www.au.af.mil/au/barnes/ccaf/certifications.asp>. In addition to its degree program, CCAF offers the following:

**B4.1. CCAF Instructor Certification (CIC) Program.** The CIC is a professional credential that recognizes the instructor's extensive faculty development training, education and qualification required to teach a CCAF course, and formally acknowledges the instructor's practical teaching experience. Qualified officer, enlisted, civilian and other service instructors are eligible for this certification. Complete details for the instructor certification program can be found at <http://www.au.af.mil/au/barnes/ccaf/certifications.asp>.

**B4.2. The Professional Manager Certification (PMC).** This professional credential is awarded by CCAF and formally recognizes an individual's advanced level of education and experience in leadership and management, as well as professional accomplishments. The PMC is primarily designed for Air Force SNCO's. However, any enlisted Airmen who meet all program requirements may be nominated and awarded the PMC. Once an individual retires, separates or is commissioned, they are no longer eligible for the PMC. Complete details can be found at <http://www.au.af.mil/au/barnes/ccaf/certifications.asp>.

**B4.3. CCAF offers the Instructional Systems Development (ISD) Certification.** The ISD Certification is a professional credential that recognizes the writers or managers' extensive training, education, qualifications and experience required to develop and manage CCAF courses. The certification also recognizes the individual's ISD qualifications and experience in planning, developing, implementing and managing instructional systems. The program is designed to broaden faculty and professional development. Complete details can be found at <http://www.au.af.mil/au/barnes/ccaf/certifications.asp>.

**PART I**

**B4.4. Air Force Credentialing Opportunities On-Line (AF COOL) Program.** AF COOL replaced the CCAF Credentialing and Education Research Tool (CERT). The AF COOL Program can be accessed at <https://afvec.langley.af.mil/afvec/Public/COOL/Default.aspx>. The site provides a research tool designed to increase an Airman's awareness of national professional credentialing and CCAF education opportunities available for all Air Force occupational specialties. The AF COOL Program also provides information on specific occupational specialties, civilian occupational equivalencies, CCAF degree programs, and AFSC-related national professional credentials available to enlisted members through credentialing agencies and professional organizations. The AF COOL Program contains a variety of information about credentialing and licensing and can be used to:

B4.4.1. Get background information about civilian licensure and certification in general and specific information on individual credentials including eligibility requirements and resources to prepare for an examination.

B4.4.2. Identify licenses and certifications relevant to an AFSC.

B4.4.3. Learn how to fill gaps between; Air Force training, experience, and civilian credentialing requirements.

B4.4.4. Get information on Tuition Assistance and GI Bill eligible funding opportunities to pay for credentialing examinations and associated fees.

B4.4.5. Learn about resources available to you that can help gain civilian job credentials.

**B4.5. Trade Skill Certification.** When a CCAF student separates or retires, a trade skill certification is awarded for the primary occupational specialty. The college uses a competency-based assessment process for trade skill certification at one of three proficiency levels: Apprentice, Journeyman, Craftsman/Supervisor. All are transcribed on the CCAF transcript.

**B4.6. Air University Associate to Baccalaureate Cooperative (AU-ABC).** AU-ABC directs Airmen with associate in applied science degrees from the CCAF to a collection of accredited "military friendly" colleges and universities to consider when completing a four-year degree. The program maximizes the application of military career education and training, and provides a multitude of online academic and support services for the enlisted member.

**B5. CCAF Degree Completion Requirements (64 Semester Hours).** The Mechanical & Electrical Technology Associates Degree (4VGA) applies to the 3E1X1 AFSC. Prior to completing a CCAF degree, the individual must be awarded a 5-level and the following requirements must be met:

**PART I**

<u>Course</u>	<u>Semester Hours</u>
Technical Education	<b>24</b>
Leadership, Management, and Military Studies	<b>6</b>
Physical Education	<b>4</b>
General Education	<b>15</b>
Oral Communication	3
Written Communication	3
Mathematics	3
Social Science	3
Humanities	3
Program Elective	<b>15</b>
Technical Education; Leadership, Management, and Military Studies or General Education	
<b>Total</b>	<b>64</b>

**B5.1. Technical Education. (24 semester hours)** A minimum of 12 semester hours of technical core subjects or courses must be applied and the remaining semester hours applied from technical core or technical elective subjects or courses. Requests to substitute comparable courses or to exceed specified semester hour values in any subject or course must be approved in advance.

<u>Technical Core Requirements</u>	<u>Semester Hours</u>
CCAF Internship	18
Electrical Power Production	20
Electrical Systems	20
Heating Systems	20
Liquid Fuel Systems	20
Refrigeration and Air Conditioning	20
Utilities Systems	20
Waste Management	3

**B5.2. Technical Electives.**

<u>Technical Electives</u>	<u>Semester Hours</u>
Air Distribution and Filtering Systems	3
Alternate Heating and Cooling	3
Blueprint Reading/Schematic Diagrams	6
Building Codes and Ordinance	3
Computer Science	6
Control Systems/Maintenance	6
Electricity/Electronics	9
Engine Principles	3
Environmental Awareness	3
Environmental Compliance	3

**PART I**

Fire-Suppression Systems	6
General Chemistry	8
General Physics	4
Hazardous Materials	6
Industrial Management	3
Industrial Safety	3
Mechanics of Soils	3
Motor, Starter, and Control Devices	6
Natural Gas Distribution	6
Quality Assurance	3
Technical Mathematics (College Algebra or Higher)	3
Technical Physics	4
Technical Writing	3
Welding and Pipefitting	3

**B5.3. Leadership, Management, and Military Studies (LMMS)** (6 Semester Hours): Professional military education, civilian management courses accepted in transfer and/or by testing credit.

**B5.4. Physical Education** (4 Semester Hours): This requirement is satisfied by completion of Basic Military Training.

**B5.5. General Education (15 Semester Hours):** Applicable courses must meet the criteria for application of courses to the general education requirements and be in agreement with the definitions of applicable general education subjects/courses as provided in the *CCAF General Catalog*.

<u>General Education Subjects/Courses</u>	<u>Semester Hours</u>
Oral Communication	3
Speech	
Written Communication	3
English Composition	
Mathematics	3
Intermediate algebra or a college-level mathematics course satisfying delivering institution's mathematics graduation requirement-if an acceptable mathematics course applies as technical or program elective, you may substitute a natural science course for mathematics.	
Social Science	3
Anthropology, archaeology, economics, geography, government, history, political science, psychology, and sociology.	
Humanities	3
Fine arts (criticism, appreciation, historical significance), foreign language, literature, philosophy, and religion.	

**PART I**

**B5.6. Program Elective.** (15 semester hours) Courses applying to technical education, LMMS or general education requirements; natural science courses meeting general education requirement application criteria; foreign language credit earned at Defense Language Institute or through Defense Language Proficiency Test; maximum 9 semester hours of CCAF degree-applicable technical course credit otherwise not applicable to program of enrollment.

B5.7. Additional off-duty education is a personal choice that is encouraged for all. Individuals desiring to become an AETC Instructor should be actively pursuing an associate degree. A degreed faculty is necessary to maintain accreditation through the Southern Association of Colleges and Schools.

**PART I**

**B6. Civil Engineer Career Field Path.** The following chart depicts the 3E1X1 specialty career path:



**PART I****B7. Enlisted Training Path.**

<b>ENLISTED CAREER PATH</b>				
<b>Education and Training Requirements</b>	<b>GRADE REQUIREMENTS</b>			
	Rank	Average Sew-On	Earliest Sew-On	High Year Of Tenure (HYT) (Active Duty Only)
<b>Basic Military Training School</b>				
<b><u>Upgrade To Apprentice</u></b> (3-Skill Level) – Complete Technical School	Amn A1C	6 months 16 months		
<b><u>Upgrade To Journeyman</u></b> (5-Skill Level) – Complete 5-level CDC – Complete CE 5-Level Core Concept web-based course – Complete all 5-level core/duty related tasks – Minimum 12 months OJT (9 months for retrainees)	SrA	3 years	28 months BTZ (22 Months)	8 years
<b><u>Trainer</u></b> – Must be qualified and certified to the perform tasks to be trained. – Attend AF Training Course – Recommended by the supervisor				
<b><u>Upgrade To Craftsman</u></b> (7-Skill Level) – Minimum rank of SSgt – Complete CE 7-Level Core Concept web-based course – Complete all core/duty related tasks – Minimum 12 months OJT (6 months OJT for retrainees)	SSgt	5 years	3 years	15 years
<b><u>Certifier</u></b> – SSgt with 5-skill level or civilian equivalent – Attend AF Training Course – Appointed by commander – Be a person other than the trainer (for core and critical tasks only)				
<b><u>Upgrade To Superintendent</u></b> (9-Skill Level) – Minimum rank of SMSgt – CE Superintendents Course (WMGT570) (AD/AFR Only, not skill level awarding)	SMSgt	20 years	11 years	26 years
<b><u>Chief Enlisted Manager</u></b> – Chief Orientation Course (AFR Only) – CE Superintendents Course (WMGT 570) (ANG Only)	CMSgt	22 years	14 years	30 years



## PART I

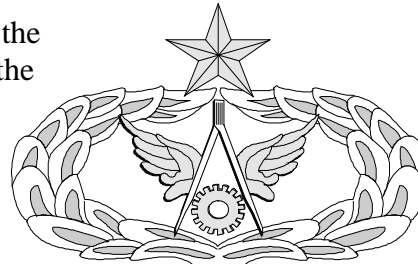
**B7.1. CE Occupational Badge.** The Civil Engineer badge reflects a great history and tradition. By wearing it, you will be recognized by your fellow airmen as having achieved an expected level of competence. The multitude of engineers before you established this expectation through excellent service in both peace and war. Eligibility criteria for award and wear of AF occupational badges can be found in AFI 36-2903, *Dress and Personal Appearance of Air Force Personnel*.

**B7.2. CE Badge Heraldry.** The gear wheel and compass have historically been used to represent the engineering profession, in both the military and civilian sector. The gear represents the essence of engineering: applying scientific principles and technology to practical ends. To Air Force engineers, the gear symbolizes an element (representing the built environment) that meshes with other environments (weapon systems and trained personnel) to enable the Air Force to perform its mission. The compass is a precision tool historically used by engineers in designing and constructing facilities and equipment. The gear and compass together symbolize all the diverse specialties within Air Force civil engineer. Finally, the wings help to portray the fundamental linkage between the engineering and aviation components; and that the built environment is the foundation supporting Air Force mission and people.

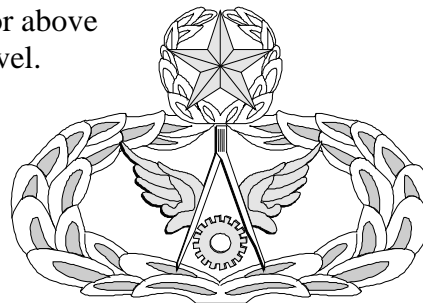
**B7.2.1. Basic Badge.** The basic badge is awarded upon successful completion of the apprentice course.



**B7.2.2. Senior Badge.** The senior badge adds a star to the top of the badge. Wear the senior badge after award of the 7-skill level.



**B7.2.3. Master Badge.** The master badge adds a wreath around the star. The Master Badge is awarded to Master Sergeant or above with 5 years in the specialty from award of the 7-skill level.



**PART I****B8. Enlisted Professional Military Education (EPME).**

**B8.1. Basic EPME (Distance Learning).** Air Force EPME is a time-in-service (TIS)-based model that ensures targeted delivery of institutional competencies (ICs) throughout the Continuum of Learning across an enlisted Airman's career through distance learning. Basic EPME Requirements will be developed in three phases across an Airman's career. Refer to AFI 36-2301, *Developmental Education*, for the most current guidance and TIS requirements.

B8.1.1. Phase 1. Phase 1 is the resident Airman Leadership School (ALS), which meets all EPME requirements (basic and comprehensive). RegAF Airmen must complete and pass Phase 1 to be eligible to enroll in Phase 2 EPME. Air Reserve Component (ARC) Airmen may accomplish ALS via DL and/or via the resident or satellite program.

B8.1.2. Phase 2. Phase 2 (Course 15) meets the basic requirements for NCOs. All RegAF and ARC Airmen must enroll within the TIS window. Failure to enroll, complete, and pass Phase 2 within one year of enrollment renders Airmen ineligible to reenlist and compete for promotion until this requirement is met. The ARC will determine the consequences for failure to complete required Phase 2 within established timeframes.

B8.1.3. Phase 3. Phase 3 (Course 14, Version 6) meets the basic requirements for SNCOs. RegAF Airmen must complete and pass Phase 2 to be eligible to enroll in Phase 3. See promotion policy for guidance related to course completion and senior rater endorsement.

**B8.2. Comprehensive EPME (In-residence).** The comprehensive learning experience EPME are in-residence courses that builds upon the Basic EPME requirements to achieve higher proficiency levels and is delivered in three phases. Refer to AFI 36-2301, *Developmental Education*, for the most current guidance and TIS requirements.

B8.2.1. Phase 1 EPME. The ALS resident program delivers both basic and comprehensive learning requirements. The ALS DL course is available for ARC Airmen and meets all basic requirements.

B8.2.2. Phase 2 EPME NCOA Intermediate Learning Experience (ILE) is a resident opportunity that delivers comprehensive learning requirements. This opportunity is available to Airmen, who meet minimum requirements.

B8.2.3. Phase 3 EPME SNCOA Advanced Learning Experience (ALE) is the advanced resident opportunity that delivers comprehensive learning requirements. This opportunity is available to Airmen; who meet minimum requirements.

**PART I****SECTION C - SKILL LEVEL TRAINING REQUIREMENTS**

**C1. Purpose.** The various skill levels in this career field are defined in terms of tasks and knowledge requirements for the career field. They are stated in broad, general terms and establish the standards of performance. An all-encompassing core and diamond tasks list has been developed for this specialty because of the diversity of the missions supported and the equipment assigned to meet mission requirements. Core and diamond tasks, knowledge items, and skill requirements are identified in the STS. Completion of the mandatory 3-skill level awarding course and the mandatory completion of the core concept courses comprise Air Force requirements.

**C2. Skill Level Training Requirements.****C2.1. Apprentice (3-Level) Training Requirements. (3E1X1)**

<b>KNOWLEDGE</b>	Completion of Heating, Ventilation, Air Conditioning and Refrigeration Apprentice (HVAC/R) course satisfies these requirements.
<b>EDUCATION</b>	For entry, completion of high school with mathematics, general science, physics, shop mechanics, electricity, and computer fundamentals is desirable.
<b>TRAINING</b>	Completion of the Heating, Ventilation, Air Conditioning and Refrigeration Apprentice course is mandatory for award of this skill level.
<b>EXPERIENCE</b>	None required.
<b>OTHER</b>	<p>For entry, award and retention of AFSC 3E131, must possess a valid state driver's license to operate government motor vehicles (GMV) in accordance with AFI 24-301, <i>Vehicle Operations</i>.</p> <p>Normal color vision as defined in AFI 48-123, <i>Medical Examinations and Standards</i>.</p> <p>Must maintain local network access IAW AFMANs 33-152, <i>User Responsibilities and Guidance for Information Systems</i> and 33-282, <i>Computer Security</i>.</p>
<b>IMPLEMENTATION</b>	The 3-skill level is awarded upon graduating the apprentice course and submission by the Unit Training Manager at the member's unit of assignment.

\*Refer to Air Force Enlisted Classification Directory (AFECD)

**PART I****C2.2. Journeyman (5-Level) Training Qualifications. (3E151)**

<b>KNOWLEDGE</b>	Principles of HVAC/R systems, controls, and components; combustion systems; air and water balancing; industrial air compressors; interpreting drawings and schematics, fundamentals of HVAC/R equipment and troubleshooting techniques; water treatment; environmental regulations for fuels, refrigerants, and hazardous materials; military and commercial publications; and environmental regulations.
<b>EDUCATION</b>	<p>For entry into this specialty, completion of high school with courses in mathematics, general science, physics, shop mechanics, electricity, and computer fundamentals is desirable.</p> <p>The following education is desirable and strongly encouraged: CCAF Mechanical &amp; Electrical Technology Associates Degree (4VGA)</p> <p>Higher education through a civilian institution</p>
<b>TRAINING</b>	<p>Completion of 5-level CDCs.</p> <p>Completion of all the paper-based AFQTPs and their associated web-based courses on the <a href="#">CE VLC</a> for all core (*) and diamond (◆) tasks with a minimum passing score of 80%.</p> <p>Completion of the CE 5-Level Core Concept web-based course located on the <a href="#">CE-VLC</a> is mandatory for award of this skill level.</p> <p>Third party certification (task certifier) of all 5-skill level core tasks identified with an asterisk (*) in the 5-skill level column of the STS.</p> <p>Third party certification (task certifier) of all 5-skill level diamond tasks identified with a diamond (◆) in the 5-skill level core task column of the STS <b>if</b> the equipment is available. Minimum requirement is the signing off tasks on the AFQTP Documentation Record.</p> <p>Certification of duty position requirements identified by the supervisor.</p>
<b>EXPERIENCE</b>	<p>Qualification in and possession of AFSC 3E131.</p> <p>Experience in operation and maintenance of HVAC/R systems and process; electrical troubleshooting, and assigned contingency equipment.</p> <p>Minimum 12 months OJT (9 months for retrainees) before award of 5-skill level.</p>

**PART I**

<b>OTHER</b>	<p>For entry, award and retention of AFSC 3E151, must possess a valid state driver's license to operate government motor vehicles (GMV) in accordance with AFI 24-301, <i>Vehicle Operations</i>.</p> <p>Normal color vision as defined in AFI 48-123, <i>Medical Examinations and Standards</i>.</p> <p>Must maintain local network access IAW AFMANs 33-152, <i>User Responsibilities and Guidance for Information Systems</i> and 33-282, <i>Computer Security</i>.</p>
<b>IMPLEMENTATION</b>	<p>Entry into 5-level upgrade training is initiated after the individual has completed all 3-level requirements. Qualification training is initiated any time individuals are assigned duties they are not certified to perform. AFQTPs are used concurrently to obtain necessary duty position qualifications.</p>

\*Refer to Air Force Enlisted Classification Directory (AFECD)

**C2.3. Craftsman (7-Level) Training Requirements. (3E171)**

<b>KNOWLEDGE</b>	<p>All 3- and 5-level knowledge requirements apply to 7-level</p>
<b>EDUCATION</b>	<p>For entry into this specialty, completion of high school with courses in mathematics, general science, physics, shop mechanics, electricity, and computer fundamentals is desirable.</p> <p>The following education is desirable and strongly encouraged: CCAF Mechanical &amp; Electrical Technology Associates Degree (4VGA)</p> <p>Higher education through a civilian institution.</p>
<b>TRAINING</b>	<p>Completion of all the paper-based AFQTPs and their associated web-based courses on the <a href="#">CE-VLC</a> for all 5- and 7- skill level core (*) and diamond (◆) tasks with a minimum passing score of 80%.</p> <p>Completion of the CE 7-Level Core Concept web-based course located on the <a href="#">CE-VLC</a> is mandatory for award of this skill level.</p> <p>Third party certification (task certifier) of all 5-and 7- skill level core tasks identified with an asterisk (*) in the 5-skill level column of the STS.</p> <p>Third party certification (task certifier) of all 5-skill level diamond tasks identified with a diamond (◆) in the 5-skill level core task column of the STS if the equipment is available. Minimum requirement is the signing off tasks on the AFQTP Documentation Record.</p> <p>Certification of duty position requirements identified by the supervisor.</p>

**PART I**

<b>TRAINING</b>	Completion of the J3ACR3E171 00AA, in residence, HVAC/R Craftsman Course, Sheppard AFB, TX is mandatory for 7-level upgrade.
<b>EXPERIENCE</b>	<p>Qualification in and possession of AFSC 3E151.</p> <p>Performing or supervising functions of HVAC/R systems, new facility design review and approval, psychrometric procedures, calculating heat load requirements, measuring subcooling and superheat, and electrical troubleshooting.</p> <p>Must be SSgt with minimum 12 months OJT (6 months for retrainees).</p>
<b>OTHER</b>	<p>For entry, award and retention of AFSC 3E171, must possess a valid state driver's license to operate government motor vehicles (GMV) in accordance with AFI 24-301, <i>Vehicle Operations</i>.</p> <p>Normal color vision as defined in AFI 48-123, <i>Medical Examinations and Standards</i>.</p> <p>Must maintain local network access IAW AFMANs 33-152, <i>User Responsibilities and Guidance for Information Systems</i> and 33-282, <i>Computer Security</i>.</p> <p>HVAC/R craftsmen should pursue any additional knowledge and skill requirements that were not taught through initial skills or upgrade training. The purpose is to exceed minimum upgrade requirements and achieve the necessary training and experience at the appropriate point in their career to be more effective in present and future duty positions. Recommended areas of study include but are not limited to: AFIT Training courses such as Project Management courses and Contract Management courses.</p>
<b>IMPLEMENTATION</b>	Entry into 7-level training is initiated when an individual is selected for SSgt and is fully qualified in the AFSC 5-skill level. Qualification training is initiated any time individuals are assigned duties they are not qualified to perform. Use OJT, CDCs, AFJQs, and AFQTPs concurrently to obtain the necessary qualifications.

\*Refer to Air Force Enlisted Classification Directory (AFECD)

**PART I****C2.4. Superintendent (9-Level) Training Requirements (3E490).**

<b>KNOWLEDGE</b>	<p>Skilled and educated in principles of water distribution and wastewater collection systems, water and wastewater treatment systems, plumbing systems, natural gas distribution systems, liquid fuels distribution systems, and pest management activities, controls, and components, combustion systems, air and water balancing, non-electric kitchen equipment, industrial air compressors, and backflow prevention devices. Interprets drawings and schematics, industrial wastewater treatment, and usage of maintenance materials such as pipes, valves, fittings, packing and gaskets, electrical and electronic controls that apply to these systems, wiring schematics and diagrams, military, commercial, and technical publications, environmental regulations for fuels, pesticides, environmental regulations for fuels, refrigerants, and military and commercial publications and hazardous materials.</p>
<b>EDUCATION</b>	<p>Must complete EMPE Phase 3</p> <p>For entry into this specialty, completion of high school with courses in mathematics, general science, physics, shop mechanics, electricity, and computer fundamentals is desirable.</p> <p>The following education is desirable and strongly encouraged: CCAF Mechanical &amp; Electrical Technology Associates Degree (4VGA)</p> <p>Higher education through a civilian institution.</p>
<b>TRAINING</b>	<p>Completion of Civil Engineer Superintendent Course (AFIT WMGT 570) conducted at Air Force Institute of Technology, Wright-Patterson AFB, OH is mandatory for Active Duty and Air Force Reserve SMSgts. This course is highly encouraged for Air National Guard SMSgts and mandatory to be promoted to CMSgt. Note: This is not a skill level awarding course.</p> <p>Completion of duty position training requirements is mandatory.</p>
<b>EXPERIENCE</b>	<p>For award of AFSC 3E490, qualification in and possession of AFSC 3E171, 3E471, or 3E473 is mandatory. Must be a SMSgt. Also, experience managing functions such as operations, facilities system maintenance, and repair of distribution, and collection systems, natural gas distribution systems, cooling towers, chillers, boilers, liquid fuels distribution systems, pest management activities, and HVAC/R systems.</p>

**PART I**

<b>OTHER</b>	<p>For entry, award and retention of AFSC 3E490, must possess a valid state driver's license to operate government motor vehicles (GMV) in accordance with AFI 24-301, <i>Vehicle Operations</i>.</p> <p>Normal color vision as defined in AFI 48-123, <i>Medical Examinations and Standards</i>.</p> <p>Must maintain local network access IAW AFMANs 33-152, <i>User Responsibilities and Guidance for Information Systems</i> and 33-282, <i>Computer Security</i>.</p> <p>3E490 Superintendents should pursue any additional knowledge and skill requirements that were not taught through initial skills or upgrade training. The purpose of ongoing training is to exceed minimum upgrade requirements with emphasis on Electrical personnel achieving the necessary training and experience at the appropriate point in their career to be more effective in present and future duty positions. Recommended areas of study include but are not limited to: AFIT Training courses such as Project Management courses and Contract Management courses.</p>
<b>IMPLEMENTATION</b>	<p>Entry into 9-level training is initiated when an individual is selected for SMSgt and is a fully qualified 7-Level. Qualification training is initiated any time an individual is assigned duties they are not certified to perform.</p>

\*Refer to Air Force Enlisted Classification Directory (AFECD)

**C2.5. Chief Enlisted Manager.**

<b>KNOWLEDGE</b>	<p>Knowledge is mandatory of Air Force training programs. CE policies, practices, and procedures of base maintenance and operations, crafts, facilities, equipment, and systems. Interpretations and applications of maintenance and work force management. General construction, and repair methods and procedures, including use and capacity of construction equipment.</p>
<b>TRAINING</b>	<p>Reserve Component Chief Orientation Course (AFRC only).</p>
<b>EXPERIENCE</b>	<p>Possess qualifications in feeder specialty (3E090) prior to award of Civil Engineer Manger code 3E000. Managerial ability to plan, direct, coordinates, implement, and control a wide range of work activity.</p>
<b>OTHER</b>	<p>NA</p>
<b>IMPLEMENTATION</b>	<p>Entry into Civil Engineer Manager Code 3E000 is initiated when an individual is selected for CMSgt and possess qualifications in a feeder specialty (3E090, 3E290, 3E490, 3E591, and 3E691).</p>

\*Refer to Air Force Enlisted Classification Directory (AFECD)



**PART I**

**SECTION D - RESOURCE CONSTRAINTS**

**D1. Purpose.** This section identifies known resource constraints, which preclude optimal and desired training from being developed or conducted, including information such as cost and manpower. Narrative explanations of each resource constraint and an impact statement describing what effect each constraint has on training are included. Also included in this section are actions required, office of primary responsibility, and target completion dates. Resource constraints will be, as a minimum, reviewed and updated annually.

D1.1. Constraints: None

D1.1.2. Equipment Constraints: None

D1.1.3. Time/Manpower/Student Man-years Constraints: None.

**D2. Apprentice (3-Level) Training: None**

D2.1. Constraints.

D2.1.1 Impact.

D2.1.2. Resources Required.

D2.1.3. Action Required.

D2.2. OPR/Target Completion Date.

**D3. Journeyman (5-Level) Training: None**

D3.1. Constraints.

D3.1.1. Impact.

D3.1.2. Resources Required.

D3.1.3. Action Required.

D3.2. OPR/Target Completion Date.

**D4. Craftsman (7-Level) Training. None.**

**D5. Superintendent (9-Level) Training. None.**

**PART I**

**SECTION E – TRANSITIONAL TRAINING GUIDE**

“There are no transition training requirements for the Heating, Ventilation, Air Conditioning, and Refrigeration specialty. This section is reserved.”

## PART II

### SECTION A - SPECIALTY TRAINING STANDARD

**A1. Implementation.** This STS will be used for technical training provided by AETC HVAC/R and will be applicable to the apprentice pipeline students with a class start date of 29 Nov 2016 (AF Unique starts 24 Jan 2017 and graduates 18 Apr 2017) and graduating on or after 18 Apr 2017. This STS will also be applicable to the AETC HVAR/R Craftsman course starting on 23 Jan 2017 and graduating on or after 10 Feb 2017.

**A2. Purpose.** As prescribed in AFI 36-2201, *Air Force Training Program*, and in collaboration with the Civil Engineer, Air Force Career Field Manager (AFCFM), it is mandatory for all civil engineers, regardless of duty assignment, to use an automated training record. The automated training record currently being utilized to document upgrade and qualification training is the Air Force Training Record (AFTR) and the application is located on the [CE-VLC](#).

**A2.1. Column 1 (Tasks, Knowledge, and Technical References).** Lists the most common tasks, knowledge, and supporting Technical References (TR) necessary for Airmen to perform duties in the 3-, 5-, and 7-skill level.

**A2.2. Column 2 (Core Tasks).** Identifies core tasks (specialty-wide training requirements) by an asterisk (\*) in the appropriate skill level sub-column. **As a minimum, trainees must complete hands-on certification on all core, critical and diamond tasks for skill level upgrade.**

**A2.2.1. Wartime Tasks.** All tasks in the 3-level course column are considered wartime tasks. In response to a wartime scenario, these tasks will be taught in the 3-level course in a streamlined training environment.

**A2.2.2. Diamond Tasks.** Tasks identified by a diamond (◆) are considered contingency/war task and are critical to the career field. Equipment shortfalls at most locations have created problems with actual hands-on certification of these tasks. In instances where required equipment is not available for instruction, completion of the corresponding task AFQTP is all that is required for upgrade/qualification training.

**A2.3. Column 3 (Certification for OJT).** Used to record completion of tasks and knowledge training requirements. Use the automated training record application to document individual qualifications. **Task certification of core, critical and diamond tasks** require a training completion date and initials of the trainee, trainer, and certifier. All non-core tasks require training completion date and initials of the trainee and trainer only.

**A2.4. Column 4 (Proficiency Codes Used to Indicate Training/Information Provided).** Indicates formal training and correspondence course requirements. It shows the proficiency to be demonstrated on the job by the graduate as a result of training on the task, knowledge and the career knowledge provided by formal courses, CDC, distance learning (DL) web-based training (WBT) and AFQTPs. See CADRE/AFSC/CDC listing maintained by the unit education and training manager for current CDC listings.

## PART II

**A2.5. Qualitative Requirements.** Contains the proficiency code key used to indicate the level of training and knowledge provided by WBT, resident training and career development courses.

**A2.6. Job Qualification Standard (JQS).** The STS becomes the JQS for OJT when placed in automated training application and used according to AFI 36-2201. For OJT, the tasks in Column 1 are trained and qualified to the go/no go level. “Go” means the individual can perform the task without assistance and meets local requirements for accuracy, timeliness, and correct use of procedures. AFQTPs, when available, shall be used to identify Air Force standardized procedures. When used as a JQS, the following requirements apply:

**A2.6.1. Documentation.** Document and certify completion of training.

**A2.6.1.1. Duty position.** Duty position requirements will be developed and identified by the workcenter supervisor and loaded into the automated training application. Completion of core, critical and diamond tasks are mandatory for all duty positions. Ensure the correct duty position title is listed under Profile 1 section of the trainee’s automated training record.

**A2.6.1.2. AFQTP Training and Documentation.** AFQTP or AFQTP assessments have been created for all core (\*) and diamond (♦) tasks. Completion is mandatory to fulfill task knowledge requirements for upgrade/qualification training. Each AFQTP provides step-by-step procedures for the trainee, trainer, and certifier in completing each core or diamond task and instructions how to document the training in the automated training record.

**A2.6.1.2.1. Training.** Documentation of the start and completion of the AFQTP in the *QTP section* located in the automated training record is required for all core and diamond tasks. The automated training record will not allow you to sign off any tasks in the JQS until the completion date has been entered. Diamond tasks require the completion of the web-based course (with the review and post-test located in the program) or completion of the AFQTP assessment located on the [CE-VLC](#) to determine if the trainee has attained the knowledge level required. Once the trainee has completed the web-based course or AFQTP assessment, the course completion certificate must be provided to the trainer/supervisor for documentation of the completion in the automated training record and completion of hands-on training, if the equipment is available.

**A2.6.1.2.2. Hands-On Training.** *DO NOT sign off the tasks in the JQS until the trainee has completed hands-on/certification training.* For diamond tasks, if the equipment is not available at home station, the completion of the AFQTP or AFQTP assessment is the **ONLY** requirement for upgrade. When the equipment becomes available either at home station or at a TDY location, the trainee can be signed off within the JQS section of the automated training record.

**A2.6.2. Transcribing from previous versions to the new CFETP.** Most items should transcribe automatically during the update of the new CFETP. The UTM and supervisor must conduct a review of the new STS to identify any new core, diamond, or non-core tasks and add those tasks to their duty positions.

**PART II**

**A2.6.2.1. Previous training certification not listed** If previous training certification is not listed in the individual record, select the parent task to be transcribed, check the task title(s) block, and click on the transcribe button. Enter the date of the original certification and sign off the task(s). The trainee will then sign off the task(s) to finalize the transcription of previous training certification. The automated application will place an entry into the trainee 623a and must be acknowledged by the transcriber and trainee.

**A2.6.2.2. Transcribing external training certification.** If a trainee attended a formal training course and received appropriate accreditation, select the 623 III section of the user's automated training record and locate the course title in the master task list, then enter the completion date. If the course title is not listed, contact the UTM to have it loaded from the master catalog. If it is not listed in the master catalog contact the Force Development Manager at AFCEC to have it loaded in the master catalog.

**A2.6.3. Documenting Career Knowledge.** When a CDC is not available, the supervisor identifies STS training references that the trainee requires for career knowledge IAW AFI 36-2201, *Air Force Training Program* and ensures, as a minimum, that trainees cover all mandatory items specified in AFI 36-2101, *Classifying Military Personnel (Officer and Enlisted)*. For two-time CDC exam failures, the unit commander will take appropriate action IAW AFI 36-2201.

**Note:** Career knowledge must be documented prior to submitting a CDC waiver.

**A2.6.4. Decertification.** When an Airman is found to be unqualified on a task, the supervisor shall identify the task in the JQS and check the box next to the task title. The supervisor shall select the Decertify button on the screen menu and enter a 623a comment explaining why the task was decertified, and then enter the Airman into qualification training. The individual is recertified using the normal certification process.

**A2.6.5. Recertification.** When an Airman is required to be recertified on a previous task due to annual or bi-annual requirements. The supervisor shall identify the task in the JQS and check the box next to the task title and select the Recertify button on the screen and entry the dates the recertification was completed.

**A2.6.6. Training Standard.** Tasks are trained and certified to the "go" level. Go means the individual can perform the task without assistance and meets the local requirements for accuracy, timeliness, and correct use of procedures. This equates to a 3c in the proficiency code key. AFQTPs, when available, shall be used to identify Air Force standardized procedures.

**A2.7. Specialty Training Standard.** The STS is a guide for development of promotion tests used in the Weighted Airman Promotion System (WAPS). Specialty Knowledge Tests are developed at the USAF Airman Advancement Division by senior NCOs with extensive practical experience in their career fields. The tests sample knowledge of STS subject matter areas judged by test development team members as most appropriate for promotion to higher grades. Questions are based upon study references listed in the Enlisted Promotions References and Requirements Catalog. Individual responsibilities are in AFI 36-2605, *AF Military Testing System*. WAPS is not applicable to the Air National Guard or Air Reserve Forces.

**PART II**

**A3. Recommendations.** Comments and recommendations are invited concerning quality of training AETC graduates receive. Reference this STS and address your correspondence regarding changes to 782 TRG/TGE, 917 Missile Road, Rm 1A300, Sheppard AFB TX 76311-2368 or E-mail 782csil@us.af.mil. A Customer Service Information Line (CSIL) has been installed for the supervisors convenience to identify graduates who may have received over or under training on tasks/knowledge items listed in this STS. For a quick response to problems, call the CSIL at DSN 736-2574 any time day or night.

**PART II****SECTION B - COURSE OBJECTIVE LIST (COL)**

**B1. Measurement.** Measurement of each objective is indicated as follows:

B1.1. Written Test (W) indicates task or subject knowledge that is measured using a written test.

B1.2. Performance Test (P) indicates required task performance that is measured with a performance test.

B1.3. Progress Check (PC) indicates separate measurement of both knowledge and performance elements measured with a performance progress check.

**B2. Standard.** The standard is 70% on written examinations. Standards for performance measurement are indicated in the objectives and delineated on the individual progress checklist. Instructor assistance is provided as needed during the progress check or performance test, and students may be required to repeat all or parts of the behavior until satisfactory performance is attained.

**B3. Proficiency Level.** Most task performance is taught to the “2b” proficiency level, which means the student can do most parts of the task, but does need assistance on the hardest parts of the task (partially proficient). The student can also determine step-by-step procedures for doing the task.

**B4. Course Objective List.** These objectives are listed in the sequence taught by Blocks of Instruction. Per AETCI 36-2641, *Technical and Basic Military Training Development*, detailed listing of the initial skills course objectives may be obtained by written request through the requesting organization’s MAJCOM to HQ AETC/A3T.

## PART II

### SECTION C - SUPPORT MATERIAL

#### **C1. Air Force Qualification Training Packages.**

C1.1. The *mandatory* AFQTPs for each skill level are identified on the 3E1X1 AFQTP Documentation Record.

C1.1.1. For a complete list of up-to-date AFQTPs applicable to the 3E1X1 AFSC, go to [CE-VLC](#).

C1.2. The UTM or supervisor can download paper-based AFQTPs. Paper-based AFQTPs can be found on the [CE-VLC](#) under the Library link and then by selecting Resources.

C1.2.1. In addition to the paper-based AFQTPs there are web-based courses or assessments developed for certain tasks that are available on the [CE-VLC](#) under the Course List link and specialty topic area.

#### **C2. AFQTP Assessment for Civil Engineer CDCs.**

C2.1. FDMs have developed CDC assessments for their career field and they are located on the [CE-VLC](#) under the topic header Civil Engineer Career Development Courses (CDCs).

C2.2. The CDC assessments are for the sole purpose of providing the Unit Commander, Unit Training Manager (UTM) and the supervisor, a predictive indicator of whether the trainee has studied sufficiently to successfully pass their CDC end of course (EOC) exam.



**PART II****SECTION D – EDUCATION AND TRAINING COURSE INDEX**

**D1. Purpose.** This section of the CFETP identifies training courses available for the electrical systems specialty. Refer to Education and Training Course Announcements (ETCA) web site for information on the Air Force in-residence courses. The web site address is <https://etca.randolph.af.mil/>.

**D2. Air Force In-Residence Courses/Mobile Training Team (MTT) Courses.**

<u>Course Number</u>	<u>Title</u>	<u>Location</u>
J3ABR3E131 00AC	HVAC/R Apprentice	366 TRS
J3AQR3E131 00AA	HVAC/R Apprentice (ITRO)	366 TRS
J3ACR3E171 00AB	HVAC/R Craftsman	366 TRS

**D3. Air Force Career Development Academy (AFCDA).**

<u>Course Number</u>	<u>Title</u>	<u>Edit Code (EC)</u>
CDC 3E151A (N - electronic) 1-3	HVAC/R Journeyman	03
CDC 3E151B (O - electronic) 1-4	HVAC/R Journeyman	03
CDC 3E151C (P - electronic) 1-4	HVAC/R Journeyman	02

**D4. Exportable/Web-based Courses/Information.**

<u>Course Number</u>	<u>Title</u>	<u>Developer</u>
Web-based	130K BTU Heater Course	AFCEC/COF
Web-based	Advanced Design Refrigerator 300 Course	AFCEC/COF
Web-based	Arc Flash Safety Awareness QTP	AFCEC/COF
Web-based	Arc Flash Safety Awareness QTP (Group Presentation)	AFCEC/COF
Web-based	Civil Engineer 5-Level Core Concepts Course (previously titled 3-Level Core Concepts Course)	AFCEC/COF
Web-based	Civil Engineer 7-Level Core Concepts Course	AFCEC/COF

**PART II**

Web-based	Electrical Safety Standards QTP	AFCEC/COF
Web-based	Electrical Test Equipment QTP	AFCEC/COF
Web-based	HVAC/R Basic Electrical Diagnostics	AFCEC/COF
Web-based	Environmental Control Unit HAC 36	AFCEC/COF
Web-based	Fall Protection Awareness	AFCEC/COF
Web-based	Fall Protection Awareness – Group Presentation	AFCEC/COF
Web-based	Field Deployable ECU Course	AFCEC/COF
Web-based	Field Deployable ECU (-9) Course	AFCEC/COF
Web-based	Healthcare Provider – CPR Course	AFCEC/CXF
Web-based	Industrial Water Treatment Course	AFCEC/COF
Web-based	M-80 Water Heater Course	AFCEC/COF
Web-based	WH-400K Water Heater Course	AFCEC/COF
Web-based	TRICON Refrigerated Container System Course	AFCEC/COF

**D5. Courses/CDCs Under Development/Revision**

<b>Course Number</b>	<b>Title</b>	<b>Date Due</b>
CDC 3E151 EC 01	HVAC/R Journeyman	TBD

**PART II**

**SECTION E – MAJCOM UNIQUE REQUIREMENTS**

“There are currently no MAJCOM unique requirements. This area is reserved.”

**PART II****SECTION F - HOME STATION TRAINING**

**F1. Purpose.** The purpose of this section is to identify the tasks, training references, and training sources available in support of contingency/wartime training. Civil Engineer forces will train to meet the full range of tasks expected in the contingency environment. Training ranges from knowledge-type training conducted in a classroom, to task-oriented hands-on training conducted in the field. These training requirements, frequencies, and sources are listed in AFI 10-209, *RED HORSE Program* and AFI 10-210, *Prime Base Emergency Engineer Force (BEEF) Program*.

**F2. Home Station Training (HST).** HST is knowledge-based and hands-on training that is conducted at the individual's home station for contingency operations. The CE Commander ensures training is provided and documented and arranges for subject matter experts to conduct training as required. AFI 10-209, Attachments 2-6 and AFI 10-210, Attachments 2-6, identifies the personnel to be trained by specialty and frequencies.

**F3. Combat Skills Training (CST).** CST must be institutionalized as an integral part of any HST program. Lessons learned from operations, such as IRAQI FREEDOM, have taught us the importance of maintaining a higher level of combat readiness. Although the inclusion of combat skills-focused training into HST does not fully prepare CE personnel to work in a high threat combat environment, the steps taken to enhance training will help elevate units to a readiness level capable of supporting safe and effective operations in low to medium risk combat environments.

**F4. Mission Essential Equipment Training (MEET).** Wartime or contingency environments often involve the use of specialized and unique mission-essential equipment that civil engineers do not use in their day-to-day operations. Due to the cost and complexity, mission essential contingency equipment and trainer expertise are not commonly found at CONUS installations. Personnel must be hands-on certified and the certification documented in their CFETP. AFI 10-210, Attachment 4, identifies minimum number of personnel to be trained, positions by specialty, frequencies and Chapter 2 identifies the locations of training sites. Inadequate training on these key equipment items can negatively impact Air Force contingency operations. **(Not applicable at this time for 3E1X1)**

**F5. AF Expeditionary (ES) Training Requirement.** AETC, as lead MAJCOM for AF ES training, revamped ancillary home-station and advanced (mission specific) expeditionary skills training plans to standardize and synchronize training across the force. Detailed requirements for AF ES training is available in AFI 36-2201, *Air Force Training Program*, Chapter 8.

**F6. Training References.**

F6.1. AFI 10-209, *RED HORSE Program*, Chapter 3 and Attachments 2-6 identify the RED HORSE recurring training requirements.

F6.2. AFI 10-210, *Prime Base Engineer Emergency Force (BEEF) Program*, Chapter 4 and Attachments 2-6 identify the Prime BEEF recurring training requirements.

F6.3. AFI 36-2201, *Air Force Training Program*, Chapter 8 identify ES training requirements.

**PART II**

F6.4. Web-based Products. Web-based products are available on the CE Virtual Learning Center (VLC) website at <https://afcec.adls.af.mil>. Personnel completing these courses can receive credit for HST. CBT products can be used in a classroom setting to train as many personnel as possible. Attendance must be documented on a sign-in roster. The sign-in roster must be maintained IAW AFI 10-210.

BY ORDER OF THE SECRETARY OF THE AIR FORCE

OFFICIAL

JOHN B. COOPER, Lieutenant General, USAF  
DCS/Logistics, Installation and Mission Support

3 Attachments

1. Qualitative Requirements (Proficiency Code Key)
2. 3E1X1 Specialty Training Standard (STS)
3. 3E1X1 AFQTP Documentation record

**Attachment 1  
Qualitative Requirements (Proficiency Code Key)**

**A1. Qualitative Requirements**

<i>This Block Is For Identification Purposes Only.</i>		
Name Of Trainee		
Printed Name ( <i>Last, First, Middle Initial</i> )	Initials (Written)	SSAN (Last four)
Printed Name Of Trainer, Certifying Official And Written Initials		
<i>N/I</i>	<i>N/I</i>	
<i>N/I</i>	<i>N/I</i>	
<i>N/I</i>	<i>N/I</i>	

**Note:** Place a continuation sheet behind the CFETP when additional space is required.

Proficiency Code Key		
	Scale Value	Definition: The individual
Task Performance Levels	1	Can do simple parts of the task. Needs to be told or shown how to do most of the task. (Extremely Limited)
	2	Can do most parts of the task. Needs only help on hardest parts. (Partially Proficient)
	3	Can do all parts of the task. Needs only a spot check of completed work. (Competent)
	4	Can do the complete task quickly and accurately. Can tell or show others how to do the task. (Highly Proficient)
*Task Knowledge Levels	a	Can name parts, tools, and simple facts about the task. (Nomenclature)
	b	Can determine step by step procedures for doing the task. (Procedures)
	c	Can identify why and when the task must be done and why each step is needed. (Operating Principles)
	d	Can predict, isolate, and resolve problems about the task. (Advanced Theory)
**Subject Knowledge Levels	A	Can identify basic facts and terms about the subject. (Facts)
	B	Can identify relationship of basic facts and state general principles about the subject. (Principles)
	C	Can analyze facts and principles and draw conclusions about the subject. (Analysis)
	D	Can evaluate conditions and make proper decisions about the subject. (Evaluation)
<p><b>Explanations</b></p> <p>* A task knowledge scale value may be used alone or with a task performance scale value to define a level of knowledge for a specific task. (Example: b and 1b)</p> <p>** A subject knowledge scale value is used alone to define a level of knowledge for a subject not directly related to any specific task, or for a subject common to several tasks.</p> <p>- This mark is used alone instead of a scale value to show that no proficiency training is provided in the course or CDC.</p> <p>(I) - Inter-service Training Review Organization (ITRO): Consolidated training with Air Force and Navy participants. Army attends on quota basis only.</p> <p>X - This mark is used alone in the course columns to show that training is required but not given due to limitations in resources.</p> <p>◆ - This symbol indicates the task is a diamond task due to equipment constraint at some units.</p> <p>Specific tasks not identified with a symbol or proficiency code key (blank) indicates that no training is provided in the course or CDC. Major commands and /or units may establish scale values and combat training as dictated by mission requirements.</p> <p><b>Note 1:</b> BLK #4: Columns (1) &amp; (2) can be relabeled to meet Career Field Requirements; i.e., 2 phase 3-skill level course, 5- and 7- level AFQTP</p> <p><b>Note 2:</b> All tasks and knowledge items shown with a proficiency code are trained during wartime.</p>		

**Attachment 2**  
**3E1X1 Specialty Training Standard (STS)**

## **A2. Specialty Training Standard**

**A2.1. Identification.** In the automated training record User Profile section the UTM will assign individuals to the correct workcenter upon in processing into the unit.

A2.1.1. For a new trainee, the UTM will assist in creating a training record on the [CE-VLC](#) and placing the trainee in the correct workcenter and specialty within their unit. Additional information will need to be entered into the following areas:

**A2.1.1.1. User Administrators:**

A2.1.1.1.1. Individual UTM

A2.1.1.1.2. Workcenter Supervisor

A2.1.1.1.3. Immediate Supervisor

**A2.1.1.2. User Training Information:**

A2.1.1.2..1 Duty Position

A2.1.1.2.2. Date Entered Duty Positions

A2.1.1.2.3. Training Status Code

A2.1.1.2.4. Date Entered Upgrade Training (UGT)

A2.1.2. For all other the UTM will need to place the individual into the correct workcenter and specialty. If the individual record is not available contact the losing unit to have the record transferred. If this fails, contact the [AFCEC-VLC](#) helpdesk for assistance. Additional information will need to be entered into the following areas:

**A2.1.2.1. User Administrators:**

A2.1.2.1.1. Individual UTM

A2.1.2.1.2. Workcenter Supervisor

A2.1.2.1.3. Immediate Supervisor

**A2.1.2.2. User Training Information:**

A2.1.2.2..1 Duty Position

A2.1.2.2.2. Date Entered Duty Positions

A2.1.2.2.3. Training Status Code

**Attachment 2**  
**3E1X1 Specialty Training Standard (STS)**

**A2.2. Specialty Tasks.** The following are tasks the workcenter supervisor will use to create the duty task list for each duty position created for their workcenter.

1. Tasks, Knowledge And Technical References	2. Core Tasks		3. Certification for OJT					4. Proficiency Codes Used To Indicate Training / Information Provided (See Explanations)					
			A	B	C	D	E	A 3 Skill Level		B 5 Skill Level		C 7 Skill Level	
	5 Level	7 Level	Tng Start	Tng Complete	Trainee Initials	Trainer Initials	Certify Initials	(1) Course	(2) DL	(1) CDC	(2) DL	(1) Course	(2) DL
<b>1. CIVIL ENGINEER (CE) COMMON CORE CONCEPTS</b> TR: <a href="#">CE Virtual Learning Center (CE-VLC)</a>													
<b>1.1.</b> Accomplish CE 5-Level Core Concepts Course <b>Note: Must complete WBT</b>	*						-	-	-	B	-	-	
<b>1.2.</b> Accomplish CE 7-Level Core Concepts Course <b>Note: Must complete WBT</b>		*					-	-	-	-	-	B	
<b>1.3.</b> CE Core Concepts Overview							A	-	-	-	-	-	
<b>2. HVAC/R SAFETY</b> TR: NFPA 70E, AFI32-1064, UFC3-560-01													
<b>2.1.</b> Electrical safety standard for AFS							A (I)	-	B	-	-	-	
<b>2.2.</b> Remove victim from energized circuits							b (I)	-	-	-	-	-	
<b>2.3.</b> Apply first aid procedures for electrical shock							b (I)	-	-	-	-	-	
<b>2.4.</b> Arc Flash Safety							A	-	-	-	-	-	
<b>3. HVAC/R PUBLICATIONS</b> TR: Fundamentals of HVAC/R 2nd Ed AHRI													
<b>3.1.</b> Tech Orders & Manufacturer's Manuals							A	-	-	-	-	-	
<b>3.2.</b> AFS Standards and Regulations							A	-	-	-	-	-	
<b>3.3.</b> Data Plate Specifications							-	-	-	-	B	-	
<b>4. TOOLS &amp; TEST EQUIPMENT</b> TR: TO's 32,33,34,35,38 series; Fundamentals of HVAC/R 2nd Ed AHRI													
<b>4.1.</b> Common hand tools							A	-	-	-	-	-	
<b>4.2.</b> Specialized tools							A	-	B	-	-	-	
<b>4.3.</b> Use Electrical Test Equipment													
<b>4.3.1.</b> Digital multimeter							2b (I)	-	b	-	-	-	
<b>4.3.2.</b> Clamp-on ammeter							2b (I)	-	b	-	-	-	
<b>4.3.3.</b> Analog multimeter							2b (I)	-	-	-	-	-	
<b>5. PIPING &amp; TUBING</b> TR: Fundamentals of HVAC/R 2nd Ed AHRI <b>Note: QTP required for UGT</b>													
<b>5.1.</b> Types							A	-	B	-	-	-	
<b>5.2.</b> Fittings							A	-	B	-	-	-	
<b>5.3.</b> Valves							A (I)	-	B	-	-	-	
<b>5.4.</b> Backflow prevention							A	-	B	-	-	-	
<b>5.5.</b> Piping & Tubing Systems													
<b>5.5.1.</b> Fabricate piping and tubing systems	*						2b	-	b	-	-	-	
<b>5.5.2.</b> Install piping and tubing systems	*						2b	-	b	-	-	-	
<b>6. BRAZING &amp; SOLDERING</b>													



**Attachment 2**  
**3E1X1 Specialty Training Standard (STS)**

1. Tasks, Knowledge And Technical References	2. Core Tasks		3. Certification for OJT					4. Proficiency Codes Used To Indicate Training / Information Provided (See Explanations)					
			A	B	C	D	E	A 3 Skill Level		B 5 Skill Level		C 7 Skill Level	
	5 Level	7 Level	Tng Start	Tng Complete	Trainee Initials	Trainer Initials	Certify Initials	(1) Course	(2) DL	(1) CDC	(2) DL	(1) Course	(2) DL
TR: ASM Handbook V-6 Welding Brazing and Soldering <b>Note: QTP required for UGT</b>													
6.1. Acetylene equipment (air and hydrocarbon)							B	-	B	-	-	-	
6.2. Oxyacetylene equipment							B	-	B	-	-	-	
6.3. Braze	*						2b	-	b	-	-	-	
6.4. Solder	*						2b	-	b	-	-	-	
<b>7. HVAC/R PHYSICS</b> TR: Fundamentals of HVAC/R 2nd Ed; AHRI Environmental Systems Technologies 2nd Ed; Principles of Refrigeration 5th Ed													
7.1. Heat flow (energy, measurement, transfer)							A (I)	-	B	-	-	-	
7.2. Fluid flow (properties, statics, dynamics)							A (I)	-	B	-	-	-	
7.3. Properties of air							A	-	B	-	-	-	
7.4. Use pressure-temperature chart							1a (I)	-	-	-	-	-	
7.5. Psychrometrics							-	-	B	-	-	-	
7.6. Plot psychrometric chart							-	-	-	-	2b	-	
7.7. Load Calculations													
7.7.1. Calculate building heat load							-	-	b	-	2b	-	
7.7.2. Determine system requirements							-	-	b	-	2b	-	
<b>8. AIR DISTRIBUTION SYSTEMS</b> TR: Environmental Systems Technology 2nd Ed; Trane Air Conditioning Manual; Principles of Refrigeration 5th Ed.; Refrigeration and Air Conditioning 4th Ed (ARI), RSMMeans® Facility Maintenance & Repair													
8.1. Constant Volume							A	-	B	-	-	-	
8.2. Variable Air Volume (VAV)							A	-	B	-	-	-	
8.3. Fan types							A	-	B	-	-	-	
8.4. Belt types							A	-	B	-	-	-	
8.5. Adjust dampers and linkage							2b	-	b	-	-	-	
8.6. Perform air balancing							-	-	b	-	2b	-	
8.7. System drawings							A	-	B	-	-	-	
8.8. Preventive maintenance							A	-	B	-	-	-	
8.9. Perform preventive maintenance							-	-	-	-	-	-	
8.10. Indoor Air Quality							A	-	B	-	-	-	
<b>9. HYDRONIC DISTRIBUTION SYSTEMS</b> TR: Fundamentals of HVAC/R 2nd Ed AHRI, RSMMeans® Facility Maintenance & Repair													
9.1. Hydronic systems							A	-	B	-	-	-	
9.2. Pumps							-	-	-	-	-	-	
9.2.1. Types and construction features							A (I)	-	B	-	-	-	
9.2.2. Install circulating pumps							1a (I)	-	-	-	-	-	
9.2.3. Replace pump packing							a (I)	-	-	-	-	-	
9.2.4. Replace mechanical seal							2b (I)	-	-	-	-	-	
9.2.5. Service water pumps							a (I)	-	-	-	-	-	
9.3. Coils							A	-	B	-	-	-	

**Attachment 2**  
**3E1X1 Specialty Training Standard (STS)**

1. Tasks, Knowledge And Technical References	2. Core Tasks		3. Certification for OJT					4. Proficiency Codes Used To Indicate Training / Information Provided (See Explanations)					
			A	B	C	D	E	A 3 Skill Level		B 5 Skill Level		C 7 Skill Level	
	5 Level	7 Level	Tng Start	Tng Complete	Trainee Initials	Trainer Initials	Certify Initials	(1) Course	(2) DL	(1) CDC	(2) DL	(1) Course	(2) DL
<b>9.4. Hydronic system flow</b>													
<b>9.4.1. Hydronic volume measurement</b>							A	-	B	-	-	-	
<b>9.4.2. Balance hydronic system</b>							-	-	b	-	-	-	
<b>9.5. Preventive maintenance</b>							A	-	B	-	-	-	
<b>9.6. Perform preventive maintenance</b>							-	-	-	-	-	-	
<b>9.7. System drawings</b>							A	-	B	-	-	-	
<b>10. ELECTRICAL</b> TR: ANSI Y32.2; 32-1064; National Electric Code (NFPA 70); National Electrical Safety Code Handbook; Fundamentals of HVAC/R 2nd Ed AHRI <b>Note: QTPs required for UGT</b>													
<b>10.1. Principles of Electricity</b>							B (I)	-	B	-	-	-	
<b>10.2. Wiring diagrams</b>							-	-	B	-	-	-	
<b>10.3. Wire system</b>							2b (I)	-	-	-	2b	-	
<b>10.4. Electrical Circuits</b>													
<b>10.4.1. Line circuit</b>							A (I)	-	B	-	-	-	
<b>10.4.2. Load circuit</b>							B (I)	-	B	-	-	-	
<b>10.4.3. Control circuit</b>							B (I)	-	B	-	-	-	
<b>10.4.4. Troubleshoot using schematic</b>		*					2b	-	b	-	2b	-	
<b>10.4.5. Correct malfunctions</b>	*						2b (I)	-	b	-	-	-	
<b>10.4.6. Troubleshoot components</b>							2b (I)	-	-	-	-	-	
<b>10.4.7. Interpret electrical drawings and symbols</b>							2b (I)	-	-	-	-	-	
<b>10.5. Protective Devices</b>													
<b>10.5.1. Circuit breakers</b>							A (I)	-	B	-	-	-	
<b>10.5.2. Fuses</b>							A (I)	-	B	-	-	-	
<b>10.6. Devices</b>													
<b>10.6.1. Switches</b>							A (I)	-	B	-	-	-	
<b>10.6.2. Timers</b>							A (I)	-	B	-	-	-	
<b>10.6.3. Transformers</b>							B (I)	-	B	-	-	-	
<b>10.6.4. Electromagnetic devices</b>							B (I)	-	B	-	-	-	
<b>10.7. Motors</b>													
<b>10.7.1. Single and three-phase</b>							B (I)	-	B	-	-	-	
<b>10.7.2. Replace motors</b>		*					2b (I)	-	B	-	-	-	
<b>10.7.3. Perform operational test</b>		*					2b (I)	-	b	-	-	-	
<b>10.7.4. Reverse rotation of three phase motor</b>							2b (I)	-	-	-	-	-	
<b>10.7.5. DC Motors</b>							-	-	-	-	B	-	
<b>10.7.6. Service electrical motors</b>							a (I)	-	-	-	-	-	
<b>11. HVAC CONTROL SYSTEMS</b> TR: UFC 3-470-01; Fundamentals of HVAC/R 2nd Ed AHRI, ASHRAE Std 135-2012, RSMMeans® Facility Maintenance & Repair													
<b>11.1. Types</b>													
<b>11.1.1. Pneumatic HVAC Control Systems</b>							-	-	-	-	-	-	
<b>11.1.2. Electrical HVAC Control Systems</b>							A	-	B	-	-	-	
<b>11.1.3. Electronic HVAC Control Systems</b>							A	-	B	-	-	-	
<b>11.1.4. Direct Digital Control (DDC)</b>							A	-	B	-	-	-	

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			A	B	C	D	E	A 3 Skill Level		B 5 Skill Level		C 7 Skill Level	
	5 Level	7 Level	Tng Start	Tng Complete	Trainee Initials	Trainer Initials	Certify Initials	(1) Course	(2) DL	(1) CDC	(2) DL	(1) Course	(2) DL
11.2. Frequency drives							A	-	B	-	B	-	
11.3. Energy Monitoring & Control Systems (EMCS)							A	-	B	-	-	-	
11.4. Troubleshoot							-	-	-	-	-	-	
11.5. Correct Malfunctions							-	-	-	-	-	-	
11.6. Calibrate							-	-	-	-	-	-	
11.7. Adjust							-	-	-	-	-	-	
<b>12. HEATING &amp; HOT WATER SYSTEMS</b> TR: ASHRAE Std 14, RSMMeans® Facility Maintenance & Repair <b>Note: QTP required for UGT</b>													
12.1. Fuel and Fuel Systems													
12.1.1. Characteristics of fuels (oil, gas)							A (I)	-	B	-	-	-	
12.1.2. Types of fuel systems							A (I)	-	B	-	-	-	
12.1.3. Inspect system for leaks							2b (I)	-	b	-	-	-	
12.2. Burners													
12.2.1. Construction features and operation of burners (oil, gas)							A (I)	-	B	-	-	-	
12.2.2. Properties of combustion							A (I)	-	B	-	-	-	
12.2.3. Combustion analyzers							A	-	B	-	-	-	
12.2.4. Perform pre-operational inspection							2b (I)	-	b	-	-	-	
12.2.5. Perform operational test		*					2b (I)	-	b	-	-	-	
12.2.6. Troubleshoot							2b (I)	-	-	-	-	-	
12.2.7. Correct malfunctions							2b (I)	-	-	-	-	-	
12.2.8. Preventive maintenance							-	-	B	-	-	-	
12.2.9. Perform preventive maintenance							a (I)	-	-	-	-	-	
12.3. Forced Air Heating													
12.3.1. Types							A (I)	-	B	-	-	-	
12.3.2. Operation							A (I)	-	B	-	-	-	
12.3.3. Perform pre-operational inspection							2b (I)	-	b	-	-	-	
12.3.4. Perform operational test							2b (I)	-	b	-	-	-	
12.3.5. Troubleshoot							2b	-	-	-	-	-	
12.3.6. Correct malfunctions							2b	-	-	-	-	-	
12.3.7. Preventive maintenance							-	-	B	-	-	-	
12.3.8. Perform preventive maintenance							a (I)	-	-	-	-	-	
12.4. Radiant Heating													
12.4.1. Types							A	-	B	-	-	-	
12.4.2. Operation							A	-	B	-	-	-	
12.4.3. Perform pre-operational inspection							2b	-	b	-	-	-	
12.4.4. Perform operational test							2b	-	b	-	-	-	
12.4.5. Troubleshoot							2b	-	-	-	-	-	
12.4.6. Correct malfunctions							2b	-	-	-	-	-	
12.4.7. Preventive maintenance							A	-	B	-	-	-	
12.4.8. Perform preventive maintenance							-	-	-	-	-	-	
12.5. Steam Generation													
12.5.1. Properties of steam							A (I)	-	B	-	-	-	
12.5.2. Boilers							B (I)	-	B	-	-	-	

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			A	B	C	D	E	A 3 Skill Level		B 5 Skill Level		C 7 Skill Level	
	5 Level	7 Level	Tng Start	Tng Complete	Trainee Initials	Trainer Initials	Certify Initials	(1) Course	(2) DL	(1) CDC	(2) DL	(1) Course	(2) DL
12.5.3. Principles of distribution systems (types and components)								B (I)	-	B	-	-	-
12.5.4. Auxiliary equipment								B (I)	-	B	-	-	-
12.5.5. Perform pre-operational inspection								2b (I)	-	-	-	-	-
12.5.6. Perform operational test								2b (I)	-	-	-	-	-
12.5.7. Troubleshoot								2b (I)	-	-	-	-	-
12.5.8. Correct malfunctions								2b (I)	-	-	-	-	-
12.5.9. Perform preventive maintenance								a (I)	-	-	-	-	-
12.5.10. Apply safety practices								2b (I)	-	-	-	-	-
12.6. Hot Water Generation													
12.6.1. Types								A	-	B	-	-	-
12.6.2. Boilers								A	-	B	-	-	-
12.6.3. Auxiliary equipment								A	-	B	-	-	-
12.6.4. Perform pre-operational inspection								2b	-	b	-	-	-
12.6.5. Perform operational test	*							2b	-	b	-	2b	-
12.6.6. Troubleshoot								2b	-	-	-	2b	-
12.6.7. Correct malfunction								2b	-	-	-	2b	-
12.6.8. Preventive maintenance								A	-	B	-	-	-
12.6.9. Perform preventive maintenance								-	-	-	-	-	-
<b>13. AIR CONDITIONING &amp; REFRIGERATION SYSTEMS</b> TR: Fundamentals of HVAC/R 2nd Ed AHRI; Modern Refrigeration and Air Conditioning, 19th Ed., RSMMeans® Facility Maintenance & Repair <b>Note: QTP required for UGT</b>													
13.1. Universal Certification								** (I)	-	-	-	-	-
13.2. Refrigerants													
13.2.1. Types and uses								B (I)	-	B	-	B	-
13.2.2. Retrofit with alternative refrigerant								a (I)	-	-	-	-	-
13.3. Basic Refrigeration Cycle								B (I)	-	B	-	-	-
13.4. Oils (types and uses)								B (I)	-	B	-	-	-
13.5. Locate refrigerant leaks	*							2b (I)	-	b	-	-	-
13.6. Recover refrigerant	*							2b (I)	-	b	-	-	-
13.7. Recycle refrigerants								-	-	-	-	-	-
13.8. Reclaim refrigerants								-	-	-	-	-	-
13.9. Pump down system	*							2b (I)	-	b	-	-	-
13.10. Pressure check system	*							2b (I)	-	b	-	-	-
13.11. Charge system	*							2b (I)	-	b	-	-	-
13.12. Perform Acid/Moisture Test								-	-	-	-	2b	-
13.13. Superheat													
13.13.1. Measure	*							a (I)	-	b	-	2b	-
13.13.2. Adjust		*						a (I)	-	b	-	2b	-
13.14. Subcooling													
13.14.1. Measure	*							a (I)	-	b	-	2b	-
13.14.2. Adjust		*						a (I)	-	b	-	2b	-
13.15. Components													
13.15.1. Compressors								A (I)	-	B	-	B	-

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**3E1X1 Specialty Training Standard (STS)**

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			A	B	C	D	E	A 3 Skill Level		B 5 Skill Level		C 7 Skill Level	
	5 Level	7 Level	Tng Start	Tng Complete	Trainee Initials	Trainer Initials	Certify Initials	(1) Course	(2) DL	(1) CDC	(2) DL	(1) Course	(2) DL
13.15.2. Evaporators								A (I)	-	B	-	-	-
13.15.3. Condensers (air and water cooled)								A (I)	-	B	-	-	-
13.15.4. Metering devices								A (I)	-	B	-	B	-
13.15.5. Accessories								A (I)	-	B	-	-	-
13.16. Capacity Control								A	-	B	-	-	-
13.17. Refrigeration Systems											-		
13.17.1. Cold Storage (permanent/portable)								B (I)	-	B	-	-	-
13.17.2. Ice machines								-	-	-	-	-	-
13.17.3. Perform pre-operational inspection								2b (I)	-	-	-	-	-
13.17.4. Perform operational test								2b (I)	-	-	-	-	-
13.17.5. Troubleshoot								-	-	-	-	-	-
13.17.6. Correct malfunctions								-	-	-	-	-	-
13.17.7. Perform preventive maintenance								-	-	-	-	-	-
13.18. Air Conditioning Systems													
13.18.1. Direct Expansion System													
13.18.1.1. Package units								A	-	B	-	-	-
13.18.1.2. Split systems								A	-	B	-	-	-
13.18.1.3. Heat pump								A	-	B	-	-	-
13.18.1.4. Perform pre-operational inspection								2b	-	b	-	-	-
13.18.1.5. Perform operational test	*							2b	-	b	-	-	-
13.18.1.6. Troubleshoot								2b	-	-	-	-	-
13.18.1.7. Correct malfunctions								2b	-	-	-	-	-
13.18.1.8. Preventive maintenance								A	-	B	-	-	-
13.18.1.9. Perform Preventive maintenance								-	-	-	-	-	-
13.18.2. Indirect Expansion System													
13.18.2.1. Geo-thermal								A	-	B	-	-	-
13.18.2.2. Chillers								A	-	B	-	B	-
13.19. Plot Pressure Enthalpy Chart								1a (I)	-	b	-	2b	-
<b>14. AIR COMPRESSING EQUIPMENT (non-aircraft generation/non-breathable)</b> TR: AFI 32-1068; RSMMeans® Facility Maintenance & Repair													
14.1. Types of systems								A	-	B	-	-	-
14.2. Perform pre-operational inspection								2b	-	-	-	-	-
14.3. Perform operational test								2b	-	-	-	-	-
14.4. Troubleshoot								2b	-	-	-	-	-
14.5. Correct malfunctions								2b	-	-	-	-	-
14.6. Preventive maintenance								A	-	B	-	-	-
14.7. Perform preventive maintenance								-	-	-	-	-	-
<b>15. AFSC SPECIFIC CONTINGENCY RESPONSIBILITIES</b> TR: AFH 10-222V2, Bare Base Assets <b>Note: QTP required for UGT</b>													
15.1. HVAC/R Contingency Equipment													
15.1.1. TRICON Refrigerated Containerized System (TRCS)													

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			A	B	C	D	E	A 3 Skill Level		B 5 Skill Level		C 7 Skill Level	
	5 Level	7 Level	Tng Start	Tng Complete	Trainee Initials	Trainer Initials	Certify Initials	(1) Course	(2) DL	(1) CDC	(2) DL	(1) Course	(2) DL
TR: TO 40R-6-11 (TM 10-8145-224-13-P-V-1-0-0)													
15.1.1.1. Theory of operation							A	-	B	-	-	-	-
15.1.1.2. Setup	◆						2b	-	-	-	-	-	-
15.1.1.3. Perform pre-operational inspection	◆						2b	-	-	-	-	-	-
15.1.1.4. Perform operational test	◆						2b	-	-	-	-	-	-
15.1.1.5. Troubleshoot	◆						-	-	-	-	-	-	-
15.1.1.6. Correct malfunctions	◆						-	-	-	-	-	-	-
15.1.1.7. Perform preventive maintenance	◆						-	-	-	-	-	-	-
15.1.2. 130K BTU Heater TR: TO 35E7-3-4-1													
15.1.2.1. Theory of operation							A	-	B	-	-	-	-
15.1.2.2. Setup	◆						2b	-	-	-	-	-	-
15.1.2.3. Perform pre-operational inspection	◆						2b	-	-	-	-	-	-
15.1.2.4. Perform operational test	◆						2b	-	-	-	-	-	-
15.1.2.5. Troubleshoot	◆						-	-	-	-	-	-	-
15.1.2.6. Correct malfunctions	◆						-	-	-	-	-	-	-
15.1.2.7. Perform preventive maintenance	◆						-	-	-	-	-	-	-
15.1.3. Field Deployable Environmental Control Unit (FDECU) TR: TO 35E9-314-1													
15.1.3.1. Theory of operation							A	-	B	-	-	-	-
15.1.3.2. Setup	◆						2b	-	-	-	-	-	-
15.1.3.3. Perform pre-operational inspection	◆						2b	-	-	-	-	-	-
15.1.3.4. Perform operational test	◆						2b	-	-	-	-	-	-
15.1.3.5. Troubleshoot	◆						-	-	-	-	-	-	-
15.1.3.6. Correct malfunctions	◆						-	-	-	-	-	-	-
15.1.3.7. Perform preventive maintenance	◆						-	-	-	-	-	-	-
15.1.4. WH-400 Water Heater TR: TO 40H3-7-1 (TM 10-4520-266-13&P)													
15.1.4.1. Theory of operation							A	-	B	-	-	-	-
15.1.4.2. Setup	◆						2b	-	-	-	-	-	-
15.1.4.3. Perform pre-operational inspection	◆						2b	-	-	-	-	-	-
15.1.4.4. Perform operational test	◆						2b	-	-	-	-	-	-
15.1.4.5. Troubleshoot	◆						-	-	-	-	-	-	-
15.1.4.6. Correct malfunctions	◆						-	-	-	-	-	-	-
15.1.4.7. Perform preventive maintenance	◆						-	-	-	-	-	-	-
15.1.5. M-80 Water Heater TR: TO 35E7-4-27-1													
15.1.5.1. Theory of Operation							A	-	-	-	-	-	-
15.1.5.2. Setup							-	-	-	-	-	-	-
15.1.5.3. Perform pre-operational inspection							-	-	-	-	-	-	-
15.1.5.4. Perform operational test							-	-	-	-	-	-	-
15.1.5.5. Troubleshoot							-	-	-	-	-	-	-
15.1.5.6. Correct malfunctions							-	-	-	-	-	-	-
15.1.5.7. Perform preventive maintenance							-	-	-	-	-	-	-

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	5 Level	7 Level	Tng Start	Tng Complete	Trainee Initials	Trainer Initials	Certify Initials	(1) Course	(2) DL	(1) CDC	(2) DL	(1) Course	(2) DL
<b>15.1.6. Advanced Design Refrigeration (ADR 300)</b> TR: TO 40R7-6-1													
<b>15.1.6.1. Theory of Operation</b>							A	-	-	-	-	-	-
<b>15.1.6.2. Setup</b>							-	-	-	-	-	-	-
<b>15.1.6.3. Perform pre-operational inspection</b>							-	-	-	-	-	-	-
<b>15.1.6.4. Perform operational test</b>							-	-	-	-	-	-	-
<b>15.1.6.5. Troubleshoot</b>							-	-	-	-	-	-	-
<b>15.1.6.6. Correct malfunctions</b>							-	-	-	-	-	-	-
<b>15.1.6.7. Perform preventive maintenance</b>							-	-	-	-	-	-	-
<b>16. Water Testing &amp; Treatment for Heating &amp; Cooling Systems</b> Note: A Web-based Course is Available if Training is Required.													
<b>16.1. Water characteristics</b>							-	-	-	-	-	-	-
<b>16.2. Purpose and types of tests</b>							-	-	-	-	-	-	-
<b>16.3. Internal treatment methods</b>													
<b>16.3.1. Determine and adjust water levels</b>							-	-	-	-	-	-	-
<b>16.3.2. Determine and adjust treatment levels</b>							-	-	-	-	-	-	-
<b>16.3.3. Determine and adjust conductivity</b>							-	-	-	-	-	-	-
<b>16.4. External treatment methods</b>							-	-	-	-	-	-	-
<b>16.5. Chemical feeding equipment</b>							-	-	-	-	-	-	-
<b>16.6. Environmental concerns</b>							-	-	-	-	-	-	-

**Attachment 3**  
**3E1X1 Air Force Qualification Package (AFQTP) Documentation Record**

### A3. AFQTP Documentation Record

A3.1. To ensure each HVAC/R trainee is trained to the correct standard, an AF Qualification Training Package (AFQTP) has been developed for each core and diamond tasks identified in the STS. These AFQTPs **are mandated** to be used by the trainee, trainer, and certifier in their on-the-job-training program for upgrade to the 5- or 7-level.

A3.2. These AFQTPs ensures all aspects of the task is covered sufficiently and provide additional task knowledge in preparation for hands-on training. AFQTPs summarize procedures on a task performance checklist for use by trainers, certifiers, and trainees.

A3.2.1. The UTM or supervisor can download paper-based AFQTPs. Paper-based AFQTPs can be found on the [CE-VLC](#) under the Library link and then by selecting Resources.

A3.2.2. In additional to the paper-based AFQTPs there are web-based courses or assessments developed for certain tasks that are available on the [CE-VLC](#) under the Course List link and specialty topic area.

A3.3. **Documentation.** Before a core or diamond task can be signed off in the JQS section of the individual automated training record the task must be signed off in the QTP section first.

A3.3.1. **Core/Diamond Tasks.** To document the completion the supervisor or trainer opens the individual automated training record, navigates to the QTP section, enter the start and completed date with signatures.

A3.3.2. **Diamond (♦) Tasks.** Supervisors/Trainers **DO NOT** sign off the corresponding JQS task until the trainee has completed hands-on training. If the required equipment is not available at your location, completion of the task's AFQTP web-based course or assessment with a passing score of 80% is all that required for upgrade training. Hands-on certification shall be accomplished at the first opportunity when equipment is available and then can be signed off on the JQS.

A3.4. 3E1X1 AFQTPs for Core and Diamond Tasks Requirements.

Task Number	Tasks, Knowledge and Technical References	Core/Diamond Tasks		Certification of AFQTPs			
		5 Level	7 Level	Tng Start	Tng Complete	Trainee Initials	Trainer Initials
<b>1.</b>	<b>CIVIL ENGINEER (CE) CORE CONCEPTS COURSES</b>						
<b>1.1.</b>	Accomplish CE 5-Level Core Concepts Course	*					
<b>1.2.</b>	Accomplish CE 7-Level Core Concepts Course		*				
<b>5.</b>	<b>PIPING &amp; TUBING</b> Accomplish Paper-based AFQTP Piping & Tubing						
<b>5.5.</b>	Piping & Tubing System						
<b>5.1.</b>	Fabricate piping and tubing systems	*					
<b>5.2.</b>	Install piping and tubing systems	*					
<b>6.</b>	<b>BRAZING &amp; SOLDERING</b> Accomplish Paper-based AFQTP Brazing & Soldering						



**Attachment 3**  
**3E1X1 Air Force Qualification Package (AFQTP) Documentation Record**

Task Number	Tasks, Knowledge and Technical References	Core/Diamond Tasks		Certification of AFQTPs			
		5 Level	7 Level	Tng Start	Tng Complete	Trainee Initials	Trainer Initials
6.3.	Braze	*					
6.4.	Solder	*					
10.	<b>ELECTRICAL</b> Accomplish the following AFQTPs: Paper-based AFQTP: Electrical Web-based: Arc Flash Safety Awareness, Electrical Safety Standards, Electrical Testing Equipment and HVAC/R Basic Electrical Diagnostics						
10.4.	Electrical Circuits						
10.4.4.	Troubleshoot using schematic		*				
10.4.5.	Correct malfunction	*					
10.7.	Motors						
10.7.2	Replace motors	*					
10.7.3.	Perform operational test	*					
12.	<b>HEATING &amp; HOT WATER SYSTEMS</b> Accomplish Paper-based AFQTP Heating & Hot Water Systems						
12.2.	Burners						
12.2.5	Perform operational test	*					
12.6.	Hot Water Generation						
12.6.5.	Perform operational test	*					
13.	<b>AIR CONDITIONING &amp; REFRIGERATION SYSTEMS</b> Accomplish Paper-based AFQTP Air Conditioning & Refrigeration Systems						
13.5.	Locate refrigerant leaks	*					
13.6.	Recover refrigerant	*					
13.9.	Pump down system	*					
13.10.	Pressure check system	*					
13.11.	Charge system	*					
13.13.	Superheat						
13.13.1.	Measure	*					
13.13.2.	Adjust		*				
13.14.	Subcooling						
13.14.1.	Measure	*					
13.14.2	Adjust		*				
13.8.	Air Conditioning Systems						
13.18.1.	Direct Expansion System						
13.18.1.5.	Perform operational test	*					
15.	<b>AFSC SPECIFIC CONTINGENCY RESPONSIBILITIES</b> Accomplish the following AFQTPs: Paper-based: AFSC Specific Contingency Responsibilities Web-based: 130K BTU Heater Course, TRICON Refrigerated Container System (TRCS) Course, Field Deployable Environmental Control Unit (FDECU), FDECU-9 Course, WH-400 Water Heater Course						
15.1.	HVAC/R Contingency Equipment						
15.1.1.	TRICON Refrigerated Containerized System (TRCS)						
15.1.1.2.	Setup	♦					
15.1.1.3.	Perform pre-operational inspections	♦					
15.1.1.4.	Perform operational test	♦					
15.1.1.5.	Troubleshoot	♦					
15.1.1.6.	Correct malfunction	♦					
15.1.1.7.	Perform preventive maintenance	♦					
15.1.2.	130K BTU Heater						

**Attachment 3  
3E1X1 Air Force Qualification Package (AFQTP) Documentation Record**

Task Number	Tasks, Knowledge and Technical References	Core/Diamond Tasks		Certification of AFQTPs			
		5 Level	7 Level	Tng Start	Tng Complete	Trainee Initials	Trainer Initials
15.1.2.2.	Setup	◆					
15.1.2.3.	Perform pre-operational inspections	◆					
15.1.2.4.	Perform operational test	◆					
15.1.2.5.	Troubleshoot	◆					
15.1.2.6.	Correct malfunctions	◆					
15.1.2.7.	Perform preventive maintenance	◆					
15.1.3.	Field Deployable Environmental Control Unit (FDECU)						
15.1.3.2.	Setup	◆					
15.1.3.3.	Perform Pre-operational inspections	◆					
15.1.3.4.	Perform operational test	◆					
15.1.3.5.	Troubleshoot	◆					
15.1.3.6.	Correct malfunctions	◆					
15.1.3.7.	Preventive maintenance	◆					
15.1.4.	WH-400 Water Heater						
15.1.4.2.	Setup	◆					
15.1.4.3.	Perform pre-operational inspections	◆					
15.1.4.4.	Perform operational test	◆					
15.1.4.5.	Troubleshoot	◆					
15.1.4.6.	Correct malfunctions	◆					
15.1.4.7.	Preventive maintenance	◆					