DEPARTMENT OF THE AIR FORCE Headquarters US Air Force Washington, DC 20330-1030 CFETP 4R0X1 Parts I and II October 31, 1998 Change 1

AFSC 4R0X1/A/B/C DIAGNOSTIC IMAGING



CAREER FIELD EDUCATION AND TRAINING PLAN

CAREER FIELD EDUCATION TRANING PLAN DIAGNOSTIC IMAGING 4R0X1/A/B/C

This change is effective February 28, 2000

1. Page insert changes for CFETP 4R0X1

Remove:	<u>Insert:</u>
Cover	Cover
i-ii	i-ii
9-14	9-14
27-28	27-28
47-48	47-48

2. Write-in changes:

Page	<u>Paragraph</u>	<u>Line(s)</u>	<u>Action</u>
49	entire page	entire page	Place an "X" over the entire page to include the page number, then insert new page 49 on the old page 49
59	23a(4)	12	Change the dash in War time to "B"
59	23b(4)	17	Place an asterisk prior to the task. Change the "B" in Phase I to "2b", and the dash in Phase II to "3b"
59	23c(6)	26	Change the dash in War Time to "B"
60	23d(14)	17	Change the "a" in Phase I to "1a", Change the dash in War Time to "1a"
60	23d(17)	20	Change "a" in Phase II to "A"
61	23f	3	Change dash in Phase II to "2a"
66	-	6	Change 8th ed, to 9th ed,
67	entire page	entire page	Place an "X" over the entire page to include the page number, then insert new page 67 on the old page

3. After necessary action, file this sheet in back of CFETP.

BY ORDER OF THE SECRETARY OF THE AIR FORCE

OFFICIAL

CHARLES H. ROADMAN II, Lt Gen, USAF, MC Surgeon General

DIAGNOSTIC IMAGING SPECIALTY CAREER FIELD EDUCATION AND TRAINING PLAN AFSC 4R0X1/A/B/C

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Certified by: 74th MG/SGSX (CMSgt Darryl W. Lee) OPR: 381 TRS/XWBA (MSgt Michael C. Nadason)

Number of Printed Pages: 92

3. Recommendations. Report unsatisfactory performance of individual course graduates to 882 TRG/TGE 939 Missile Rd Sheppard AFB, TX 76311-2245. Reference specific STS paragraphs.

7 Attachments:

- 1. Qualitative Requirements
- 2. Diagnostic Imaging Specialty
- 2a. Mammography Specialty
- 3. Nuclear Medicine, A shred
- 4. Ultrasound, B shred
- 5. Magnetic Resonance Imaging, C shred
- 6. Bibliography and Cross-Talk Listing of 4R0X1 Training References

This Block Is For Identification Purposes Only				
Name Of Trainee				
Printed Name (Last, First, Middle Initial)		Initials (Written)	SSAN	
Printed Name Of Trainer and	1 Cortifyin	a Official And Writton Initia	do	
		g Official And Written mitta	us	
N/I	N/I			
N/I	N/I			
N/I	N/I			
N/I	N/I			
N/I	N/I			
N/I	N/I			
1//2	1,72			
N/I	N/I			
N/I	AT/T			
N/I	N/I			

QUALITATIVE REQUIREMENTS

		Proficiency Code Key
	Scale Value	Definition: The individual
	1	Can do simple parts of the task. Needs to be told or shown how to do most of the task. (Extremely Limited)
Task	2	Can do most parts of the task. Needs help only on hardest parts. (Partially Proficient)
Performance	3	Can do all parts of the task. Needs only a spot check of completed work. (Competent)
Levels	4	Can do the complete task quickly and accurately. Can tell or show others how to do the task. (Highly Proficient)
	a	Can name parts, tools, and simple facts about the task. (Nomenclature)
*Task	b	Can determine step by step procedures for doing the task. (Procedures)
Knowledge	c	Can identify why and when the task must be done and why each step is needed. (Operating Principles)
Levels	d	Can predict, isolate, and resolve problems about the task. (Advanced Theory)
	A	Can identify basic facts and terms about the subject. (Facts)
**Subject	В	Can identify relationship of basic facts and state general principles about the subject. (Principles)
Knowledge	C	Can analyze facts and principles and draw conclusions about the subject. (Analysis)
Levels	D	Can evaluate conditions and make proper decisions about the subject. (Evaluation)

Explanations

- This mark is used alone instead of a scale value to show that no proficiency training is provided in the course or CDC.
- X This mark is used alone in course columns to show that training required but not given due to limitations in resources.

NOTE: All tasks and knowledge items shown with a proficiency code in column 3E are trained during wartime.

Attachment 1 28

^{*} \hat{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)

^{**} 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.

	- STS 4R0X1 -	2. CERTIFICATION FOR OJT AND QUALIFICATION TRAINING PACKAGES					3. TRA	INING P	ROFICIE	ENCY CO	DDES	
	ASKS, KNOWLEDGE, TECHNICAL EFERENCES AND CORE TASKS	A Start Date	B Completion Date	C Trainer's Initials	D Trainee's Initials	E Certifier's Initials	F QTP	A AQR Course	B 3-Skill Level Course	C 5-Skill Level CDC	D 7-Skill Level Course	E War Time Crs
20e(6)	Embolotherapy							_	_	_	_	_
20e(7)	Venous filter procedures							Ī	-	_		_
20e(8)	Biliary interventions							-	-	-	-	_
20e(9)	Genitourinary interventions							-	-	_	_	_
20e(10)	Needle biopsy procedures							_	-	-	-	_
20e(11)	Percutaneous abcess drainage							_	-	-	-	_
20e(12)	Percutaneous gastrostomy							_	-	-	-	_
20e(13)	Percutaneous nephronstomy							_	-	-	-	_
20e(14)	Foreign body retrieval							-	_	_	-	_
20e(15)	Vascular pressure measurements							I	ı	_	_	_

21 MAMMOGRAPHY PROCEDURES (SEI) TR: Merrill's Atlas of Radiographic Positions and Radiologic Procedures (Vol 2, Ch 24); ACR Radiologic		C 5-Skill Level	D 7-Skill Level	Е
TR: Merrill's Atlas of Radiographic Positions and Radiologic Procedures (Vol 2, Ch 24); ACR Radiologic			Course	War Time Crs
Technologists Manual				
21a Perform routine mammography				
* 21a(1) Craniocaudad (CC)	-	4c	-	_
* 21a(2) Mediolateral oblique (MLO)	-	4c	_	_
21b Perform special mammography				
* 21b(1) Spot compression	-	4c	_	_
* 21b(2) Magnification	-	4c	_	_
* 21b(3) Exaggerated craniocaudad	-	4c	_	_
21b(4) Cleavage	-	3c	_	-
21b(5) Axillary tail	-	3c	_	-
21b(6) Tangential	-	b	_	-
* 21b(7) Rolled view	-	3c	_	_
* 21b(8) Augmented breast (implants)	-	4c	_	_
* 21b(9) 90-degree lateral	-	3c	_	_
21b(10) Lateromedial (LM)	-	3c	_	_
21b(11) Lateral medial oblique (LMO)	-	3c	_	_
21b(12) Caudocranial (reverse CC)	-	3c	_	_
21b(13) Superolateral to inferomedial oblique	-	b	_	_
21b(14) Post-mastectomy	-	b	_	_
21c Assist in performing special mammographic procedures				
21c(1) Stereotactic biopsy	-	A	_	_
21c(2) Needle localization	-	A	_	_
21c(3) Aseptic techniques/sterile procedures	-	A	_	_
21c(4) Breast ultrasound	-	A	_	-

- STS 4R0X1 -	2. CERTIFICATION FOR OJT AND QUALIFICATION TRAINING PACKAGES							INING P	ROFICIE	ENCY CO	DES
TASKS, KNOWLEDGE, TECHNICAL REFERENCES AND CORE TASKS	A Start Date	B Completion Date	C Trainer's Initials	D Trainee's Initials	E Certifier's Initials	F QTP	A AQR Course	B 3-Skill Level Course	C 5-Skill Level	D 7-Skill Level Course	E War Time Crs
21 MAMMOGRAPHY PROCEDURES (SEI) TR: Merrill's Atlas of Radiographic Positions and Radiologic Procedures (Vol 2, Ch 24); ACR Radiologic Technologists Manual											
ACR guidelines, accreditation standards, and quality assurance											
* 21d(1) Technologist and radiologist continuing education requirements							_	_	A	_	_
21d(2) Frequency of tests							-	_	A	_	_
21d(3) Types of tests											
21d(3)(a) Screen-film contact/cassette test							-	-	В	_	-
21d(3)(b) Compression test		 					_	_	В	_	-
* 21d(3)(c) Phantom test							-	-	3c	_	-
21d(3)(d) Viewboxes							-	-	В	_	-
* 21d(3)(e) Sensitometry test							-	-	3c	_	-
21d(3)(f) Repeat analysis							_	_	В	_	-
21d(3)(g) Processor cleanliness							-	_	В	_	_
21d(3)(h) Visual checklist (mammography unit)							-	_	В	_	_
21d(3)(i) Fixer retention analysis							-	-	b	-	-
21d(3)(j) Darkroom fog test							-	-	b	-	-
21d(3)(k) Screen cleanliness							-	-	В	-	-
21d(3)(1) Darkroom cleanliness							-	-	В	-	-
21e Anatomy and Physiology							_	_	A	_	_
21f Risk factors and benefits							_	_	A	_	_
21g Processing and artifacts							_	_	С	_	_

- communication, and Air Force occupational safety and health programs are followed. Performs tests on radiation protection equipment. Assesses staff competence, monitors appropriateness of care and completeness of examination requests.
- 4.2.7. Plans, organizes, and supervises diagnostic imaging activities. Assists and advises officer-in-charge on design and development of organizational structure. Analyzes workload and establishes production controls and performance standards for administrative and technical diagnostic imaging activities. These activities include: preparation, maintenance, and disposition of radiologic reports, records, and correspondence; receiving patients; using and maintaining equipment; darkroom activities; performing diagnostic imaging examinations; and diagnostic and therapeutic procedures. Coordinates on interdepartmental issues that interface with diagnostic imaging. Prepares and implements financial plan, monitors and analyzes annual expenditures. Prepares equipment purchase requests and justifications. Monitors equipment performance and preventive maintenance activities. Recommends new equipment procurement. Performs as the diagnostic imaging facility manager.
- 4.3. **Duty Titles.** Appropriate duty titles for personnel working in this specialty depend on rank and/or skill level. Individuals possessing the 3-skill level, regardless of rank hold the duty title of *Diagnostic Imaging Apprentice*. Sub-specialties and shreds are Diagnostic Imaging, XXXX (Nuclear Medicine/ Ultrasound/ MRI/ CT/ Interventional/ Mammography/Radiation Oncology) Apprentice. Individuals possessing the 5-skill level, regardless of rank, hold the duty title of *Diagnostic Imaging Journeyman*. Sub-specialties and shreds are Diagnostic Imaging, XXXX (Nuclear Medicine/ Ultrasound/ MRI/ CT/ Interventional/ Mammography/ Radiation Oncology) Journeyman. Individuals possessing the 7-skill level, regardless of rank, hold the duty title of *Diagnostic Imaging Craftsman*. Sub-specialties and shreds are Diagnostic Imaging, XXXX (Nuclear Medicine/ Ultrasound/ MRI/ CT/ Interventional/ Mammography/ Radiation Oncology) Craftsman. In addition, individuals in the ranks of SSgt through MSgt who hold supervisory or management positions over an entire department or section may hold the duty title NCOIC. The title Diagnostic Imaging Superintendent is reserved for Senior Master Sergeants who possess the 9-skill level. However, a Master Sergeant who fills a funded SMSgt position may also hold the title Superintendent. The title Diagnostic Imaging Manager is reserved for Chief Master Sergeants. Any NCOIC who overseas a flight with an Officer (Radiologist) assigned may use the title "Flight Chief".
- **5. Skill/Career Progression.** Adequate training and timely progression from the apprentice to the superintendent skill 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 appropriate training, education, and experience at proper points in their career.
- 5.1. **Apprentice** (3) **Level.** Initial skills training in this specialty consists of the task and knowledge training provided in Phase I and Phase II. Initial skills training requirements were reviewed during the 4R0X1X U&TW held August 1998 at Sheppard AFB. The decision to train specific task and knowledge items

is based on JRCERT accreditation requirements, review of OSR data, and 4R0X1 subject matter expert (SME) input. After completing initial skills training, apprentices will work with qualified diagnostic imaging journeymen, craftsmen, and radiologists to further enhance their knowledge and skills. Job assignments will normally include duties in diagnostic imaging service administration, routine clinical radiography, and/or assisting in special clinical radiography. The apprentice will enter upgrade training using the 4R051 Career Development Course (CDC), and will receive on-the-job training required for certification in all core tasks listed in the STS. The apprentice should devote their full time to learning the medical field and the primary job and to passing the Air Force Quality Control Test. Completion of national certification in radiography by the American Registry of Radiologic Technologists (ARRT) at the earliest opportunity is highly recommended. Taking an advanced first aid course, qualifying as an Emergency Medical Technician, or becoming a cardiopulmonary resuscitation (CPR) instructor are examples of how apprentices could increase their knowledge of the medical field.

- 5.2. **Journeyman** (5) Level. Following completion of the prerequisites for upgrade to the 5-skill level, new journeymen should consider expanding their personal and professional horizons as they enter into continuation training. Job assignment possibilities widen to include more emphasis in special clinical radiography areas, duties as a preceptor/clinical instructor for Phase II students, duties in diagnostic imaging logistics, and first line supervisory duties in routine clinical radiography or diagnostic imaging service administration areas. Completion of continuing education requirements is mandatory for maintaining current ARRT registration. Attending computer training classes, completing requirements for the Community College of the Air Force (CCAF) Associate of Applied Science Degree in Radiologic Technology, and active participation as a member in the American Society of Radiologic Technologists (ASRT) and its state and local affiliates is encouraged. The more senior journeyman may consider training into one of the Special Experience Identifier (SEI) or AFSC shred areas as well as certain special duty assignments such as Technical Training Instructor duty. (Individuals must have, or be able to complete requirements for an Associate Degree within one year following assignment to instructor duty.) Active involvement in squadron and community activities is strongly encouraged. Individuals will begin preparation for promotion to Staff Sergeant under the Weighted Airman Promotion System (WAPS). Individuals will attend Airman Leadership School after 48 months in the Air Force, or upon selection for promotion to Staff Sergeant.
- 5.3. **Craftsman (7) Level.** Upon selection for promotion to the grade of Staff Sergeant, journeymen may be entered into upgrade training for the 7-skill level (no earlier than the first day of the promotion cycle). After completing the first 12 months of the required 18 months of upgrade training (UGT), individuals may attend the 7-level resident course at Sheppard AFB. (Note: Individuals who have previously held a 7-skill level in another career field are eligible to attend the 7-level resident course after only six months of UGT) Craftsmen are expected to be knowledgeable and highly skilled in a wide variety of duties within the AFS. They may serve in supervisory, administrative, or management positions in the basic AFS areas, or in technical or supervisory positions in one of the subspecialty areas. Phase II course Supervisors, the career field technical writer, instructors and instructor supervisors at the technical training school are normally selected from this group of widely experienced technologists. By now, individuals

should have completed the CCAF degree. Individuals are encouraged to continue collegiate education toward a baccalaureate or advanced degree in a specialty directly related to the AFSC (radiologic technology or health sciences) or one that would prepare the individual for the higher level management positions in the AFSC (business administration, personnel management, or education). Continued membership, active participation, and service in leadership roles in the ASRT and in its state and local affiliates is encouraged. Craftsmen selected for promotion to Technical Sergeant will attend a MAJCOM Noncommissioned Officer Academy. Active involvement in squadron, base, and community activities to help build leadership and management abilities is strongly encouraged.

- 5.4. **Superintendent (9) Level.** Superintendents are normally assigned to top level supervisory positions at the regional hospital or medical center level, or as the educational program director of the technical school at Sheppard AFB. (The program director position requires a minimum educational level of a Bachelor's degree, and a minimum of two years prior teaching experience in an accredited Radiologic Technology program.) Collegiate courses in the areas of financial and personnel management should be included in the education program as the individual completes a baccalaureate or advanced degree. Active involvement should continue in squadron, base, and community activities and in all levels of the career field's professional organizations with emphasis placed on assuming leadership roles. Completion of the Senior Noncommissioned Officer Academy is required for all persons selected for promotion to Chief Master Sergeant.
- 6. **Training Decisions.** The CFETP uses a building block approach (simple to complex) to encompass the entire spectrum of training requirements for the diagnostic imaging 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 most recent training decisions for the 4R0X1X career field were made during a Utilization and Training Workshop (U&TW) held at Sheppard AFB in August 1998. Training decisions made for this AFS have been, and must continue to be made with the full understanding of their impact on the external, civilian accreditation of the programs.
- 6.1 **4R0X1** Accreditation. The 4R0X1 training program is accredited by the JRCERT, which makes graduates eligible to sit for the national certification examination in radiography offered by the ARRT. Continued JRCERT accreditation is based on our compliance with the "Standards for an Accredited Educational Program for the Radiographer" published by the JRCERT. These "Standards" are designed to assess the effectiveness of a program at achieving student learning outcomes consistent with national standards of practice in radiography. Currently, the Air Force radiography program is accredited as a 12-month program. Individuals who graduate from the 3-skill level course (52 weeks total between Phase I and Phase II), successfully complete the 4R051 CDC, and pass the Air Force Quality Control Test are eligible to take the ARRT's certification examination in radiography. Implementation of the Mammography Quality Standards Act of 1992 requires Air Force 4R0X1s who are performing mammography to be certified by the ARRT, or to hold an unrestricted state license from the state in which they practice. Since mammography is a mission requirement at nearly every medical

treatment facility where 4R0X1s are assigned, maintaining the link between our training programs and civilian accreditation and certification agencies is necessary to ensure a continual supply of Registered Technologists to provide for mission capability around the globe.

- 6.2 **4R0X1A** Accreditation. The tri-service 4R0X1A training program, sponsored by the Naval School of Health Sciences (NSHS)-Bethesda, is accredited by the JRCNMT, which makes graduates eligible to sit for the national certification examinations in nuclear medicine offered by the ARRT and the NMTCB. Continued JRCNMT accreditation is based on compliance with the "Standards for an Accredited Educational Program in Nuclear Medicine Technology" published by the JRCNMT. The tri-service accredited program consists of both Phase I (conducted at NSHS-Bethesda) and Phase II (conducted at Lackland AFB, TX 78236 and Travis AFB, CA 94535) training courses. Maintaining this accreditation provides a constant source for certified nuclear medicine technologists for the Air Force, which helps ensure compliance with Nuclear Regulatory Commission licensing requirements for operating nuclear medicine departments.
- 6.3 **Initial Skills.** Initial skills training in AFSC 4R0X1 is provided through Course J3AQR4R031 (Phase I) conducted by AETC through the 381st Training Squadron (381 TRS), Sheppard AFB TX 76311-2246, and Course J5ABO4R031 (Phase II) conducted at multiple CONUS locations under the guidance of the 381 TRS. The following changes were made in the initial skills/3-skill level course during the 1998 U&TW:
- 6.3.1. Added a requirement to teach career progression in Phase II.
- 6.3.2. Added a requirement to teach Privacy Act and release of patient information in Phase II.
- 6.3.3. Added a new STS subject knowledge item titled "Computerized Radiography."
- 6.3.4. Deleted a requirement to teach several radiographic equipment quality assurance tests.
- 6.3.5. Added a requirement to teach physics of computed tomography (CT) in Phase II."
- 6.3.6. Added a requirement to teach basic performance of head CT in Phase II.
- 6.4. **Five Level Upgrade Requirements.** The 5-skill level CDC column of the STS was revised to add needed material in digital radiography.
- 6.5. Seven Level Upgrade Requirements. The 7-level residence course content was revised to include material on maintaining training records and the use of radiology information systems such as CHCS and Intranet. Also, training on technical and regulatory overviews of all the subspecialty areas of the career field was increased from proficiency code level A to B. In addition, the attendees of the 1998 U&TW decided to add the Air Force Quality Control Test to the requirements for 7-level upgrade. Therefore, individuals who began Phase I Diagnostic Imaging Apprentice training on or after 15 April 1997 must pass the Air Force Radiology Quality Control Test to be upgraded to the 7-skill level.
- 6.6. **Proficiency Training.** Any additional knowledge and skill requirements that are not taught through initial skills or upgrade training are assigned to continuation training.

The purpose of the continuation-training program is to provide additional duty position or collateral training that exceeds the minimum upgrade training requirements for the current skill level. Emphasis should be placed on preparing the individual for expanded utilization in present and expected future duty positions. Supervisors at all levels must develop a continuation training program that ensures subordinates receive the broadest possible exposure to appropriate continuation training throughout their careers.

- **7. Community College of the Air Force.** Enrollment in CCAF occurs upon completion of basic military training. CCAF provides the opportunity to obtain an Associate in Applied Sciences Degree. In addition to its associate degree program, CCAF offers the following:
- 7.1. **Occupational Instructor Certification.** Upon completion of instructor qualification training, consisting of the Basic Instructor Course and supervised teaching practicum, CCAF instructors who possess an associate degree or higher may be nominated by their school commander/commandant for certification as an occupational instructor.
- 7.2. **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 four proficiency levels: Apprentice, Journeyman, Craftsman/Supervisor, or Master Craftsman/Manager. All are transcribed on the CCAF transcript.

7.3. **Degree Requirements.** All airmen are automatically entered into the CCAF program. Prior to completing an associate degree, the 5-level must be awarded and the following requirements must be met:

Semester I	Hours
Technical Education	24
Leadership, Management, and Military Studies	6
Physical Education	4
General Education	15
Program Elective	15
Technical Education; Leadership, Management, and Military	
Studies; or General Education	
Total	64

- 7.3.1. **Technical Education** (24 Semester Hours): A minimum of 12 semester hours of Technical Core subjects/courses must be applied and the remaining semester hours applied from Technical Core/Technical Elective courses
- 7.3.1.1. **Radiologic Technical Education** (24 Semester Hours): A minimum of 12 semester hours of Technical Core subjects/courses must be applied and the remaining semester hours applied from Technical Core/Technical Elective subjects/courses. Requests to substitute subject/courses must be approved in advance by the Services Branch at CCAF.

Technical Core

Subjects/Courses	Semester Hours
ARRT Registry	24
CCAF Internship	
Clinical Practicum	
Introduction to Radiologic Technology	3
Radiographic Anatomy and Physiology	3
Radiographic Physics	3
Radiographic Positioning	3
Radiographic Techniques and Darkroom Procedures	
Special Radiographic Procedures	3

Gopla Saha. Fundamentals of Nuclear Pharmacy. 3rd ed, Springer-Verlag, 1992.

Roger C. Sanders. <u>Clinical Sonography: A practical Guide</u>. 2nd ed, Little Brown and Company, 1991. Euclid Seeram. <u>Computed Tomography: Physical Principles, Clinical Applications, and Quality</u> Control. WB Saunders, 1994.

Sheila A. Sorrentino. <u>Mosby's Textbook for Nursing Assistants</u>. 3rd ed, Mosby-Year Book, Inc., 1992. Peggy Woodward, et. al. <u>MRI for Technologists</u>. McGraw-Hill, Inc., 1995.

James A. Zagzebski, Essentials of Ultrasound Phsyics. Mosby-year Book, Inc., 1996.

Charles P. Barrett, et al. <u>Primer of Sectional Anatomy with MRI and CT Correlation</u>. (2nd edition or later) Williams and Wilkins, 1994

Gerard J. Tortora and Sandra Reynolds Grabowski, <u>Principles of Anatomy and Physiology</u>. 8th ed, Harper Collins, 1996.