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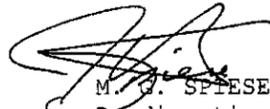
1. Purpose. To publish standards and regulations regarding the training of CH-46E aircrew per the reference.

2. Information. Per reference (a), the Flight Leadership Standardization program has been added to Chapter 1 of this Manual. This program affects the Designation Tables and Instructor Requirements Tables on pages 1-9 and 1-10. The Flight Leadership Standardization Evaluator Plan of Instruction (POI) has been added to paragraph 140, starting on page 1-112. Flight Leadership POIs, beginning with Section Leader, are contained in paragraph 150, starting on page 1-117.

3. Recommendations. Recommended changes to this publication are invited, and may be submitted via the syllabus sponsor (MAWTS-1) and the appropriate chain of command to: Commanding General, Training and Education Command, Aviation Training Branch via e-mail (refer to <http://www.tecom.usmc.mil/atb/contacts.htm>) or the Defense Message System using the following plain language address: CG TECOM QUANTICO VA ATB.

4. Reserve Applicability. This Manual is applicable to the Marine Corps Total Force.

5. Certification. Reviewed and approved this date.

  
M. G. SPIESE  
By direction

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CH-46E PILOT

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CHAPTER 1

CH-46E PILOT

100. MARINE MEDIUM HELICOPTER SQUADRON (CH-46E) UNIT CORE COMPETENCY. Marine Aviation plays a crucial role in the MAGTF's ability to conduct Maneuver Warfare. The ultimate goal of Marine Aviation is to attain the highest possible combat readiness to support Expeditionary Maneuver Warfare while at the same time preserving and conserving our Marines and equipment. Embedded within our combat readiness is the ability to rapidly, effectively, and efficiently deploy on short notice and the ability to quickly and effectively plan for crises and/or contingency operations thereby ensuring Marine Aviation remains ready for combat when and where the need arises. The CH-46E T&R Manual represents the collaborative effort of CH-46E Subject Matter Experts who designed training standards to maximize the full combat capabilities of the CH-46E and its crew. These standards, intrinsic in the core competency section, describe and define unit capabilities and requirements necessary to maintain like-squadron proficiency in core skills and combat leadership. Training events are based on specific requirements and performance standards to ensure aircrew maintain a common base of training and depth of combat capabilities. Together, the T&R comprises a building block approach to ensure that trained aircrews remain ready, relevant, and fully capable of supporting the MAGTF commander.

1. HMM Mission. Support the MAGTF Commander by providing assault support transport of combat troops, supplies and equipment, day or night under all weather conditions during expeditionary, joint or combined operations.

2. Mission Essential Task List (METL)

a. (UJTL TA 1.1.2) Conduct Shipboard Deck helicopter Landing Qualifications.

b. (UJTL TA 1.1.4) Conduct Sea and Air Deployment Operations.

(1) Maintain the capability to deploy and operate from advanced bases, expeditionary airfields, Forward Operating Bases (FOBs), and naval shipping.

(2) Perform organizational maintenance on assigned aircraft.

c. (UJTL TA 1.2.1) Conduct Air Assault Operations and Air Assault.

(1) Provide assault support transport of combat troops.

(2) Provide support for casualty evacuation operations.

(3) Maintain self-defense capability from ground-to-air and air-to-air threats.

d. (UJTL TA 1.2.3) Conduct Amphibious Assault and Raid Operations.

(1) Conduct assault support for maritime special operations.

- e. (UJTL TA 4.2) Distribute Supplies and Provide Transport Service
  - (1) Conduct aerial re-supply.
  - (2) Provide support for mobile Forward Arming and Refueling Points (FARPS).
- f. (UJTL TA 6.2) Conduct Joint Personnel Recovery.
  - (1) Conduct Tactical Recovery of Aircraft and Personnel (TRAP) operations.
  - (2) Augment local Search and Rescue (SAR) assets.
- g. (UJTL TA 6.4) Conduct Noncombatant Evacuation.
  - (1) Provide support for evacuation operations.

3. Table of Organization. Refer to Table of Organization 8940 managed by Total Force Structure, MCCDC, for current authorized organizational structure and personnel strength for CH-46 units. As of this publication date, CH-46 units are authorized:

Squadron  
12 aircraft  
28 Pilots/19 Crew Chiefs/19 Aerial Gunner/Observers

4. Core Capability. A core capable squadron is able to sustain 20 sorties on a daily basis during contingency/combat operations. The above sortie rates are based on 1.5 hour average sortie duration and assumes > 70 percent FMC aircraft and > 90 percent T/O aircrew. If unit FMC aircraft < 70 percent or assigned crew < 90 percent T/O, core capability will be degraded by a like percentage. A core capable squadron is able to accomplish all tasks designated in the unit METL from a main base, expeditionary base, and/or carrier/amphibious platform (as appropriate per aircraft/system).

5. METL/Core Skill Matrix. CH-46 core skills directly support the METL as follows:

METL	FAM/ INST	CAL	EXT	FORM	TERF	NS HLL	NS LLL
a. Conduct Shipboard Deck helicopter Landing qualifications	X					X	X
b. Conduct Sea and Air Deployment Operations	X	X	X	X	X	X	X
c. Conduct Air Assault Operations and Air Assault	X	X	X	X	X	X	X
d. Conduct Amphibious Assault and Raid Operations	X	X	X	X	X	X	X
e. Distribute Supplies and Provide Transport Service	X	X	X	X	X	X	X
f. Conduct Joint Personnel Recovery	X	X		X	X	X	X
g. Conduct Noncombatant Evacuation	X	X		X	X	X	X

METL	AG	GTR	MAT	HIE	TAC	CQ
a. Conduct Shipboard Deck helicopter Landing qualifications						X
b. Conduct Sea and Air Deployment Operations	X	X	X		X	X
c. Conduct Air Assault Operations and Air Assault	X	X	X	X	X	X
d. Conduct Amphibious Assault and Raid Operations	X	X	X	X	X	X
e. Distribute Supplies and Provide Transport Service	X	X	X		X	X
f. Conduct Joint Personnel Recovery	X	X	X	X	X	X
g. Conduct Noncombatant Evacuation	X		X		X	X

METL	SFAM	*TAC	*CAL	*EXT	*NBC	*DM	*MAT	*HIE	*TG	*CQ
a. Conduct Shipboard Deck helicopter Landing qualifications	X									X
b. Conduct Sea and Air Deployment Operations	X	X	X	X	X	X	X		X	X
c. Conduct Air Assault Operations and Air Assault	X	X	X	X	X	X	X	X	X	X
d. Conduct Amphibious Assault and Raid Operations	X	X	X	X	X	X	X	X	X	X
e. Distribute Supplies and Provide Transport Service	X	X	X	X	X	X	X	X	X	X
f. Conduct Joint Personnel Recovery	X	X	X			X	X	X	X	X
g. Conduct Noncombatant Evacuation	X	X	X			X	X		X	X
* Core Plus Skill										

6. Core Model Minimum Requirements (CMMR). CMMR is measured in terms of the minimum numbers of Core Skill Proficiency (CSP) crews and minimum numbers of combat leaders per paragraphs a. and b. below:

a. Minimum Unit CSP Requirements. As a minimum, in order to be considered Core Competent, a unit must possess the following numbers of crews who are proficient in each core skill (Unit CSP).

CH-46E CMMR (Unit CSP Requirements)				
CORE SKILL	SQDN Pilots	SQDN Crew Chiefs	SQDN AG/O	SQDN Crews
FAM/INST	16	8	8	8
CAL	16	8	8	8
EXT	12	6	6	6
FORM	16	8	8	8
TERF	16	8	8	8
NS HLL	16	8	8	8
NS LLL	16	8	8	8
AG	16	8	8	8
GTR	12	6	6	6
MAT	12	6	6	6
HIE	12	6	6	6
TAC	12	6	6	6
CQ	12	6	6	6

CH-46E CMMR (Unit CSP Requirements)				
CORE PLUS SKILL	SQDN Pilots	SQDN Crew Chiefs	SQDN AG/O	SQDN Crews
SFAM	-	6	-	6
TAC	12	6	6	6
CAL	12	6	6	6
EXT	12	6	6	6
NBC	12	6	6	6
DM	12	6	6	6
MAT	12	6	6	6
HIE	12	6	6	6
TG	-	6	-	6
CQ	12	6	6	6

A standard CH-46 crew consists of 2 Pilots, one Crew Chief, and an AG/O. A CSP crew consists of individuals representing each crew position who have achieved and maintain individual CSP. In order to be considered proficient in a core skill, a crewmember must attain and maintain proficiency in core skill events as delineated in paragraphs (1) and (2) below.  
\* Proficiency in Core Plus Skills is not required to obtain unit CSP.

(1) Events Required to Attain Individual CSP. To initially attain CSP in a core skill, an individual must simultaneously have a 'proficient' status in all of the Core (200-300) T&R events listed in the table below for that core skill:

Individual CSP Attain Table						
Pilot	FAM/ INST	CAL	EXT	FORM	TERF	NS HLL
T&R event requirements to attain CSP	S200 201R 202R	S210 211 212R	S220 221R 392R	S230 231R	S240 241 242 243R	S250 251R 252 253R 254 255 256 257R
R = Refresher POI event S = Event conducted in simulator						

Individual CSP Attain Table							
Pilot	AG	CQ	NS LLL	GTR	MAT	HIE	TAC
T&R event requirements to attain CSP	281R 321R	S290 291 293 300 301R	S310 311R 312R 313R 314R	S330 331R 332R	S350 351R	S360 361R 362	S370 371 372 S373 374 375R
R = Refresher POI event S = Event conducted in simulator							

(2) Events Required to Maintain Individual CSP. To maintain CSP in a core skill, an individual must maintain proficiency in all of the Core (200-300) T&R events listed in the table below for that core skill.

Individual CSP Maintain Table							
Pilot	FAM/ INST	CAL	EXT	FORM	TERF	NS HLL	NS LLL
T&R event requirements to maintain CSP	201R 202R	- 212R	221R 392R	231R	243R	257R	313R 314R
R = Refresher POI event S = Event conducted in simulator							

Individual CSP Maintain Table						
Pilot	AG	GTR	MAT	HIE	TAC	CQ
T&R event requirements to maintain CSP	281R 321R	331R 332R	351R	361R	375R	301R
R = Refresher POI event S = Event conducted in simulator						

(3) Events Required to Attain Individual Proficiency in Core Plus Skills. Proficiency in Core Plus Skills is not required to obtain unit CSP. Training to Core Plus Skills is at the discretion of the unit commanding officer. To initially attain proficiency in a Core Plus Skill, an individual

must simultaneously have a 'proficient' status in all of the T&R events listed in the table below for that Core Plus Skill:

Individual Core Plus Skills Attain Table								
CH-46 Pilot	TAC	CAL	EXT	NBC	DM	MAT	HIE	CQ
T&R event requirements	400	413R	420R	S430	S440	450	460R	490
to attain Core Plus	401			431R	441R	451R	461R	491R
Skill proficiency	402R			432	442R		462R	
							463R	
R = Refresher POI event								
S = Event conducted in simulator								

(4) Events Required to Maintain Individual Proficiency in Core Plus Skills. To maintain proficiency in a core plus skill, an individual must maintain proficiency in all of the T&R events listed in the table below for that core plus skill:

Individual Core Plus Skills Maintain Table								
CH-46 Pilot	TAC	CAL	EXT	NBC	DM	MAT	HIE	CQ
T&R event requirements	402R	413R	420R	431R	441R	451R	460R	491R
to attain Core Plus					442R		461R	
Skill proficiency							462R	
							463R	
R = Refresher POI event								
S = Event conducted in simulator								

b. Minimum Combat Leader Requirements. At a minimum, in order to be considered Core Competent, a unit must possess the following numbers of aircrew with the listed flight leadership designations. The flight leadership designations of the squadron CO, XO, OpsO, and MO should not be used to meet the squadron flight leadership minimums (HAC not inclusive). The intent of this note is not to prevent the squadron's senior leaders from flying in these billets, but rather, to ensure that the squadron has appropriate depth due to the fact that competing demands may limit the flight time of these senior leaders. FCP, although not specifically a combat leader, is required to sustain Core Capability in contingency operations.

CMMR (Unit Combat Leadership Requirements)	
DESIGNATION	SQDN Pilots
HAC	12
SEC LDR	6
DIV LDR	4
FLT LDR	2
AMC	2
FCP	4

7. Qualifications, Designations, and Instructor Requirements Tables. The tables below delineate T&R events required to be completed to attain initial qualifications, to re-qualify, and to attain designations. All stage

lectures, briefs, squadron training and prerequisites shall be complete prior to completing final events. Qualification and designation letters signed by the commanding officer shall be placed in individual NATOPS and APR/MPR jackets. Loss of proficiency in all qualification events causes the associated qualification to be lost. Regaining a qualification requires completing all R coded syllabus events associated with that qualification. Designations are command specific. Therefore, if pilot has not had PCS or PCA orders since previous designation letter, no additional designation letter is required. Follow-on commands shall repeat "initial documentation procedure."

Qualification (TRACKING CODE)	Initial Event Qualification Requirements
NATOPS (600E)	IAW OPNAVINST 3710.7.
Instrument (601E)	IAW OPNAVINST 3710.7.
CRM (640E)	IAW OPNAVINST 1542.7.
TERF (650)	241, 242, 243
NSQ HLL (651)	251, 252, 253, 254, 255, 256, 257
AG (EAC) (652)	281, 282, 283, 321, 322
CQ (653)	300, 301
NSQ LLL (654)	311, 312, 313, 314
DM (655)	441, 442
TG (EAC) (656)	481, 482
FRS TERFQ	507
FRS NSQ	513

Designation (TRACKING CODE)	Designation Requirements
HAC	602, 603, 604, 605 (Redesignation shall require, at a minimum, 604 or 605. Balance of the syllabus prior to HAC check shall remain at the discretion of the commanding officer.)
TERFI (660)	IAW MAWTS-1 Course Catalog
DMI (661)	IAW MAWTS-1 Course Catalog
NSFI (662)	IAW MAWTS-1 Course Catalog
NSI (663)	IAW MAWTS-1 Course Catalog
AGI (EAC) (664)	IAW MAWTS-1 Course Catalog
TGI (EAC) (665)	IAW MAWTS-1 Course Catalog
WTI (666)	IAW MAWTS-1 Course Catalog
NSSI (667)	IAW MAWTS-1 Course Catalog
FRSI (668)	500, 501, 502, 503, 504, 505, 506, 507, 508, 509, 511
FRSCCI (668)	500, 501, 502, 503, 504, 505, 506
SEC LDR (612)	606 THROUGH AND INCLUDING 612.
DIV LDR (616)	613 THROUGH AND INCLUDING 616.
FLT LDR (617)	617
AIR MSN CDR (618)	618
FCF (674)	IAW OPNAVINST 4790 and command specific directives, 630E
FLSE	IAW Flight Leadership Program Model Manager requirements.

Note: Refer to paragraph 153 for tracking code explanation.

a. Instructor Requirements. A unit should possess the following numbers of aircrew with the listed instructor designations IAW MCO 3500.12 (WTTP).  
Note: Squadron CO/XO instructor designations shall not count toward the following numbers:

INSTRUCTOR DESIGNATION	Pilots	C/C
TERFI	6	6
DMI	2	2
NSI	4	4
WTI	2*	2**
AGI	N/A	4+
TGI	N/A	2
FLSE	2	N/A

\*One shall be assigned as the squadron WTI. The squadron CO, XO, OPSO, and AMO shall not fill the squadron WTI billet.  
\*\*One shall be assigned in Operations as the squadron enlisted WTI.  
+AG/O's holding AGI designation shall not be included in this number.

8. Training Progression Models. Training progression models provide community recommended qualification and designation attainment timelines for the average crewmember.

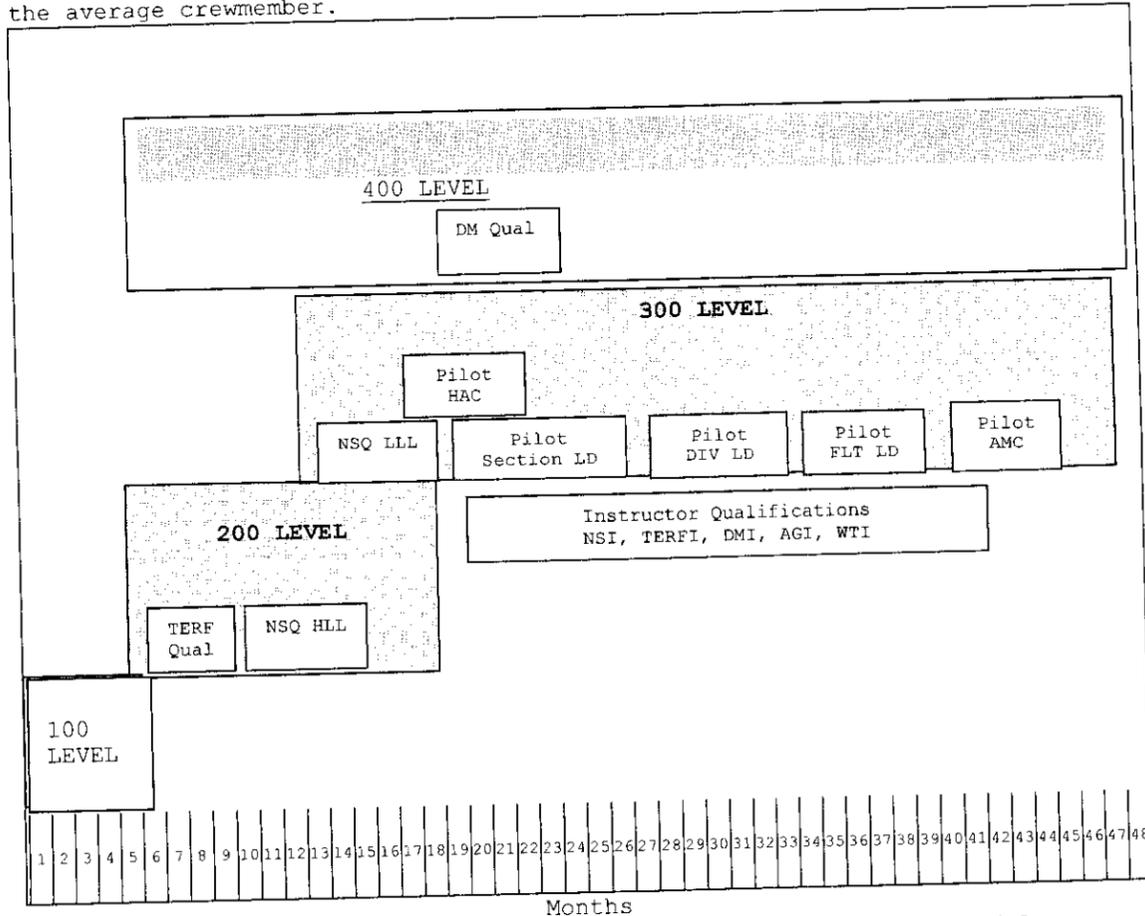


Figure 1-1.-- CH-46E Pilot Notional Training Progression Model.

101. PROGRAM OF INSTRUCTION (POI) FOR BASIC PILOT. Transition and Conversion pilots will fly the Basic POI.

<u>WEEKS</u>	<u>COURSE/PHASE</u>	<u>ACTIVITY</u>
1-2	Ground/Academic Training	Training Squadron
3-20	Core Skill Introduction	Training Squadron
21-29	Core Skill Basic	Tactical Squadron
30-49	Core Skill Advanced	Tactical Squadron
50-56	Core Skill Plus	Tactical Squadron

102. POI FOR REFRESHER/MODIFIED REFRESHER PILOT

<u>WEEKS</u>	<u>COURSE/PHASE</u>	<u>ACTIVITY</u>
1	Ground/Academic Training	Training Squadron
2-9	Core Skill Introduction	Training Squadron
10-13	Core Skill Basic	Tactical Squadron
14-17	Core Skill Advanced	Tactical Squadron
18-20	Core Skill Plus	Tactical Squadron

120. GROUND/ACADEMIC TRAINING COURSES OF INSTRUCTION. Utilize academic courseware as outlined in the Computer Based Training (CBT) program and Chapters 6 and 9 of the MAWTS-1 Course Catalog.

130. EVENT PERFORMANCE REQUIREMENTS

1. General

a. The following conditions apply:

<u>Environmental Conditions</u>	
<u>Code</u>	<u>Meaning</u>
	Shall be flown during hours of daylight: (by exception - there is no use of a symbol)
N	Shall be flown during hours of darkness, may be aided or unaided
N*	Shall be flown during hours of darkness must be flown unaided
(N*)	May be flown during hours of darkness - If flown during hours of darkness must be flown unaided
(N)	May be flown during darkness - If flown during hours of darkness; may be flown aided or unaided
NS	Shall be flown during hours of darkness - Mandatory use of Night Vision Devices
(NS)	May be flown during darkness - If flown during hours of darkness; must be flown with Night Vision Devices
Note - If the event is to be flown in the simulator the Simulator Instructor shall set the desired environmental conditions for the event.	

b. Pilots should fly all simulator (S) training codes prior to the first flight in the aircraft in stage.

c. Simulators. The Weapons Systems Trainer (WST)/Aircrew Procedures Trainer (APT) should be used in those flights designated S or S/A within the syllabus. Demonstration and exercise modes of the flight simulator shall be

used within the training syllabus. If the flight simulator is not available, simulator periods designated as S may be waived.

d. Aircraft/Simulator Codes. These codes are assigned to delineate whether the event uses a simulator or an airframe. The codes are located in the event header following the POI codes. A = aircraft, S = simulator, A/S = aircraft preferred/simulator optional, S/A = simulator preferred/aircraft optional.

2. Computer Based Training (CBT) Program. All pilots shall complete assigned CBT lessons prior to completion of the applicable stage.

3. Evaluation Sorties

a. A designated NATOPS Instructor (NI)/Assistant NATOPS Instructor (ANI) shall evaluate RQD-600.

b. A designated instrument evaluator shall evaluate RQD-601.

c. Unless a specific instructor pilot requirement is assigned to the event, at a minimum a Helicopter Aircraft Commander (HAC) or appropriate Instructor Pilot (IP) acting as Pilot In Command (PIC), proficient in a given event should evaluate all initial events required for a basic Conversion, Transition, or Refresher Pilot Under Instruction (PUI), or any non-proficient (e.g. delinquent) pilot who has exceeded the re-fly factor. The evaluator shall complete an ATF for the event.

d. If the commanding officer has waived/deferred a syllabus event, the squadron Pilot Training Officer/WTI/EWTI must place a waiver/deferral letter in section 3 of the APR.

e. All 200-600 level ATFs will be developed and maintained by the Syllabus Sponsor. Updated ATFs will be disseminated in conjunction with publication of Interim Approved T&Rs.

f. All flights annotated with an E shall be evaluated per T&R Program Manual paragraph 304.3.b.

g. The Pilot Training Officer/WTI/Enlisted WTI (EWTI) shall ensure all Aircrew Training Forms (ATFs) are entered in section 3 of the Aircrew Performance Record (APR) for all initial events flown. These ATFs shall remain until a more current ATF replaces it. Multiple ATFs may be collected per training event if applicable or directed.

h. Transition and Conversion pilots shall be assigned to the basic POI and shall have ATFs entered in section 3 of the APR for all flights. Refresher/Modified Refresher pilots shall have ATFs entered in section 3 of the APR for all flights designated by a R or MR in the flight description. These ATFs will replace ATFs previously entered in section 3.

4. Syllabus Assignment. Basic, Transition, and Conversion pilots shall fly the entire syllabus. Refresher/Modified Refresher pilots should fly those flights designated by an R or MR in the flight description. The FRS CO may waive or defer Core Skill Introduction syllabus events as required and in accordance with the program manual.

5. Refresher Syllabus. The Refresher syllabus is designed for pilots who have previous experience in the CH-46. Pilots returning to a squadron, who have previously been assigned to the Basic POI (completed at least one squadron fleet tour) shall be assigned to the Refresher POI. In addition, pilots assigned to the Basic POI who have attained Individual Core Skill Proficiency in all Core Skills (completed all "Individual CSP attain table" events), shall be re-assigned to the Refresher POI.

a. FRS Refresher Training. FRS Refresher training is prescribed for pilots returning to a DIFOP operating force billet, who have previously been assigned to the Basic POI but have not flown the model aircraft within established time intervals. Pilots who have been out of type longer than 485 days but less than or equal to 730 days will receive a Modified Refresher (MR) syllabus at the FRS. Pilots who have been out of type for greater than 730 days shall receive full Refresher syllabus (R) at the FRS. Upon joining a tactical squadron they will continue to complete the Refresher POI by flying all R-coded events.

b. Tactical Squadron Refresher Training. Delinquent pilots returning to the tactical squadron shall be assigned to the Refresher POI and shall complete 200-600 level R-coded events. When all R-coded events in a stage are successfully completed, all remaining events in that stage that are proficient or delinquent are updated. Incomplete (never previously completed in the Basic POI) events are not updated and must be completed in addition to R-coded events.

c. Refresher Waivers and Deferrals. Commanding officers may waive or defer portions of a Refresher pilot's training requirements per paragraph 305 of MCO P3500.14 (Aviation T&R Program Manual). For waived events, CRP credit shall be credited and event proficiency status shall be updated. For deferred events, the pilot must complete the event at a later date when equipment and logistics can support. CRP credit will not be assigned. For both waived and deferred events, a documentation letter will be placed in Section III of the pilot's ATJ.

d. Refresher Designations. Refresher pilots may regain previously held flight leadership designations (HAC, Sec Ld, Div Ld, Flt Ld, AMC) by re-completing the associated flight leadership evaluation event for each previously accomplished designation. A designation letter will be placed in the pilot's ATJ.

e. Refresher Qualifications. Refresher pilots may regain previously held qualifications by successfully re-completing all R-coded events associated with the respective qualification (unless waived per paragraph 305). A qualification letter will be placed in the pilot's ATJ.

f. Refresher Certifications. Refresher pilots may regain previously held certifications in accordance with the MAWTS-1 Course Catalog or the T&R as appropriate. Refer to the Course Catalog for re-certification requirements for all instructor certifications, excluding FRSCCI. A certification letter will be placed in the pilot's ATJ.

6. Aircrew Evaluation Flights. All pilots shall have the appropriate evaluation form filled out upon completion of the following:

a. Annual NATOPS Check (RQD-600).

- b. Annual Instrument Check (RQD-601).
- c. Annual CRM Check (CRM-640)
- d. Any flight in the Core Skill Basic, Core Skill Advanced, Core Plus phase as recommended by the Squadron Standardization Board.

7. Crew Resource Management (CRM). Aircrews shall brief techniques of CRM for all flights and/or events.

8. Definitions

a. Demonstrate. The description and performance of a particular maneuver by the instructor, observed by the PUI. The PUI is responsible for knowledge of the procedures prior to the demonstration of a required maneuver.

b. Discuss. An explanation of systems, procedures, or maneuvers during the brief, in flight, or post flight.

c. Evaluate. Any flight designed to evaluate aircrew standardization that does not fit another category such as SARCK, HACCK, T2PCK, etc.

d. Introduce. The instructor may demonstrate a procedure or maneuver to a student, or may coach the PUI through the maneuver without demonstration. The PUI performs the procedures or maneuver with coaching as necessary. The PUI is responsible for knowledge of the procedures.

e. Review. Demonstrated proficiency of a maneuver by the PUI.

131. CORE SKILL INTRODUCTION PHASE

1. General

a. The CH-46E Fleet Replacement Squadron (FRS) shall develop the standardization of introductory flight maneuvers, classroom materials and procedures for instructional/student training and maintain the Core Skill Introduction Phase syllabus for the CH-46E T&R.

b. FRS Instructors shall log 200 to 400 level codes that are comparable in performance standards of a 100 level code.

2. Familiarization (FAM)

a. Purpose. To develop preliminary flight skills in the CH-46E and become familiar with aircraft flight characteristics, limitations, emergency procedures, and to develop proficiency in all maneuvers contained in the familiarization stage.

b. General

(1) Pilots will find detailed descriptions of all flight maneuvers in the CH-46E NATOPS Flight Manual and the FRS CH-46E Standardization Manual.

(2) All pilots shall study and obtain a basic knowledge of aircraft systems and discuss them in a brief. All emergency procedures and

limitations shall be memorized and evaluated in flight IAW the CH-46E NATOPS Flight Manual.

(3) All pilots shall be responsible for all emergencies and maneuvers previously discussed or flown throughout this stage of flight.

(4) All pilots shall have a flight physical, emergency egress and NASTP (Physiology and Water Survival) completed and up-to-date prior to flying a FAM-109.

(5) Pilots will be prepared to discuss the seven critical steps of CRM as applicable to each event.

c. Crew Requirements

(1) Simulator Training - Two RACs/qualified instructor.

(2) Flight Training - IP/RAC/CC or IP/REF/CC.

d. Ground/Academic Training

(1) All pilots shall complete all assigned CBT lessons prior to FAM-109.

(2) All pilots shall complete the Course Rules Class, Load Computation Class, and Crew Resource Management Class prior to FAM-109.

(3) RACs shall complete the Pilot Familiarization (PFAM) Class, CNCS/PFPS Introduction Class prior to FAM-109.

(4) All pilots shall complete the NATOPS Open Book Test, Course Rules Test, and SOP Test prior to FAM-109.

(5) Pilots will be prepared to discuss the seven critical steps of CRM as applicable to each event.

e. Flight and Simulator Event Training (10 Flights, 15.5 Hours/10 Simulator Events, 20.0 Hours)

SFAM-100      2.0      R,MR E WST S

Goal. Introduce cockpit preflight inspection, checklists, and engine start procedures.

Requirement

Discuss: (ref: CH-46E NATOPS Manual, CH-46E Flight Standardization Manual)

Functions the Weapons System Trainer (WST) can simulate and those that are not possible.

Engines and related systems.

Beep trim switches.

Primary/secondary indications.

Start/shutdown limitations.

Operation of cockpit controls/equipment.

Introduce/Evaluate:  
Interior inspection/pre-start checklist.  
Normal engine start.  
Single engine start/engagement.  
Pre-taxi checklist.  
Radios and communication.  
Voice communication.  
ICS operation.  
UHF & VHF operation.  
Normal shutdown.

Performance Standards. Pilot shall demonstrate knowledge of engine systems, NATOPS Checklists, and communication systems.

Prerequisite. Appropriate FRS CBT Lessons.

External Syllabus Support. WST/APT.

SFAM-101

2.0 E WST S

Goal. Introduce pattern work and ground emergencies.

Requirement

Discuss: (ref: CH-46E NATOPS Manual, CH-46E Flight Standardization Manual)  
APU.

Introduce/Evaluate:  
Ground taxi.  
Takeoff checklist.  
Vertical takeoff.  
Hover patterns.  
Transition to forward flight.  
Normal Pattern.  
Landing checklist.  
Normal approach to a hover.  
Vertical landing.

Review:  
Engine start/shutdown.  
Rotor engagement.  
Communication procedures.

Emergencies:  
Engine start malfunctions.  
Hot start/cold hang-up.  
Circuit breaker malfunctions.  
Starter hang-up.  
APP/APU malfunctions.  
Circuit breaker malfunctions.  
Battery malfunction.  
APU fire.

Performance Standards. Pilot shall demonstrate knowledge of APU and start emergencies, conduct engine start and shutdown

IAW NATOPS pocket checklist and basic FAM maneuvers IAW FRS Standardization Manual.

Prerequisite. SFAM-100, appropriate FRS CBT program lessons.

External Syllabus Support. WST/APT.

SFAM-102

2.0 E WST S

Goal. Introduce engine related problems in the transition stage and practice basic FAM maneuvers.

Requirement

Discuss: (ref: CH-46E NATOPS Manual, CH-46E Flight Standardization Manual)  
Rotor Brake.

Introduce/Evaluate:

Communications procedures.  
Normal approach to a hover.  
Normal approach to a no-hover.  
Max Gross Wt (minimum power) takeoffs and landings.

Review: All previously introduced malfunctions and procedures.

Emergencies:

Engine condition actuator malfunctions.  
ECA failure rotor brake on.  
ECA failure on shutdown (FREEZE/MAX/MIN).  
Single engine emergencies.  
HIGE.  
HOGE.  
Takeoff.  
Engine compartment fire (on deck).  
Transformer rectifier failure.  
Cross-tie failure (APU running).  
Utility hot light.  
Rotor brake slippage.

Performance Standards. Pilot shall demonstrate knowledge of the rotor brake system, ECA failures and operation of the aircraft under high gross weights (minimum power).

Prerequisite. SFAM-101, appropriate FRS CBT program lessons.

External Syllabus Support. WST/APT.

SFAM-103

2.0 E WST S

Goal. Introduce running takeoffs and landings and AFCS off flight.

Requirement

Discuss: (ref: CH-46E NATOPS Manual, CH-46E Flight Standardization Manual)  
AFCS.

Introduce/Evaluate:  
Running takeoff.  
Running landing.  
AFCS off flight.  
Single engine Landings/waveoffs.

Review: Start and shutdown checklist and all previously introduced maneuvers.

Emergencies:  
ECA failures in flight.  
Maximum.  
Minimum.  
Intermittent.  
Generator failure.  
LCT failures.

Performance Standards. Pilot shall demonstrate knowledge of the automatic flight control system, single engine operation, and running takeoffs and landings.

Prerequisite. SFAM-102, appropriate FRS CBT program lessons.

External Syllabus Support. WST/APT.

SFAM-104

2.0 R,MR E WST S

Goal. Review previous pattern work and introduce steep approaches and autorotations.

Requirement

Discuss: (ref: CH-46E NATOPS Manual, CH-46E Flight Standardization Manual)  
Engine oil system.

Introduce/Evaluate:  
Steep approaches.  
Hover landing.  
No hover landing.  
Straight in 80 kt autorotation.

Review: AFCS off flight and all previously introduced maneuvers and emergencies.

Emergencies:  
Single engine emergencies.  
Lube pump drive shaft failure.  
Sprag clutch slippage.  
Compressor stall.  
DC bus failure.

Performance Standards. Pilot shall demonstrate knowledge of the engine oil system, single engine operation, steep approaches and autorotations.

Prerequisite. SFAM-103, appropriate FRS CBT program lessons.

External Syllabus Support. WST/APT.

SFAM-105

2.0 E WST S

Goal. Introduce 90-degree power recovery autorotation, emergency throttle operations and review previous maneuvers.

Requirement

Discuss: (ref: CH-46E NATOPS Manual, CH-46E Flight Standardization Manual)  
Emergency throttle system.

Introduce/Evaluate:  
Obstacle takeoff.  
Emergency throttle operations.  
90-degree autorotation.

Review: All previously introduced procedures.

Emergencies:  
Single engine emergencies.  
Power turbine speed signal interruption (Flex shaft failure).  
Engine compartment fire.  
Essential bus failures.  
Control boost malfunctions.  
Rotor brake failure in flight.

Performance Standards. Pilot shall demonstrate knowledge of the emergency throttle system, obstacle takeoff and 90-degree autorotation.

Prerequisite. SFAM-104, appropriate FRS CBT program lessons.

External Syllabus Support. WST/APT.

SFAM-106

2.0 E WST S

Goal. Review/evaluate all previously introduced maneuvers and emergencies.

Requirement

Discuss: (ref: CH-46E NATOPS Manual, CH-46E Flight Standardization Manual)  
Electrical system.

Introduce/Demonstrate:  
AFCS off during portions of flight.  
Autorotation.  
Emergency throttle operations.

Review: All previously introduced maneuvers and emergencies.

Emergencies:  
Fuel contamination.  
Fuel boost malfunctions.  
Engine driven fuel pump failure.  
Electrical fire/smoke.  
Single and dual AFCS malfunctions.  
Transmission malfunctions.  
Gauge malfunctions.  
Imminent failure.

Performance Standards. Pilot shall demonstrate knowledge of the electrical systems and all previously introduced maneuvers and emergencies.

Prerequisites. SFAM-105, appropriate FRS CBT program lessons.

External Syllabus Support. WST/APT.

SFAM-107

2.0 R,MR E WST S

Goal. Review all FAM stage maneuvers.

Requirement. (ref: CH-46E NATOPS Manual, CH-46E Flight Standardization Manual)

Evaluate: Previously introduced maneuvers and emergencies.

Emergencies: AC essential bus failure and DC bus failure.

Prerequisite. SFAM-106, appropriate FRS CBT program lessons.

Performance Standards. Pilot shall demonstrate knowledge of start, shutdown and in flight emergencies and demonstrate proficiency in checklists and cockpit layout.

External Syllabus Support. WST/APT.

SFAM-118

2.0 R,MR E WST S

Goal. Introduce/Evaluate ECCS start/shutdown, ground emergencies and basic single engine emergencies.

Requirement

Discuss: (ref: CH-46E ECCS NATOPS Manual/CH-46E Flight Standardization Manual)

ECCS system  
Theory of operation.  
Start sequence.  
Shutdown sequence.

Normal mode operation.  
Manual mode operation.  
Emergencies  
Hot Start.  
Single engine failure takeoff.  
Single engine failure in HOGE.  
Single engine failure in flight.  
Compressor stall.

Introduce/Evaluate:  
Normal engine start.  
Normal shutdown.

Emergencies:  
Hot start.  
Single engine failure on takeoff.  
Single engine failure in HOGE.  
Single engine failure in flight.  
Compressor stall.  
ECA failure on shutdown.

Performance Standards. Pilot shall demonstrate knowledge of ECCS, NATOPS checklists and basic single engine emergencies with ECCS.

Prerequisite. SFAM-107, appropriate FRS CBT Lessons.

External Syllabus Support. WST/APT.

SFAM-119

2.0 R,MR E WST S

Goal. Introduce/Evaluate ECCS in flight emergencies.

Requirement

Discuss: (ref: CH-46E ECCS NATOPS Manual/CH-46E Flight Standardization Manual)

ECCS system  
Fail freeze circuitry.  
Engine malfunction analysis chart.  
Emergencies  
ECCS failure in flight.  
Flex shaft failure in flight.  
Sprag clutch slippage.

Review: Start and shutdown checklist and previously introduced emergencies.

Emergencies:  
ECCS failure in flight.  
Flex shaft failure in flight.  
Sprag clutch slippage.

Performance Standards. Pilot shall demonstrate knowledge of ECCS, inflight emergencies and demonstrate proficiency in NATOPS checklists.

Prerequisite. SFAM-118, appropriate FRS CBT Lessons.

External Syllabus Support. WST/APT.

FAM-108

0.0 R,MR E 1 STATIC ACFT A

Goal. Introduce normal ground and preflight procedures.

Requirement

Discuss: (ref: CH-46E NATOPS Manual, CH-46E Flight Standardization Manual, FRS Preflight Manual)

Systems

APU/Ground Power.

CNCS.

Emergencies

APU compartment fire.

All emergency procedures covered in simulator stage.

Introduce/Evaluate:

Mission Brief to include ODO and NATOPS Brief. Load Computation and CG Limitations.

Aircraft Discrepancy Book to determine aircraft status: up/down discrepancies, discrepancies that modify the mission plan, and aircraft properly serviced for mission.

Preflight routine to include gear checkout/preflight, flight line safety and tour of squadron maintenance spaces.

Preflight.

Postflight.

Visual communication with hand signals ashore (start/engage/shutdown).

Hot seat procedures.

Emergency egress.

CNCS FAM on APU/ground power.

NATOPS Checklists (prestart/starting engines/engaging rotors/pretaxi/pretakeoff/takeoff/prelanding/post-landing/shutdown).

Performance Standards. Pilot shall demonstrate knowledge of aircraft systems and nomenclature and squadron procedures for flight line safety.

Prerequisite. SFAM-119, appropriate FRS CBT program lessons.

External Syllabus Support. Ground power source.

FAM-109

2.0 E 1 CH-46E A

Goal. Introduce start, normal ground and flight procedures including low work and normal approaches. Review SFAM-101.

Requirement

Discuss: (ref: CH-46E NATOPS Manual, CH-46E Flight Standardization Manual)

Systems

Engine condition system.

Engine oil system.  
Flight Control System  
Emergencies  
Hot start/engine fire.  
Engine compartment fire.  
Rotor brake slippage during engine start.  
ECA failure with rotor brake on.  
ECA failure on shutdown.  
Cold hang-up.  
APU compartment fire  
ECA failure in flight

Demonstrate/Introduce:  
Normal cockpit procedures.  
Starting procedures.  
Communication procedures.  
Pretaxi procedures.  
Ground taxiing.  
Elevated nose wheel taxi/rearward taxi (demo).  
Vertical takeoff.  
Transition to forward flight (demo).  
Normal approach (demo).  
Max gross takeoff and landing (demo).  
Hover patterns.  
Operation of engine beep trim switches.  
Shutdown procedures.  
Aircraft trim/CDRB usage.  
Home field course rules.

Performance Standards. Pilot shall demonstrate knowledge of aircraft systems and introduce basic FAM maneuvers.

Prerequisite. FAM-108, ACAD-001 through ACAD-012 complete.

FAM-110

2.0 E 1 CH-46E A

Goal. Introduce landing pattern options. Practice start, normal ground and previously introduced flight procedures. Review SFAM-102.

Requirement

Discuss: (ref: CH-46E NATOPS Manual, CH-46E Flight Standardization Manual)

Systems

Power Management System.  
Engine Condition Control System.

Emergencies

Single engine failure while HIGE.  
Single engine failure on takeoff.  
Lost communications per local course rules.  
All previously introduced emergencies.  
Single engine failure in flight.  
Dual engine failure in flight.  
Engine restart in flight.

Demonstrate/Introduce:  
No hover landing (demo).  
Simulated single engine/runway landing (demo).  
Steep approach (demo).  
Running takeoff/landing (demo).  
Ramp and hatch usage (demo).  
Torque horn (demo).  
Local course rules.

Review/Evaluate:  
Normal cockpit procedures.  
Starting procedures.  
Communication procedures.  
Pretaxi procedures.  
Ground taxiing.  
Elevated nose wheel taxi/rearward taxi.  
Vertical takeoff.  
Transition to forward flight.  
Normal approach.  
Max gross takeoff and landing.  
Hover patterns.  
Operation of engine beep trim switches.  
Shutdown procedures.  
Aircraft trim/CDRB usage.  
Home field course rules.

Performance Standards. Pilot shall demonstrate knowledge of aircraft systems introduce and review basic FAM maneuvers.

Prerequisite. FAM-109 and appropriate FRS CBT program lessons.

FAM-111

2.0

E 1 CH-46E A

Goal. Review previous FAM maneuvers. Practice normal cockpit procedures. Review hover/low work, ground taxi, and normal approaches.

Requirement

Discuss: (ref: CH-46E NATOPS Manual, CH-46E Flight Standardization Manual)

Systems

Electrical Systems to include AC, DC, and generators.  
AFCS.

Emergencies

Generator failure.  
Electrical Fire.  
Single AFCS failure.  
Dual AFCS failure.

Demonstrate/Introduce:

PMS-off flight (demo).  
Single engine failure on takeoff and HIGE (demo).  
Straight-in autorotation (demo).  
AFCS off flight (demo).  
Steep approach.

Single engine flight/approach/wave-off.  
No-hover landing.  
Running takeoff/landing.  
Local course rules.

Review/Evaluate:  
Ground taxiing.  
Vertical takeoff.  
Transition to forward flight.  
Normal approach.  
Max gross takeoff and landing.  
Communications procedures.  
Previously introduced maneuvers as necessary.

Performance Standards. Pilot shall demonstrate knowledge of aircraft systems, introduce and review basic FAM maneuvers.

Prerequisite. FAM-110 and appropriate FRS CBT program lessons.

FAM-112

2.0 E 1 CH-46E A

Goal. Introduce AFCS off flight and minimum power pattern work. Review SFAM-103.

Requirement

Discuss: (ref: CH-46E NATOPS Manual, CH-46E Flight Standardization Manual)

Systems

Transmissions and Drive System to include Sprag Clutch.  
Emergency Throttle System.  
Rotor Brake System.

Emergencies

Fuselage fire in flight.  
Smoke and fume elimination.  
Engine fire in flight.  
Imminent transmission failure.  
Rotor brake failure in flight.  
Sprag clutch seizure.  
Sprag clutch slippage.

Demonstrate/Introduce:

Ninety-degree power recovery autorotation (demo).  
Single engine to a spot (demo).  
Straight-in autorotation.  
AFCS off flight.  
Single engine failure on takeoff/HIGE.  
PMS-off flight.

Review/Evaluate:

Running takeoff and landing.  
Single engine flight/approach/waveoff.  
No hover landing.  
Local course rules.  
Steep Approach.  
Max gross weight/min power takeoff and landings.

Previously introduced maneuvers as necessary.

Performance Standards. Pilot shall demonstrate knowledge of aircraft systems, introduce and review basic FAM maneuvers.

Prerequisites. FAM-111 and appropriate FRS CBT program lessons.

FAM-113

1.5

R,MR E 1 CH-46E A

Goal. Review previous pattern work and introduce Emergency Throttle operations. Review maneuvers from SFAM-104.

Requirement

Discuss: (ref: CH-46E NATOPS Manual, CH-46E FRS Standardization Manual)

Systems

Engine Fuel Control.  
Engine Fuel System.

Emergencies

Nf flex shaft failure.  
Fuel jettison.  
Fuel boost pump failure.  
Engine driven fuel pump failure.  
Fuel quantity indicator failure.  
Compressor stall.  
Single engine failure HOGE.  
Dual engine failure HOGE.

Demonstrate/Introduce:

Practice ETS operation/approaches (demo).  
Max-glide power recovery autorotation (demo).  
Simulated ECA failure in flight (demo).  
Ninety degree power recovery autorotation.  
Simulated single engine to a spot.

Review/Evaluate:

Straight-in power recovery autorotation.  
Max gross weight/min power takeoff and landings.  
AFCS off flight/approaches.  
Simulated single engine approach/landings.  
Simulated single engine failure on takeoff.  
Simulated single engine failure HIGE.  
Previously introduced maneuvers as necessary.

Performance Standards. Pilot shall demonstrate knowledge of aircraft systems, introduce and review basic FAM maneuvers.

Prerequisite. FAM-112 and appropriate FRS CBT program lessons.

FAM-114

1.5

E 1 CH-46E A

Goal. Introduce ETS/manual trim techniques and review as required.

Requirement

Discuss: (ref: CH-46E NATOPS Manual, CH-46E Flight Standardization Manual)

Systems

Utility Hydraulic System.  
Hydraulic Boost System.

Emergencies

Hydraulic flight control boost failures.  
Utility hydraulic system/subsystem failure.  
Utility hydraulic system overheating.  
LCT actuator failures.  
Other emergencies as required.

Demonstrate/Introduce:

FAM maneuvers in various cyclic trim modes (demo).  
Practice ETS operations in flight (demo).  
Manual trim approach/landings.  
ETS approach/landings.  
Maximum glide power recovery autorotation.

Review/Evaluate:

Ninety degree power recovery autorotation.  
Single engine to a spot.  
Max gross weight/min power takeoff and landings.  
AFCS off flight/approaches.  
Steep approach.

Performance Standards. Pilot shall demonstrate knowledge of aircraft systems, introduce and review basic FAM maneuvers.

Prerequisite. FAM-113 and appropriate FRS CBT program lessons.

FAM-115

1.5

E 1 CH-46E A

Goal. Review/evaluate all previously introduced maneuvers and emergencies.

Requirement

Discuss: (ref: CH-46E NATOPS Manual, CH-46E Flight Standardization Manual)

Systems

Integrated Cargo Handling Systems.  
Review all system limitations.

Emergencies

Engine AGB chip light/lube pump drive shaft failure.  
All previously introduced emergencies as required.

Miscellaneous

Ditching.  
Single engine takeoff from water/water taxi.  
Inadvertent HEFS inflation.  
Cargo jettison.

Review/Evaluate:

All previously introduced FAM maneuvers.

Max glide power recovery autorotation.  
ETS operations.

Performance Standards. Pilot shall demonstrate knowledge of aircraft systems, introduce and review basic FAM maneuvers.

Prerequisite. FAM-114 and appropriate FRS CBT program lessons.

FAM-116            1.5                    R,MR E 1 CH-46E A

Goal. FAM stage progress check.

Requirement

Discuss: (ref: CH-46E NATOPS Manual, CH-46E Flight Standardization Manual)  
Review all system limitations.

Review/Evaluate:  
All FAM stage maneuvers.  
All previously introduced emergencies.

Performance Standards. Pilot shall demonstrate knowledge of aircraft systems and basic FAM maneuvers as well as the capability to preflight the aircraft.

Prerequisite. FAM-115 and appropriate FRS CBT program lessons.

FAM-117            1.5                    R,MR E 1 CH-46E A N\*

Goal. Introduce night unaided operations.

Requirement

Discuss: (ref: CH-46E NATOPS Manual, CH-46E Flight Standardization Manual)  
Aircraft lighting and use.  
Radar altimeter use.  
CRM.  
Night scan.  
Prelaunch communications with light signals.  
Emergency procedures at night.

Introduce/Evaluate:  
Takeoff to a hover.  
Transition to forward flight.  
Normal approach.  
Vertical landing from a hover.  
Running landing.  
Steep approach.  
Power recovery autorotations.  
AFCS off flight/approach/landing.  
Simulated single engine approach/landing.  
ETS approach/landing.

Performance Standards. Pilot shall demonstrate the ability to operate the aircraft and systems during night operations.

Prerequisite. FAM-116 and appropriate FRS CBT lessons.

2. Instruments (INST)

a. Purpose. To develop proficiency in instrument flight procedures under instrument conditions using all navigation aids.

b. General

(1) Pilots will find maneuver descriptions in the NATOPS Instrument Flight Manual and explanations in the FRS CH-46E Standardization Manual.

(2) Pilots will conduct all instrument flights day or night under actual instrument conditions or hooded in the case of simulated instrument flight. Instructor pilots shall discuss aircraft lighting prior to RAC's first night flight.

(3) All flights will terminate with an instrument approach when practical.

(4) Pilots will be prepared to discuss the seven critical steps of CRM as applicable to each event.

(5) Prerequisite. Appropriate FRS CBT program lessons.

c. Crew Requirement

(1) Simulator Training - Two pilots/Qualified Instructor.

(2) Flight Training - IP/RAC/CC or IP/REF/CC.

d. Ground Training. All pilots that do not possess a current instrument rating shall complete IGS prior to INST-126.

e. Flight and Simulator Event Training (3 Flights, 4.5 Hours/3 Events, 6.0 Hours).

SINST-120      2.0                      E WST S

Goal. Introduce Communication and Navigation Control System (CNCS) Procedures.

Requirement

Discuss:

CNCS System Architecture.  
CNCS Components.

Demonstrate/Introduce:

Function Keys.  
Line Select Keys (LSK)  
Dedicated Keys.  
HHSI Modes.  
Apply/Check Power.

Check System Status.  
Loading/Creating a Flight Plan.  
Changing Radios/Scan/Presets.  
Changing TACAN.  
Changing IFF/Mode 3/Mode C.  
Direct-to a Waypoint.  
Holding Pattern.  
Bearing/Distance Waypoint from know Position.

Emergencies: System Failures and Trouble Shooting CNCS.

Performance Standards. Pilot shall demonstrate all basic knowledge of the CNCS IAW CH-46E NATOPS.

External Syllabus Support. WST/APT.

SINST-121

2.0 R,MR E WST S (N\*)

Goal. Introduce radio, TACAN, ADF, and radar altimeter procedures.

Requirement

Review:

Instrument checklist.  
ITO.  
Altitude hold procedures.  
Level speed change.  
Timed turns.  
S-1 patterns.  
Full/partial panel unusual attitude recoveries.  
Partial panel.  
Oscar pattern.  
Instrument autorotation.

Introduce/Evaluate:

TACAN procedures.  
LF/UHF ADF procedures.  
GCA procedures.  
In flight emergencies.

Performance Standards. Pilot shall perform all basic instrument maneuvers IAW FRS Standardization Manual as well as conduct a TACAN approach within the parameters set forth in the Instrument Manual.

Prerequisite. SINST-120, appropriate FRS CBT program lessons.

External Syllabus Support. WST/APT.

SINST-122

2.0 R,MR E WST S (N\*)

Goal. Practice basic instrument flight and coordination maneuvers.

Requirement

Discuss:

Maneuver limitations.  
Compass system control panel.  
Instrument scan.

Introduce/Evaluate:

Instrument checklist.  
Level speed change.  
Timed turns (standard and one-half standard rate).  
Climbs and descents.  
Unusual attitudes.  
Partial panel at cruise altitude.  
Oscar pattern.  
Vertical S-1 pattern.

Emergencies: Perform as required.

Performance Standards. Pilot shall perform all basic instrument maneuvers IAW FRS Standardization Manual as well as conduct a TACAN approach within the parameters set forth in the Instrument manual.

Prerequisite. SINST-121, appropriate FRS CBT lessons.

External Syllabus Support. WST/APT.

INST-123

1.5 R,MR E 1 CH-46E/WST A/S (N\*)

Goal. Practice TACAN/GCA procedures.

Requirement

Discuss: (ref: CH-46E NATOPS Manual, CH-46E Flight Standardization Manual)

All TACAN Procedures  
GCA (PAR/ASR) Procedures  
Emergencies in Approach Environment  
Communication w/Approach Controllers

Introduce/Evaluate:

TACAN point-to-point navigation.  
TACAN tracking, radial changes.  
TACAN holding.  
TACAN arcing.  
TACAN approach.  
TACAN missed approach.  
GCA (PAR, ASR) procedures.  
TACAN departure.

Review/Evaluate:

Instrument takeoff.  
UHF/ADF orientation.

Emergencies: As required.

Performance Standards. Pilot shall perform all basic instrument maneuvers IAW FRS Standardization Manual as well as conduct a TACAN/GCA approach to an approved military field within the parameters set forth in the Instrument Manual.

Prerequisite. SINST-122, appropriate FRS CBT program lessons.

External Syllabus Support. Operable TACAN, GCA approach.

INST-124

1.5 R,MR E 1 CH-46E/WST A/S (N\*)

Goal. Introduce enroute procedures.

Requirement

Discuss: (ref: CH-46E NATOPS Manual, CH-46E Flight Standardization Manual)

Fuel management.  
Internal fuel tank procedures.

Introduce/Evaluate:

GCA (ASR).  
Cross-Country Procedures.  
Flight logs.  
File flight plan.  
Departure/airways/arrival procedures.  
Close out flight plan.

Review/Evaluate:

TACAN procedures.  
GCA (PAR).  
Basic instruments.

Emergencies: Perform as required.

Performance Standards. Pilot shall perform all basic instrument maneuvers IAW FRS Standardization Manual as well as conduct a TACAN/GCA approach an approved military field within the parameters set forth in the Instrument manual.

Prerequisite. INST-123, appropriate FRS CBT program lessons.

External Syllabus Support. Operable TACAN, GCA Approach.

INST-125

1.5 R,MR E 1 CH-46E/WST A/S (N\*)

Goal. RAC Instrument Review or Refresher Instrument Check.

Requirement

Review/Evaluate: All previously introduced instrument maneuvers and procedures.

Emergencies: Perform as required.

Performance Standards. Pilot shall demonstrate the ability to perform instrument maneuvers safely IAW Instrument Flight Manual.

Prerequisites. INST-124, appropriate instrument minimums per OPNAVINST 3710.7.

External Syllabus Support. Operable TACAN, GCA approach.

3. Navigation (NAV)

a. Purpose. To develop navigation skills using charts and maps.

b. General

(1) Pilots will find information on Navigation in the FRS CH-46E Standardization Manual and the Air NTTP 3-22.3 CH-46E

(2) All Conversion aircrews qualified and current in navigation in previous type aircraft are exempt.

(3) Pilots will be prepared to discuss the 7 critical steps of CRM as applicable to each event.

c. Crew Requirement. IP/RAC/CC.

d. Ground Academics. All RACs shall complete the Navigation Class and PFPS Advanced Class prior to NAV-131

e. Flight and Simulator Event Training (3 Flights, 4.5 Hours)

NAV-131            1.5                    E 1 CH-46E A

Goal. Introduce day visual navigation.

Requirement

Discuss: (ref: CH-46E NATOPS Manual, CH-46E Flight Standardization Manual, Air NTTP 3-22.1/Air NTTP 3.22.3/Air NTTP 3.22.5 CH-46E).

CRM.

Lost plane procedures.

Time/distance checks.

Distance estimation and map legend information.

Map Preparation.

METT-TSL considerations on route selection.

Introduce:

Navigation procedures emphasizing use of terrain, contour features, and triangulation to determine position.

Use of 1:250,000 maps.

Point-to-point navigation to at least 5 checkpoints at 200 to 500 feet AGL. Remain within 500 meters of course line.

Performance Standards. Pilot shall perform a navigation route utilizing a 1:250,000 map remaining within 500 meters of

course throughout the route that consists of a minimum of 5 checkpoints.

Prerequisite. FAM-112, FRS Navigation class.

NAV-132

1.5 E 1 CH-46E A

Goal. Review NAV-131.

Requirement

Discuss: (ref: CH-46E NATOPS Manual, CH-46E Flight Standardization Manual, Air NTTP 3-22.1/Air NTTP 3.22.3/Air NTTP 3.22.5 CH-46E).

Comfort level.  
Navigation techniques.  
Map preparation.  
Boundaries.  
Wind correction for DR navigation.  
In flight route changes.  
Onboard navigation systems.  
Basic Survivability Concepts.

Plan and navigate at 200-300 feet AGL to a minimum of 6 predetermined terrain features using 1:50,000 maps. Remain within 200 meters of course line. Use appropriate onboard navigation systems, if available.

Performance Standards. Pilot shall perform a navigation route utilizing a 1:50,000 map remaining within 200 meters of course for a minimum of 6 checkpoints.

Prerequisite. NAV-131.

NAV-133

1.5 E 1 CH-46E A N\*

Goal. Introduce visual navigation at night.

Requirement

Discuss: (ref: CH-46E NATOPS Manual, CH-46E Flight Standardization Manual, Air NTTP 3-22.1/Air NTTP 3.22.3/Air NTTP 3.22.5 CH-46E)

CRM.  
Special characteristics of night NAV.  
Map preparation/mission planning.  
Onboard navigation systems.  
Aircraft Signatures.

Introduce:

Dead reckoning navigation to at least 4 points using pre-computed times and airspeeds.  
Altitude at 500-1,000 feet AGL.

Review: 1:250,000 maps/onboard navigation systems.

Performance Standards. Pilot shall perform a night navigation route utilizing a 1:250,000 map remaining within 500 meters of course for a minimum of 4 checkpoints at night.

Prerequisite. FAM-117 and NAV-132.

4. Confined Area Landings (CAL)

- a. Purpose. To develop takeoff and landing skills in confined areas.
- b. General. Maneuver descriptions; refer to paragraph 131.1b.

(1) Pilots will find information on Confined Area Landings in the CH-46E NATOPS Flight Manual, FRS CH-46E Standardization Manual, and the Air NTTP 3-22.3 CH-46E.

(2) Pilots will be prepared to discuss the 7 critical steps of CRM as applicable to each event.

- c. Crew Requirement. IP/RAC/CC or IP/REF/CC.
- d. Ground Training. Refer to paragraph 131.1d.
- e. Flight and Simulator Event Training (2 Flights, 3.0 Hours/1 Event, 2.0 Hours)

SCAL-140            2.0            E WST S

Goal. Introduce confined area work.

Requirement

Discuss: (ref: CH-46E NATOPS Manual, CH-46E Flight Standardization Manual, Air NTTP 3-22.1/Air NTTP 3.22.3/Air NTTP 3.22.5 CH-46E).

CRM.  
Aircraft clearance.  
Zone brief.

Introduce/evaluate:

Confined area approach.  
Confined area landing.  
Masking/unmasking.  
Low level quick stops.  
Bunts/rolls.  
Low level flight.

Emergencies:

ETS operation.  
Emergency landing in trees.  
Others as required.

Performance Standards. Pilot shall perform landing to a confined area emphasizing obstacle clearance and TERF Maneuvers IAW Air NTTP 3-22.1/Air NTTP 3.22.3/Air NTTP 3.22.5 CH-46E.

Prerequisite. Appropriate FRS CBT program lessons.

External Syllabus Support. WST/APT.

CAL-141            1.5                    R E 1 CH-46E A

Goal. Introduce confined area work.

Requirement

Discuss: (ref: CH-46E NATOPS Manual, CH-46E Flight Standardization Manual, Air NTTP 3-22.1/Air NTTP 3.22.3/Air NTTP 3.22.5 CH-46E)

- CRM.
- Aircraft clearance.
- Zone brief.
- Confined area approaches and landings.
- Aircraft vulnerability.

Demonstrate: Mainmount landing.

Introduce/Evaluate:

- Confined area approach.
- Confined area landing.
- Obstacle Approach.
- Waveoff.
- Obstacle takeoff.

Emergencies:

- Emergency landing in trees.

Performance Standards. Pilot shall perform confined area landings to an unprepared surface.

Prerequisite. FAM-116, appropriate FRS CBT lessons.

External Syllabus Support. CAL zones.

CAL-142            1.5                    E, 2 ACFT

Goal. Conduct multiple aircraft approaches, landings and departures to a confined area.

Requirement

Discuss: (ref: CH-46E NATOPS Flight Manual, CH-46E FRS Standardization Manual, Air NTTP 3-22.3 CH-46E).

- CRM.
- Section cruise principles.
- Section formation types.
- Section approaches to a confine area.
- Section landings and departures to a confined area.
- Lead change.

Evaluate:

- Section cruise formation.
- Section cruise approaches and landings to a confined area.

Section cruise departures from a confine area.  
Lead change.

Review: FORM-151.

Performance Standards. Pilot shall perform cruise formation flight and multiple cruise landings to a confined area or landing zone. Pilot shall fly established pattern, recognize closure rate to landing point, remain oriented in zone, maintain safe obstacle clearance, and maintain section integrity during approach and landing.

Prerequisite. CAL-141, FORM-152, FAM-116.

External Syllabus Support. CAL zone to accommodate a section.

5. Formation (FORM)

a. Purpose. To develop parade and cruise formation principles and techniques.

b. General

(1) Pilots will find information on Formation in the CH-46E NATOPS Flight Manual, FRS CH-46E Standardization Manual and the Air NTP 3-22.3 CH-46E.

(2) Pilots will be prepared to discuss the 7 critical steps of CRM as applicable to each event.

c. Crew Requirements. IP/RAC/CC or IP/REF/CC.

e. Flight and Simulator Event Training (2 Flights, 3.0 Hours/1 Event, 2.0 Hours)

SFORM-150      2.0                      E WST S (NS)

Goal. Introduce day formation procedures.

Requirement

Discuss:

Aircraft lighting and use.  
Radar altimeter use.  
CRM.  
Day scan.  
Visual cues for day formation.  
Depth perception/relative motion.  
Hazards peculiar to formation.

Introduce/Evaluate:

Section takeoff.  
Cruise formation.  
Parade formation.  
Breakup and Rendezvous.  
    Running rendezvous.  
    Carrier rendezvous.

Crossovers.  
Cruise crossovers.  
Parade crossovers.  
Turns.  
Cruise turns.  
Parade turns.  
  
Lead Changes.  
Cruise lead changes.  
Parade lead changes.  
Section landings.

Emergencies: Electrical system malfunctions or as required.

Performance Standards. Pilot shall perform confined area landings to an unprepared surface.

Prerequisite. SCAL-140, appropriate FRS CBT program lessons.

External Syllabus Support. WST/APT.

FORM-151

1.5 R E 2 CH-46E A

Goal. Introduce formation procedures.

Requirement

Discuss: (ref: CH-46E NATOPS Manual, CH-46E Flight Standardization Manual, Air NTTP 3-22.1/Air NTTP 3.22.3/Air NTTP 3.22.5 CH-46E).

Cruise principles.  
Radius of turn concept.  
Formation types.  
Break up and rendezvous.  
Overrun.

Introduce/Evaluate:

Cruise formation.  
Cruise turns.  
Section cruise confined area takeoffs and landings.  
Lead change.

Emergencies: Perform as required.

Performance Standards. Pilot shall perform cruise formation flight and 5 section cruise landings to an unprepared surface.

Prerequisite. CAL-141, appropriate FRS CBT Lessons.

External Syllabus Support. CAL zones.

FORM-152

1.5 2 E CH-46E A

Goal. Introduce parade formation procedures.

Requirement

Discuss: (ref: CH-46E NATOPS Manual, CH-46E Flight Standardization Manual, Air NTTP 3-22.1/Air NTTP 3.22.3/Air NTTP 3.22.5 CH-46E).

Hand/light signals.  
Parade principles.

Introduce/Evaluate:

Parade formation.  
Crossovers.  
Parade turns.  
Lead changes.  
Section parade takeoffs.

Emergencies: Perform as required.

Performance Standards. Pilot shall perform parade formation flight and section parade landings.

Prerequisite. FORM-151, appropriate FRS CBT lessons.

External Syllabus Support. Prepared surface runway.

6. External Loads (EXT)

a. Purpose. To develop skills necessary for external cargo operations.

b. General. Refer to paragraph 241.1b.

(1) Pilots will be prepared to discuss the 7 critical steps of CRM as applicable to each event.

(2) Pilots will find information on external operations in the CH-46E NATOPS Flight Manual, FRS CH-46E Standardization Manual and the Air NTTP 3-22.3 CH-46E.

(3) Pilots will be prepared to discuss the 7 critical steps of CRM as applicable to each event.

c. Crew Requirements. IP/RAC/CC.

d. Flight and Simulator Event Training (1 Flight, 1.5 Hours/1 Event, 2.0 Hours)

SEXT-160

2.0

E WST S

Goal. Introduce day external cargo operations.

Requirement

Discuss:

HST signals.  
Power available versus power required limitations.  
CRM.  
Crew comfort level.  
Obstacle clearance.

Load and pendant.

Introduce/Evaluate:

Configure aircraft for external cargo.  
Approach to pickup zone.  
Cargo hookup.  
Departure from pickup zone.  
Enroute phase.  
Cargo delivery.  
Simulated hoist operations.  
External cargo operations to a confined area.  
Obstacle takeoff with external cargo.  
Confined area landings.  
Steep approach to a confined area.

Emergencies: Perform as required.

Failure of one engine with an external load.  
Loss of ICS.  
Aerodynamically unstable/oscillating loads.  
Cargo jettison.

Performance Standards. Pilot shall perform 5 pickups and dropoffs to a confined zone.

Prerequisite. SCAL-140, appropriate FRS CBT program lessons.

External Syllabus Support. WST/APT.

EXT-161

1.5 E 1 CH-46E A

Goal. Introduce external cargo operations.

Requirement

Discuss:

Inadvertent IMC while conducting external operations.  
Approach to pickup zone.  
Cargo hookup.  
Departure from pickup zone.  
Enroute phase.  
Cargo delivery.  
External operations to a confined area.  
Obstacle takeoff with external cargo.  
Standard terminology.  
Hook/pendant preflight.  
Cargo jettisoning.  
Loss of ICS.

Introduce/Evaluate:

Pickup and delivery of FMF equipment (when available).  
External cargo operations to a confined area.  
Obstacle takeoff with external cargo.

Review/Evaluate:

Confined area landings.  
Steep approach to a confined area.  
Obstacle takeoff.

Emergencies: Perform as required.

Performance Standards. Pilot shall perform a minimum of five pickups and dropoffs of external load within 10 meters to a confined area.

Prerequisite. CAL-141, appropriate FRS CBT lessons.

External Syllabus Support. HST, external load, pendant, hook, and CAL zones.

7. Terrain Flight (TERF)

a. Purpose. To introduce the PUI to Terrain Flight (TERF) operations and maneuvers.

b. General

(1) Maneuver descriptions; refer to CH-46E FRS Standardization Manual and Air NTTP 3-22.1/Air NTTP 3.22.3/Air NTTP 3.22.5 CH-46E.

(2) Pilots will be prepared to discuss the seven critical steps of CRM as applicable to each event.

c. Crew Requirements. IP/RAC/CC/AGO or IP/REF/CC/AGO.

d. Ground/Academic Training. All RACs shall complete the TERF Class prior to TERF-170.

e. Flight and Simulator Event Training (1 Flight, 1.5 Hours

TERF-171      1.5                      R, MR E 1 CH-46E A

Goal. Introduce TERF operations.

Requirement

Discuss: (ref: CH-46E NATOPS Manual, CH-46E Flight Standardization Manual, Air NTTP 3-22.1/Air NTTP 3.22.3/Air NTTP 3.22.5 CH-46E).

CRM.

Aircraft clearance.

Emergencies in TERF environment.

TERF maneuvers.

Introduce/evaluate:

Maximum performance takeoff.

Performance checks.

Masking/unmasking.

Low level quick stops.

Bunts/rolls.

Low level flight/turns.

Zoom climb.

Spiral climbout/approach.

Low level approach.

Offset approach.

Emergencies:  
ETS operation.  
Emergency landing in trees.  
Others as required.

Performance Standards. Pilot shall perform TERF maneuvers emphasizing obstacle clearance IAW Air NTTP 3-22.1/Air NTTP 3.22.3/Air NTTP 3.22.5 CH-46E.  
Prerequisite. FAM-116, appropriate FRS CBT program lessons.

External Syllabus Support. Low level TERF area in controlled airspace.

8. Night Systems (NS)

a. Purpose. Introduce Pilot to NS in performing all basic FAM, NAV, and CAL maneuvers under a HLL Condition.

b. General

(1) Pilots will find information on Formation in the FRS CH-46E Standardization Manual, CH-46E NATOPS Flight Manual, MAWTS-1 NS Manual and the Air NTTP 3-22.3 CH-46E.

(2) Pilots will be prepared to discuss the seven critical steps of CRM as applicable to each event.

c. Crew Requirement. IP/RAC/CC/AGO or IP/REF/CC/AGO

d. Ground/Academic Training

(1) All pilots shall complete the Nite Lab and NS Class prior to SNS-180.

(2) All pilots shall be FAM Stage, NAV Stage, and CAL Stage complete before SNS-180.

e. Flight and Simulator Event Training (3 Flights, 5.0 Hours/1 Event, 2.0 Hours)

SNS-180

2.0

E WST S NS

Goal. Introduce NS procedures.

Requirement

Introduce/Evaluate:  
Goggle/Degoggle.  
NS eyelane/goggle preflight.  
Aircraft lighting procedures.  
Scan techniques.  
Vertical takeoffs/landings.  
Hover patterns.  
Normal approaches.

Emergencies: Any previously introduced emergency as appropriate.

Performance Standards. Pilot shall practice NS procedures and scan technique to prepare for aircraft events.

Prerequisite. SFAM-107, Nite Lab, Night Systems class and appropriate FRS CBT lessons.

External Syllabus Support. WST/APT, Night Vision Goggles.  
2.0 R E 1 CH-46E A NS

NS-181

Goal. Introduce NS flight.

Requirement

Discuss: (ref: CH-46E NATOPS Manual, CH-46E Flight Standardization Manual, MAWTS-1 NS Manual)

CRM.  
Crew comfort levels.  
NS failures.  
Depth perception.  
Aircraft lighting.  
Emergency procedures.  
MAWTS-1 NS Manual.  
ANVIS 6 or 9 NS, and NS HUD (HMD).

Introduce:

Use of NS at an unlighted outlying field under ambient light levels greater than .0022 LUX as depicted by the computer generated Light Level Planning Calendar.  
Use and wear of NS while performing taxi, basic air work, low work, and touch-and-go pattern work.

Emergencies: Perform as required.

Performance Standards. Pilot shall practice basic FAM maneuvers safely while wearing NS.

Prerequisite. FAM-117, Nite Lab, Night Systems class, appropriate FRS CBT lessons.

External Syllabus Support. NS, unlit airfield.

NS-182

1.5 E 1 CH-46E A NS

Goal. Introduce NS navigation.

Requirement

Discuss: (ref: CH-46E NATOPS Manual, CH-46E Flight Standardization Manual, Air NTTP 3-22.1/Air NTTP 3.22.3/Air NTTP 3.22.5 CH-46E, MAWTS-1 NS Manual)

Map preparation.  
Cockpit interior lighting.  
CRM.  
Crew comfort levels.  
Inadvertent IMC.  
NS navigation techniques.  
Onboard navigation systems.

Aircraft survivability equipment.

Introduce/Evaluate:

Navigation to at least five points using 1:250,000 maps.  
Altitude 200-500 feet AGL.

Emergencies: Perform as required.

Performance Standards. Pilot shall perform a navigation route utilizing NS remaining within 500 meters of course for a minimum of five checkpoints.

Prerequisite. NAV-133, NS-181.

External Syllabus Support. NS.

NS-183            1.5                    E 1 CH-46E A NS

Goal. Introduce NS CALs.

Requirement

Discuss:

CRM.  
Crew comfort levels.  
NS failures.

Introduce/Evaluate: NS confined area landings/takeoffs at various unlighted CAL zones.

Emergencies: Perform as required.

Performance Standards. Pilot shall perform confined area landings to an unprepared surface utilizing NS.

Prerequisite. CAL-141, NS-182.

External Syllabus Support. NS, CAL zones.

9. Review (REV)

a. Purpose. To demonstrate proficiency in performing Core Skill Introduction events per NATOPS and other appropriate publications.

b. General. All pilots under instruction shall complete SREV-190. Moreover, all CH-46 pilots shall fly this event once per month if an approved simulator is available. If an approved simulator is not available, the squadron NATOPS officer may substitute a written examination on normal and emergency procedures.

(1) Pilots will be prepared to discuss the seven critical steps of CRM as applicable to each event.

(2) Prerequisite. Refer to paragraph 231.1d.

c. Crew Requirements. IP/RAC/CC.

- d. Ground Training. Completion of NATOPS closed book examination.
- e. Flight and Simulator Event Training (1 Flight, 1.5 Hours/1 Event, 2.0 Hours)

SREV-190            2.0                    R E WST S

Goal. Review previous maneuvers and emergencies.

Requirement

Review/Evaluate:  
FAM stage maneuvers.  
Instrument stage maneuvers.  
Confined area landings.

Emergencies: Perform all previously introduced emergencies.

Performance Standards. Pilot shall perform all FAM maneuvers and emergencies IAW CH-46E NATOPS and FRS Standardization Manuals.

Prerequisite. Appropriate FRS CBT program lessons. All previous stages complete.

External Syllabus Support. WST/APT.

REV-191            1.5                    E 1 CH-46E A

Goal. Review previous maneuvers and emergencies.

Requirement

Review/Evaluate: All maneuvers from all previous Core Skill Introduction flights.

Emergencies: All previously introduced emergencies.

Performance Standards. Pilot shall perform all FAM maneuvers and emergencies IAW CH-46E NATOPS and FRS Standardization Manuals.

Prerequisite. SREV-190.

10. Core Skill Introduction Check (CSIX)

a. Purpose. The PUI will demonstrate proficiency in performing duties as a Core Skill Introduction complete copilot per this syllabus, NATOPS and other appropriate publications.

b. General

(1) At the completion of CSIX-192, the PUI shall be designated a Helicopter Second Pilot (H2P) in the CH-46E.

(2) The PUI is responsible for any/all maneuvers and emergencies contained in the Core Skill Introduction phase.

(3) Prerequisite. The PUI shall meet all CBT and NATOPS prerequisites prior to this flight.

- c. Crew Requirements. IP/RAC/CC or IP/REF/CC.
- d. Academic Training. Completion of open and closed book examinations.
- e. Flight and Simulator Event Training (1 Flight, 1.5 Hours)

CSIX-192            1.5            R,MR E 1 CH-46E A

Goal. RAC/Refresher NATOPS evaluation.

Performance Standards. Pilot shall perform all FAM maneuvers and emergencies IAW CH-46E NATOPS, Air NTTP 3-22.3 and FRS Standardization Manuals.

Prerequisite. REV-191.

132. CORE SKILL BASIC PHASE

1. Familiarization (FAM)/Instruments (INST)

a. Purpose. To review day and night FAM maneuvers, navigation procedures, basic instrument procedures, and introduce/evaluate ECCS normal and emergency procedures.

b. General

(1) Pilots will find FAM maneuver descriptions in the NATOPS Manual and FRS Stan manual.

(2) The NATOPS Instrument Flight Manual (NAVAIR 00-80T-112) defines basic instrument procedures.

(3) The NATOPS (A1-H46AE-NFM-300 VOL. 1) describes normal and emergency procedures.

(4) Pilots shall discuss CRM as applicable to each event.

(5) Aircrew shall be NSQ for the appropriate light level, or NS-251 complete and instructed by an NSI for events conducted on NS. If not NSQ for the appropriate light level, FAM-201 shall be conducted in the local pattern.

(6) Prerequisite. CSIX-192.

c. Minimum Crew Requirements. P/CP/CC.

d. Ground/Academic Training. Utilize academic courseware as outlined in the MAWTS-1 Course Catalog.

e. Flight and Simulator Event Training (2 Flights, 3.0 Hours /1 Simulator Event, 2.0 Hours)

SFAM/INST-200 2.0 WST/1 CH-46E S/A (N)

Goal. Review day and night familiarization maneuvers and basic instrument procedures.

Requirement

Discuss:

Familiarization maneuvers.  
Aircraft lighting and use.  
Night scan.  
Night fixation.  
CRM.  
Basic instrument procedures.  
NS HUD.  
ASE.  
CDNU operations and precision navigation equipment.

Introduce:

ASE.  
Integrated comm/nav equipment.  
NS HUD.  
ARC-210 Remote head.

Review:

Familiarization maneuvers.  
Operations at lighted and unlighted fields.  
Basic instrument procedures to include turn patterns, vertical S-1 patterns, Oscar patterns, partial panel flight, and instrument autorotations.  
Instrument Approaches.  
Emphasize emergency procedures that pilot cannot fly in the aircraft; e.g., dual engine failure, full autorotation, flex shaft failure, ECA malfunctions, compressor stalls, etc.

Performance Standards. IAW NATOPS/Instrument Flight Manuals.

External Syllabus Support. WST/APT (May be accomplished in static aircraft).

FAM/INST-201 2.0 R 1 CH-46E A (N)

Goal. Review day and/or night familiarization maneuvers, navigation above 200 feet.

Requirement

Discuss:

CRM.  
Local course rules.  
Map preparation.  
Route selection.  
Night scan.  
Night fixation.

Review:

FAM stage maneuvers.  
Navigation above 200 feet using a minimum of five checkpoints.  
Emergency procedures, as required.  
CNCS operation.

Performance Standards. Pilot shall fly pattern within 50 feet and 10 kts of briefed altitude and airspeed, established pattern checkpoints, recognize closure rate to a landing point, remain oriented on zone, and land within two rotors of intended point of landing.

Prerequisite. SFAM/INST-200.

External Syllabus Support. Landing areas.

FAM/INST-202 1.5 R 1 CH-46E A (N)

Goal. Review day and/or night basic instrument scan and procedures.

Requirement

Discuss:

Aircraft lighting and use.  
Basic instrument procedures.  
IFR planning and flying procedures.  
CRM.  
Map preparation.  
Route selection.

Review:

Basic instrument procedures to include turn patterns, vertical S-1 patterns, Oscar pattern, partial panel flight, and instrument autorotations.  
Instrument approaches.  
Instrument scan.  
IFR planning and flying procedures.

Performance Standards. Pilots shall fly pattern within 50 feet and 10 kts of briefed altitude and airspeed, fly established pattern and route checkpoints, recognize closure rate to landing point, and land within two rotors of intended point of landing.

Prerequisite. SFAM/INST-200.

External Syllabus Support. NAVAIDS and/or IFR capable facility.

2. Confined Area Landings (CAL)

a. Purpose. To develop proficiency in takeoffs and landings in a confined area.

- b. General. Pilots will find maneuver descriptions in the NATOPS Flight Manual. Pilots shall discuss CRM as applicable to each event.
- c. Minimum Crew Requirements. P/CP/CC.
- d. Ground/Academic Training. Utilize academic courseware as outline in the MAWTS-1 Course Catalog.
- e. Flight and Simulator Event Training (2 Flights, 3.0 Hours/1 Simulator Event, 2.0 Hours)

SCAL-210      2.0              1 WST S

Goal. Conduct day and night single and multiple aircraft confined area landings, tactical approaches and departures.

Requirement

Discuss:

Low/high threat tactical approaches, landings and departures to a confined area.  
Power settling/settling with power.  
Low altitude emergency procedures (e.g., landing in trees).  
Power requirements at high gross weights to affect safe takeoffs/landings.  
LZ brief/evaluation.

Introduce:

Low/high threat tactical approaches.  
Landings and departures to a confined area.  
CRM.  
Crew comfort level.  
Night fixation.  
Effects of wind.  
Landing in valleys and canyons.  
Crosswind, upslope, and downslope landings with respect to tail clearance. Use of taxi/forward cyclic trim position.

Review: CAL-141.

Performance Standards. Pilots shall fly pattern within 50 feet and 10 kts of briefed altitude and airspeed, fly established pattern checkpoints, recognize closure rate to landing point, remain oriented in zone, demonstrate Power Management, maintain safe obstacle clearance, and land within two rotors of intended point of landing.

External Syllabus Support. WST/APT.

CAL-211      1.5              1 CH-46E A

Goal. Conduct single aircraft confined area landings, tactical approaches and departures.

Requirement

Discuss:

Low/high threat tactical approaches, landings and departures to a confined area.  
Power settling/settling with power.  
Low altitude emergency procedures (e.g., landing in trees).  
Power requirements at high gross weights to effect safe takeoffs/landings (power checks).  
Rotor blade clearances (blade walk).  
LZ brief/evaluation.

Introduce:

Low/high threat tactical approaches.  
Landings and departures to a confined area.  
CRM.  
Crew comfort level.  
Effects of wind.  
Landing in valleys and canyons.  
Crosswind, upslope, and downslope landings with respect to tail clearance.  
Use of taxi/forward cyclic trim position.

Review: CAL-141.

Performance Standards. Pilots shall fly pattern within 50 feet and 10 kts of briefed altitude and airspeed, fly established pattern checkpoints, recognize closure rate to landing point, remain oriented in zone, demonstrate Power Management, maintain safe obstacle clearance, and land within two rotors of intended point of landing.

Prerequisite. SCAL-210.

External Syllabus Support. CAL zones.

CAL-212

1.5 R 2+ ACFT A

Goal. Conduct multiple aircraft tactical approaches, landings and departures to a confined area.

Requirement

Discuss:

Section and division tactical approaches.  
Landings and departures to a confined area in all threat environments.

Introduce:

Section/division tactical approaches (if applicable).  
Landings and departures to a confined area in all threat environments.

Review: FORM-151.

Performance Standards. Pilots shall fly pattern within 50 feet and 10 kts of briefed altitude and airspeed, fly established pattern checkpoints, recognize closure rate to landing point, remain oriented in zone, demonstrate power management, maintain safe obstacle clearance, land within two

rotors of intended point of landing (lead), and maintain section integrity during approach and landing (wingman).

Prerequisite. CAL-211.

External Syllabus Support. CAL zone that accommodates multiple aircraft.

3. External Cargo Operations (EXT)

a. Purpose. To develop proficiency in day external cargo operations and introduce external cargo operations in a confined area with close coordination of a Helicopter Support Team (HST).

b. General. Pilots shall discuss CRM as applicable to each event.

c. Minimum Crew Requirements. P/CP/CC.

d. Ground/Academic Training. Utilize academic courseware as outline in the MAWTS-1 Course Catalog.

e. Flight and Simulator Event Training (1 Flight, 1.5 Hours/1 Simulator Event, 2.0 Hours)

SEXT-220      2.0              WST S

Goal. Conduct day external load hookups and drops to a confined area.

Requirement

Discuss:

CRM during external load operations.  
Tactical considerations during external lift operations.  
Emergency procedures with external loads.

Review: External load hookups and drops to a confined area.

Performance Standards. Pilots shall fly pattern within 50 feet and 10 kts of briefed altitude and airspeed, fly established pattern checkpoints, utilize solid instrument scan, demonstrate proper CRM/voice commands, properly respond to crew positioning calls, recognize closure/descent rates, maintain briefed clearance below load, maintain situational awareness of obstacle clearance, demonstrate ability to hold extended hover, demonstrate understanding of HOGE requirements, complete a minimum of five hookups and drops, place load within 5 meters of intended point of drop.

External Syllabus Support. WST/APT/operable TEN.

EXT-221      1.5              R 1 CH-46E A

Goal. Review external load operations from a confined area.

Requirement

Discuss:

CRM during external load operations.  
Tactical considerations during external lift operations.  
Hoist and winch operations.  
Emergency procedures during external operations.  
Command jettisoning procedures.  
HST Brief.

Review: EXT-161.

Performance Standards. Pilots shall fly pattern within 50 feet and 10 kts of briefed altitude and airspeed, fly established pattern checkpoints, utilize solid instrument scan, demonstrate proper CRM/voice commands, properly respond to crew positioning calls, recognize closure/descent rates, maintain briefed clearance below load, maintain situational awareness of obstacle clearance, demonstrate ability to hold extended hover, demonstrate understanding of HOGGE requirements, complete a minimum of five hook ups and drops, place load within 5 meters of intended point of drop.

Prerequisite. SEXT-220, CAL-211.

External Syllabus Support. HST, external load, LZ, hook and pendant.

4. Formation Flight (FORM)

a. Purpose. To review formation and introduce tactical formation maneuvering.

b. General

(1) Pilots shall discuss CRM as applicable to each event.

(2) Initial/refresher flights shall be flown during the day.

Subsequent flights may be flown at night if proficient in the day sortie and NSQ for the appropriate light level.

c. Minimum Crew Requirements. P/CP/CC/AGO.

d. Ground/Academic Training. Utilize academic courseware as outline in the MAWTS-1 Course Catalog.

e. Flight and Simulator Event and Training (1 Flight, 1.5 Hours/1 Simulator Event, 2.0 Hours)

SFORM-230      2.0                      WST S

Goal. Review section formation and introduce tactical section/division formation maneuvering.