

Crew Resource Management- Way Forward

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Commander's Intent

The update to the USCG Crew Resource Management (CRM) course is not a wholesale replacement of current CRM principles or training. The current four basic CRM principles (SCAR model; Situational Awareness, Communications, Assertiveness and Risk Management) are embedded in the new CRM courseware. The “updated” portion of the CRM material is the additional information on Personal Error Control (PEC).

The PEC concept is based on a scientific approach to identifying the conditions under which an individual is most likely to commit an error. By identifying when an individual is error prone, and then preventing those situations from developing during missions, we can eliminate many of the potential errors that may occur. In addition to being customizable to each individual, PEC accounts for the two different types of error- errors and violations. The underlying causes that contribute to errors and violations are Error Producing Conditions (EPC) and Violation Producing Conditions (VPC). These concepts are analogous to the Human Factors Analysis and Classification System taught in most aviation human factors courses and used in accident investigation and analysis. By incorporating the concepts into CRM we are encouraging our aircrews to think about preventing incidents and accidents while conducting their mission.

Traditional Risk Management in CRM has adopted the philosophy that “to err is human” and therefore errors are inevitable. The result was Error Management and the effort was placed on error traps and minimizing the consequence of error. While those skills are still important and are integral to effective Operational Risk Management (ORM), to resign oneself to the inevitability of committing an error is to admit defeat before even beginning. It places one in a continuous defensive posture and requires constant monitoring to identify an error and then mitigate the consequences.

PEC moves beyond the defensive nature of error trapping and arms you, each individual in the crew, with the tools to identify your own unique set of EPCs and VPCs. By knowing your own precursors to error, you can adjust your personal attitudes and behaviors to prevent some error from even occurring. This is a uniquely offensive approach to Error Management. By identifying your own EPCs and VPCs, and then preventing them from becoming part of the mission profile, you can prevent error from occurring. The product is more time and attention; it allows you to focus more on effective mission execution.

The PEC philosophy has one very basic and tremendously important assumption- each member of the crew is a professional aviator. Hence, the CRM courseware now includes modules on Flight Discipline and Normalizing Excellence to help us understand what it means to be a professional. It is each instructor's challenge to convey the importance of these concepts. It is each student's responsibility to approach these concepts without bias.

For PEC to be effective, as individuals we must aspire to become truly professional aviators; as a community we must challenge each member of our crew to join us on that journey.

Courseware Organization

The CRM disc has two folders- Instructor Files and Modules. The Instructor Files folder has additional case studies and other CRM related material not necessarily included in the updated version of the CRM course. However, if you desire, they are suitable for any CRM discussion or training session.

The Modules folder has the current version of each CRM courseware module (.ppt files) and one Instructor Guide Appendix (.pdf file).

Standardization of Instruction

Coast Guard aviation's success is partly based upon standardization. To that end, CRM instruction will be standardized in the following ways: courseware will not be modified by instructors without written approval from CG-1131 (except for case studies as outlined in this guidance), instructors will teach the only modules required for the course of instruction being taught and only certified instructors will teach CRM Initial or CRM Refresher.

CRM Initial. Only those instructors who are attached to the Aviation Training Center (ATC) or the Aviation Technical Training Center (ATTC) and are currently CRM Initial instructor certified are qualified to teach CRM Initial.

CRM Refresher. ATC CRM Initial certified instructors and officers currently designated as unit Flight Safety Officers, who have attended the FSO Standardization course within the current or previous year, are certified to instruct CRM Refresher training.

CRM Module Map

The CRM courseware modules are broken down into three categories: Basic Tenant, New But Known and CRM+. The category to which a module belongs will determine when it will be taught in the CRM Refresher schedule. The modules map as follows.

<u>CRM Module</u>	<u>Category</u>
Module 1- Introduction to CRM	CRM+
Module 2- Flight Discipline	CRM+
Module 3- Normalizing Excellence	CRM+
Module 4- Fatigue	New But Known
Module 5- Nutrition & Hydration	New But Known
Module 6- Stress	New But Known
Module 7- Hazardous Attitudes (Assertiveness)	Basic Tenant
Module 8- Error Producing Conditions	CRM+
Module 9- Effective Communications	Basic Tenant
Module 10- Situational Awareness	Basic Tenant
Module 11- Mutual Support	New But Known
Module 12- Class Exercise	Initial CRM Only
Module 13- Risk Management	Basic Tenant
Module 14- Automation Airmanship	Initial CRM Only

Module 14- Automation Airmanship is deemed too airframe specific at this point for fleet-wide use. It will only be taught in Initial CRM and pertinent aspects will be incorporated into the Transition and Proficiency courses for applicable aircraft. Module 9- Effective Communications and Module 11- Mutual Support are similar and complementary. They will be combined into a single module to be taught in the third year of the implementation cycle (CY 2011).

How To Create an Instructor Guide

To create an Instructor Guide:

1. Print each of the fourteen modules in “Notes Pages” view.
 - a. Below each slide will be the “Instructor’s Notes” for that slide. The notes cover the talking points and material to be taught for each slide.
2. Print out the Instructor Guide Appendix.
 - a. This file has additional case study background and other pertinent information for some of the modules. Unlike the files in the “instructor files” folder, the material in this file is part of the current courseware and the instructor needs to know this material.

Implementation Plans

CRM Initial Training Plan

CRM Initial instruction can begin immediately. Instructors should use the pre and post tests to verify the course’s effectiveness. Test results shall be forwarded to CG-1131 for inclusion in the Program Assessment Tool and courseware revision process. CRM Initial is designed to be taught in two eight hour days.

CRM Refresher Training Plan

CRM Refresher instruction can begin immediately. To prevent training fatigue and unit burden, CRM Refresher instruction is to be implemented via a four calendar-year plan. Using the module map, in each of the next four years CRM Refresher instruction will include one each of the Basic Tenants, two of the "Known But New" modules, and ALL of the CRM+ modules. CRM Refresher is taught in approximately two to three hours.

Each CRM Refresher session should use the following template to allot time per module:

Intro: 10 mins

Basic Tenant: 30 mins

Known But New: 20 mins

CRM+: 90-120 mins

The CRM Refresher instruction schedule is as follows:

CY 2009

Intro- Module 1

Basic Tenant- Situational Awareness (Module 10)

Known But New- Nutrition & Hydration (Module 5)

CRM+- ALL CRM+ Modules (see below)

CY 2010

Intro- Module 1

Basic Tenant- Risk Management (Module 13)

Known But New- Fatigue and Stress (Module 4 & Module 6)

CRM+- ALL CRM+ Modules (see below)

CY 2011

Intro- Module 1

Basic Tenant- Communication (Module 9)

Known But New- Nutrition & Hydration (Module 5)

CRM+- ALL CRM+ Modules (see below)

CY 2012

Intro- Module 1

Basic Tenant- Hazardous Attitudes (Module 7)

Known But New- Fatigue and Stress (Module 4 & Module 6)

CRM+- ALL CRM+ Modules (see below)

CRM+ Modules

Module 2- Flight Discipline

Module 3- Normalizing Excellence

Module 8- Error Producing Conditions

Case Study and Illustrative Scenario Policy

Replacement of Provided Case Studies and Illustrative Scenarios

In the CRM courseware there are various real-world examples that are analyzed to demonstrate how the academic concepts being presented actually manifest themselves in reality. Depending on length and depth, the examples are grouped as a Case Study (long example chosen to illustrate a complex idea or the interaction of multiple fundamental concepts) or an Illustrative Example (short example to illustrate a single concept or multiple facets of the same basic concept).

Chosen properly, a case study or illustrative scenario is a method by which the instructor can elicit student participation and guide the discussion to illustrate the desired training points. Therefore, instructors must be comfortable with the content and the context must be relevant to the student. To ensure instructor-student-case study compatibility, instructors are authorized to replace specific case studies or illustrative scenarios with examples meeting instructor expertise or student interest criteria. When replacing the authorized case studies or illustrative scenarios listed below, no prior approval from CG-1131 is required. However, instructors must exercise care to ensure the selected example illustrates the intended learning points (as outlined in *Learning Points for Case Studies and Illustrative Scenarios*). Examples chosen must also meet the criteria in *Use of Mishap Messages* section.

List of Case Studies Authorized For Instructor Replacement

Module 1, NASA X-31

Module 8, Massachusetts State Police

List of Illustrative Scenarios Authorized For Instructor Replacement

Module 2, HH-65 “Go Back”

Module 3, LtCol Bud Holland

Module 3, LCDR John Bates

Module 6, HH-65 “Don’t Go Back”

Module 7, “Broken Dreams”

Module 8, HU-25 “Crossfeed”

Module 11, HC-130J “Two Heads Down”

Learning Points for Case Studies and Illustrative Scenarios

Each case study and illustrative scenario in the courseware was specifically chosen to facilitate the discussion towards a desired learning point. Instructors are authorized to replace specific ones with examples pertaining to their own or their student’s interests. When doing so, instructors must ensure the selected example illustrates the intended learning points of the one removed. To facilitate this replacement, each case study’s and illustrative scenario’s intended learning points are as follows:

Case Study Learning Points

1. Module 1, NASA X-31
 - a. Introduce the CRM loop

- b. Demonstrate that CRM has organizational as well as individual/crew implications
- c. Each aspect of the CRM loop is demonstrated:
 - i. Ask Questions –
 - 1. Test Director asking the question about follow-through regarding pitot heat (not connected, not operational, not placarded as inoperative, not included in supplemental flight manual)
 - 2. Test team members asking the question about why they were flying in weather conditions contraindicated by their test plan
 - 3. Control room personnel asking about the difference between the two airspeed indications
 - ii. Advocate Concern/Action – ties to above
 - 1. Delay the flight until weather conditions were favorable
 - 2. Recommend the pilot switch to the reversion mode on flight controls
 - iii. Resolve Differences – ties to above issues that should be resolved, and,
 - 1. Engineer in Control Room seeing differences between indicated and inertial airspeeds should have initiated the CRM loop by asking ‘why’ and terminating the test until resolution
 - iv. Decide on Appropriate Action – ties back to the scenario prior to loss of control and also prior to launch.
 - 1. Once past the go/no-go decision, the appropriate action becomes selection of the reversion mode as the final aircraft-saving opportunity.
 - v. Review Continuously – flight and organizational ties
 - 1. Flight – Review the plan as it becomes apparent that weather may be a factor
 - 2. Organizational – review the full test plan and risk mitigation decisions (immediate ejection on loss of control) in light of data gathered in 200 flights and years of operation.

2. Module 8, Massachusetts State Police Air Wing

- a. Demonstration of Error Producing Condition #5, Normalization of Deviance (NOD)
 - i. Phase 1 – pre-flights become less detailed, fuel tank maintenance is skipped
 - ii. Phase 2 – no catastrophic events occur due to practices of Phase 1, deviation continues
 - iii. Phase 3 – deviation becomes the standard, pre-flights are cursory, fuel tank maintenance stops
 - iv. Phase 4 – public crash, loss of 4 lives

- v. NOD always begins with baby steps and the lack of an immediate negative consequence paves the way for continued deviance.
- b. Demonstrates three other Error Producing Conditions that are present
 - i. Low Signal to Noise Ratio – gradual decrease in fuel output is not readily evident in the cockpit (without enforced standards of preflight and power checks)
 - ii. Faulty Risk Perception – the organizational approach to flying and treatment of aircraft as flying patrol cars and taxis led to a diminished perception of the inherent risks of aviation.
 - iii. Inadequate Standards – a small, isolated unit out of the immediate crosscheck of higher headquarters led to a degradation of standards and diminished understanding of the importance of trained and current instructors and a robust standardization program

Illustrative Scenario Learning Points

1. Module 2, HH-65 “Go Back”
 - a. Primary- Open a discussion NOT about the rules regarding movement to/from the cockpit, but rather ABOUT FLIGHT DISCIPLINE and what that means to us as individuals and professional aviators.
 - b. Topics raised include rule compliance, motivation, stress, time pressure, unique event and mission success.
 - c. An example that raises flight discipline questions would be appropriate.
2. Module 3, LtCol Bud Holland
 - a. Primary- To identify the perfect example of a rogue aviator and how they are created and not born.
 - b. The primary point is to illustrate the Normalization of Deviance and how to institute a culture of Normalizing Excellence.
 - c. An example illustrating how a rogue aviator is created would be appropriate.
3. Module 3, LCDR John Bates
 - a. Primary- Further illustrates the idea of a rogue aviator.
 - b. This example further develops the idea that the organization is responsible for creating rogue operators.
 - c. An example of an organization condoning and thereby contributing to a rogue aviator’s development and growth would be appropriate.
4. Module 6, HH-65 “Don’t Go Back”
 - a. Primary- Illustrate the effects of Stress on decision making.
 - b. A prime discussion point for this example is to examine how flight discipline helps prevent errors when under extreme stress.
 - c. An example of how stress affects decision making would be appropriate. Care should be taken to include one that has aspects of positive flight discipline.

5. Module 7, “Broken Dreams”
 - a. Primary- Illustrate one of the Hazardous Attitudes.
 - b. This example demonstrates how outside commitments, and our desire to keep them, can adversely impact aeronautical decision making.
 - c. An example illustrating any of the Hazardous Attitudes would be appropriate.

6. Module 8, HU-25 “Crossfeed”
 - a. Primary- Illustrate one of the ten Error Producing Conditions (EPC).
 - b. This example illustrates the Low Signal to Noise Ratio EPC. The example also ties in the CRM loop to further illustrate how situation monitoring can catch and correct mistakes before they contribute to a mishap.
 - c. An example illustrating any of the ten EPCs would be appropriate. This example was chosen due to the difficulty often experienced when attempting to explain the Low Signal to Noise Ratio concept.

7. Module 11, HC-130J “Two Heads Down”
 - a. Primary- Illustrate one of the seven skills of Automation Airmanship.
 - b. This example is for Mode Awareness, but an example for any of the skills would be appropriate.

Use of Mishap Messages

Instructors may use mishap message of their choosing in their classroom. They shall be presented as a case study or illustrative scenario to facilitate CRM learning and discussions of desired learning points and not to second guess the mishap crew’s actions or abilities. In choosing appropriate Coast Guard mishaps to discuss, consideration should be given the service’s interpretation of the mishap crew’s actions, mishap date, seriousness of the mishap and the mishap’s complexity. CG-1131 written approval shall be obtained prior to using a Class A or Class B mishap. If there is any doubt concerning the appropriateness of a mishap, CG-1131 should be consulted prior to including a mishap in a CRM discussion.

Mishap messages may contain privileged information and require special safeguards. They are not releasable outside of the Coast Guard Data Network (CGDN) and users of the CGDN are strictly prohibited from forwarding electronic copies of mishap messages outside of the CGDN (including to personal email accounts for home study or preparation). Paper copies of mishap messages should not be made and are not authorized for release to non-USCG members (including companies and their representatives under contract by the USCG or any other government agency).

As appropriate, CG-1131 will approve simulator reenactments of actual mishaps or simulator recreations of scenarios similar to actual mishaps. Requests for simulator reenactments shall be routed to CG-1131 through Aviation Training Center or Aviation Technical Training Center Commanding Officer and CG-711. CG-1131 retains final approval authority to ensure privileged information is not inadvertently released and to maintain sensitivity to service and individual needs.