COMPLIANCE WITH THIS PUBLICATION IS MANDATORY

This publication implements Air Force Policy Directive (AFPD) 11-2, *Aircrew Operations*, Air Force Instruction (AFI) 11-200, *Aircrew Training, Standardization/Evaluation, and General Operations Structure*, and is consistent with AFPD 11-4, *Aviation Service.* It establishes the Air Force Cockpit/Crew Resource Management and Threat & Error Management (CRM/TEM) Program. This publication is applicable to all civilian employees and uniformed members of the Regular Air Force, Air Force Reserve (AFR), and Air National Guard (ANG). This publication does not apply to the United States Space Force Ensure all records generated as a result of processes prescribed in this publication adhere to Air Force Instruction 33-322, *Records Management and Information Governance Program*, and are disposed in accordance with the Air Force Records Disposition Schedule, which is located in the Air Force Records Information Management System. Submit suggested changes to this publication on Air Force (AF) Form 847, *Recommendation for Change of Publication*, through the chain of command, to AF/ACTF, **usaf.pentagon.af-a3.mbx.actf-workflow@mail.mil**. Major commands (MAJCOMs), direct reporting units (DRUs), and Headquarters Air Force Field Operating Agencies (FOAs) may supplement this publication; coordinate supplements with the Deputy Chief of Staff, Operations, Directorate of Training and Readiness, and Aircrew Task Force (AF/ACTF) before publishing. The authorities to waive wing/unit level requirements in this publication are identified with a Tier ("T-0, T-1, T-2, T-3") number following the compliance statement. See DAF Instruction (DAFI) 33-360, *Publications and Forms Management*, for a description of the authorities associated with the Tier numbers. Submit requests for waivers through the chain of command to the appropriate Tier waiver approval authority, or alternately, as directed at **paragraph 1.4** Compliance with attachments to this publication are mandatory.

SUMMARY OF CHANGES

This document has been substantially revised and needs to be completely reviewed. Major changes include the addition of Threat and Error Management (TEM) requirements under the umbrella of the CRM/TEM Program.

Section A—Cockpit/Crew Resource Management and Threat & Error Management (CRM/TEM) Program Description

1. Overview. The Air Force CRM/TEM program provides crewmembers with performance-enhancing knowledge and skills directly applicable to their roles in the mission of the Air Force. CRM/TEM Program training is a key component of a combined effort to identify and manage threats to ensure safe and effective mission operations. CRM/TEM Program training begins with crewmembers' initial Air Force flying training and is continuously built upon throughout their operational careers.   Training objectives are tailored to the knowledge and skill level of the crewmember.   CRM/TEM Program training should emphasize performance skills more than academic objectives as the crewmember becomes more proficient.

1.1. **CRM/TEM Program Purpose.** The CRM/TEM Program focuses on the effective utilization of all appropriate and available resources as countermeasures to operational threats and human errors so as to ensure mission success. CRM and TEM are independent, yet also interdependent.   CRM emphasizes how flight and crewmembers communicate, manage resources, and make decisions. TEM emphasizes effective management and communications regarding operational threats and human errors.   Crewmembers must be proficient in CRM and TEM skills. Safe and effective operations are achieved when CRM/TEM Program skills and technical expertise are employed together.

1.2. **Goals.** The CRM/TEM Program goals are:

1.2.1. Maximize operational effectiveness and combat capability.

1.2.2. Preserve personnel and material resources.

1.2.3. Ensure the safety of non-combatant civilians and friendly forces.

1.2.4. Facilitate mishap reduction by providing skills, processes, tools, and techniques to aircrew members to effectively identify threats and mitigate errors in aviation operations.

1.3. **Objectives.** Design and manage CRM/TEM Program training to accomplish the following objectives:

1.3.1. Develop aircrew understanding and proficiency of human factors skills to cultivate a safe and effective operational environment while accomplishing mission requirements.

1.3.2. Develop aircrew skills and strategies in recognizing and responding to threats and aircrew errors to prevent conditions that may lead to mishaps.

1.4. **Waivers.** Unless otherwise specified or tiered, the Deputy Chief of Staff for Operations, Director of Training and Readiness (AF/A3T) is the waiver authority for the provisions of this publication. Route waivers through applicable channels to MAJCOM/A3 (operations or equivalent). As applicable, MAJCOM/A3s will forward requests to AF/A3T, with an info copy to AF/ACTF.

2. **Roles and Responsibilities.**

  2.1. **Headquarters Air Force, Director of Training and Readiness (AF/A3T).** Through the ACTF, manages the CRM/TEM Program and provides resources to implement guidance in this publication.

  2.2. **Commanders.**

    2.2.1. MAJCOMs, FOAs and DRUs establish and manage their respective programs in accordance with this publication. MAJCOMs may implement their CRM/TEM Programs as either "Cockpit" or "Crew" Resource Management, based on their respective missions.

    2.2.2. Provide proportional funding as necessary to support the lead MAJCOM CRM/TEM Program.

  2.3. **Air Force Safety Center (AFSEC).** Provides advice and support to AF CRM/TEM Program Working Group as defined in **Section B** of this publication.

  2.4. **CRM/TEM Program Managers.** MAJCOM, FOA, and DRU CRM/TEM Program Managers develop and implement local CRM/TEM Program requirements in accordance with this manual. **(T-2)** See **paragraph 5.3.1**.

  2.5. **Flight/Crew Members.** Attends CRM/TEM Program training sessions and adheres to established policies and procedures in accordance with this publication. **(T-3)** Lead commands define "crew member" in terms of their own operational mission requirements.

  2.6. **Air Education and Training Command** shall ensure aircrew training curricula adheres to guidance in this publication.

3. **Program Requirements.** Compliance with the CRM/TEM Program is mandatory for aircrew members. (T-2)

  3.1. **Guidance.** Lead MAJCOMs ensure CRM/TEM Program requirements, currency, tracking, and evaluation guidance are in AFMAN 11-2 mission design series (MDS) specific volumes 1 and 2, in accordance with AFI 11-200. **(T-2)** Ready Aircrew Program (RAP) tasking memo or similar product may provide additional guidance. Guidance includes:

    3.1.1. Establishing training frequency, required attendees, and method for tracking crewmember currencies.

    3.1.2. Use of AF Form 4031, *CRM/TEM Skills Criteria Training/Evaluation Form,* or MAJCOM/FOA/DRU approved substitute, to establish the skills training/evaluation criteria.

    3.1.3. If using a contract vehicle, provide a uniform CRM/TEM Program via a contract vehicle that covers all applicable units to include units gained from AFR or ANG.

  3.2. **Training Program.** Each MAJCOM, FOA and DRU CRM/TEM Program Training Manager will address the following CRM/TEM Program skills. Skills must be:

    3.2.1. Integrated into flight briefings and debriefings. **(T-2)**

    3.2.2. Integrated into training syllabi. **(T-2)**

    3.2.3. Evaluated during initial qualification and recurring evaluations and assessed during designated CRM/TEM Program training events using the AF Form 4031, or approved

MAJCOM substitute. **(T-2)** In addition, the AF Form 4031 will be used as a framework to assess CRM/TEM Program skills and strategies during all aircrew evaluations while using the AF Form 3862, *Flight Evaluation Worksheet*, or MAJCOM approved substitute. **(T-2)**

3.3. **CRM/TEM Program Model.** Mission effectiveness and safe operations represent the desired operating environment. As crewmembers encounter operational threats or make errors, there is a potential to move away from the desired operating environment. Unmitigated, the result may be an Undesired State (US)—possibly leading to a mishap. The effective application of CRM/TEM Program skills and strategies creates a proactive pathway, returning crewmembers to mission effectiveness and safe operations. **Figure 1** is a CRM/TEM Program model depicting the interaction and employment of CRM/TEM Program skills.

Figure 1. CRM/TEM Program Model.

3.4. **CRM Core Curricula.** The CRM/TEM Program core curricula includes the following knowledge and skill sets that are to be taught and demonstrated during classroom and simulator training (see AF Form 4031 or approved substitute).

3.4.1. *Mission Analysis* . Includes pre-mission analysis and planning, briefing, ongoing mission evaluation, and post mission debrief. Clearly define mission overview/goals and existing/potential threats or anticipated errors that might adversely affect mission success, along with relevant threat/error mitigation strategies. **(T-2)** Mission analysis instruction will include specific TEM tools and techniques throughout the mission/flight. **(T-2)** Debrief instruction will include aircrew responses and outcomes to threats and errors, giving emphasis to any US that may have occurred. **(T-2)**

3.4.2. *Situational Awareness (SA)* . Includes knowledge and skill objectives for identifying errors, preventing the loss of SA, recognizing the loss of SA, and techniques for recovering from the loss of SA. Recognize the need for action and verbalize/act on unexpected events.

3.4.3. *Communication* . Includes knowledge of common errors, cultural influences, and barriers (rank, age, experience, position, etc.). Skills will encompass listening, feedback, precision and efficiency of communication with all members and agencies (crewmembers, wingmen, weather, air traffic control, intelligence, etc.). Use precise terminology, acknowledge all communications, and ask questions/provide clarification as applicable.

3.4.4. *Risk Management (RM)/Decision Making.* Includes risk assessment, the RM processes (deliberate, real time RM)/tools, breakdowns in judgment and flight discipline, problem-solving, evaluation of hazards, and control measures. Identify contingencies and alternatives, gather all available decision data, and clearly state decisions.

3.4.5. *Crew/Flight Coordination* . Includes the knowledge and skills required within (i.e., internal) and outside the crew/flight members (i.e., external) for mission coordination, flight/mission integrity contracts, team-building, leadership, command authority, responsibility, behavioral styles, assertiveness, persistence, conflict resolution, hazardous attitudes, legitimate avenues/methods of dissent, and solution driven statements. Adapt as situational demands require, focus attention on task, and ask for inputs.

3.4.6. *Task Management* . Includes establishing priorities, using available resources to manage workload, overload/under-load, complacency, management of automation, checklist discipline, standard operating procedure (SOP), the verbalization of concerns relating to tasks, and the proposal of solutions to known task issues.

3.5. **TEM Core Curricula.** Includes knowledge that TEM is a structured, proactive, systems approach to principles employed using multiple layers of defenses. Recognize and enforce that TEM strategies are intuitive, logical, and flexible, designed to identify, prevent, and mitigate threats and/or trap (allay) inevitable crewmember-made errors. TEM promotes vigilance versus complacency by implementing an active, continuous process of identifying and preparing for threats and identifying and repairing errors at the earliest opportunity. Failing to effectively manage threats or errors negatively influences safe operations, which may lead to US and possible mishaps.

3.5.1. *Threat Identification and Mitigation* . Effective threat identification and mitigation strategies enhance SA and reduce the potential for crewmember error. The appropriate response to a threat is: Identify and Prepare. The earlier threats are identified (both anticipated and unanticipated), the more quickly and effectively they can be managed. Threats not properly identified, or identified but not effectively mitigated, may result in a degradation of safe operations. Effective threat mitigation strategies include: persistently briefing known and anticipated threats along with expected actions, evaluating and confirming current and expected tasks and/or flight progress, effective wingman duties, and adhering to SOP.

3.5.2. *Error Recognition and Mitigation* . Effective error management addresses the negative consequences of human errors, either made by oneself or by another flight/crewmember. Anticipate errors based on task complexity and circumstance. The earlier an error is identified, the more quickly it can be repaired. Effective strategies for error management include: anticipation of errors (e.g., as discussed during mission planning), maintaining awareness of aircraft status and flight/crew actions, appropriate task prioritization, and confirmation of the appropriately selected automation level for the situation. Effective error-countermeasures include continuous employment of flight path

management (FPM) concepts, effective pilot monitoring (PM) and crewmember monitoring (CM), and communication/ coordination techniques such as verbalize, verify, and monitor (VVM).

3.5.3. *Undesired State (US)* . A US is a safety- or mission-compromised aircraft state (position, altitude, condition, configuration, or mission crew events/performance) resulting from ineffective CRM/TEM. The appropriate response to a US is: Identify and Recover. Once the US has been identified, aircrews must take immediate corrective action—this action will likely include a combination of CRM, TEM, and technical skills. A US from which a crew does not immediately recover may lead to an incident, accident, mishap, or mission failure.

3.6. **CRM/TEM Program Training Phases.** Each phase of training should prepare individuals to apply the knowledge and skills acquired in their specialty and motivate participants for the next phase of training. Training phases will include up-to-date CRM/TEM Program best practices. **(T-2)** Curricula will tailor CRM/TEM Program knowledge and skill objectives to fit the unique characteristics of each primary mission. **(T-2)** Discussions will include the practical application of CRM/TEM Program skills and strategies for each crew position. (**T-2**)

3.6.1. *Introductory or Awareness CRM/TEM Program Training.* Normally conducted in a formal training environment by Air Education and Training Command. Students learn standard CRM/TEM Program terminology and core concepts, along with TEM principles and introductory strategies (e.g., effective pilot flying (PF) and PM behaviors, flight member monitoring, CM behaviors, and VVM). Lesson plans will include a description of the building block approach to CRM/TEM Program training that the individual will participate in throughout their operational career. **(T-2)**

3.6.2. *Formal Training Unit/Combat Crew Training School CRM/TEM Program Training* . Students learn to apply knowledge and skills related to their assigned aircraft. Academic training is complemented during aircraft/simulator training. Emphasis should be placed on CRM/TEM Program techniques relating to preflight planning, briefing, in-flight utilization, and debriefing. This should include a succinct review of the CRM/TEM Program Model and CRM/TEM Program core concepts, as identified in paragraphs **3.3**, **3.4**, and **3.5** Mission-oriented simulator training (MOST) sessions or other simulated or actual operational scenarios may be used as an integral part of CRM/TEM Program training. Evaluate students for technical expertise, as well as CRM/TEM skills based on the core curricula concepts. **(T-2)** If aircrew training devices are not available, students should participate in group problem-solving exercises.

3.6.3. *Mission-Specific Continuation CRM/TEM Program Training* . MAJCOMs, FOAs and DRUs are responsible for CRM/TEM Program continuation training. (**T-2**) This training reinforces aircrew CRM/TEM Program academic knowledge, skills, and strategies. In addition, it bolsters the preemptive identification and mitigation of operational threats and aircrew-made errors, thereby reducing the potential for mishaps.

3.6.3.1. Emphasize CRM/TEM Program skills and strategies in the mission qualification and continuation training programs so they become part of crewmembers' habit patterns and inseparable parts of operational practices. **(T-2)** Debriefings will

include crewmembers' CRM/TEM Program performance (highlights/deficiencies) using AF 4031 (or approved substitute) as a guide. **(T-2)**

3.6.3.2. Frequency for recurring CRM/TEM Program continuation training is defined in the AFMAN 11-2 MDS specific volume 1, a RAP tasking memorandum, or a similar product. Lead commands are responsible for providing guidance to standardize CRM/TEM Program MDS-specific training policies and requirements. All aircrew require mission-specific continuation training. **(T-2)** Separating training by crew position should normally be avoided, however, it is not mandatory to conduct this training with a complete aircrew.

3.6.4. *Flight Instructor/Evaluator Training* . All flight and simulator instructors/evaluators (military and civilian) will complete instructor and evaluator specific CRM/TEM Program training (**T-2**) This training will normally be accomplished as part of an instructor or evaluator upgrade program. **(T-2)** Existing aircrew instructors and evaluators, who have not previously attended the Instructor CRM/TEM Program course, must complete this training. **(T-2)** Courseware builds on the previous blocks of training, both to reacquaint candidates with CRM/TEM Program fundamentals and to maintain continuity of terminology and strategies. MAJCOMs, FOAs, and DRUs develop courseware related to instructing and evaluating key CRM/TEM Program skills that apply to command and aircraft-specific missions. **(T-2)** Personnel may conduct this training at operational units, formal training units, or a combination, as required. Training includes, but is not limited to, the proper use of AF Form 4031 (or approved substitute). See AFMAN 11-2MDS, Volume 1, RAP tasking memo, or similar product for specific requirements. Annotate "CRM/TEM Program Instructor" within the crewmember's training record upon completion of this course. **(T-2)**

3.6.4.1. Include CRM/TEM Program instructor or evaluator training in all instructor and evaluator upgrade programs. (**T-2**)

3.6.4.2. Flight instructors and evaluators should be highly proficient in all CRM/TEM Program skills and be experts in the recognition, observation, and reinforcement of these skills as they are applied by aircrew members in a mission environment.

3.6.4.3. Commanders will ensure contractor simulator instructor pilots have the CRM/TEM Program Instructor training requirement written into their performance work statement (PWS) to ensure the aforementioned instructors receive this training. **(T-2)**

3.6.5. *CRM/TEM Program Facilitator Training* . The CRM/TEM Program Facilitator Training course is intended to teach foundational CRM/TEM Program skills and principles that make CRM/TEM Program effective and motivating to aircrew members.

3.6.5.1. CRM/TEM Program Facilitator Requirements. Formal CRM/TEM Program academic curricula must be delivered by a trained CRM/TEM Program Facilitator. **(T-2)** Facilitator training will include training in running exercises, structured crew observation, and effective academic feedback. **(T-2)**

3.6.5.2. Obtaining CRM/TEM Program Facilitator Training**.** CRM/TEM Program Facilitator training is obtained via any Department of Defense (DoD) or non-DoD agency that provides certified or accredited CRM/TEM Program or CRM/TEM

Program Facilitator training and/or is recognized by the MAJCOM CRM/TEM Program Manager. **(T-2)** Annotate "CRM/TEM Program Facilitator" within the crewmember's training record upon completion of this training.

3.6.5.3. CRM/TEM Program Facilitator Responsibilities. Once trained, CRM/TEM Program Facilitators are expected to maintain knowledge of current CRM/TEM Program concepts. Though the formal CRM/TEM Program Facilitator training course provides foundational CRM/TEM Program concepts and principles, CRM/TEM Program Facilitators should continually update their CRM/TEM Program knowledge, in addition to updating their classroom academic skills.

4. Supporting Information. HQ Air Force Safety Center, MAJCOM, FOA, DRU and unit safety staffs will screen mishaps and human factors-related information for human performance errors. **(T-2)** MAJCOM, FOA, DRU and unit safety staffs should utilize HAF and lead command safety newsletters, or equivalent, related to CRM/TEM trend analysis. This information should be available for use during all phases of CRM/TEM training, as part of academics, simulator scenarios or for CRM/TEM case studies. When specifically requested, MAJCOM safety staffs will provide sanitized, non-privileged mishap/hazard driven safety information relating to human performance to include safety metrics related to CRM/TEM.

Section B—CRM/TEM Program Administration

5. Air Force Oversight. AF/A3T provides oversight of the AF CRM/TEM Program. The AF CRM/TEM Program Steering Committee and AF CRM/TEM Program Working Group provide a means of gathering and analyzing program effectiveness and changes.

5.1. **The AF CRM/TEM Program Steering Committee.** The Steering Committee provides resources for administrative support to the AF CRM/TEM Program Working Group and standardizes CRM/TEM Program requirements, terminology, and change management.

5.1.1. **Membership.**

5.1.1.1. ACTF, Chair.

5.1.1.2. Deputy Chief of Staff, Operations, Directorate of Training and Readiness, Combat Air Forces Division (AF/A3TC).

5.1.1.3. Deputy Chief of Staff, Operations, Directorate of Training and Readiness, Mobility Air Forces Division (AF/A3TM).

5.1.1.4. HQ Air Force Flight Standards Agency/Operations Directorate (AFFSA/XO).

5.1.2. **Schedule.** The Steering Committee meets prior to each Aircrew Management Executive Council (AMEC) meeting and, as needed, to review inputs and set working group agenda items.

5.1.3. **Contact information.** ACTF workflow email: **usaf.pentagon.af-a3.mbx.actf-workflow@mail.mil**.

5.2. **The AF CRM/TEM Program Working Group.**

5.2.1. **Membership.** Members of the AF CRM/TEM Program Steering Committee, AFSEC representative, MAJCOM/FOA/DRU A3 (or equivalent) representatives, and additional personnel, as designated by the aforementioned steering committee.

5.2.2. **Scope and Administration.** The Working Group reviews program execution, policy changes, industry standards, and receives feedback from command programs.

5.2.2.1. The Working Group will meet in conjunction with AMEC meetings or as designated by the AF CRM/TEM Program Steering Committee. Agenda items may be submitted to the Steering Committee for consideration.

5.2.2.2. Report recommendations and findings to the Director of Training and Readiness (AF/A3T) and then disseminate to MAJCOM, FOA and DRU operations directorates.

5.3. **Command Execution and Oversight.** Execution and oversight of command CRM/TEM Programs rests within the MAJCOM, FOA and DRU operations directorates. MAJCOM, FOA and DRU Safety and Surgeon General Directorates are advisors and provide respective subject matter experts to the operations directorates for inputs to course content and delivery.

5.3.1. **CRM/TEM Program Manager.** Each MAJCOM, FOA and DRU will appoint a CRM/TEM Program Manager within the operations (or equivalent) function that will be responsible for the command program. **(T-1)** The CRM/TEM Program Manager will:

5.3.1.1. Ensure lead command's 11-2 MDS specific volumes 1 and 2 publications (or RAP tasking memo/similar product) provide CRM/TEM Program policy guidance. **(T-2)**

5.3.1.2. Implement lead command CRM/TEM Program policy guidance. **(T-2)**

5.3.1.3. Ensure each applicable CRM/TEM Program training phase (**paragraph 3.6**) is implemented and evaluated. **(T-2)**

5.3.1.4. Forward AF Form 4031 (or approved substitute) trend data to CRM/TEM Program instructors/facilitators. **(T-2)**

5.3.1.5. Ensure a system is in place to collect topic-relevant aircrew performance information (e.g., Standardization and Evaluation trends, sanitized mishap data, hazardous air traffic reports (HATR), military flight operations quality assurance (MFOQA) analysis, Line Oriented Safety Audit (LOSA) findings, Airman Safety Action Program (ASAP) reports, and inspector general reports), and send to CRM/TEM Program Facilitators and Instructors. **(T-2)**

5.3.1.6. Evaluate contractor implementation of CRM/TEM Program objectives. **(T-2)** Where discrepancies are identified, initiate corrective actions. **(T-2)**

5.3.1.7. Ensure quality assurance representatives (QARs) and Inspectors General have current evaluation guidance to evaluate CRM/TEM Program objectives. **(T-2)** Where discrepancies are identified, initiate corrective actions. **(T-2)**

5.3.1.8. Provide feedback to the AF CRM/TEM Program Working Group regarding program status covering: training continuum, standardization, and research and development needs. **(T-2)**

5.3.1.9. Interact with MAJCOM, FOA or DRU CRM/TEM Program advisors (Safety, Aerospace Physiology, etc.), ensuring CRM/TEM Program training is effective and minimizes redundancies with other programs as provided by Safety, Aerospace Physiology, etc. **(T-2)**

5.3.1.10. Provide training to develop and improve CRM/TEM Program knowledge and skills, based on paragraphs **3.3**, **3.4**, **3.6**, information procured via the AF Form 4031 (or approved substitute), and sources deemed pertinent by the MAJCOM CRM/TEM Program Manager. **(T-2)** Sources may include: AFSEC and MAJCOM safety reports, military and civilian aviation mishaps, ASAP reports, MFOQA analysis, MAJCOM standardization/evaluation information, Federal Aviation Administration (FAA) Advisory Circulars, FAA Safety Alerts, LOSA recommendations, and findings from the aviation industry.

5.3.1.11. Ensure continuation training incorporates real-world operational experiences, sanitized mishap data, research findings, critiques, and flight evaluation trends. **(T-2)** Courseware will contain up-to-date case studies covering human factors elements and will be presented in an interactive format so as to exercise students' decision making and reasoning skills and, where appropriate, stimulate discussion. **(T-2)** The CRM/TEM Program knowledge and skill objectives taught will be tailored to the unique characteristics of the MAJCOM's, FOA's, DRU's primary missions. **(T-2)**

5.3.1.12. Identify the process for gathering, analyzing, and incorporating CRM/TEM Program trend data from MAJCOMs into existing training and evaluation programs. **(T-2)**

5.3.1.13. Ensure continuity of course content with Air Education and Training Command's Introductory or Awareness CRM/TEM Program Training. **(T-2)** See **paragraph 3.6.1**.

5.3.1.14. Ensure that data collected and/or generated through CRM/TEM Program and trend gathering processes are not used for monitoring aircrew performance to initiate punitive or adverse action. **(T-2)**

5.3.1.15. The above requirements are not all inclusive and MAJCOMs may augment their CRM/TEM Program training with aviation industry standard practices or methodologies. Training for CRM/TEM Program or other programs should comply with MAJCOM-specific supplements, if any, to this publication. MAJCOMs will continue to adhere to the training requirements outlined in this publication. **(T-2)**

5.3.2. **Command Steering Committees.** MAJCOMs, FOAs and DRUs may establish command steering committees to identify the most effective methods for delivering and administering CRM/TEM Programs.

JOSEPH T. GUASTELLA, Jr., Lt Gen, USAF
Deputy Chief of Staff, Operations

Attachment 1

GLOSSARY OF REFERENCES AND SUPPORTING INFORMATION

References

AFPD 11-2, *Aircrew Operations,* 31 January 2019

AFPD 11-4, *Aviation Service*, 12 April 2019

AFI 11-200, *Aircrew Training, Standardization/Evaluation, and General Operations Structure,* 21 September 2018

DAFI 33-360, *Publications and Forms Management*, 1 December 2015

AFI 33-322, *Records Management and Information Governance Program*, 23 March 2020

Prescribed Form

AF Form 4031, *CRM/TEM Skills Criteria Training/Evaluation Form*

Adopted Form

AF Form 847, *Recommendation for Change of Publication*

AF Form 3862, *Flight Evaluation Worksheet*

Abbreviations and Acronyms

A3—Operations

AF—Air Force

AFI—Air Force Instruction

AFR—Air Force Reserve

AFSEC—Air Force Safety Center

AMEC—Aircrew Management Executive Council

ANG—Air National Guard

ASAP—Airman Safety Action Program

CM—Crewmember Monitoring

CRM—Cockpit/Crew Resource Management

DAFI—Department of the Air Force Instruction

DAFPD—Department of the Air Force Policy Directive

DOD—Department of Defense

DRU—Direct Reporting Unit

FAA—Federal Aviation Administration

FPM—Flight Path Management

FOA—Field Operating Agency

HATR—Hazardous Air Traffic Report

LOSA—Line Oriented Safety Audit

MAJCOM—Major Command

MDS—Mission Design Series

MFOQA—Military Flight Operations Quality Assurance

MOST—Mission-Oriented Simulator Training

PF—Pilot Flying

PM—Pilot Monitoring

PWS—Performance Work Statement

QAR—Quality Assurance Representative

RAP—Ready Aircrew Program

RM—Risk Management

SA—Situational Awareness

SOP—Standard Operating Procedure

TEM—Threat & Error Management

US—Undesired State

VVM—Verbalize, Verify, Monitor

Terms

A3—Standard A-Staff two-digit office symbol for Operations.

Cockpit/Crew Resource Management (CRM)—The effective use of all available resources (people, weapon systems, facilities, equipment, and environment) by individuals or crews to safely and efficiently accomplish an assigned mission or task.

Communication—The act of sharing information with others to cause action: to direct, to inform, to question, or to persuade.

Coordination—As used in this publication, the act of working with all the members of the crew/flight to accomplish the tasks of the mission.

Crew—As used in this publication, any collection of Air Force personnel who routinely work together to accomplish an Air Force mission. For example, an air task order-designated team of fighter pilots and airborne battle managers prosecuting an interdiction mission uses "crew" skills to maximize effectiveness.

Crewmember Monitoring (CM)—A crewmember who is not in direct maneuvering control of the aircraft, yet jointly responsible for actively monitoring the aircraft's current/projected flight path and energy state, intervening if necessary.

Decision Making—The ability to choose a course of action using logical and sound judgment based on available information.

Errors—Actions or inactions that lead to deviations from organizational or flight crew intentions or expectations, reduce safety margins, and increase the probability of adverse operational events on the ground or in flight. Unmanaged and/or mismanaged errors can lead to an undesired aircraft state. Errors in the operational context tend to reduce the margins of safety and increase the probability of adverse events.

Flight Discipline—The judgment and actions exercised by AF personnel to adhere to the spirit, intent, and written word of governing guidelines in the presence of temptation to do otherwise, while executing the Air Force flying mission. It also includes the prioritization of tasks based on crew responsibilities to ensure safe mission accomplishment while demonstrating the highest degree of integrity in the performance of flight duties.

Flight Path Management (FPM)—The planning, execution, and monitoring of the aircraft's guidance, trajectory, and energy state. FPM applies anytime the aircraft is in motion—in flight or on the ground. All cockpit crewmembers must ensure that effective FPM is a primary and shared responsibility during all phases of flight.

Mission Debrief—Reviewing and discussing mission accomplishment, looking at what was achieved, what barriers were encountered, and how the mission could be accomplished better next time.

Mission-Oriented Simulator Training (MOST)—Training presented as a part of a CRM/TEM Program in a realistic, operationally-based simulator environment in real time.

Mission Planning—Taking all of the information for a mission and developing short term, long term, and contingency plans to coordinate, allocate, and monitor crew/flight and aircraft resources. Effective planning leads to flight conduct that removes uncertainty, increases mission effectiveness, and enhances safety.

Performance Work Statement (PWS)—In layman's terms, a document incorporating standards that inform the contractor of specific contractual requirements and relevant desired outcomes.

Pilot Flying (PF)—The pilot at the flight controls who is in direct maneuvering control of the aircraft. The PF is primarily responsible to control and monitor the aircraft's current/projected flight path and energy state (including autoflight systems, if engaged).

Pilot Monitoring (PM)—The pilot at the flight controls who is not in direct maneuvering control of the aircraft, yet is primarily responsible for actively monitoring the aircraft's current/projected flight path and energy state, intervening if necessary.

Risk Management—The systematic process of identifying hazards, assessing risk, making control decisions, implementing control decisions, and supervising/reviewing the activity for effectiveness for both on- and off-duty missions/activities.

Situational Awareness (SA)—In flying and aircraft operations, refers to an aircrew member's continuous *accurate* perception of self and aircraft in relation to the dynamic environment of flight, threats, and mission, as well as the ability to forecast, then execute, tasks based upon that perception.

Skills Criteria—Defined skills used as the basis for operational training and evaluation. The characteristics of the skills are that they are easily identifiable and offer consistency in grading evaluation.

Task Management—The ability to alter a course of action based on new information, maintain constructive behavior under pressure, and adapt to internal and external environment changes.

Threat—An event or error that occurs outside the influence of the aircrew (i.e., it was not caused by the crew), that increases operational complexity and must be managed to maintain safety margins, and requires crew attention. All threats have the potential to negatively affect flight operations.

Threat and Error Management (TEM—)—An aviation industry-recognized best practice, TEM is a structured, proactive, systems approach that builds on multiple layers of defenses; and, applies to all single and multi-seat aircraft operators, flight, and crewmembers. TEM is intuitively, logically, and flexibly designed to identify, avoid, trap (allay) and mitigate threats and/or inevitable human errors to avoid US, mission failure, and potential mishaps.

Undesired State (US)—Operational conditions where an unintended situation results in a reduction in margins of safety. US' are a result of ineffective CRM/TEM and may lead to an incident, accident, mishap, or mission failure.

Verbalize, Verify, and Monitor (VVM)—An aviation industry-proven monitoring and cross-checking TEM technique. Using VVM, aircrew members: (1) Verbalize their intentions prior to acting on them, (2) Verify that the intended actions have been made, and (3) Monitor those actions to ensure the intended outcome(s) have occurred, thereby mitigating threats and trapping errors.