***About the Commentary**:* The Commentary addresses selected issues within the AVIATORS' MODEL CODE OF CONDUCT (AMCC) to elaborate on their meaning, provide interpretive guidance, and suggest ways of adopting the AMCC. It is intended primarily for implementers, policy administrators, aviation association management, and pilots who wish to explore the AMCC in greater depth. Please send your edits, errata, and comments to <PEB@secureav.com>. Terms of Use are available at <http://secureav.com/terms.pdf>.

COMMENTARY TO
AMCC III.d – *TRAINING AND PROFICIENCY*

d. train to recognize and deal effectively with emergencies,

Pilots must prepare to deal with emergencies[1] resulting from mechanical failures,[2] in-flight fires, aeromedical factors,[3] collision and adverse weather.[4] A thorough learning of emergency procedures, combined with regular drills, goes far to limit the catastrophic nature of emergency situations.[5] "[P]ilots are better able to deal with such situations if they practice them."[6] "[R]eadiness to cope with emergencies is gained by thorough study and frequent practice of the emergency procedures given in the [POH]."[7] It is essential to apply procedures systematically.[8]

> For example, a complex emergency might require accomplishing one or more emergency procedure checklists, replanning a route and descent profile to a nearby emergency airfield, and communicating with the controlling agency to describe "the nature of the emergency, the amount of fuel in hours and minutes, and number of souls on board" – the big three for ATC. With all that going on, who can remember to lower the landing gear? *The point is simply that normal procedures must be so firmly ingrained in our habits that we are able to fight through the chaos and confusion of an emergency or other in-flight event to keep our procedural discipline*.[9]

"During an emergency, a pilot's first obligation is to aviate, to concentrate on flying the aircraft in a safe, professional manner despite any distractions that may exist."[10] In addition, pilots must understand when to declare an emergency,[11] their authority upon declaring an emergency,[12] how to obtain and use services available from ATC in an emergency,[13] and possible post-flight responsibilities.[14] The pilot's mental attitude, preparation, and training are essential elements for survival.[15]

An in-flight fire presents the most ominous of emergencies, closely followed by structural airframe failure.[16] Pilots should train for engine shut down without hesitation and immediate landing as the generally recommended procedure.[17] As Barry Schiff puts it, a "controlled crash landing is preferable to cremation."[18] Emergency descent techniques should be well understood and regularly practiced.[19] Training for emergency evacuations is also important because "most deaths and serious injuries following a survivable accident are because of post-crash fire and inhalation of smoke and toxic fumes."[20]

Emergency training should include upset/emergency maneuver training,[21] water landings,[22] and survival skills.[23] Over-water operations (beyond gliding distance to shore) require additional training.[24] Pilots are charged with becoming familiar with an aircraft's emergency equipment and the applicable procedures for its use in an emergency.[25] For this reason, transition training should include thorough exposure to emergency procedures.[26] Each category, class and type aircraft present unique emergency considerations.[27] Simulators are particularly helpful for emergency training.[28] Emergency procedures include providing effective preflight briefings to passengers.[29]

If you handle an emergency "correctly, you have taken a huge step towards self-confidence, as well as inspiring the confidence of others . . . . [If poorly managed] you have sown seeds of doubt in yourself and others that might never completely disappear."[30] "In one very real sense, it all comes down to training."[31] *Train to survive the unthinkable.*[32]

CODE EXAMPLES:[33]

- "A professional pilot must maintain a level of proficiency that will ensure the pilot's ability to . . . cope with emergency situations." *Management Guide,* National Business Aviation Association[34]
- "From the start, a student should be taught to be self-reliant and to respond quickly to emergency situations." *The Sky Diver's Information Manual*, United States Parachute Association[35]

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[1] "A distress or an urgency condition." FAA, AIM (ASA 2005), p. 900. Training and proficiency regarding emergency operations is mandated in FAR 61.107(b)(x), *available at* < http://www.faa.gov >, *also available at* < http://risingup.com/fars/info/part61-107-FAR.shtml > (for private pilot certificates); FAR 61.127(b)(ix), *available at* < http://www.faa.gov >, *also available at* < http://risingup.com/fars/info/part61-127-FAR.shtml > (for commercial pilot certificates).

[2] *See generally* JERRY A. EICHENBERGER, HANDLING IN-FLIGHT EMERGENCIES (McGraw-Hill 1995) (presenting practical responses to diverse emergency mechanical failures and environmental hazards). *See also* Rock Brown, *When You Go NORDO*, IFR, May 2005, p. 12 (loss of radio communications); *Pitot-Static Failures*, AVIATION SAFETY, Mar. 2005, pp. 14-17 (concluding, in part, "that a pilot can never be too knowledgeable about the airplane's systems"). *Ed.* – the possible types of emergencies and corresponding literature are too extensive to include in this commentary. Thus, the above annotations are merely representative.

[3] *See* FAA, Office of Aerospace Medicine, *at* < http://www.faa.gov/about/office_org/headquarters_offices/avs/offices/aam/ > (linking extensive aeromedical resources).

[4] Telephone Interview with Ken E. Hoffman, Chairman of the Board, NAFI (Oct. 4, 2003). *See generally* FAA, *Airplane Flying Handbook*, Ch. 13 (2004) < http://www.faa.gov/library/manuals/aircraft/airplane_handbook/media/faa-h-8083-3a-7of7.pdf > (extensive treatment of emergency procedures).

[5] EICHENBERGER, *supra* note 2, p. 4.

[6] RICHARD L. COLLINS & PATRICK E. BRADLEY, CONFIDENT FLYING – A PILOT UPGRADE 235 (Aviation Supplies & Academics, Inc. 2nd ed. 2001). "A very significant factor in successfully handling an emergency is familiarity with the cockpit and the airplane. Such familiarity, which can come only from time spent flying, serves to make it much more likely that the pilot will identify the developing emergency earlier in the chain of events, reduce the likelihood of panic, and achieve a successful outcome." Email from Michael Radomsky, Pres., Cirrus Owners and Pilots Ass'n (Oct. 18, 2005).

[7] NEIL D. VAN SICKLE, MODERN AIRMANSHIP 479 (Van Nostrand, 3rd ed. 1967).

[8] *See generally* FAA, *Emergency Procedures*, AIM, Ch. 6, (ASA 2005) pp. 735-756.

[9] TONY KERN, FLIGHT DISCIPLINE 79 (McGraw-Hill 1998) (emphasis added).

[10] BARRY SCHIFF, FLYING WISDOM: THE PROFICIENT PILOT 8 (ASA 1997).

[11] *See, e.g.*, FAR 135.19, *available at* < http://www.faa.gov >, *also available at* < http://www.risingup.com/fars/info/part135-19-FAR.shtml > (Emergency operations).

[12] FAR 91.3, *Responsibility and authority of the pilot in command, available at* < http://www.faa.gov >, *also available at* < http://risingup.com/fars/info/part91-3-FAR.shtml >:

> (a) The pilot in command of an aircraft is directly responsible for, and is the final authority as to, the operation of that aircraft.
> (b) In an in-flight emergency requiring immediate action, the pilot in command may deviate from any rule of this part to the extent required to meet that emergency.
> (c) Each pilot in command who deviates from a rule under paragraph (b) of this section shall, upon the request of the Administrator, send a written report of that deviation to the Administrator.

[13] *See* FAA, *Emergency Services Available to Pilots*, AIM, § 6-2-1, pp. 736-745 (ASA 2005). And, consider use of the U.S. Coast Guard's "5 Cs": confess, communicate, climb, comply and conserve. *Reprinted in* NEIL D. VAN SICKLE, MODERN AIRMANSHIP 650-651 (Van Nostrand, 3rd ed. 1967).

[14] For example, responsibilities to notify the FAA. *See* FAR 91.3(c), *supra* note 12.

[15] *See generally* FAA, *Land Survival: Are You Prepared?*, FAA-P-8740-59 (1999), and FAA, *Water Survival: The Skills You Never Want to Use*, FAA-P-8740-58 (1998), *available at* < http://www.faa.gov >; U.S. ARMY SURVIVAL MANUAL, FM 21-76 (1970), *available at* < http://www.equipped.com/fm21-76.htm >; *see also* < http://www.survival.com >.

[16] EICHENBERGER, *supra* note 2, p. 35.

[17] Bob Buck put it most bluntly, "Get the son of a bitch back on the ground as fast as possible." BOB BUCK, NORTH STAR OVER MY SHOULDER 14 (Simon & Schuster 2002).

[18] BARRY SCHIFF, THE PROFICIENT PILOT, VOL. 2, 148 (ASA 2001).

[19] *See, e.g.*, DALE DEREMER, SEAPLANE PILOT 180-181 (ASA 2003) (explaining emergency descent techniques).

[20] Vincent Czaplyski, *Would You Be Ready?*, AOPA PILOT, Aug. 2005, pp. 117, 118 (considering that crash impact is often a secondary factor in injury/death).

[21] RICH STOWELL, EMERGENCY MANEUVER TRAINING 4 (Rich Stowell Consulting, Pub. 1996).

[22] BARRY SCHIFF, THE PROFICIENT PILOT II 291-299 (Macmillan 1987).

[23] Barry Schiff put it graphically as follows (describing the environment in the southwestern United States):

> The temperature in the sun can reach more than 150ºF. In an attempt to remain cool, the body perspires and loses up to 2.5 pints of water per hour. After a day or so, however, sweating ceases because the body has no more water to give. The tongue swells, and speaking becomes impossible. Crash survivors develop such a raging, overwhelming urge to drink that they resort to drinking urine, fuel, and oil. Delirium sets in, and people imagine that the sand or dirt is a lake and begin to 'drink' it, but the throat is so swollen that swallowing is impossible. Water can no longer save such a person. A cut does not bleed because the blood is too thick. Body temperature rises. And just before this gruesome, agonizing death, some may discover that they have just enough water left to cry tears of pain.

BARRY SCHIFF, FLYING WISDOM: THE PROFICIENT PILOT 226-227 (ASA 1997). *See generally* Dean Chamberlain, *Keeping Safe in the Desert*, FAA AVIATION NEWS, July 2002 (providing salient survival checklists); Carole Jewett, *Post-Crash Care*, AVIATION SAFETY, Sept. 2005, pp. 4-7 (considering equipment and knowledge necessary to survive until rescued, including first aid, leadership, and ethical dilemmas).

[24] *See generally* Flight Safety Foundation, *Waterproof Flight Operations*, FLIGHT SAFETY DIGEST (Sept. 2003-Feb. 2004).

[25] FAR 91.5.5(b), *Familiarity with operating limitations and emergency equipment, available at* < http://www.faa.gov >, *also available at* < http://risingup.com/fars/info/part91-505-FAR.shtml >.

[26] In transition training, the "emergency operation of all airplane systems should be performed when practicable. Such operations should include the emergency extension of gear and flaps, the use of boost pumps, fuel transfer, replacement or resetting of fuses or circuit breakers, and the isolation of specified electrical circuits. The operation of pressure fire extinguisher systems, and such operations as the emergency extension of the landing gear by CO_2 should be explained and simulated. The emergency operation of the pressurization and oxygen system should be covered on airplanes so equipped." FAA, AC 69-9b, *Pilot Transition Courses for Complex Single Engine and Light, Twin-Engine Airplanes* (Jan. 15, 1974), p. 5, *available at* < http://www.airweb.faa.gov/Regulatory_and_Guidance_Library/rgAdvisoryCircular.nsf/0/9fb4b32f92b4de56862569b9007093eb/$FILE/ATT4Q7X4/AC61-9B.pdf >. Such emergency training should also include: forced landings, engine-out emergencies, and emergency descents. *Id*., pp. 5-7. *See generally* National Business Aviation Ass'n, *Management Guide*, § 2.2.3.4. (Emergency Training), *available to members at*: < http://web.nbaa.org/member/ops/adm/mgmtguide/2/ >.

[27] For example, regarding multi-engine aircraft, one retired airline captain explained, "we ***presume*** that every departure will include an engine failure at the most inopportune moment. If one does not fail – so much the better. It is far more frequent to see light twin pilots who only deal with or even think about engine-out procedures during a biennial flight review. We also ***presume*** that the aircraft will not arrive with both engines running either. Thankfully we have never experienced either of the foregoing except in training, but the whole point is - don't be surprised if and when it happens." Email from Gary L. Evans, Esq., COATS & EVANS, P.C. (Oct. 4, 2003). *See* DALE DEREMER, SEAPLANE PILOT 179-197 (ASA 2003) (regarding seaplane emergencies).

[28] "Until you've gone through serious simulator-based training, it's hard to appreciate just what a poor training platform your aircraft is. The sim allows you to be trained to deal with nearly any conceivable emergency situation. Perhaps a third of the malfunctions and emergencies we train for in the sim cannot be done in the aircraft, either because they're impossible to duplicate (*e.g.*, overvoltage trip, induction system icing, propeller overspeed, left main gear won't extend) or are simply too dangerous to practice (e.g., engine failure immediately after takeoff, flying with a heavy load of airframe ice)." Mike Busch, *Simulator-Based Recurrent Training for Piston Singles and Twins*, AVweb (May 5, 1998), *at* < http://www.avweb.com/news/reviews/182534-1.html >. "Use [a high-quality simulator] to the max by sighing up for the nastiest program you can find, and schedule an extra day for emergencies." Frank Farwell, *This Isn't Happening!*, AVIATION SAFETY, Oct. 2005, p. 8. *See* Commentary to AMCC III.a, *Training and Proficiency, available at* < http://www.secureav.com/Comment-AMCC-III.a-Training.pdf > (discussing flight training devices and simulators). *Cf.* "Simulators are ok for procedures but no substitute for time in airplanes because there is no risk." Interview with Richard L. Collins, at AirVenture, in Oshkosh, Wis. (July 29, 2003).

[29] BARRY SCHIFF, FLYING WISDOM: PROFICIENT PILOT, VOL. 3, 226 (ASA 1997) (Recognize both a "legal and moral obligation to brief passengers before departure."). *See* A SAMPLE PASSENGER BRIEFING PACKAGE, *at* < http://www.secureav.com/briefing.pdf > (includes sample emergency procedure instructions for passengers); AMCC II.c, *Passengers and parties on the surface, available at* < http://www.secureav.com/Comment-AMCC-II.c-Passengers.pdf >.

[30] TONY KERN, REDEFINING AIRMANSHIP 60 (McGraw Hill 1997).

[31] Farwell, *supra* note 28, p. 9.

[32] Flight Safety Foundation, *Train to Survive the Unthinkable*, FLIGHT SAFETY DIGEST 372-384 (Sept. 2003- Feb. 2004) (urging operators to go beyond the basic regulatory requirements in developing training programs).

[33] Code Examples are examples from relevant codes of conduct that are presented for background, perspective, and comparison. Code Examples are not necessarily endorsed by the AMCC Commentary.

[34] Sect. 2.1 (Rev. IV, June 2005), *available to members at*:
< http://web.nbaa.org/member/ops/adm/mgmtguide/2/ >.

[35] Sect. 4-2, *available at* < http://www.uspa.org/Publications/SIM/SIM_2001.pdf >.

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