***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.a – *TRAINING AND PROFICIENCY*

a. participate in training sufficient to maintain and improve proficiency beyond minimum legal requirements,

Training includes at least two components: in-flight training (oral instruction and observation by a flight instructor, and time operating the flight controls) and ground training (discussion, written and self-guided materials, and exercises) both of which contribute to flight safety.[1] Neither can substitute for the other. Training involves:

- *primary training;*
- *training for additional certificates, ratings and operating privileges;*[2]
- *recurrent training*[3] to retain currency and improve piloting skills; and
- *non-rating training*, sometimes called *advanced proficiency training.*

Training requirements for Part 91 operations set a minimum proficiency threshold for legal operation, such that certification is frequently called a mere "ticket to learn." Rating training puts new tools at a pilot's disposal and provides additional safety benefits, even where the rating is not directly used. For example, instrument training can help the VFR pilot learn to reject a proposed flight through a better understanding of weather conditions.[4]

Non-rating training, "bridg[es] the training gap [by] address[ing] gray areas left in normal flight training."[5] It may include:

- transition training[6] to unfamiliar aircraft, including via the use of *mentors*;[7]
- equipment- and system-specific training pertinent to the safe and effective operation of modern technology in the cockpit;[8]
- participation in flight safety programs;[9]
- weather analysis training;
- risk management[10] training;
- accident review and analysis;[11] and
- advanced skills training.[12]

There is a well-recognized need for advancement of GA pilots' skills. Some argue that all pilot training should *aspire* toward the level provided airline and corporate pilots, since they do the best job of risk management in aviation,[13] or, at the very least, that training should be geared to help each pilot reach his full potential.[14] Despite these ambitious goals, training and currency requirements for Part 91 operations often fall short of the mark.[15]

Proficiency - *Proficiency* can be defined as satisfying a particular standard of performance. Examples:

- the pilot is capable of performing a maneuver and has the skill to apply the appropriate control inputs at the appropriate times;

- the pilot knows when to use the maneuver;
- the pilot understands the limitations of the machine regarding the maneuver;
- the pilot knows why to use or not use the maneuver in a given set of circumstances; and
- the pilot uses correct and logical reasoning to put the whole picture together.[16]

Lack of proficiency is a risk factor as significant as lack of experience.[17] Training sufficient to maintain and improve proficiency generally goes well beyond the mere satisfaction of regulatory requirements.[18] Proficiency training is a lifelong endeavor that requires structure, habit, and commitment. It is an essential component of airmanship.[19] "Frequent and disciplined flying that focuses on maintaining both physical and mental skills is the best prescription for avoiding poor proficiency."[20] Pilots should voluntarily undergo the equivalent of a Flight Review[21] annually rather than every two years[22] and, if instrument rated, an instrument proficiency check (IPC) every six months.[23] Some maintain that proficiency also depends in part on a pilot's self-confidence.[24] Of course, this assumes that the pilot's confidence is based upon real, not imagined, proficiency.

Pilots should create, undertake, and periodically update a personalized program of study or series of training exercises that satisfy the demands for proficiency. As one recognized expert stresses, "[y]ou and you alone are ultimately responsible for your learning."[25] (You may be responsible for your learning, but you are not necessarily the best judge of whether real learning took place.) This regimen should "[f]ocus on what will most likely kill you."[26] "A small number of hours flown solely for the purpose of maintaining proficiency and practicing skills are worth more than a large number of hours spent droning along."[27] Also, consider the educational benefits of joining an aircraft-specific "type" club.[28] The development of a personal pilot proficiency program also advances an ethical approach to flying.[29]

The following discussion of *currency* and *competency* is provided to distinguish them from *proficiency*.

Currency – *Currency* refers to the flight time and tasks a pilot must complete to satisfy legal requirements for undertaking flight operations. It implicates minimum requirements[30] and does not guarantee proficiency.[31] "The regulatory definition of current doesn't really cut it. The fact that we can go forever without flying an approach in actual weather conditions and still be considered current is ludicrous."[32] "It is interesting that when we [an aviation insurer] place a currency requirement on an insured that goes beyond the FAR minimums we often hear, 'but the FAA doesn't require that'. There seems to be a real lack of understanding that FAA requirements are *minimum* requirements. When you are putting millions of dollars on the line, the standard needs to more than a minimum."[33] "Pilots who want to stay alive go far beyond the FAA's currency rules."[34]

Competence – One view holds that competence is what you can *do*, not what you *know*. Another view holds that knowledge is an underlying requirement of competence and cannot be separated from performance.[35] Nonetheless, competence to engage in a particular flight is typically assessed based on the pilot's accumulation of flight hours, gauged against the particular type and mission of planned flight operations. Aviation education tends to focus on the "what you know" component of competence, typically by assessing a pilot's satisfaction of the FAA *Practical Test Standards* or the equivalent.[36] Unfortunately, a pilot's "competence" is not usually tested in the context of challenging conditions[37] such as high gross weight, high density altitude, or actual emergency conditions. Nonetheless, it is essential to describe conditions under which a pilot demonstrates competence.[38]

Some GA professionals assert that the training industry resists performance-based competency standards because the implicit higher level of quality control leads to higher associated costs.[39] (Such standards describe objectively what a student must demonstrate.[40]) This is an area of increasing focus and experimentation within the aviation training community. For example, an international initiative is developing a "competence approach" to flight training requirements.[41]

Simulation and Flight training Devices

Flight training devices, including simulators, are increasingly valuable, if not preferable for many types of training. One recognized aviation trainer described their value to both primary and recurrent training as:

> immeasurable, not only for procedural training, but more importantly, for the development of aeronautical decision making skills essential to flight safety. Even with the advent of low cost, PC-based training devices on the market, GA has not come close to tapping into their potential.
>
> A simple example can show the power of scenario-based, simulator instruction. Ask any instrument pilot about the lost communications procedure and you can expect the rote-memorized regulatory dissertation. Put that same pilot in a real time, lost com lesson on a training device and watch him/her fall apart. This is just one very small example of how effective simulator training can expose hidden weaknesses and challenge a pilot's critical thinking skills.
>
> Without the effective use of simulators in a training program, pilots will never be given the opportunity to explore envelopes and develop the judgment essential to improving the GA safety record. While it is true that low-end training devices lack the feel of the real aircraft, it is not their purpose to teach stick and rudder skills. Used correctly, the simulator is a platform for fostering analysis and synthesis; for developing correlative and decision-making skills. And aren't these the issues that contribute significantly to the GA accident rate?[42]

Despite the great benefits and capabilities of flight training devices,[43] some experts have emphasized their limitations relative to the satisfaction of some training requirements.[44]

> In most situations, simulators appear to be a useful tool in training for most routine and emergency situations. However, simulators have functional limitations which may be detrimental to a pilot learning to handle certain situations. For example, airplane upsets which involve larger g-load excursions, vertical and/or lateral loading, and other "unusual" aircraft attitudes may well not be accurately portrayed in a ground-based FFS. In these cases, *realism* is sorely degraded due to a host of machine limitations and human factors, to such a degree that the value of training for upsets in a ground-based simulator could be questioned. *Ultimately, the limitations of the most widely used pilot training tool could well be responsible, at least in part, for the record-setting number of loss of control accidents.*[45]

Some aviators neither recognize the benefits of flight training devices nor exploit their important benefits for a variety of reasons.[46]

> **CODE EXAMPLES:**[47]
>
> - "[C]ontinually improve our own teaching and flying skills through education and operational experiences." *Code of Ethics*, National Association of Flight Instructors[48]
> - "I will not operate any aircraft without first receiving appropriate instruction and training." *Code of Conduct*, Georgia Sport Flyers Association[49]

- "A professional pilot must maintain a level of proficiency that will ensure the pilot's ability to operate the aircraft." *NBAA Management Guide*, National Business Aviation Association[50]

- "Continuous learning enhances the pilot's performance and proficiency and should be encouraged by both the training providers and the operators." *Guidelines for Business Aviation Pilot Training*, National Business Aviation Association[51]

- "[C]ontinue to keep abreast of aviation developments so that his skill and judgment, which heavily depend on such knowledge, may be of the highest order." *Pilot's Code of Ethics,* Air Line Pilots Association[52]

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[1] *See Introduction to the Aviators' Model Code of Conduct – Commentary, available at* < http://www.secureav.com/Comment-AMCC-Introduction.pdf > (addressing "flight safety").

[2] For example, for complex endorsement, or aircraft over 12,500 Lbs.

[3] *See, e.g., NBAA Training Guidelines, Single Pilot Operation of Very Light Jets and Technically Advanced Aircraft* (Jan. 2005), p. 9, *available at* < http://web.nbaa.org/public/ops/safety/vlj/VLJ_TrainingGuide.pdf> (urging that recurrent training for VLJs should be conducted annually, "as a minimum" and should address the following: "Pre-training study package review, Mentor recommendations, if applicable, Incident review and industry events, Review of manufacturer's maintenance and operations bulletins, Recurrent critical maneuvers training, Review operating minimums, Practical application of CRM/SRM, LOFT (SBT) format, Unsatisfactory result criteria, [and] additional training plan." *Id*.).

[4] Interview with Rich Stowell, Aviation Learning Center, in Santa Paula, Cal. (Jan. 2, 2003). A commercial rating will help a pilot to operate to a higher professional standard.

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

[6] This may include checkouts requiring an endorsement (*e.g.*, for high-performance or tail wheel aircraft). *See* FAR 61.31(e) and (f), *Additional training required for operating in complex and high-performance aircraft, respectively, available at* < http://www.faa.gov >, *also available at* < http://www.risingup.com/fars/info/part61-31-FAR.shtml >; FAA, AC 69-9b, *Pilot Transition Courses for Complex Single Engine and Light, Twin-Engine Airplanes* (Jan. 15, 1974), *available at* <http://www.airweb.faa.gov/Regulatory_and_Guidance_Library/rgAdvisoryCircular.nsf/0/9fb4b32f92b4de56862569b9007093eb/$FILE/ATT4Q7X4/AC61-9B.pdf >; Yacovone et al., *Flight experience and the likelihood of U.S. Navy mishaps*, 63 AVIATION, SPACE, AND ENVTL. MEDICINE 72-74 (1992), *quoted in* TONY KERN, REDEFINING AIRMANSHIP 57-58 (McGraw-Hill Professional 1997) (presenting the acute limitations of general flight experience with regard to transitioning to new aircraft); Barry Schiff, *Advanced Cockpit Conundrum*, AOPA PILOT, Oct. 2005, p. 56 (describing the New Zealand Civil Aviation Authority's pilot endorsement requirement–demonstrating competencefor a particular make and model of GPS prior to its use in actual conditions).

Cf. PHILIPPINE AVIATION CODE, Admin. Order #60 *Licensing of Airmen* (Philippine aviation rules do not utilize endorsement for transitioning to different aircraft. Rather, retesting/pilot certification is required). One flight training expert opined, "generally, the FAA's approach to transitioning seems to have worked well for many years. To require full retesting and additional pilot certification just to transition from one aircraft to another may enhance safety but it would also create a tremendous financial burden on the flying public. In addition, one must wonder if the FAA and industry would be equipped to handle that job. Is there merit to the Philippine approach? Perhaps, but we have never seen the Philippine data supporting their conclusion." Email from G. A. "Sandy" Hill, VP, NAFI (Oct. 4, 2002).

[7] The role and value of the *mentor* is gaining attention in GA, including with the roll-out of very light jets—and differs from that of the CFI. *Very Light Jets*, FLIGHT SAFETY DIGEST, July 2005, p. 22. Mentoring is

also recognized in support of flight instructor credentialing. *NAFI Master Instructor Application, available at* < http://nafinet.org/programs/mi_app_word.doc > (includes, as an option, serving as a "Mentor to a newly certificated CFI").

[8] Thomas K. Glista, FAA, Technically Advanced Aircraft [TAA] Safety Study Team Meeting, in Phila., Pa. (Nov. 1, 2003) ("Master the *Buttonology!*" *Id.*). "Pilots must learn to *think inside the box*." Curtis N. Sanford, Co-chair, Cirrus Pilot Proficiency Program, *quoted in* Email from Michael Radomsky, Pres., Cirrus Owners and Pilots Ass'n (Oct. 18, 2005). *See generally* AMCC VI, *Use of technology*.

The integration and interaction of multiple aircraft-based systems is challenging available training. For example, training materials have not yet been identified that explain the practical *integrated* use and analysis of NEXRAD and sferics. *Sferics* refers to "atmospherics" and relates to devices that detect electromagnetic energy radiating from lighting, such as from thunderstorms. *See* ROBERT N. BUCK, WEATHER FLYING 186-189 (McGraw-Hill Professional 4th ed. 1998) (explaining sferics).

"[P]ilots who are not comfortable with computers, have special training needs that must be addressed through add-on training modules. Training programs must provide additional time for these pilots to meet the performance standards." TAA Safety Study Team, GENERAL AVIATION TECHNICALLY ADVANCED AIRCRAFT FAA-INDUSTRY SAFETY STUDY 23 (Aug. 23, 2003) (emphasis added), *available at* < http://www.cirrus147.com/TechnicallyAdvancedAircraftFAA.pdf >.

[9] *See* Commentary to AMCC III.b, *Participate in flight training safety programs, available at* < http://www.secureav.com/Comment-AMCC-III.b-Training.pdf >.

[10] *See* AMCC I.d, *Recognize and manage risks effectively*.

[11] *See* Don Smith, *Head in the Sand – Why is 'accident' a dirty word?*, NAFI MENTOR, Apr. 2003, pp. 10-11, *available at* < http://www.nafinet.org > (urging that a failure to provide accident training in the training curriculum is "not simply an insignificant omission; it must be considered dangerously unethical"). Also, review of popular commercial and association aviation periodicals, diverse on-line resources, and subscription services is helpful. "The great thing about aviation is that its participants are great readers." Interview with Drew Steketee, Pres./CEO, The BE A PILOT Program, in Phila., Pa. (Nov. 1, 2003).

[12] For example, such as Emergency Maneuver Training ("EMT"), wilderness seaplane courses, formation flying, and crop dusting. "[C]ontextual spin training appears able to reduce the occurrences of accidental spins during critical flight operations." Richard Stowell, *Spins Without Fear*, AVIATION SAFETY, Mar. 2005, p. 5.

[13] Air carrier captains are required to complete a check ride every six months; they may conduct only operations for which they are specifically trained, and must receive recurrent training. FAR 121.441 *Proficiency checks, available at* < http://www.faa.gov >, *also available at* < http://risingup.com/fars/info/part121-441-FAR.shtml >.

[14] KERN, *supra* note 6, p. 51 (and urging pilots to transcend safety skills and seek to achieve effectiveness, efficiency, precision and continuous improvement) *Id.*, pp. 52-53.

[15] *See generally* Charles L. Robertson, *Challenges in Aviation Education*, FAA AVIATION NEWS, Jul.-Aug., 2005, pp. 18-20 (noting the traditional omission in aviation literature to references of "teaching the development and transfer of cognitive skills"). Richard L. Collins exclaimed, "the provision of current recurrent training misses the point – it needs realism; there are not enough practical skills conveyed." Richard L. Collins, *The IFR Conundrum*, FLYING, June 2005, p. 55, 59 ("Go to proficiency training and an institution's response to bad performance is usually more training with an eventual sign-off." *Id.*). "Instrument proficiency is another way to address risk, and the FAA requirements here are woefully inadequate and will become more so with the introduction of glass cockpits for light airplanes." Richard L. Collins, *Risky Business*, FLYING, Sept. 2004, pp. 33, 36.

[16] J.C. Boylls, *Teaching Proficiency*, NAFI MENTOR, July 2003, p. 14.

[17] Yacovone et al., *Flight experience and the likelihood of U.S. Navy mishaps*, 63 AVIATION, SPACE, AND ENVIRONMENTAL MEDICINE 60 (1992), *quoted in* KERN, *supra* note 6, pp. 57-58.

[18] *See* FAR 61.107 *Flight proficiency* (Private Pilots), *available at* < http://www.faa.gov >, *also available at* < http://risingup.com/fars/info/part61-107-FAR.shtml >, and FAR 61.127 *Flight proficiency* (Commercial Pilots), *available at* < http://www.faa.gov >, *also available at* < http://risingup.com/fars/info/part61-127-FAR.shtml >.

In the 1960s, the FAA's Aircraft Development Service found that 51% of private pilots flew less than 50 hours per year and 40% had gone more than 3 months or more without logging flight time.

[19] "[There is] no such thing as a natural pilot. The guy with the most *experience* is the best." Chuck Yeager, Presentation at AirVenture, in Oshkosh, Wis. (July 31, 2003). "Get more flying time than the other guy; make every flight count; and don't bust your ass." *Id*. However, the pilot with the most experience might not be the most competent. The well-recognized adage merits restatement: *train the way you fly; fly the way you train*. (Of course, this assumes that the pilot had good training.)

[20] KERN, *supra* note 6, p. 64.

[21] That is, voluntarily complete a Flight Review every year rather than every two years as required by the regulations. *See* FAR 61.56(c) *Flight review, available at* < http://www.faa.gov >, *also available at* < http://risingup.com/fars/info/part61-56-FAR.shtml >; AOPA Air Safety Foundation, *Volunteer Pilots* (1999), *available at* < http://www.aopa.org/asf/publications/volunteer.pdf > (urging an annual Flight Review conducted by a CFI).

[22] FAR 61.56(d), *Flight review*, states: "A person who has, within the period specified in paragraph (c) of this section, passed a pilot proficiency check conducted by an examiner, an approved pilot check airman, or a U.S. Armed Force, for a pilot certificate, rating, or operating privilege need not accomplish the flight review required by this section."

[23] "The data show that when we get serious recurrent training and instrument proficiency checks on a six-month basis, our accident rate drops off to about that of the Part 135 operators, and that when we take simulator-based training it drops even further." Rick Durden, *I'm Current. I Think*, IFR, Mar. 2002, p. 12. *See* NBAA, THE MANAGEMENT GUIDE, § 2.15 *Single Pilot Operations Under IFR* (Sept. 1999), *available to members at* < http://www.nbaa.org >.

[24] *See, e.g.*, KERN, *supra note* 6, p. 53 (confidence as "a prerequisite for success in flying"); RICHARD L. COLLINS, THE PERFECT FLIGHT 99 (Thomasson-Grant 1994) (confidence as "an asset in flying").

[25] KERN, *supra* note 6, p. 321 (Presenting a holistic/comprehensive airmanship model for instructing and evaluating airmanship. *Id*. pp. 343-440). "I would think that the best approach would be a self-test . . . if the pilot cannot meet his own performance goals, predetermined, that is before his flight, that would be the best incentive. Doing something about his poor performance would not be threatening in any way. A demonstration in front of someone else takes the fun out of staying in practice." Email from Frank Hofmann, Sec'y, Canadian Owners and Pilots Ass'n (June 3, 2003).

[26] Robert A. Wright, Mgr., GA and Commercial Div., FAA, Presentation at AirVenture, in Oshkosh, Wis. (July 31, 2003).

[27] RICHARD L. COLLINS & PATRICK E. BRADLEY, CONFIDENT FLYING 212 (Aviation Supplies and Academics 2nd ed. 2001) ("A few hours with an instructor, I think, can be as helpful from a proficiency standpoint as many more hours of routine, less focused, flying." *Id*., p. 217).

[28] For example, the American Bonanza Society, Cessna Pilots Association, Cirrus Owners and Pilots Association, the Malibu Mirage Owners and Pilots Association or other aircraft-specific club. "You see, currency is not just stick handling. It is also knowing what is up with your type of airplane, where you can go to get help, where you can buy parts, read about someone's experience in a similar type of airplane, find out where the skeletons are. The point is that it is likely not stick handling skills which is killing people.

Rather it is, I think, people not being at one with the whole operation and environment. Type clubs help in that respect." Email from Frank Hofmann, Sec'y, Canadian Owners and Pilots Ass'n (June 3, 2003).

[29] *See* AMCC VII.e, *Promote ethical behavior within the GA community*, *available at* < http://www.secureav.com/Comment-AMCC-VII.e.pdf >.

[30] Mark R. Twombly, *The Cost of Not Flying*, AOPA PILOT, Mar. 2005, p. 42.

[31] *See* Bruce Landsberg, *The great airplane chainsaw massacre*, AOPA PILOT, Aug. 2005, p. 52 (recognizing that proficiency is "very much an individual requirement").

[32] Richard Collins, *Seven Ways to Minimize IFR Risk*, FLYING, Oct. 2003, p. 88-89.

[33] Email from Jim Lauerman, Chief Aviation Underwriter, Avemco Insurance Co. (Oct. 12, 2005).

[34] Richard Collins, *Risky Business*, FLYING, Sept. 2004, p. 33, 36. "In most cases, pilots should consider the need for currency beyond that specified by the FAR." FAA, AC 61-98A, *Currency and Additional Qualification Requirements for Certified Pilots* (Mar. 26, 1991), *available at* < http://www.airweb.faa.gov/Regulatory_and_Guidance_Library/rgAdvisoryCircular.nsf/0/cb2f6b39028b7146862569dc00721f42/$FILE/Contents.pdf >. *See generally* Bill J. Singleton, *Current vs. Proficient*, FAA AVIATION NEWS, Oct. 1998, *available at* < http://www.aopa.org/members/files/topics/currency/current.html >; AOPA, *Currency Overview*, *at* < http://www.aopa.org/members/files/topics/currency/overview.html >.

[35] *Cf.* "To maintain the requisite knowledge and skills a lawyer should keep abreast of changes in the law and its practice, engage in continuing study and education, and comply with all continuing legal education requirements to which the lawyer is subject." Am. Bar Ass'n, MODEL CODE OF PROF'L RESPONSIBILITY, at R. 1:1 *Competence* (1980), *available at* < http://www.abanet.org/cpr/ethics/mcpr.pdf >.

[36] *Compare* FAR 141, app. K(3)(a)(2) – *Special Preparation Courses*, requiring a special preparation course to "[p]repare the graduate with the necessary skills, *competency*, and proficiency to exercise safely the privileges of the certificate, rating, or authorization for which the course is established." (emphasis added). *See generally* FAR 141.83 *Quality of training*, *available at* < http://www.faa.gov >, *also available at* < http://risingup.com/fars/info/part141-83-FAR.shtml >.

The Practical Test Standards are works-in-progress. "The FAA has never been able to prescribe training requirements that address problem areas, and they probably never will be able to do so. That leaves students and instructors to improvise." RICHARD L. COLLINS & PATRICK E. BRADLEY, CONFIDENT FLYING – A PILOT UPGRADE 67 (Aviation Supplies and Academics 2nd ed. 2001). "My opinion is that we don't need more rules, higher official minimums, or more "clarification," the guidance is fine—it's up to us as pilots and flight instructors to follow it." Bruce Landsberg, *Practical Standards*, AOPA PILOT, Sept. 2004, pp. 48, 50.

See NBAA Training Guidelines, Single Pilot Operation of Very Light Jets and Technically Advanced Aircraft (Jan. 2005), p. 1, *available at* < http://web.nbaa.org/public/ops/safety/vlj/VLJ_TrainingGuide.pdf > ("Traditionally, training has been conducted with the objective of passing the necessary Practical Test Standard (PTS) without regard to obtaining proficiency."); J. Mac McClellan, *Cross-Country Time Matters Most*, FLYING, Mar. 2005, pp. 7-8 (urging proficiency in cross-country flying: "[T]he FAA doesn't think IFR cross-country time counts for much, even though half of all general aviation IFR accidents occur en route. This almost total disregard for the value of cross-country experience extends throughout the general aviation population. [Y]ou find the unfamiliar and unexpected . . .").

[37] Consider the widely publicized statistic that only 10 percent of the U.S. population would be capable of becoming competent to fly VFR safely, and 0.1 percent of the U.S. population is instrument rated, of which only 15% are current. AOPA Air Safety Foundation, [cite].

[38] "It is absolutely crucial, and that is one of the things I'm watching out for as I sit on ICAO's [the International Civil Aviation Organization's] Flight Crew Licensing Panel, that the context in which

competency is demonstrated and evaluated is carefully described. Controlling this variable I think will be more difficult than evaluating competency. In research I did when I considered what effect prior experiments had on the results and learning outcomes of Physics experiments, I demonstrated that the order of exercises can steer the effectiveness of a learning situation. This may mean, for example, that one might, in a flight test, do the difficult exercises first, get them behind the individual, so that the student can settle back and think more clearly from then on. What is considered an obstacle by one pilot, however, may not coincide with that of the next pilot. Just to say that when you measure competence, 'context' also includes the ordering of the exercises. It is a can of worms, and unless resolved, ICAO's move to competency based training standards is doomed and will result in no better than the hours-based system in place now." Email from Frank Hofmann, IAOPA Representative to ICAO (Dec. 21, 2002).

[39] To the extent that the FAA controls the PTS, some training experts urge that it is unfair to claim that the training industry resists changes.

[40] "The current situation world-wide is that there is great variance in how maintenance of competency is demonstrated through recency of experience. Requirements range from flying times of 12 hours/year to no set minimum hours/year. The regulators in the group favoured a minimum hour requirement with a demonstration of competence by flight testing. This approach, based on no evidence of how these times were derived, was unacceptable to IAOPA. Strong reservations were expressed with this approach. Ultimately an IAOPA recommendation was accepted by the group [permitting choice of adoption among member states]." ICAO Flight Crew Licensing and Training Panel (FCLTP) Meetings – Report (May 12-23, 2003); Interview with Frank Hofmann, Canadian Owners and Pilots Association, Sec'y and IAOPA Representative to ICAO, in São Paulo, Braz. (Oct. 4, 2003).

[41] ICAO, Flight Crew Licensing and Training Panel (FCLTP), Work Group C (developing a comprehensive, competency-based internationally recognized programme for the design of training relating to the flight crew function).

[42] Email from Cary Green, Manager of Training, Commercial Airline Pilot Training (CAPT) Program, Embry-Riddle Aeronautical University (September 30, 2005).

[43] "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 >. "Flight training devises keep CFI's from creating emergencies, while trying to train in emergencies." Email from Josh Smith, General Manager, West Valley Flying Club (Oct. 19, 2005).

"Simulators are invaluable when used correctly and appropriately. 'Full motion' simulator exercises formed an important part of my own preparation to fly my Cirrus SR22 across the Atlantic. Among other things, I learned that the survival gear can get in the way of certain activities - for example, I changed my ditching checklist so that I activated the Personal Locator Beacon *before* donning gloves, because the gloves prevented the activity. I learned that the deployment of the *parachute system* causes my checklist to fall to the floor. I learned that I have enough time while descending at 'minimum sink' speed to organize the cockpit . . . and on, and on. Most of these lessons could have been learned no other way." Email from Michael Radomsky, Pres., Cirrus Owners and Pilots Ass'n (Oct. 18, 2005).

[44] "Simulators are ok for procedures but no substitute for time in airplanes because there is no risk." Interview with Richard Collins, at AirVenture, in Oshkosh, Wis. (July 29, 2003).

[45] Capt. Janeen A. Kochan, et al., *The Application of Human Factors Principles to Upset Recovery* TRAINING, 50TH ANNUAL CORPORATE AVIATION SAFETY SEMINAR, AVIATION SAFETY-CONTEMPORARY CHALLENGES, FLIGHT SAFETY FOUNDATION (Apr. 2005), pp. 280-281(emphasis added).

[46] These reasons include:

1. Instructors who cling to traditional views that the airplane is the best training platform (that's the way they were taught),
2. Hiring requirement for CFIs to build as much "flight" time as possible,
3. Instructors who have never been exposed to airline training and therefore are unfamiliar with the benefits of scenario-based (LOFT) instruction,
4. Perception by GA pilots that simulator training is less effective than the real thing (fueled by 1-3 above!), creating a reluctance by pilots to use them in training,
5. Lack of scripted scenarios that must be carefully crafted to optimize learning during LOFT scenarios,
6. Resistance by FAA to adopt certification standards for PC-based devices, and
7. Resistance by FAA to allow the logging of such time toward a certificate or rating.

Email from Cary Green, *supra* note 42.

[47] *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.

[48] *Available at* < http://www.nafinet.org/who/code.html >.

[49] *Available at* < http://www.georgiasportflyers.com/pages/gsfa.pdf >.

[50] § 2.1. *Flight Operations Personnel Certificates, Ratings and Training* (Mar. 2001).

[51] § 3.2 (Sept. 1, 2002), p. 6, *available to members at* < http://www.nbaa.org >.

[52] *Available at*: < http://www.alpa.org >.

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