Aircraft Coordination Training in the U.S. Air Force Air Training Command

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The absolute necessity for coordinated action among all crewmembers in a multi-place aircraft, due to the relationship between effective crew coordination and flying safety, has become increasingly apparent. In fact, a recent analysis of business jet accidents over the past 20 years showed approximately 68% of those accidents were directly related to ineffective crew coordination.

While no two aircraft accidents are the same, most crew coordination problems can be grouped into three broad categories. The first category includes task prioritization problems where an entire aircrew has channeled its attention on a specific problem, malfunction, or distraction and ignored the basic control or navigation of the aircraft. Ineffective communication is the second category of problems. Accidents of this type include misunderstandings between crewmembers, often at a critical point in the flight, or even an absence of communication between the aircraft commander and his or her crew regarding his or her immediate intentions and/or plan. The third category of errors involves lack of coordinated action between the various crewmembers with regard to duties and tasks. In this instance, one pilot may be task-saturated while the other acts as a casual observer. Or the situation might involve a totally intimidated co-pilot (co-pilot syndrome) who fails to provide vital input to the actions of the aircrew team.

Our challenge is to provide training to aircrews that will enable them to overcome these problem areas. While certainly not an all-inclusive list, some of the needed skills include command, discipline, leadership, followership, cockpit cross-check, situational awareness, judgment, decision making, prioritization, workload sharing, and communications. Air Training Command (ATC), with the advent of Specialized Undergraduate Pilot Training (SUPT) in the early 1990's, will have a track of pilot training dedicated to crew-type aircraft such as tankers and transports. Just as we provide basic flying skills to new Air Force pilots today, we must prepare to provide basic initial aircrew coordination training to the tanker-transport pilots in SUPT. In preparation for that role, we are reviewing the more successful programs in use today, both in civilian aviation and the military.

The civilian airlines were among the first flying organizations to address the crew coordination problem in a formal way. Their present training programs typically include three phases: 1) a self study program on the concept of team dynamics, 2) a seminar that addresses leadership styles and individual reaction/behavior, and 3) Line Oriented Flight Training (LOFT) simulator missions which allow the crewmembers to practice the principles they have learned. Ineffective communication is the second category of problems. Accidents of this type include misunderstandings between crewmembers, often at a critical point in the flight, or even an absence of communication between the aircraft commander and his or her crew regarding his or her immediate intentions and/or plan. The third category of errors involves lack of coordinated action between the various crewmembers with regard to duties and tasks. In this instance, one pilot may be task-saturated while the other acts as a casual observer. Or the situation might involve a totally intimidated co-pilot (co-pilot syndrome) who fails to provide vital input to the actions of the aircrew team.

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AIRCREW COORDINATION TRAINING—SHAUD

Another effective crew coordination program is conducted in the military by units of the Military Airlift Command (MAC). The MAC training program is similar to that of the airlines and typically begins with academic instruction, such as a discussion of the most common crew interaction problems, communication techniques, and leadership-followership dynamics. The program also includes a case study of an aircraft accident where crew coordination was a contributing factor. Lastly, a Mission Oriented Simulator Training (MOST) sortie is conducted, similar to the LOFT mission, which provides a real mission scenario for practicing crew coordination techniques. Following the MOST mission, an extensive debrief is conducted with the crewmembers evaluating their performance as a team and making observations on their own interaction problems (2).

Crew coordination training in ATC will incorporate many of the proven techniques used in the airlines and MAC. The main difference is that ATC will be providing initial training to student pilots who are not yet totally proficient in their individual pilot skills, so we will need to tailor our training accordingly. The key advantage to an ATC program is that we will have an opportunity to establish the proper crew “mind set” in these students early in their aviation careers. My doctoral research at Ohio State University in the 1970’s pointed to the need for such training to insure that co-pilots, in particular, take an active role in the safe operation of a crew aircraft (4). That research indicated that the most important ingredient in avoiding the “co-pilot syndrome” was to establish the proper mind-set within each individual pilot, emphasizing his or her personal responsibility for having the total picture of controlling the aircraft—meaning more than just sitting there as casual observer and part-time helper. Specifically, the co-pilot needs to have both the ability and courage to act when necessary and to know that action on his or her part is expected and accepted by the aircraft commander.

Our conceptual view of crew coordination training in ATC includes ground training, simulator training and emphasis during the actual flying training missions. Initial training in the primary phase of the flying training program will not be significantly changed and continue to concentrate on basic flying skills, including aircraft handling, aerobatics, and formation, with focus on the solo student sortie and the individual skills needed to aviate and navigate. This focus is exactly the same regardless of bomber, fighter, tanker, or transport follow-on assignment and, most importantly, the quality checks on the pilot will also be the same.

After the students enter the tanker-transport track of the advanced phase of training, we will begin to concentrate on teaching specific techniques for crew coordination, evaluating a wide range of previous aircraft accidents for examples of poor crew coordination, and exposing students to situations where coordinated action is critical. All of this training will then be put together during flight training missions in the tanker-transport training system (TTTS) aircraft. The emphasis will be on flying, not simulation. The reason for this view is the concept that simulator time is supplemental to flying time and simulators provide training best when used by experienced pilots rather than brand new students. It is the real and stressful flying experience of the pilot which provides the mental “transfer function” that translates simulator hours into having some relationship with actually flying. With the student pilot the mental “transfer function” that comes from experience under the stress of actual flying has obviously not been developed. Certainly some cockpit, aircraft traffic control, and emergency procedures can be taught effectively in a simulator, but we feel that the emphasis in student pilot training should be on actual flying. The risk of a simulator ride is that of a student pilot failing a part of the curriculum. The risk of flying an airplane is being in harm’s way. The risks are not equivalent; the stress is not equivalent; the training is not equivalent.

The TTTS aircraft will be a commercially available business jet with flight deck seating for two pilots and an observer, thus allowing one student to watch the instructor and performance of another. We are also planning on several “team” rides in the training aircraft where both students fly at the same time, with and without an instructor pilot observer. The TTTS will provide ATC with an exceptional vehicle for training crew coordination skills.

Summary

Just as the crew preflight briefing is an ideal forum for establishing a proper crew coordination mind-set for a particular mission, Air Training Command has a unique opportunity to begin establishing that mind-set for an entire flying career. Through the tanker-transport track of training in SUPT, we hope to lay the foundation for teamwork in the cockpits of our Air Force multi-place aircraft. As with flying skills, this foundation will then be reinforced by the Major Commands through their own crew coordination training programs.

REFERENCES