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The Methods of Training Young Military Pilots

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Annotation: This article analyzes strategic issues in Air Force undergraduate pilot training (SUPT). Also it describes the key variables that determined pilot training's historical development, what type of training system, generalized or specialized, produces the best cost to effect. Furthermore, it evaluates recent structural changes to SUPT and analyzes the pilot training systems of the Air Force of Uzbekistan. It synthesizes the study's findings and implications to suggest an optimal course for future Air Force pilot training.

Key words: methods, young pilot, military pilot, specialized undergraduate pilot training (SUPT), pilot training system, introductory flight training (IFT).

I. Introduction

Preparing and educating military pilots is considered one of the most sophisticated and expensive process. The entrance into this process is very unique regarding medical requirements, aptitude testing and flight screening. This is intended to determine whether a candidate has the necessary aptitude to become a military pilot in a reasonably short time. Young people with aptitude and abilities become the Higher Military Aviation School cadets and they finish their studies for five years, which include a theoretical part and the basic flight training on a piston and jet trainer or a helicopter. After that, graduate pilots are assigned to the front-line units. The main goal of pilot education and training process is to produce a combat-ready pilot during the optimal time and at an affordable cost. There are many factors that affect this process, but some of the most important ones are curriculum and training equipment (i.e. training aircraft or helicopter), which strongly corresponds to the front-line equipment characteristics. Acquisition of new aircraft in combat units also means remodeling the education and flight training system. It is not an easy process and it has to be carefully designed and tailored to the needs. The capabilities of new aircraft and their specific characteristics have to be recognized. The role and purpose of new equipment also have to be considered, as well as their operational environment. This paper discusses the current model of military pilot education and flight training, the acquisition of new aircraft and their impact on the future model of military pilot education and training.

II. Materials

Undergraduate Pilot Training (UPT) is arguably Air Force's most significant training program among countries. Beyond its purely technical function, UPT has become both a cultural rite of passage and the institutional portal through which most Air Force leaders pass. While frequently modified, the program has undergone few fundamental changes during its history. Two overriding training methodologies have emerged:

- a generalized training system;
- the current specialized training system.

In a generalized system, all young pilots, regardless of future assignment, fly the same aircraft and follow the same syllabus from start to awarding of wings. Under a specialized approach, after a common initial phase, young pilots are placed in "tracks" which use aircraft and specifically tailored to their future assignment. The Air Force needs a training system that will continue producing the world's finest pilots in order to sustain its dominance into the 21st century. This study examines strategic issues in the Air Force's undergraduate pilot training system and seeks answers to the following questions:

1.) Which system, generalized or specialized, produces the best ratio of cost to effect over the life cycle of a pilot?

2.) What has been the effect of recent structural changes in the pilot training system?

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3.) What can the Air Force learn from the pilot training experiences of two other technologically comparable air forces?

4.) What system will best serve the Air Force's future needs?

The study begins with a historical analysis of pilot training's first 50 years –from its roots. Several themes and patterns emerge. In the absence of an official training doctrine to guide its early development, pilot training evolved from a variety of factors.

The classification process spawned the inevitable rivalries between different flying communities that remain in place today. A post-war statement by Air Service Director, Maj.Gen. Charles Menoher, explained how a young pilot's "track" was determined: "At no time was the selection of the kind of training a cadet was to take left to his choice. It might have been considered, but...his suitability for the work...decided his classification"[1]. Stereotypes were established early. Pursuit pilots should be young and aggressive, and have "initiative and quickness of perception." Desired traits for observation pilots were maturity, attention to detail, and an interest in "military tactics and maneuvers." Bomber pilots, on the other hand, should be older with a "good sense of navigation and expert at cross-country flying"[2]. Notwithstanding these efforts to identify and match capabilities with aircraft, in practice, manpower requirements at the front often determined a new pilot's assignment. Adding to the friction and tumult associated with war-time production, the Air Service conducted pilot training both at home and abroad[3]. This was a practical necessity. The large-scale training programs already in place in France and Britain could more easily accommodate the rapidly growing number of trainees than could the American-based establishment.

III. Methodology And Results

Of course, Air Force pilot training cannot be viewed as a purely technical training program. Teaching a young pilot how to assemble and fire a rifle in a given amount of time is technical training. Undergraduate pilot training is also education. The program seeks to imbue graduates with less quantifiable traits – leadership, esprit de corps, confidence, courage, decisiveness, judgement, etc. – that ideally characterize military pilots. This human, less-quantifiable aspect of the program, of course, is not reducible to a set of measurable tasks and does not fit as neatly into the ISD framework. The role of the instructor pilot is critical in this human component of pilot training. Nevertheless, the preceding assessment of UPT versus SUPT within the more quantifiable ISD framework yields some clear findings. Unarguably, SUPT is more aligned with ISD principles. The specialized method of training better matches media to task, is more responsive to end-user needs, and has produced large cost savings for the Air Force. Also, the evidence demonstrates that SUPT has had little, if any, adverse effect on force structure flexibility. In addition to SUPT's implementation, the Air Force has, in recent years, introduced other structural changes to its pilot training system. Specifically, both its screening program and instructor force have undergone significant alterations.

The only high education institution in the Republic of Uzbekistan, which has the study program in aviation with its graduate studies, is the Higher Military Aviation School of the Republic of Uzbekistan. This study program called Military Aviation is specific in many ways. First of all, it also meets the Air Force requirements. Due to this, the program is unique. The purpose of the program is the education of the Higher Military School cadets (the military term for students) for the occupation of Aviation officers – aircraft pilots or helicopter pilots, as well as traffic engineers. These studies in Military Aviation are performed during five academic years. A cadet gains a degree of Bachelor of Military Aviation and in addition to a Diploma, a Diploma Supplement is also issued to cadets, which certifies the cadet's competences for professional Air Force pilot. The whole process is very demanding for cadets and their professors and instructors. The study is divided into two main parts. The main goal of this phase is a theoretical preparation for the upcoming flight training in training squadrons. This phase is also considered as a preparation phase in terms of core activities (flying) during studying. The first group of these courses is theoretical, methodological and scientific ones. The second group is professional and practical courses. It includes the

[1] Memo, Maj. Gen. Menoher to Chief of Staff, Apr 21, 1919, Box 620, 353.9, entry 166, RG 18, NA, as found in Cameron, p. 131.
[2] Memo from Chief of Training, Office of Dir. Mil Aero, to Comdg Offs, all Flying Fields, Aug 23, 1918, entry 206, RG 18, NA, as found in Cameron, p. 131.
[3] 5 Maurer, "Aviation in the U.S. Army, 1919-1939," General Histories, USAF Historical Research Center, Washington D.C., 1987, p. xxii.

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courses such as General and Radio Navigation, Communications (Phraseology), Mechanics of Flying, Aerodynamics, Aircraft Construction, Meteorology, Aircraft Engines, Flight Instruments and Systems and Air Law. Due to the international standardization most of the listed courses are compatible with similar courses, which are a part of studies in other aviation universities around the world. The English language standards are also taken into account. The cadets have to speak English fluently. This does not only mean being able to speak and understand the standard phraseology. If an individual has to function in a team, the English proficiency needs to be high enough[4]. The second phase is flight training at airplanes and helicopters and it is crucial for the cadet-pilots. It consists of basic and advanced flight training either at an airplane or a helicopter. Basic flight training: A cadet, who passes aptitude testing and a theoretical part, begins the basic flight training. Students learn the basics of flying, aerobatics, VFR/IFR4 navigation, night and formation flying. This is done at a light piston aircraft. Successful cadets progress to other courses based on flying ability and military need. The basic jet training prepares cadets for the advanced jet training by teaching more advanced maneuvering and tactics on more powerful aircraft. The advanced jet training includes night flying, low - level navigation, as well as weapons and tactics training on a jet-driven aircraft. The training prepares them to move to the front-line combat jets. The helicopter pilot training includes basic maneuvering, such as hovering to more advanced training such as night flying and high terrain flying. The existing flight training system is not up to date. It is expensive and not effective enough.

The introduction of new aircraft into service will demand that pilots, load masters, aircraft handlers and maintenance personnel, who currently operate and maintain the existing aircraft, be trained to operate the new types. The new organizational structure has to be created simultaneously with the transition to the new type. There is a number of challenges in planning and managing the successful introduction of the new aircraft[5] into service:

– acquisition of new aircraft;
– training of flying instructors;
– training of pilots;
– training of aircrew, which includes aircraft handlers and weapons technicians;
– preparation for new operational flying roles including both day and night, all weather and other specialist tasks;
– the need to conduct routine maintenance on the aircraft efficiently;
– the transition to the new organizational structure consistent with the new roles;
– the achievement of the defined levels of operational capability.

This military acquisition and introduction into service project involves the correlation between sets of complex problems. Each of the sub-systems such as aircraft hardware acquisition, pilot training, maintainer training and facilities upgrading and management, is complex. The sub-systems are related to each other in the context of both maintaining the current capability whilst upgrading to the higher levels of capability over a period of transition. The introduction of the major enhancement to the Air Force capability involves considerably more than acquiring new equipment.

IV. Conclusion

This article emphasizes the required training inside the Higher Military Aviation School curriculum and flight training. There have been significant delays between the courses. The obsolete training equipment did not reduce the amount of training undertaken on the expensive front-line aircraft. Time spent on training significantly affects costs, in manpower and equipment. The time to train aircrew also affects the time available to fly during their career. Ageing analog training aircraft means that aircrews leave the training system less prepared to operate more complex, modern aircraft equipped with digital cockpits and aircraft management systems. This means they have to train on the front-line aircraft, which is costly. Flight training is expensive. Costs increase as aircrew progresses through the system and the cost per flying hour of the training aircraft also increases. Ageing training aircraft are unreliable and expensive to maintain. Reduction

[4] Pilot Training Compass: Back to the Future, European Cockpit Association, 2013.
[5] Mclucas A;Lyell D;Rose B, 2006, 'Defence Capability Management: Introduction Into Service of Multi-Role Helicopters', in 24th International Conference of the Systems Dynamic Society, 24th International Conference of the Systems Dynamic Society, Nijmegen, The Netherlands, presented at 24th International Conference of the Systems Dynamic Society, Nijmegen, The Netherlands, 23 - 27 July 2006.

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of failure later in the training system (where sunk costs are higher) could reduce unnecessary expenditure. Some other factors affect the time, cost and success of flight training. These include aircraft and instructor availability, runway conditions and available airspace.

The main aims for the new model are to:

– develop aptitude tests to help identify specific skills necessary for the future aircrew;

– optimize time in training;

– close the skills gap between aircrew finishing training and skills needed to use the front-line aircraft;

– reduce the overall cost of flight training.

The reduction of unproductive periods between the courses, increasing the number of available training aircraft and proficient instructors in a dedicated training airfield can optimize time in training.

Reference

1. Memo, Maj. Gen. Menoher to Chief of Staff, Apr 21, 1919, Box 620, 353.9, entry 166, RG 18, NA, ascfound in Cameron, p. 131.
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