GLIDER FLIGHT TRAINING APPLICATION IN TURKISH AIR FORCE

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Abstract: *Using gliders in training both popular and cheap in civil and military aviation. Although it is cheap, all of the flight's phases include aerobatic training can be learned by glider. For this reason, most countries use gliders in their Air Forces. Turkish Air Force also has gliders for training. In this work, quality of training and intensity of glider usage? has been assessed. Also, differences in training and size of the fleet have been compared with other countries' air forces. As a result, gliding training in Turkish Air Force isn't as noteworthy and sufficient as in other countries. Points that need to be improved were disclosed and discussed.*

Keywords: *Gliding, Soaring, Sailplane, Flight Training, Glider, Turkey*

1. INTRODUCTION

Gliding is popular in both popular civil and military aviation thanks to its low operational cost for training. There are too many benefits of glider training before going on powered airplanes. For this reason, some of the armies use gliders as a basis for flight training. This kind of training is cheap and beneficial for air forces because they can determine the ability of the cadets' skills in this way. However, gliding is not popular in Turkey and the Turkish Air Force only has 4 training gliders for cadets. In this study, glider training will be evaluated and compared with the air force of other countries.

2. BENEFITS OF GLIDING

These days pilots are trained as a computer operator by limited flight systems which reduce the importance of the pilot's skills in civil aviation. However, military aviation requires significant piloting skills. First of all, gliders' cockpit generally divided into two parts, front and rear like most of the advance military trainers (KT-1T, Super Tucano, T-38, etc.) but aircraft are used for the basics of flight (T-41, Cessna 172-182, etc) are designed side-by-side. According to this specification, glider cockpits are more likely to military cockpits. The dual command system is another important part of the training. Besides, glider flight ensures coordinated control which means using ailerons and rudder in balance. Moreover, cadets can experience how aircraft behave in the stall, spin, and other abnormal situations and learn how to manage it. Two-seater glider's ''G limits''

also higher than single engine basic aircraft which provide better aerobatic performance. Although higher G limits of the glider, cadets learn every phase of aerobatic maneuvers at lower G and speed than military jets or ~~turbine~~ piston props. Aerobatic maneuvers and complete gliding flight teach pilots energy management. In addition, cadets learn energy management by using thermals and other meteorological occurrences and can test the force of the air. Finally, flight planning should be perfect in glider flight because there is only one landing. For this reason, altitude control by using spoiler, following flight path and checkpoints are enormously important. This important factor can prepare cadets emergency landings engineless like Sully (Chesley Sullenberger) who was a famous former military pilot and commercial airline pilot [1-3].

3. GLIDING IN TURKEY

Gliding isn't popular in Turkey there is only one glider flight school under Turkish Aeronautical Association. This school has been in Eskişehir İnönü since 1935 and has 6 active two-seater SZD-50-3 Puchacz. In addition, 2 Puchacz, 2 Ventus, 2 Discus, 3 Jantar 48 Std, 3 Jantar 42-2 Open Class, 3 IS-29 D2, 3 motoglider, and 3 PZL-104 Wilga tow planes have been grounded due to lack of maintenance since 2013. Also, one Grob 103 two-seater has just had airworthiness under İstanbul Glider Club. Therefore, there is only training flight for beginners and some intermediate students. Cross-country flights and glider races aren't organized in Turkey and the only İnönü airfield is open for civil flights. Training is divided into 2 parts beginner gliding course which includes dual command training by the instructor and license course include gliding badge A, B, C, and glider pilot license (GPL) with many solos [3-5].

FIG. 1. Turkish Air Force's SZD-50 Puchacz glider in Yalova Airfield.

4. GLIDER TRAINING IN TURKISH AIR FORCE

Students at the 2nd grade of Air War College, National Defence University takes a glider training course in summer. This course consists of beginner gliding course and gliding badge A course. So, candidates are trained in 23-25 sorties flight training in Yalova airfield. These flights are made with Air Force's own Puchacz gliders. Turkish Air Force has 4 gliders for these training but there is no glider flight instructor in the

army. For this reason, Turkish Aeronautical Association sends civil instructors for these flights.

In Yalova, it's impossible to use thermals or slope liftings due to geographical conditions thus flight time is limited.

All flights are made by winch launching which is another criteria limits flight time. Consequently, all lessons are conducted from releasing winch cable until the landing. The only advantage of the airfield is being at the sea level which does increase the performance of the glider. In addition, until the 2015 military high school students had a beginner glider course in Bursa [6-9].

5. GLIDER TRAINING IN OTHER COUNTRIES' AIR FORCES

Glider flight is much popular in the rest of Europe, Australia, New Zealand, and America. Whence, some of these countries use glider for training under the cadet program. For example, Canadian Air Cadet which is supported by the Canadian Air Force conducts an average of 50000 glider flights (Familiarization, training, competitions) annually and 350 cadets are trained in these courses. These flights are made with Schweizer 2-33 and 2-33A low-performance gliders [10-11].

Another example is the Royal Air Force Gliding Soaring Association (RAFGSA) which has 1 center and 7 clubs in the United Kingdom. That association was founded to provide glider flight opportunity for RAF servicemen and women. With its large fleet (Self Launch Gliders, Motogliders, Gliders, Tow planes), RAFGSA offers flight courses for all level student pilots and pilots and some of them can be free. Moreover, RAFGSA organizes competitions in the United Kingdom [12-14].

FIG. 2. Royal Air Force's Grob T1 Viking (Military version of Grob 103) Two-Seater Training Glider in RAF RIAT Air show (https://hiveminer.com/Tags/glider%2Cmilitary, Micheal Hibbins)

Australian Air Force Cadets also gives importance to the glider training. In these flights, brand new ASK-21 MI (Self-launched) and DG-1001 gliders are used for. These courses are supported by the Australian Air Force's scholarships [15-18].

Gliding training has an important place in the United States Air Force (USAF). The extremely large fleet is in service for cadets training. In this fleet, TG-10B (Military version of L-23 Super Blanik) is used for basic of training (Airmanship 251).

In this program, the 3rd grade of cadets reaches almost 300 solo flight every year in over 7000 sorties. Later, 40 cadets are selected to become a soaring flight instructor (Airmanship 461). These instructors teach the basics of glider flight. To keep them motivated, the USAF Academy has 2 competition team. One of them joins aerobatic championships with TG-10B. Other one joins cross-country flights and competition with TG-15A (Military version of Schempp-Hirth Duo Discus) and TG-15B (Military version of Schempp-Hirth Discus-2). This team try to break national records and compete against other civil clubs in the USA. In addition, the USAF Academy has been renewing fleet by DG-1001 (TG-16) high-performance two-seater gliders and that academy has reached over 200000 sorties yearly [19-21].

FIG. 3. TG-16A is prepared for flight by cadets and instructor (https://www.usafa.af.mil/News/Photos/igphoto/2000933786/).

CONCLUSIONS

Glider flight training is common worldwide but the level of development depends on gliding culture. Countries with well gliding opportunities also have good support from their armies. In these armies, glider flight has an important role to introduce aviation to air cadets. For this reason, undeveloped gliding in Turkey may cause a low level of glider training in Turkish Air Force. With 4 gliders and instructor, cadets can only have gliding badge A in the summer season. In 2017, only 73 air cadets got gliding badge in Turkish Air Force [22]. If the fleet made wider, cadets would experience soaring better. Also, glider training would be part of the academic year with credit lessons like the USAF Academy. On the other hand, it's legal to fly students who are 16-year-old in Turkey. So, it is possible to give military high school students, just can have a beginner course, gliding badge A or more. With that cheap training, the military can keep cadets motivated for years. In addition, the Turkish Air Force can train own glider flight instructors in the military. With that way, cadets' interest would increase for gliding.

Flying with different types of aircraft brings experience to the pilot. Positive factors of gliding cannot be ignored. A famous example of aviation history, Captain Sullenberger who was a former fighter pilot had glider flight training in USAF Academy, didn't hesitate to land on the Hudson River without both engines of a huge airliner. In addition

to his experience and knowledge, he also was guided by his knowledge of gliding. So, the engineless flight must be experienced for emergencies and abnormal situations.

REFERENCES

[1] Stewart, K., The glider pilot's manual, Airlife, 2001;
[2] FAA., Gliding Handbook, 2013;
[3] Keskin, S., Türk Hava Kurumu Genel Başkanlığı Planör Uçuş Okulu Başlangıç Eğitim El Kitabı, Ankara, 1988;
[4] Kushan M.C., Gurgen S., A to Z World Airplanes, Helicopters and Unmanned Aerial Vehicles (in Turkish), Nisan Publishing, Eskisehir, Turkey, 2016;
[5] https://www.thk.org.tr/ ;
[6] https://www.msu.edu.tr/eng/sayfadetail?SayfaId=49&ParentMenuId=43;
[7] http://www.hho.edu.tr/Documents/TanitimKitapcigi/08_Askeri.pdf;
[8] http://www.hho.edu.tr/EN/Military/UcusEgitimi.aspx;
[9]https://www.hvkk.tsk.tr/trtr/T%C3%BCrk_Hava_Kuvvetleri/%C4%B0nsan_Kaynaklar%C4%B1/E%C4%9Fitim_ve_%C3%96%C4%9Fretim/Hava_Harp_Okulu_Komutanl%C4%B1%C4%9F%C4%B1;
[10] http://www.cadets.ca/en/summer-opportunities/training-centres-eastern-gliding-about.page;
[11] http://www.cadets.ca/en/summer-opportunities/training-courses.page;
[12] https://web.archive.org/web/20110405171920/http://www.raf.mod.uk/rafgliding/;
[13] https://www.rafsportsfederation.uk/sports/;
[14] http://www.rafgsa.org/;
[15] http://www.aviation.3wg.aafc.org.au/about/fleet;
[16] http://www.aafc.org.au/wp-content/uploads/AAFC-Gliding.pdf;
[17] http://www.aafc.org.au/what-we-do/gliding/;
[18]https://australianaviation.com.au/2015/03/australian-air-force-cadets-presented-with-newest-glider-at-avalon/;
[19] https://www.aetc.af.mil/About-Us/Fact-Sheets/Display/Article/261039/soaring-programs-at-usafa/;
[20] https://www.academyadmissions.com/the-experience/military/airmanship/;
[21]https://www.dg-flugzeugbau.de/en/wp-content/uploads/sites/2/2016/12/US-Air-Force-DG-1001-segelfliegen-INTERNATIONAL.pdf;
[22] Türk Hava Kurumu Faaliyet raporu, 2018, Ankara, Turkey.