ZRÍNYI MIKLÓS DEFENCE UNIVERSITY
KOSSUTH LAJOS MILITARY SCIENCE FACULTY
MILITARY SCIENCE DOCTORIAL DEPARTMENT

THE POSSIBILITIES OF IMPROVEMENT OF FLIGHT SAFETY CULTURE IN THE HUNGARIAN AIR FORCE WITH A SPECIAL REGARD TO HUMAN FACTOR CONCEPT

REVIEWER ON PhD THESIS

Written by:
 Lt. Col Dudás Zoltán

Supervisor:
 Dr. Hadnagy Imre József

Budapest

2007.

INTRODUCTION

It is obvious that every country that has military forces protects them carefully. Having armed forces is not cheap, consequently nations that posess armed forces carrefully prorect them, especially since they are financed with the tax- payers' money. It is especially true about the especially expensive, high technology air force. The loss of military flying aircrew can be of especially serious consequences, it can destroy combat capabilities, and most of all, morale. But due to the generally accepted risk factors, the effect of these is not as dramatic as in case of civilian catastrophies, and the economic interests are not of the main priority, but the loss of crews (especially in the case of bigger nations) is unacceptable today, even in case of wars. The well- trained crew, which is difficult to replace in case of its loss, as well as the extremely costly equipment and technics can serve the nation and ther alliance only if it prepares for combat dangers whilst in peacetime.
This aim can be achieved with the presence of three factors: an acceptable economic background, a flexible flight organisational system and a modern training system.

None of them alone is able to quarantee flight, and they cannot be made responsible when talking about flight. Brilliant preventive training activities can be successful if the number of flight hours is low, but no matter how much they fly, the actions of pilots can be useless from a flight   point of view without preventive measures. In the system of flight safety, unfortunately, it is still the principle of „blood priority" prevails, in other words, safety measurements are taken only after the occurance of the flight event. On the other hand, in a system based on safety culture, prevention, or actions prior to the flight event are stressed. For this reason, in my research, I aim to change this kind of thinking.

As I have already mentioned, the establishment of this kind of system and way of thinking is not a financial matter mainly, or it can be if we speak about human life and the preservation of flight techniques. The priority of flight is of no doubt compared to the other work forms of the branch. Safety is a complex system, where information is the most valuable and the most important factor. The success of preventive work depends on the quantity, and more importantly,the source of the information that can be the basis of analysis. If we want to establish tendencies or reasons, we need widescale information about the flight risks. Accordingly, we need it on a daily basis, with easy access, as well as channels for continuous flow of filight safety information and guidance.

Besides, there is a need for wide scale training system, that is harmonised with the requirements of the alliance, and is aimed at the most realistic types of training tasks. It is here that commanders face the biggest dilemma.

They are under pressure because they need to find the balance between the maximum combat readiness and the the possible highest level of safety, on the other hand, they thy need to stay within the limited amount of resources. The quarantee of flight safety, both in peacetime and in time of conflicts is nothing else but the commander's risk management, the best assesment of the risk, what factors and what way they threaten the crew, as well as the successful performance of the given tasks. Miltary flying is an exceptionally risky activity, but for the sake of success the risk must be taken, because acceptance of risks on the one side benefits in saving human lives on the other side. But taking unneccessary risks is senseless. This is the sensitive balance that quarantees safety, from training flights to combat tasks themselves. To keep the balance between the benefits of the flight misions and the rational risk is a complex task. There are several methods for the reduction of flight safety risks that should be applied by the commanders with care.

The composition and the actuality of the topic are supported by the following reasons:
-The system of the Hungarian flight system, though it has approached the requirements of the alliance, has not been able to renew its safety culture
- the development of flight safety system is slowed by this outdated thinking
- domestic publications do not claruify the essence of the neccessary changes in flight
- flight culture or its terminology are either outdated or do not exist in written form
- jurisdictial regulations forget about prevention in the state air traffic, at the same time, this area is uncovered in the Hungarian special literature.

As reasonesd by the above- mentioned, I aimed to research the following:
1. Reasons influencing flight safety and the summary of their relationship
2. The role and the place of the humnan factor in the flight system
3. The comparison and the synthesis of flight models
4. To disclose the links in flight safety risks
5. To clarify the role of statistics in flight safety and their analysis in connection with prevention
6. To analyse the military flight statistics of the last 50 years
7. To work out the formation of the safety culture from the point of view of the human factor
8. To show the relationship between training and safety
9. To establish a concept or strategy based on new, pro-active prevention and a new culture (way of thinking)

To be successful in reaching the aims, during the research of the topic I applied such general methids as observation, inductive conclusion, synthesis and critical adaptation or document - analysis.

For the purpose of reaching the set goals:
-I studied domestic and foreign literature
-I used special materials from the Internet

-I took part in flight safety conferences in the USA and Canada. I used my experiences to form my own concept of the system

I have been publishing continuously, and I have prepared a paper on my research results

- I had consultations at the HQ of the Hungarian AF and with the specialists working at the Air Force office of the HmoD, as well as with the foreign air force specialists visiting our country

- I kept talking with Canadian and American colleagues through the Internet, I used the results when composing this paper

-   I used my experience when teaching the theoretical and practical aspects of the topic
-   I used my experience of being a flight safety high ranking officer
-   I took part in science conferences and applied my gained knowledge in my paper

In my opinion the composed topic:

-   Can be a good basis for flight safety specialists in the developmrent of flight and on further scientific research
-   Can contribiute for working out prevention regulations and for learning materials
-   As a teaching aid, it can contribute to pilot training materials
-   It can contribute to further study materials

My research was built up as following:

- In the introduction together with the introduction of the characteristics of flight safety and the actuality of the topic, I introduce the aims of the research and the applied methods

- In the first part I analyse the system of fight safety, factors and inherency, the relationship between the factors influencing flight safety

- In the second part I adapt critically, the models that describe the system and its components

- In the third part I summarise the inherency of the flight safety risks and the methods of its reduction, I analyse theconnection of statistics and flight safety, I will analyse available data in connection with the Hungfarian Air Force and the relationship between risk and its reduction.

- In the fourth part I will summarise the cultural factors influencing flight safety and define the culture of flight safety. I will work out the basis of the change, through the demonstration of the trust theory and the strategy of flight safety.

- In the fifth part I will demonstrate the relationship of flight training and flight safety and analyse the safety aspects of modern flight training

- In the sixth part I will work out the methods for increasing flight safety and I will adapt the defence in depth to the system of flight safety

- In the conclusion I will summarise the results of my research and I will make further offers for further application and research

1. THE BASIS OF THE FLIGHT SAFETY SYSTEM

Maintenance of the flight safety is of strategic importance in military flying, since a trained crew and the equipment operated by them is threatened not only by enemy activities, but other factors endangering flights. These factors are present not only in wartime but in peacetime, as well.

In the first part I introduced these factors and their influence on flight safety. I proved that in the group of three factors, the objective, subjective, and the unidentified dangers the subjective factor is the key one.

This special place is the one for the human factor due to its activities. The human factor is the most changeable of all the factors and it can actively influence the flight system, contrary to the other factors that show relative stability.

According to my own perception, the human factor comprises all those individual and organisational characteristics and influences, which directly affect flight safety. In this part I proved that only the human factor is able to form the further factors in the system of flying. When speaking about the objective factors the development of flight infrastructire and the aircraft by the human factor as well as the establishment of the regulation system of aviation.In these factors, the human factors are determined and together they establish the level of flight safety. In the case of the remaining factors, for example the natural relations.The human factor can manage the risk factors with the modification of flight frames. The third group, the group of hidden risks, can originate from any of the above-mentioned groups, but their reconnaissance and identification is only possible by the human factor and it is one of the biggest challenges of aviation. **The central topic of my paper, and the basis of the examination is the demonstration of the possibility for safety improvement hidden in the human factor.** We can state that the flight safety is determined mostly by the human factor, consequently, the work of flight safety should be concentrated on this factor.

2. THE SYSTEM MODEL OF FLYING

In the second part I worked on the analysis of flight theory description and its composition and their adaptation.

I demonstrated the technical and human conditions of increasing flight safety, which appear in the inner and outer connection points of the flight system. I examined the conditions from the human factor point of view, so I examined those connection points whose refining can increase the safety level of the entire system.

In this part I examined in detail and adopted the three relevant theories of the flight system, namely, **the REASON, the RASMUSSEN and the EDWARDS- type SHEL models.**

The REASON model basically analyses flight system through air transport event analysis.

The latent deficiences threatening flying and their realisation means the basis for the strenghtening of the system, with the method of prevention of human errors causing an air traffic event.

The model is based on the undoubtedly progressive thought that many equal factors, reasons make a basis for an air traffic event, consequently one person cannot be blamed for the event and that is why different elements of the system share the responsibilty.

When analysing the model, I pointed out that its application alone, due to different characteristics of flight cultures, cannot quarantee either the examination of the objectiove flight event, or the effective prevention, since it is based on events that have already happened.

In the next part I did the adaptation of the Rasmussen model for the special working environment of flying. The model which demonstrates the work psychology means analyses error possibilities from the wiorker's point of view. (Worker means pilot in my adaptation). This model shows human error in three different ways: error and missing on apractice level And error on the regulation and knowledge - based level.

I demonsrated that error levels can be connected with the skills of the aircraft pilot, his preparedness, his training, and consequently, with the maintenance of the skills and with proper training error possibilities, can be reduced.

I established that the models of approaching human error are basically different in their start point, I illustrated with examples, the characteristics of mistakes, errors and inaccuracies.

While the Reason model describes specifically the way leading to the development of three flight events; the errors. Rasmussen, on the other hand, describes the error characteristics of the work performing person, with the the help of describing the psychological asopects of the work process. In his system the human error capacity characteristics are shown universally, so their interpretation to the flight system was done by me.

In the second part I analysed the Edward's SHEL model from the wider point of view of the human factor, and in connection with them I reached some basic conclusions.

In the SHEL model there are three key factors: the human factor (liveware), the technical factors (hardware), and also the soft factors that give the operational frame of the system (software). Here we meet the narrow concept of the human factor, but the wider embracing environment of the three factors. This basically restricts the application of the model, because the connection of the environmental point to the outer borders of flight science, at the same time, the interpretation of the human factor stops at the pilot, consequently, the original system can give a realistic picture of the connection between the factors only when adapted to a wider interpretation of the human factor. I made the analysis of the SHEL model from the point iof view of the wider adaptation of the human factor, and in connection I made some basic observations.

When we analyse flight, the quality of safety is provided by the quality in the connection of the system elements. Whe analysing the connection of the elements, we can establish the three dimensions of the system.

From the human side, I established the first dimension as the technology and the person, as well as the connection between the regulations and the person.

I proved that beyond the original ergonomic-based concept of Edward's, on the L-S connection point, the error-proof operation of the system, for example the unified procedures, as well as the training can be the means of safety elevation.

In the interpretation of thee second dimensions of the mode, I demonstrated the relationship between the system elements and the environment, accordingly, the wider interpretation of the environment where the system of aviation functions is connected with millions of threads to the social environment and culture. The demonstration of the social environment and the correlation of the system touches the limitations of aviation science, but it was established that the financial and human resources taken from the wider environment influence the entire system, consequently, they fundamentally detemine the possibility for safety.

The analysis of the third dimension of the SHEL model, in my own intrerpretation, was done by arranging it in connection system outside the described factors.

I established, after examining the mutual connections appearing open the secondary points of the human paradigm, that it is neccessary to work out a wider and a narrower interpretation of the human factor, namely, between the individual and the society and between the individual and individual. By this I reached the final level of the human factor, to the executive, who has a special position from the point of view of risk escalation, because the success of the safety work finishes on the level of the individual.

Description of the connection between the organisation and the individual led to the establishment of the definition of the human factor: human factor is the summary of the individual and organisational mixture of the human activity that primarily influences flight safety.

3. FLIGHT SAFETY RISK

In the third chapter I lolked through those methods that deal with risk assessment and management. Dangers that appear during flying can originate from any factors that influence flight safety. Risk itself is the danger, or to be more precise, the consequence of the danger, the possibility of its event, and also the exposition or the duration of danger. Risk appreciation begins with the danger appreciation. Danger appreciation depends, on the one hand on the education of the human factor, on the other hand, on the information system and the danger awareness of the organisation. All these factors are cultural factors that are connected with the human factor.

With the analysis of the data from 48 years of Hungarian military aviation I proved that half of the air traffic events can be associated with the human factor.

I demonstated the anomalies in the military flight safety statistics and the system of the event categorisation, and based on them I made the following critical remarks:

-   There is an inconsistency in the change of the system of event classification, as long as the basis for division in different categories of importance is not the same, so it is almost

impossible, or at least it is very difficult to differentiate between events of the same importance.

- Before 2000 the classification system favoured quick and simple division, but it does not give a shadowed picture of the real risk value
- The modern system of the 11 point table prepared for the reason group classification of the events was not in harmony with the philosophy of analysis, whose aim was to find the responsible person, so the classification did not use the possibilities provided by the table.

I demonstrated the options of risk management, and its relationship with the statistics and the informational. system of the flight safety. With the analyses of the old-time and modern-time professional regulations it became clear that how the classification of air traffic events mirrored the risk level of the events.

I showed that without the exact recording and processing of the data gathered from flight safety system which is the basis of prevention it is impossible to manage the risk. The flight safety information system must supply the data with such precision that would enable to give the precise orientation of prevention in the process of risk management.

For this there is a need for an event risk orientation system in the process of the analysis. It can be established in the Hungarian military that both in the event classification and in the handling of the statistical data, there are possibilities for serious development, and it is advisable to use them in the future, and there isa need for the establishment of possibilities of risk management in flight safety.

4. CHANGE OF CULTURE IN FLIGHT SAFETY

The main thought of the 4th chapter is the culture of flight, which, in my view, basically defines the level of safety. The safety culture is comprised of two factors, the relationship between the individual and the organisation in the direction of, and their activities.

According to my definition, the culture of flight safety is nothing else, but the summary of the human factors of aviation and those activities that provide flight safety according to its priority, and as a major factor.

I demonstrated that if we analyse people who work in aviation according to their capabilities and characters we can establish that the above-mentioned reasons occur from the the characters of individuals and the organisational circumstances surrounding them.

This inner/outer influence defines how the individuals will process information, to make decisions or solve a problem.

I proved that the culture of aviation is strictly connected to the human factor, or to be more precise, to its two forms, the executive and the organisational. In the case of the executive the flght is influenced by the conditions of flying, as a specific activity and the individual characteristics. Surviving extreme physical hardship, so to fight the risk factors arising from them, the executive (the pilot) must stay in perfect physical and mental condition.

Taking care of these is also a part of the safety culture as well as other factors that influence physical and mental capabilities, such as:

-the level of the flight knowledge

-the level of flight skills, manual skills

-characteristics of the personality

From the point of view of the above-mentioned factors it is clear that the training and education and the corresponding selection system means the formation of the individual in the safety culture. If we stay with the human aspect, we can see that besides individual and medical conditions, the key factors are the skills, education and individuality that is committed.

I showed that directing the individual towards can be possible through the organisational aspects of safety culture. Safety culture in an organisation, in our case in the air force, can be based on an educational and selective system, on information and feedback system, and on flight safety organisational system that embraces all special areas. To change the individual and organisational elements of the flight safety system, it is neccessary tio change the present flight safety culture.

During the analysis I concluded or recomended the following:

Changing the basic paradigm means that the following is needed to be done in the area of the human paradigm:

- the theory of trust must be used at all levels

- the organisational system of flight safety must be further developed

- there must be aims for flight safety, their details must be shown in flight safety strategy and priogrammes

- the executives must be safety motivated

I also demonstrated:

-the theory of trust means an atmosphere of openness, where the information basis of prevention is not comprised of information abvout previous events but also errors that did not lead to serious events, and they can get into the system anonymously.

- To achieve this, at all level of individual and organisational activities, from the point of view of flight, the following conditions must be achieved:
- all commanders, at all levels must becommitted to safety
- personnel must be aware the impotance of
- areas of responsibility must be set strictly and be made sure that the front liners are aware of it, too
- maintenanbce of the professinal education level must be kept high level. Commanders must provide sufficient training, workshops must be organised
- personnel must be motivated ti keep regulations by setting appropriate goals and a system of praise or punishment
- it is important that the leadership controls the work of their subordinates, answer stheir questions and encourages inquires
- it should be allowed to make sensible errors! (It is important to make a differnce between an unwanted error and a lack of discipline. Making an error that does not go together with

breaking the rules, should be viewed differently than undiscipline. **Everybody has the right to make a proper mistake, (consequently, it should not be sanctioned.)**

- the policy of the so-called non-accusement should be established, so instead of looking for someone to blame, it is advisable to concentrate on reasons and prevention
- personnel must be involved in the safety establishment, to arrange a forum for their opinion
- channels for information gathering and information exchange should be established
- anonymity must be provided for those who notice errors
- it is a basic requirement for the flight safety organisational system that it would encourage the application of the theory of trust, to maintain the flight culture, to analyse and gather data continuously, to support widescale cooperation and communication and to establish the „no-accusation" policy at all levels of the air force.
- To reach the long-term aims of the culture change, it is neccessary to prepare a flight safety concept, where besides goals, diagnostic appreciation must be mentioned, and to measure the resistance of the organisation. One of the basic elements of the flight culture is taking care of the human element, which is the most impressive means of the human paradigm concept, so we should not leave out the motivation of awarding from the development of the culture.

5. RELATIONSHIP BETWEEN THE FLIGHT TRAINING AND SAFETY

In the 5th chapter I pointed out that in accordance with the 4th chapter, the system of pilot training, the safety culture shows a tight link with the foundation of personal responsibility for knowledge, skills, and personal characteristics.

When analysing requirements of pilot training I established that there is a discrepancy between them and the safety. In my opinion, safety as a requirement is a part of effectiveness and it contributes to a professional establishment and productivity, and eventually, by minimising losses, it can satisfy economic criteria.

I pointed out that safety in pilot training is possible through maintaining stable theoretical knowledge and practical skills and the sanctions against behaviour dangerous for safety.

In my opinion, in pilot training, risk-oriented approach is of main priority, which is proved by theparadox of pilot training, namely, in peacetime pilot training, the appearance of realistic training elements poses an extra risk, at the same tuime this bigger risk has the benefit of a higher level of self-assurance and success in real combat conditions. Finding the acceptable risk level during peacetime training cannot miss the real-time risk measurement.

I pointed out the possibilities for safety elevation, namely, the neccessity to establish risk value, which helps to build the danger acknowledgment during training of pilots, and consequenly, it raises safety.

6. THE POSSIBILITIES OF SAFETY DEVELOPMENT

In the 6th chapter I adapted defence in depth. The theory of the defence in depth provides the possibility to eliminate the deficiencies of the flight descriptions, because the models I described are not uniform in their points of view and their aims, and because of the complexity of the flight system they cannot embrace the entire system.

The theory is well-known from military history, and it means development and stronger establishment defence lines to counter some dangerous influence, which in our case is against an air traffic error. In my opinion, in case of flight safety the theory is applicable, as long as it gives an answer to the description of uncovered areas of flight description models.

The defence lines posess concrete command levels, persons and organisations. Accordingly, I described the structure of the defence in depth as following:

- moving from the strategic to the tactical level, the fortification of the flight safety system quarantees error safety before the air traffic event. On a strategic level working out the long-term aims and priorities and the training of those on a lower level quarantees the strength of the system, and its resistance against errors. The final line of defence is the regulations, to keep them is the responsibility of the air traffic authorities.
- The aims and priorities on a strategic level are subdivided to tasks and programs on a pretactical level, the same way as it is done in case of I.T. and information systems, which are of key importance in prevention. For those acting on a pretactical level there is a serious role in maintenance of the system in preactivity, as long as with the analysis of the gathered flight safety information, with the established tendencies, the appearing problems can be flexibly solved. Validation of the theory of trust is impossible without the tactical level.
- So, on the tactical level, or the level of executive, the work of the flight safety system is, and the success of the prevention is decided, as well. The strength of the system is performed by in danger acknowledgment, in training, in open dialogue, and in the system of information and instructions.

In the system, established by me, each of the defence levels has concrete aims and tasks, wich is by itself is a quarantee for the organisation of the flight safety work and the continuous functioning if the system, which is the basis for all preventive activities. In the complexity of the introduced structure, in the case of human paradigm appearance and the appearance of the theory of defence in depth, it can assist the long-term development of the flight safety culture.

THE SCIENTIFIC RESULTS OF THE RESEARCH

1. Proof of the neccessity of paradigm change, with the focus on the human aspect.
2. Foundation of a modern flight safety strategy (concept), work out the basis of a new flight safety culture which is supported by the aspect of the human factor.
3. The Reason, Rassmussen and the Edwards-type SHEL model, as well as the defence in depth theory adaptation to the flight safety activities system.
4. The establishment of the definition of the flight safety culture, and the introduction of the way of thinking and attitude in the flight safety.
5. The comparison analysis and supplement of the flight system models.
6. Specification of theories and the system of pilot training from the point of view of a new flight safety culture.

My research has not yet finished, and I am going to proceed with my scientific work in the area of further aspects of flight safety. In my opinion,based on my research results, the following main research areas should be examined in the future:

- At the base of the Combined Arm Command of the Hungarian Defence Forces, as well as the National Traffic Safety Board and the National Traffic Authority, in a cooperation based on mutual exchange of data and opinion to continue research of available statistical data analysis about the development of information systems.
- To continue research on voluntary data provision and its willingness from those who work in flying.

In my opinion, my research:
- can contribute to the development of a new flight safety strategy, for the formulation of new regulations, manuals and instruction books
- can assist the attitide formation of commanders and staff, as well as that of airforce personnel.
- Can be a basis for research for flight safety specialists and researchers of the topic
- It can be used in military higher education, on the basic university education, for supplementary education, and as a manual for the pre-education of aircraft operators.
- It can assist further research work

Budapest, 20th March, 2007

/Lt. Col Dudás Zoltán /

PUBLICATIONS

1. Bunkóczi Sándor - Dudás Zoltán : Hogyan tovább, pilótával vagy nélküle
Nemzetvédelmi egyetemi közlemények 2003. 7. évf. 2.sz.

2. Bunkóczi Sándor - Dudás Zoltán: Pilótanélküli repülőeszközök a hadviselésben
Repüléstudományi közlemények, ZMNE 2003. 15. évf. 35. sz.

3. Dudás Zoltán: A közvetlen légitámogatás lehetőségei
Nemzetvédelmi egyetemi közlemények 2003. 3.sz.

4. Dudás Zoltán: A légi kutatás-mentés és a Cospas - Sarsat rendszer
Repüléstudományi közlemények, ZMNE 2001. 13. évf. 33. sz.

5. Dudás Zoltán: A pilóta szerepe a repülésbiztonságban
Repüléstudományi közlemények, ZMNE 2001. 2. különszám

6. Dudás Zoltán: A repülésbiztonsági információ fontossága
Fél évszázad forgószárnyakon a katonai repülésben tudományos konferencia kiadvány
ZMNE RMI, 2005. különszám (CD ROM)

7. Dudás Zoltán: A repülésbiztonság fejlesztésének jövőbeni irányai a repülőcsapatoknál
Tanulmány a Légierő Parancsnokság tudományos tanácsának „Légierő stratégia és képességek" című pályázatra, 2004.

8. Dudás Zoltán: A repülésbiztonsági kultúra kialakítása a Magyar Honvédség légierejénél
Nemzetvédelmi Egyetemi Doktorandorum 2002. 1. évf. 1.sz.

9. Dudás Zoltán: A repülésbiztonság új értelmezése
Repüléstudományi közlemények, ZMNE 2002. 2. különszám

10. Dudás Zoltán: A tipikus hibák felismerése a helikoptervezetők gyakorlati kiképzésében
Repüléstudományi közlemények, ZMNE 2000. 12. évf. 22. sz.

11. Dudás Zoltán: Az angliai csata intenzív időszaka
ZMNE Hallgatói közlemények, ZMNE, 2001. 1. sz.

12. Dudás Zoltán: Basics of flight safety risk
ZMNE, Hadmérnök 2007. március

13. Dudás Zoltán: Repülésbiztonsági veszélyek és kockázatok
100 éves a géprepülés tudományos konferencia kiadvány
ZMNE RMI, 2003. különszám (CD ROM)

14. Dudás Zoltán: Repülőesemény statisztikák 1957-2006
Új évszázad, új technológia tudományos konferencia kiadványa
ZMNE RMI, 2006. különszám (CD ROM)
ISSN 1714 0604

15. Kovács István - Dudás Zoltán: Az A-10 Thunderbolt
Repüléstudományi közlemények, ZMNE 2000. 12. évf. 30 sz.

16. Kovács István - Dudás Zoltán: Szemléletváltás a repülőkiképzésben
Repüléstudományi közlemények, ZMNE 2001. 1. különszám

17. Ruttai László - Krajnc Zoltán - Dudás Zoltán: A légtér feletti ellenőrzés képességének szintjei Repüléstudományi közlemények, ZMNE 2002. 2. különszám

LECTURES

1. Dudás Zoltán: A tipikus hibák felismerése a helikoptervezetők gyakorlati kiképzésében
Repüléstudományi konferencia, Szolnok 2000.

2. Dudás Zoltán: A pilóta szerepe a repülésbiztonságban
Repüléstudományi konferencia, Szolnok 2001.

3. Dudás Zoltán: Szemléletváltás a repülőkiképzésben
Repüléstudományi konferencia, Szolnok 2001.

3. Dudás Zoltán: A repülésbiztonság új értelmezése
Repüléstudományi konferencia, Szolnok 2002.

4. Dudás Zoltán: A légtér feletti ellenőrzés képességének szintjei
Repüléstudományi konferencia, Szolnok 2002.

5. Dudás Zoltán: A közvetlen légitámogatás lehetőségei
NATO kompatíbilis magyar tüzérség c. konferencia, ZMNE Budapest 2001.

6. Dudás Zoltán: Repülőesemény statisztikák 1957-2006
Repüléstudományi konferencia, Szolnok 2006.

CURRICULUM VITAE

Origin   11. 23. 1968 Budapest.

Studies   1987-1990. Killián György Air force College

1995. English course
1996. British Council English course
1996-1998. ZMNDU KLKF Szentendre, Secondary training
1998-2000. ZMNDU Budapest
2000-2003. ZMNDU PhD qualification
2001-2003. Italian course
2003 STANAG 6001 English course

Positions   1990. Asbóth Oszkár Helicopter Wing, Börgönd,
helicopter pilot
1992. Szolnok Helicopter Wing, helicopter pilot
1993. Air Force College Szolnok, instructor pilot
1994-1998 Air Force College Szolnok, teacher
2004-2005 MoD Military Aviation Authority,
chief pilot
2005- 2007, MoD Military Aviation Authority
flight safety officer (chief pilot)

Languages   STANAG 6001 English level „3"
English advanced level type „C"
Italian intermediate level type „C"