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**Actual questions of military airports' and flight missions' fire
protection, in particular the functioning of fire fighting services in
the system of survive to operate (STO)**

titled (PhD) dissertation's authorial description

Scientific leader of the project:

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2003

I. THE RESEARCHING PROJECT'S SUMMARY ITS METHODS AND REASON

Fire protection is not regulated enough in the Hungarian Military.

After joining the NATO, the regulators of fire protection haven't followed the changes.

The law about national fire protection and rescue was lately followed by the portfolio's fire protection order, which refers to the military.

The rules which were repealed by this order, still haven't been replaced.

This time the fire protection orders in the Hungarian Military are originated to 1976, and they are not suitable for the national prescriptions, most of them are out of date.

According to the new order, the regeneration of the Hungarian Defence Forces' fire protection has begin.

Fire fighters appearing at all guiding levels, are planning and controlling the special fire protection activities.

However, the Defence Ministry order wasn't followed by the lower level laws' setting to the changed environment and requirements.

The procedures prepared in the area of fire protection, the organized tools, the structure and training of the fire fighting unit is still from the time of the Warsaw Pact.

Nevertheless, aircrafts of the allied forces have appeared on the Hungarian military airports.

According to the fifth paragraph, our own aircrafts can carry out missions from foreign countries' airports.

The NATO's proposals on military forces developing at the area of fire protection, in the fire fighting rescue procedures, required the commonality, and the compatibility of the equipment needed to fire, with the NATO.

The fire prescriptions of the Hungarian Defence Forces, the organizations of fire protection, their equipment and preparedness are not providing the missions that derive from the allied situation, to be done.

So that the rescue operations from aircrafts that are applied from home airports, the procedures of the fire, and the offers of NATO Standardization Agreements, are deviate from our capabilities.

At this time, the fire fighting units are not capable of fulfilling the changed requirements.

Considering these precedents, I made these scientific aims below:

- Proving the connections between the components of military airports fire protection, and the airports' security, defining the fire protection's place and its role, in the system of STO.
- Forming the method of describing the procedures and characteristics of the fire fighting and rescue from military aircrafts.
- Forming the structural organization of the Hungarian Air Force's fire fighting units, that fits into the system of STO.
- Working out the system of choosing, training and requirements of military airports' fire fighting units.

For reaching the scientific aims that I made in my dissertation, I used the methods below:

I compared home and foreign fire protection rules. Analysing the elements of airports, and synthesising these elements, I defined the components of the airports' fire protection.

I also analysed the elements of survive to operate, and with adding them to its functions I defined the place and role of fire protection.

Analysing foreign experiences, I proved the importance of describing the aircrafts' Fire fighting and rescue.

I set an example of a NATO airplane to analyse the characteristics of fire fighting and rescue, and

I synthesised the method of describing aircrafts' crash fire fighting and rescue (CFR), created the organizational structure of military airports' fire fighting units with the help of system model, and the system-examination method.

I described the situation of training fire fighters with historical method. Analysing the fire fighters home and NATO training and requirements of admission, I synthesised the new requirements.

II. THE SHORT DESCRIPTION OF THE COMPLETED RESEARCHES AND ITS CONCLUSIONS

My dissertation which was made during my scientific researches, consists of 4 chapters.

In the first chapter, I examined the system of laws in connection with the military airports, with comparing analysis. I defined the components of fire protection on airfields, the missions of fire fighting units, and the place and role of fire protection in the system of STO.

Conclusions:

The ICAO contains the main international rules in connection with airfields fire protection.

The Standardization Agreement of NATO is connected to the prescriptions of ICAO, but they're raising more severe requirements in many areas, and they're enforcing their military characteristics, with ordering special rules. Treating with the NATO STANAG, and its home implementation have begun. In consequence of military airports' and aircrafts' modernization, they developed to individual bases, and nowadays they're also developing along with the formation of aircraft techniques.

The fire protection of the airfields is the component of airfields' safety systems. There's a connection between the military airfields' safety, and the capability of survive to operate, meaning that the airfields' safety systems are taking part in STO.

The military airports preventing and rescuing fire protection, the missions' hazards, and placement are concentrated to 2 areas: the fire protection of the airfields, and flying operations. According to the system of missions, the fire fighting unit's main function is the crash fire fighting and rescue.

The present qualification of CFR crews is incomplete, because it is not dealing with the time interval between the start and the beginning of operation.

The states of crash fire readiness that I recommended, are dealing with this interval. Military airports of Hungarian Defence Forces are in the fifth CFR services identification category.

The ability, with which the units of air force are saving themselves in traditional and in mass destruction warfare environments, is the STO. The unit's fire protection is one component of the STO. The crash fire fighting and rescue is the component of STO's recuperation function.

With the raising of fire protection's effectiveness the threat level of STO can be provided.

In the second chapter, I analysed a NATO aircraft's fire hazards, its characteristics, the capable fire fighting agents, and I made the description system of the military aircrafts' CFR procedures.

Conclusions:

The CFR crew's main function in the STO, in the function of recuperation is the fire fighting and rescue. The Hungarian Defence Forces' fire fighting unit nowadays doesn't have the required skills, in the area of CFR. In the Hungarian Defence Forces there's no rule for CFR, and because of this, they're not applying the same CFR procedures. So there's a need for the description of military aircraft CFR procedures.

The military aircrafts structure can contain many types of hazardous materials, which can cause higher fire hazard. These characteristics are needed to be concerned, during the preparing of fire procedures.

The best for putting out military aircraft's fires is the foam agents. At first during the combined putting out, the powder is to be applied, and then the foam, because the powder can crack the foam.

The CFR procedures of the military aircrafts are different, but the tasks are the same. After grouping into a system, the CFR procedures can be written down.

The operations that create task groups, and the information that is needed for the operations' accomplishment, results in the CFR description method.

Filling it with records the description as a database – methods of accomplishment, and characteristics integrating into database – results in the description of crash fire fighting and rescue procedures, typical of the given aircraft.

In the third chapter, with the help of system-examination method, and the system model, I analysed the structural system of airfields CFR crews, the components of CFR shift, and I proposed a new system of organization.

Conclusions:

The fire fighting units of military airports can be explained as systems. With the purpose of increasing the efficiency of a fire fighting unit's functioning, and creating its organizational structure, the system-examination method can be used.

The fire fighting units' subsystems are the CFR shifts. The CFR shift has the functions in connection with the flight missions' fire protection and the airport's fire protection, which are suitable for the airport's fire readiness category, for the sake of STO.

A component of the military airports' CFR shift is the rapid reaction vehicle and its crew, which can operate in 2 minutes time, at any point of the airfield, and it's capable of combined attack.

The other component is the heavy vehicle and its crew, which can carry at least 6500 litres of water, and it's capable of foam attack.

The military airports' CFR shift consists of 9 fire fighters who are ready and capable of operating, 1 rapid reaction vehicle and 2 heavy vehicles. The CFR shift's capability provides the airport's fifth CFR services identification category.

On military airfields, platoons containing CFR shifts are doing the fire protection's operative special tasks. The fire fighting platoons are containing a command post and 5 CFR shifts.

On every military airfields, the same fire fighting organizational systems are required.

In the forth chapter, I analysed the situation of training fire fighting units, I defined the new entrance and training requirements, and I proposed a system of training, and a method of its valuing.

Conclusions:

The components of military airports' fire personal categories have changed. As a result of decreasing training time, the balance of training and requirements has been upset.

In military airports' fire assignments, engaged services leaded by professional commanders, are needed to be employed.

The STANAG 7145 defines the requirements for the military airports' fire fighting services, which are accepted by the Hungarian Defence Forces.

There's a need for publicizing a measure that considers home specialities, for the standardization agreement to come into operation.

Requirements of admission for military airports' fire fighting services have 3 areas. These are: health suitability, some outstandingly important individual signs, and educational qualifications.

In the countries of NATO, the military airports' fire fighting services are receiving special trainings that are different from general fire fighters. These trainings are grouped into basic, and advanced categories.

The training system made by myself contains all the knowledge about military airports' fire protection.

It adapts to the characteristics of engaged services, and makes it possible to apply the changes in flight into the training system.

It provides preparedness for military airports' fire fighting services to fill the requirements.

To value the CFR services of military airports', the MSZ K 1123 "Military Airports Fire Protection" standard's fifth annex is to be used.

III. SUMMARY OF SCIENTIFIC RESULTS, PROPOSALS

With joining the NATO, the environment of military airports' fire protection has changed. The 31/2001 (XII.28.) Minister of Defence order which was issued for the rule XXXI. in 1996, was not followed by revaluing the components of fire protection. The airports' CFR services identification categories were not defined. The CFR services were not informed of the aircrafts fire fighting and rescue characteristics, their training reflects the old method of view.

In my work I searched for the solutions of these problems and defectiveness.

In my dissertation, according to my purposes:

- Based on the international and home rules comparison I established that the home fire protection rules are left behind of international ones in the respect of military airports' fire protection. I defined the components of military airports' fire protection, I explained the connections between military airports' safety and its fire protection. I defined the orders and tasks of military fire fighting units. I worked out the states of CFR readiness. I defined the identification category of Hungarian military airports' CFR services. I defined the fire protection's place and its role, in the system of STO.

- I established that a Hungarian Defence Forces' fire fighting unit doesn't have the required skills, in the area of CFR. I compared the researches experienced on my study tour, and the requirements discovered in the first chapter, I concluded to the need for describing the CFR. I analysed the hazards of aircrafts fire. Comparing the usable agents and hazards I defined the fire procedures. Analysing the characteristics of an F-16 aircraft's CFR procedures, I discovered aircrafts' hazards, and CFR specialities. Synthesizing the results, I made a system. I established the typical task groups of military aircrafts' CFR. I defined the main operations of task groups. I chose the operations, and made a database which is aircraft specified. I established the method of describing military airports' CFR procedures.
- With the help of system-examination I researched the organization of military airports' fire fighting service. Explaining the fire fighting organization as a system, I outlined that. I indicated the purpose of examination, I defined the coherences of the system. Defining the purpose of examination I worked out the CFR shift's system model. I explained the system's aim and I depicted the system's effect, and its connection to environmental components. I analysed the functional structure of a fire fighting service. I depicted the structural relations in form of classifying structure. I worked out the components of CFR readiness shifts, and the system of their service-supplement. I proposed a new organizational structure for military airports' fire fighting service.
- I valued the situation of training fire fighters with historical method. Because of the changed situation, I compared the training and requirements of admission for Hungarian Defence Forces' and NATO fire fighters, and I defined the new requirements. I analysed the requirements of admission for military airports' fire fighters, their choosing requirements and I compared them with the NATO states' requirements of admission. I proposed new requirements of admission for military airports' fire fighters. And I also worked out the training system which is suitable for these new requirements.

According to my summarized conclusions, I established the following:

Treating with the NATO STANAG, which is connected to fire protection, and its home implementation have begun. The fire protection of the airfields is the component of airfields' safety systems. There's a connection between the military airfields' safety, and the capability of survive to operate, meaning that the airfields' safety systems are taking part in STO. The military airports preventing and rescuing fire protection, the missions' hazards, and placement are concentrated to 2 areas: the fire protection of the airfields, and flying operations.

According to the system of missions, the fire fighting unit's main function is the crash fire fighting and rescue.

The states of crash fire readiness that I recommended, are dealing with the interval between start and the beginning of operation.

Military airports of Hungarian Defence Forces are in the fifth CFR services identification category.

The unit's fire protection is one component of the STO. The crash fire fighting and rescue is the component of STO's recuperation function. With the raising of fire protection's effectiveness the threat level of STO can be provided. The CFR crew's main function in the STO, in the function of recuperation is the fire fighting and rescue.

The Hungarian Defence Forces' fire fighting unit nowadays doesn't have the required skills, in the area of CFR.

In the Hungarian Defence Forces there's no rule for CFR, and because of this, they're not applying the same CFR procedures.

The military aircrafts structure can contain many types of hazardous materials, which can cause higher fire hazard. These characteristics are needed to be concerned, during the preparing of fire procedures. The CFR procedures of the military aircrafts are different, but the tasks are the same. After grouping into a system, the CFR procedures can be written down.

The operations that create task groups, and the information that is needed for the operations' accomplishment, results in the CFR description method. Filling it with records the description as a database – methods of accomplishment, and characteristics integrating into database – results in the description of crash fire fighting and rescue procedures, typical of the given aircraft.

The fire fighting units of military airports can be explained as systems. The fire fighting units' subsystems are the CFR shifts. The components of the military airports' CFR shift is the rapid reaction vehicle and its crew, and the heavy vehicle and its crew.

The military airports' CFR shift consists of 9 fire fighters who are ready and capable of operating, 1 rapid reaction vehicle and 2 heavy vehicles. The CFR shift's capability provides the airport's fifth CFR services identification category. The fire fighting platoons are containing a command post and 5 CFR shifts.

The airfields CFR services identification categories are the same, so that on every military airfields, the same fire fighting organizational systems are required.

The organizational structure of military airports' fire fighting service that I worked out, enables the continuous guarantee of rescue and fire fighting services that is suitable for the airports' fifth CFR identification category. The development of guiding shifts enables the CFR identification service category's temporary raising, and it supports the planning and completing of training fire fighters. It also guarantees the rescue of the people injured in crashes, and the fire attack. The proposed shifts are capable of participating in recuperation missions that are for the survival of an airport base, and co-operating with the participated organizations in recuperation. In their capability, size, and components, they're suitable for the requirements of home and NATO STANAGs.

The components of military airports' fire personal categories have changed.

As a result of decreasing training time, the balance of training and requirements has been upset.

In military airports' fire assignments, engaged services leaded by professional commanders, are needed to be employed.

The STANAG 7145 defines the requirements for the military airports' fire fighting services, which are accepted by the Hungarian Defence Forces. There's a need for publicizing a measure that considers home specialities, for the standardization agreement to come into operation.

Requirements of admission for military airports' fire fighting services have 3 areas.

These are: health suitability, some outstandingly important individual signs, and educational qualifications.

The training system made by myself contains all the knowledge about military airports' fire protection. It adapts to the characteristics of engaged services, and

makes it possible to apply the changes in flight into the training system. It provides preparedness for military airports' fire fighting services to fill the requirements.

To value the CFR services of military airports', the MSZ K 1123 "Military Airports Fire Protection" standard's fifth annex to be used.

SCIENTIFIC RESULTS

Scientific results that I propose:

- 1. I proved the connections between the components of military airports fire protection, and the airports' security, I defined the fire protection's place and its role, in the system of STO.*
- 2. I formed the method of describing the procedures and characteristics of the fire fighting and rescue from military aircrafts.*
- 3. I formed the structural organization of the Hungarian Air Force's fire fighting units, that fits into the system of STO.*
- 4. I worked out the system of choosing, training and requirements of military airports' fire fighting units.*

PROPOSALS

According to the facts that were defined in my PhD. dissertation, I propose:

- Grouping the military airports of Hungarian Defence Forces into the fifth CFR services identification category.
- Describing the procedures and characteristics of the fire fighting and rescue from military aircrafts that use home airports, by my method.
- Using of the CFR shift and service timetable, which I formed, on military airports' CFR readiness services.
- Creation of the organizational structure which I formed, and recording it into table of personal, during the development of military airports' fire fighting services.
- Completing the system of admission of military airports' engaged fire fighting personnel, with the requirements of admission and choosing, worked out by myself.

- Modification of the 31/2001 (XII.28.) Minister of Defence order as the airports' CFR identification category, and the number of crew to fire vehicles in readiness shifts would define the number of military airports' fire fighters.
- Definition of training requirements for the military airports' fire fighting services, by the STANAG 7145.
- The modification of fire fighting services' training system, in the form that I proposed.
- Using of MSZ K 1123 standard's fifth annex for valuing military airports' CFR readiness services.
- Rewriting the requirements of fire fighters' levels, according to the STANAG 7145 and the standard mentioned before.

Moreover, my dissertation can be used for training airports' fire fighters.

It can give a basis of a new theme and project for military airports' fire fighting services.

With the help of the describing method of military aircraft CFR procedures, a uniform regulation for air force or units, a commander guide, and collection can be made. These also can be fitted into the training system of fire fighters.

The components of military airports' fire protection, the connections between fire protection and fire fighting services survive to operate can give the basis of the air force and its subunits' fire fighting plan.

The results of my researches can be used in planning of the air force's system of survival, and also can be used in researches in connection with STO.

My researches on the area of military airports can be continued. New scientific results are expected on the area of CFR readiness shifts' technical equipment, and development of airport fire vehicles. Fire fighting units' mobility, their air transportability, and deployment, are questions to be worked out.

In my opinion, I successfully filled my dissertation with the experiences that I achieved during 17 years in organizing military airports' fire protection, the ones that I learned on study tours, the knowledge that I achieved during my PhD studies, and the results of my researches. My dissertation contributes to Hungarian Defence Forces, in particular the development of the air force's fire protection.

PUBLICATIONS

Competitions

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2. Gábor Csutorás: Experiences, methods of completing tactical fire fighting exercises of fire fighting units (MH VVF-ség a vegyivédelmi szolgálat 45 éves megalakulására 1995)
3. Gábor Csutorás: Experiences of helicopter fire fighting in the Hungarian Defence Forces (ZMNE TDK dolgozat I.díj 1997)
4. Gábor Csutorás: Operation system and organizations that provide air force units' survival in an NBC environment (MH LVK Tudományos Tanács műhelymunka pályázat 1999)
5. Gábor Csutorás: Air operations in NBC environment (A vegyivédelmi szolgálat 50.évfordulója Somos alapítvány LEVKF különdíja 2000.)

Presentations

1. Gábor Csutorás: Questions of CSAPATREPÜLŐ units' NBC protection (Csapatrepülő szkaharcászati konferencia 1992 április)
2. Gábor Csutorás: Air operations in NBC environment (Vegyivédelmi Konferencia a vegyivédelmi szolgálat 50.évfordulója alkalmából 2000.május.24.Bp.ZMNE)
3. Gábor Csutorás:Fire fighting vehicles used on military airports (doktoranduszok konferenciája ZMNE 2001.november.19)
4. Gábor Csutorás: Place of the NBC defence support, its role and its components in the operational support system of the air force (előadás "Future Aviation Technologies 2002" Nemzetközi Konferencia Szolnok 2002. április 13.)
5. Gábor Csutorás: Is there a chance to survive? (Doktoranduszok I.Jász-Nagykun-Szolnok Megyei Tudományos Konferenciája Szolnok 2002.november 8.)

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2. Gábor Csutorás: Expert opinion of the “Fire protection of military airports” MSZK 1123:1999 standard (Magyar Szabványügyi Testület)
3. Gábor Csutorás: CCA procedures and configuration of NATO air forces. (jegyzet ZMNE Repülőtiszti Intézet 2001)
4. Gábor Csutorás: Fire fighting vehicles used on military airports (Doktoranduszi Konferenci, A 2001. novemberi konferencián elhangzott előadások anyaga ZMNE Bp. 2001 64-73.p)
5. Gábor Csutorás: Air operations in NBC environment (Hadtudományi Tájékoztató 2001/3 41-52.p.)
6. Gábor Csutorás: Choosing and training of military airports’ fire fighters (ZMNE Hallgatói Közlemények VI.évfolyam I.szám 2002. 93-1003p.)
7. Gábor Csutorás: Fire protection of military airports MSZ K 1123:2002. (Magyar Katonai Szabvány. Magyar Szabványügyi Testület)
8. Gábor Csutorás: Fuel fires on military airports (Új Honvédségi Szemle 2002/7.szám 71-78.p)
9. Gábor Csutorás: Place of the NBC defence support, its role and its components in the operational support system of the air force (Repüléstudományi Közlemények “FAT 2002” különszám 2. ZMNE Tudományos Kiadványa 17-22.p.)
10. Gábor Csutorás: Questions of rescuing aircrafts’ crews in the fire (Kard és Toll Válogatás a Hadtudomány doktoranduszainak tanulmányaiból 2002/1 HM Oktatási és Tudományszervező Főosztály Kiadványa 116-121.p.)
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15. Gábor Csutorás: Is there a chance to survive? (Konferencia Kiadvány CD-ROM Doktoranduszok I.Jász-Nagykun-Szolnok Megyei Tudományos Konferenciája)

CURRICULUM VITAE

Birth date: 09.04.1957.

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Rank: Lieutenant Colonel (1998-)

Experience:

1979-1981 NBC Reconnaissance Platoon Leader

1981-1982 NBC Deputy Squadron Commander

1982-1985 NBC Squadron Commander

1985-1996 NBC Defence Chief (brigade)

1998-2000 NBC Defence Chief of Hungarian Air Force Staff

2001- Hungarian Air Force Command Senior Developing Officer

Educations:

1975-1979 NBC Commander Branch

1992-1993 NBC Staff Officer Course

1994 Intermediate Fire Protection Course

1996-1998 ZMNE National Defence University

2000 NATO NBC Defence Course