

## BASIC OPERATION CAPABILITIES OF THE SLOVAK AIR FORCE

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***Abstract:** The paper describes basic operation capabilities of the Air Forces of the Slovak Republic. The capabilities have to be achieved within the specific requirements and capabilities and stem from the operational requirements, placed on the modern Air Forces conducting future operations and air campaigns. The Air Power, Air Defence tasks, and tactical Air Force assets are elaborated and characterized in this paper.*

***Keywords:** Air Force, operational capabilities, NATINADS, MiG-29, sophistic weaponry.*

### 1. INTRODUCTION

Doctrine documents of the Allies characterise the Air Force as the capability of combat force projection in the air or space by means of airborne platforms and guided missiles. Air force is best applied predominantly in joint and combined operations over the whole scope of the conflict. It is the most powerful element in manoeuvre capabilities of combat and combat support operations. From the point of view the compatibility of future Air Forces of the Slovak Republic capabilities with other segments of the Slovak Republic Armed Forces, the focus is on basic operation capabilities, which determine in decisive role the quality increase in capabilities of task achievement, primarily in the airborne air defence within the Air Defence of Slovak Republic Armed Forces. The capabilities have to be achieved with the specific requirements and capabilities and stem from the operational requirements placed on the Air Forces of the Slovak Republic in future operations and air campaigns.

### 2. AIR FORCE SPECIFICS

Air Force can be characterised by such fundamental and unique characteristics as the movement in three-dimensional space, focused on the wide range of height, velocity and range

use. The basic factors of effective deployment of airborne platforms are:

- rapid projection of capabilities, abilities and capacities,
- operation far away from protected objects,
- ability to operate deep in the operation space,
- rapid and flexible response to changes in the course of operation activity,
- wide range,
- clear situation overview of the operation space,
- flexibility and versatility,
- concentrated impact of power,
- sustainability depending on logistic support,
- limited endurance in operation space,
- vulnerability (on the ground and in the air).

These factors determine the advantage and special role of the Air Force in both military and non-military operations and missions, but, on the other hand, are limiting and narrowing ones in the planning and implementation of the deployment at different levels of conflicts.

The key advantages, crucial in the use of the Air Force, can be found in such capabilities as rapid and flexible projection of force in the area of interest without geographical limitation. Over the last several years, Air Force has been used in a great extent in the escalation of military force and threat, as a part of complex political and military strategies of deterring and persuasion.

Without favourable air situation over the operation space of Ground Force or the Navy, Air Force cannot conduct operations with necessary freedom and operation pace. It provides rapid reaction for the attack against point reinforced targets out of ground asset range.

It can supplement or replace artillery and armour fire power. It can operate simultaneously against tactical operation and strategic targets in joint operation space. It requires localised command, control and planning and decentralised operation focused on effects. Moreover, manned or unmanned airborne platforms, designed for surveillance, search, observation and intelligence, are irreplaceable in achieving information and intelligence advantage, and decision-making process advantage as well [2, 3, 4].

### 3. AIR FORCE TASKS

Following comprehensive analyses and real evaluation of possible contribution to joint defence of Alliance interests, responsibilities

have been adopted, which are decisive for further development of air defence and undermine the trends of development in the following decades. They focus primarily on the area of airborne operations and adequate personnel training. The training in peace time conditions necessitates further requirements on the implementation of a wide range of standards according to the regulation and harmonising of air space utilisation within International Civil Aviation Organization (ICAO). Furthermore, they involve the preparation of an air unit for NATINADS system to meet NATO standards and criteria. Modernisation of air and ground assets to make navigation, communication and identification systems and devices compatible for self-protection of aircraft in the whole electromagnetic spectrum also plays an important role.

A system of regular evaluation of task achievement in the form of so-called Key Tasks has been developed along with the Component Command Air HQ in Ramstein, Germany [1].



Fig. 1 Structure of the Slovak Republic Armed Forces

The tasks of Air Force of the Slovak Republic Armed Forces (Fig. 1) can be divided into the following basic categories:

- the defence of the territory of the Slovak Republic by all available assets and forces,

- the defence of facilities of special importance and other important facilities,
- providing the integrity of the Slovak Republic air space,
  - o the defence of the Slovak Republic air space sovereignty,
  - o the defence of the NATO – NATINADS integrated air space,
- providing support to aircraft in emergency over the area of the Slovak Republic,
- support of NATO and EU forces during flybys, in the area of deployment and during their deployment in the Slovak Republic- Host Nation Support,
- constant surveillance and monitoring of the Slovak Republic air space.

A section of the Air Force of the Slovak Republic Armed Forces has become a part of joint integrated system of air space defence NATINADS. The full participation in sharing the responsibilities, resulting from this fact, requires a different understanding in relation to previous approaches, mainly in the ways of operation preparation, personnel training and building specific capabilities.

The key role is taken by the functioning integrated structure of command and control (C2), which relies on a complex summary of information from the available sources and sensors, its processing and the distribution to all users.

Providing the defence of the sovereignty of the Slovak Republic air space in the context of possible threats is an important part of the activities of the national system of integrated air defence, in line with the Concept of capabilities of the future Armed forces of the Slovak Republic. The main assets of the airborne air defence comprise tactical aircraft of the Air Force, equipped with combat and training jet aircraft, stationed at Sliach Air Wing.

Tactical Air Force has undergone a lot of changes over the period of the sovereignty of the Slovak Republic. Apart from a significant decrease in the total number of aircraft, a major structure change has occurred as well. Over the last years, the Air Force has lost specialised airborne platforms for effective ground operation support, due to high cost and being not economical. The threat of the air

force not being capable of meeting the responsibilities and tasks in the necessary effect, both to national and alliance responsibilities has become imminent. To divert this threat, the modernisation projects of all types of current air assets have commenced in order to provide compatibility and interoperability in both joint and international operations.

Tactical aircraft assets currently represent 12+3 MiG-29 (10 Mig-29 AS, 2 MiG-29UBS, 2 Mig-29 A and 1 Mig-29UB), along with 10 L-39 aircraft in CM and ZAM modifications, which represent the training system for tactical air force. After the modernisation programme is completed by 2015, the tasks resulting from operation requirements can be successfully fulfilled [1, 2, 3].

The diversity of airborne facilities in the area of operations and responsibility of the air force is a challenge, and it also determines the criteria for an effective weapon complex with adequate ground based technical and logistic support and robust system of command, control and communication. The importance of such system is also emphasised by the fact, that the response to new threats of misuse of a civilian aircraft as a terrorist weapon, so called RENEGATE, requires a rapid decision-making process, which necessitates an adequate system of command, control and communication. The effective achievement of common air space protection and defence tasks is a prerequisite for member countries Cross border Operations.

Following the fore-mentioned requirements and tasks, the fundamental characteristics of the weapon complex developed in this way, can be summarised into the following key areas:

- supersonic combat aircraft,
- multi-purpose concept – multi-purpose use:
  - o medium range active and passive guided airborne target weapons,
  - o accurate, guided ground target ammunition,
- integrated attack and defence systems,
- data and information interconnectivity into a networked system of other combat platforms and sensors of the Armed Forces of the Slovak Republic and NATO,

- aerial refuelling
- the possibility of operation deployment from limited airport runways.

#### 4. FIGHTER AIRCRAFT MiG-29

Fighter aircraft MiG-29 AS and MiG-29 UBS (FULCRUM) (Fig. 2) are supersonic jet fighter aircraft primarily designed to operate against airborne targets. They are closely associated with the defence of airspace sovereignty of the Slovak Republic. Since 2005 they have served as a part of an integrated NATO Air Defence system within the European Allies. They belong to the most

powerful fighter aircraft, thus being demanding for air personnel skills and experience. Only the pilots with the license for subsonic jet trainer aircraft can be integrated into the supersonic jet fighter training programme.

MiG-29 AS and MiG-29UBS have an extended technical lifecycle which is to expire in between the years 2029 and 2035. After their modernization the jet fighter aircraft are to meet the NATO norms and standards and EUROCONTROL recommendations, which specify the compatibility between jet fighter aircraft and communication, navigation and identification systems (CNS).



Fig. 2 Supersonic jet fighter aircraft MiG-29AS from Air Wing Sliač

##### General characteristics:

- Crew: One
- Length: 17.37 m (57 ft)
- Wingspan: 11.4 m (37 ft 3 in)
- Height: 4.73 m (15 ft 6 in)
- Wing area: 38 m<sup>2</sup> (409 ft<sup>2</sup>)
- Empty weight: 11,000 kg (24,250 lb)
- Loaded weight: 16,800 kg (37,000 lb)
- Max takeoff weight: 21,000 kg (46,300 lb)
- Powerplant: 2×Klimov RD-33 after burning turbofans, 8,300 kgf (81.4 kN, 18,300 lbf) each

##### Performance:

- Maximum speed: Mach 2.25 (2,400 km/h, 1,490 mph) At low altitude: 1,500 km/h, 930 mph

- Range: 700 km (430 mi)
- Ferry range: 2,100 km (1,800 mi) with 1 drop tank
- Service ceiling: 18,013 m (59,100 ft)
- Rate of climb: initial 330 m/s average 109 m/s 0-6000 m[101] (65,000 ft/min)
- Wing loading: 442 kg/m<sup>2</sup> (90.5 lb/ft<sup>2</sup>)
- Thrust/weight: 1.01

##### The reasons for modernization:

1. The modification of cockpit equipment of MiG-29 needs to be standardized according to the NATO requirements, which cover the interoperability of all systems.
2. It is vital to regain the baseline MiG-29 performance, which includes ability to identify airborne targets, according to NATO standards.

3. The use of an original Russian navigation system RSBN, which is the basic part of airborne navigation and airborne weapon system, has been terminated by the resolution of the Slovak Republic government. The accomplishment of flying missions would be impossible without an appropriate replacement of the original RSBN system. Replacement of the whole Russian RSBN system with a primary NATO navigation system – TACAN means into an aircraft avionic system

4. Changing the flight data indication from metric system into Anglo-Saxon system.

5. The improvement of flight security in the international flight corridors.

The manufacturer of MiG-29 is in charge of the modernization. It guarantees the utility of the system as a whole and the MiG-29 flight security as well. The manufacturer cooperates with BAE SYSTEMS, ROCKWELL COLLINS and Aircraft Repair Company Trenčín JSC. The modernization of networking and communication equipment is compatible with NATO equipment and meets the further requirements of interoperability in combat operations.

The modernization of radio navigation systems meets NATO standards. Navigation equipment is fully compatible with NATO systems and guarantees safe navigation in international flight corridors and landing on both military and civilian airports.

The modernization of identification equipment meets the latest NATO standards. Such an extensive installation has never been performed in any MiG-29 jet fighter in the world. The identification equipment will meet the standards and further NATO identification systems requirements. Also NATO jet fighters have to be newly equipped with the same identification equipment to support compatibility.

The modernization of cockpit is to bring better and easier equipment operating, data readability, testing of newly installed equipment and to lessen pilot stress during the flight, thus considerably improving the flight safety of MiG-29.

The system of flight data indication and radio communication will be fully compatible with NATO jet fighters.

The mutual integration of Russian and “western” systems guarantees the reliability and safety of MiG-29 systems as a whole. This modernization meets the NATO standards defined for this type of air assets. It provides the compatibility of jet fighter systems with NATO systems (5-10 year period), thus providing space for considering the further need for new jet fighter aircraft.

## 5. CONCLUSIONS

The Slovak Air Force performed an upgrade on their MiG-29/29UB in order to achieve full NATO compatibility. Work has been done by RAC MiG and Western firms, starting from 2005. The aircraft now has onboard navigation and communications systems from Rockwell Collins, an IFF system from BAE Systems, new glass cockpit features multi-function LCD displays and digital processors and also fitted to be integrating with Western equipment in the future. However, the armaments of the aircraft remain unchanged. Already 12 MiG-29 were upgraded and had been delivered as of late February, 2008.

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