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## SEARCH AND RESCUE SYSTEM IN POLAND

**Summary.** On the 25th of January 2018, the Civil and Military Aeronautical Rescue Coordination Centre (ARCC) commenced operations in the Polish Air Navigation Services Agency (PANSa). PANSa significantly increased its contribution in the domain of coordination of search and rescue activities in ASAR service in the Polish area of responsibility. Before this date, all tasks of ARCC Centre were conducted mainly by the Armed Forces of the Republic of Poland, which performed the coordination function in ASAR (Aeronautical Search and Rescue) service. The bodies responsible were the Aeronautical Search and Rescue Centre located in the Air Operations Centre – Air Component Headquarter in Warsaw and the sub-centre in Gdynia, part of the Naval Operations Centre of Naval Component Headquarter.

According to international commitments resulting mainly from the Convention on International Civil Aviation signed on 7th of December 1944 in Chicago and ratified by Poland together with Annex 12 “Search And Rescue”, Poland committed to establishing aeronautical search and rescue service called ASAR within the Polish region to assure its operation. ASAR service is the only service in Poland for rescue purposes and is designated for the search and rescue of aircraft in distress, provision of help for aircraft crews and passengers and other victims of aeronautical accidents (regardless of the nationality of the aircraft and persons). ASAR service tasks include search of the designated area to locate aircraft and victims of aeronautical accidents, determine their status and

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commence rescue actions at the location using dedicated forces and measures as well as forces and measures of other systems, mainly from the State Medical Rescue and the National Firefighting and Rescue System and the Maritime Search and Rescue Service. ASAR services consists of: commanding element – Civil-Military Aeronautical Rescue and Coordination Centre, executive elements – Aeronautical Search and Rescue Teams (LZPR), and supporting elements – alerting points (air traffic services units operating in the framework of alerting service).

**Keywords:** search and rescue, aeronautical accidents, aviation, civil and military, Polish Air Navigation Services Agency.

## 1. INTRODUCTION

According to international commitments resulting mainly from the Convention on International Civil Aviation signed on 7th of December 1944 in Chicago and ratified by Poland together with the Annex 12 “Search And Rescue”<sup>2</sup>, Poland committed to establishing an aeronautical search and rescue service called ASAR within Polish region to assure its operation. ASAR service is the only service in Poland for rescue purposes and is designated for the search and rescue of aircraft in distress, provision of help for aircraft crews and passengers and other victims of aeronautical accidents (regardless of the nationality of the aircraft and persons). ASAR service is responsible for search and rescue of all aircraft flying within the Warszawa Flight Information Region (FIR Warszawa). It also acts over the terrestrial area of aeronautical search and rescue region overlapping boundaries of respective flight information regions.

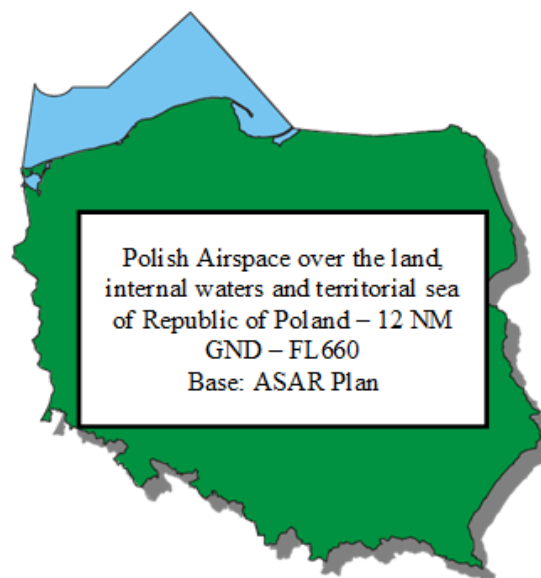


Fig. 1. Flight Information Region (FIR) – Warsaw

<sup>2</sup> Journal of Law 1959, No. 35, Position 212 *Convention on International Civil Aviation, signed in Chicago on 7<sup>th</sup> of December 1944*

ASAR service may also provide help in areas of human health and life-threatening situations other than air accidents or incidents. ASAR service tasks include search of designated area to locate aircraft and victims of aeronautical accidents, determine their status and commence rescue actions at the location using dedicated forces and measures as well as forces and measures of other systems, mainly from the State Medical Rescue<sup>3</sup>, the National Firefighting and Rescue System<sup>4</sup> and the Maritime Search and Rescue Service<sup>5</sup>.

ASAR services consist of:

- a) commanding element – Civil-Military Aeronautical Rescue and Coordination Centre
- b) executive elements – Aeronautical Search and Rescue Teams (LZPR)
- c) supporting elements – alerting points (air traffic services units operating in the framework of the alerting service)

## 2. CREATION OF THE CENTRE IN PANSA

With effect from 25th of January 2018, PANSA significantly increased its contribution in the domain of coordination of search and rescue activities in ASAR service in the Polish area of responsibility. On that day, the Civil and Military Aeronautical Rescue Coordination Centre (ARCC) commenced operations in the Polish Air Navigation Services Agency (PANSA). Before this date, all tasks of the ARCC Centre were conducted mainly by the Armed Forces of the Republic of Poland, which performed the coordination function in ASAR (Aeronautical Search and Rescue) service. The bodies responsible were the Aeronautical Search and Rescue Centre located in Air Operations Centre (COP) – Air Component Headquarter in Warsaw and the sub-centre in Gdynia, a part of the Naval Operations Centre (COM) of the Naval Component Headquarter.

When the ARCC Centre in PANSA became operational, both military elements became known as sub-centres and were included in the ARCC Centre structures. ARCC Centre includes the following elements: Rescue Coordination Centre (RCC) located in PANSA and two military sub-centres: the Warszawa ARSC (Aeronautical Rescue Sub-Centre) and the Gdynia ARSC. However, the main organisational effort related to the assignment of the main air rescue forces is still the responsibility of the aviation of Armed Forces. Placement of the RCC Centre in military structures of the Air Operations Centre (COP) and the Naval Operations Centre (COM) used in the previous solution, impeded cooperation with neighbouring rescue systems and extended information flow with air traffic services. The basic advantage of the present solution is significantly increased efficiency and effectiveness of activities coordination and shortening of information flow, that is, cooperation with neighbouring systems and air traffic services due to placement of the centre in the hierarchy of institutions included in air traffic services and rescue services in Poland. According to the Journal of Law on Crisis Management<sup>6</sup>, such a solution is valid during peace and crisis. During wartime, full responsibility of aeronautical rescue system is moved to the Armed Forces. Additionally, in the Armed Forces Operational Command (DO RSZ), from the

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<sup>3</sup> Journal of Law 2016, Item 1868 with later changes: *Act of 8 September 2006 on the State Emergency Medical Service*

<sup>4</sup> Journal of Law 2014, Item 1317: *Regulation of the Minister of the Interior of September 15, 2014 on the scope, detailed conditions and procedure for including fire protection units in the National Rescue and Fire Fighting System*

<sup>5</sup> Journal of Law 2012, Item 733: *Regulation of the Minister of Transport, Construction and Maritime Economy of 22 June 2012 on the detailed organization of the Maritime Search and Rescue Service*

<sup>6</sup> Journal of Law 2017, Item 209 with later changes: *Act of 26 April 2007 on crisis management*

structures from which experts were delegated to work in the Civil-Military ARCC, works are conducted to prepare the Letter of Agreement with Territorial Defence Forces Command, aiming to create land search and rescue groups based on resources at the disposal of Territorial Defence Forces

According to the documents regulating the ARCC activities<sup>7</sup>, the following main tasks are assigned to the ARCC:

- receipt of information on aircraft safety threats and persons covered by ASAR services activity range
- analysis of information on aircraft safety threats for aircraft conducting flights within the Polish airspace
- conduction of activities verifying and clarifying information on aircraft safety threats for aircraft conducting flights within the Polish airspace
- supervision of condition and abilities to undertake search and rescue activities by ASAR service units
- management and coordination of activities of ASAR services units, especially management of the Aeronautical Search and Rescue Teams (ASRT) activities
- on-going analysis and situation assessment and adjustment of undertaken SAR activities including decisions of their suspension and completion
- notification of cooperating units
- notification of air defence units and institution providing air traffic services on flights of civil and military aircraft conducting search and rescue activities

The greatest challenge for the centre is the correlation of activities of several subjects which presently do not have the technical compatibility (especially in the communication domain) as well as the procedural interoperability. ARCC's task is to provide correct coordination of SAR actions and proper cooperation with air traffic services and units of the National Firefighting and Rescue System and the State Medical Rescue and the Maritime Search and Rescue Service. To achieve this, the ARCC cooperates with the National Headquarters of the Police, the National Headquarters of the State Fire Service, the Polish Medical Air Rescue, the National Headquarters of the Border Guard), the Voivode Crisis Management Centres, civil and military aerodrome services (including aeroclubs) and subjects authorised to conduct rescue activities like mountain rescue (GOPR, TOPR) and water rescue (MOPR, WOPR). Moreover, the ARCC cooperates with services responsible for search and rescue in all neighbouring states (Denmark, Sweden, Russia, Lithuania, Belarus, Ukraine, Slovakia, Czech Republic and Germany).

In order to provide proper coordination between the RCC Centre in PANSA and the ARSC sub-centres, the following competency division were introduced:

RCC is responsible for:

- receipt of information on safety threat
- analysis of information on safety threat
- conduction of verifying and clarifying activities
- commencement of search and rescue action
- coordination of activities with cooperating and neighbouring RCCs

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<sup>7</sup> The basic document standardizing ARCC activity is „*PLAN ASAR Search and Rescue Operation Plan*, Minister of Infrastructure and Construction 2017. The basis for operations of military elements of ASAR services over the land and military SAR system in territorial waters and open sea is „*Instructions for military air and sea rescue*” MON DORSZ 2017.

ARSC sub-centres are responsible for:

- analyse and supervision of capabilities of subordinated ASRTs (Aeronautical Search and Rescue Teams)
- management of activities of subordinated ASRTs
- notification of air defence units on conducted activities
- resuming RCC functions in case those capabilities were lost by the PANSA centre

Present dislocation of duty measures is shown in Fig. 2

ARSC Warsaw:

- ASRT – 1 (1.GPR) – Świdwin
- ASRT – 2 (2.GPR) – Mińsk Mazowiecki
- ASRT – 3 (3.GPR) – Kraków
- ASRT - 4 (1.dlot) – Leźnica Wielka
- ASRT designated ad hoc

ARSC Gdynia:

- ASRT – 5 (43. BLotMW) – Oksywie
- ASRT – 6 (44. BLotMW) – Darłowo
- ASRT – 7 (44. BLotMW) – Cewice
- ASRT designated ad hoc

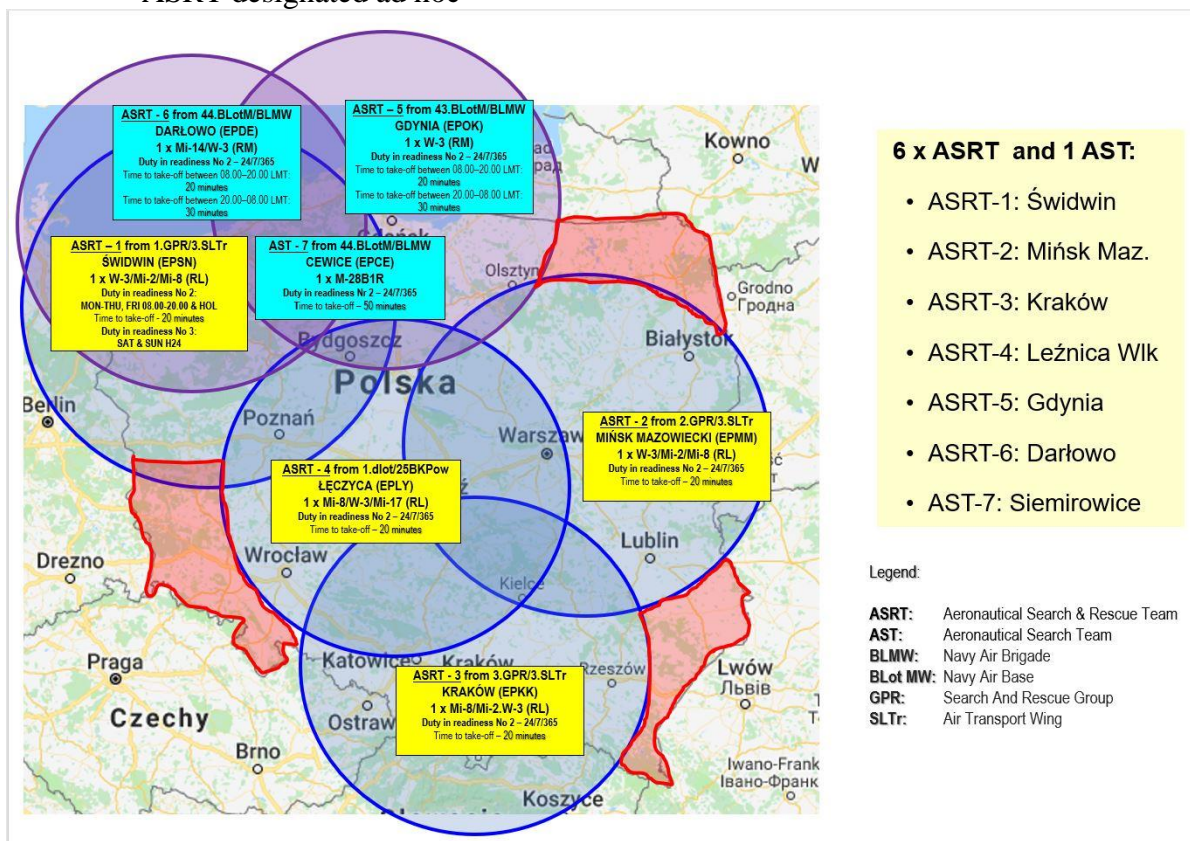


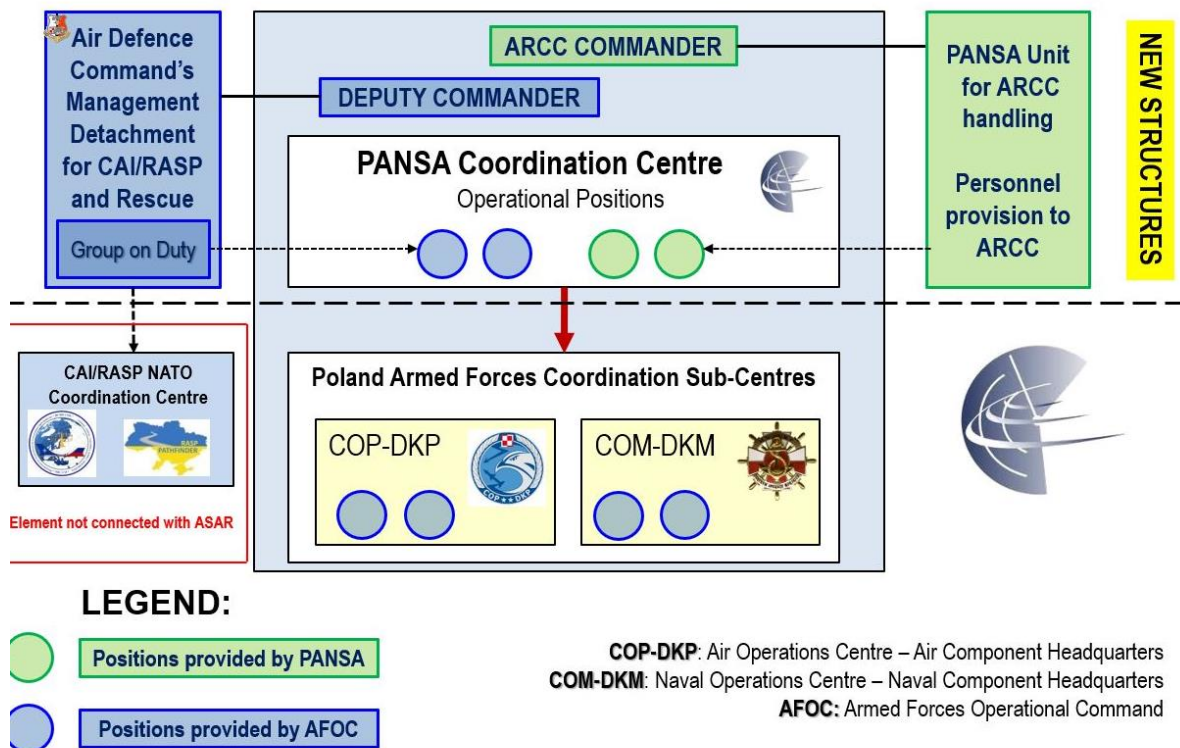
Fig. 2. Operational range of particular ASRTs

Source: Armed Forces Operational Command presentation (DO RSZ), PANSA Conference in Jachranka, 2018



Analysis of ASRT dislocation shows the uneven placement of measures in the Polish territory, resulting from the availability of aerodrome network at the disposal of the Air Forces. There are places in Poland in the range of even four Aeronautical Search and Rescue Teams, however, there are regions beyond the operational range of ASRTs operating from regular aerodromes/bases (especially in southeast, northeast and southwest part of Poland).

In the case of lost capabilities by the sub-centres to manage ASRTs activities during a mission, this task is assumed by the RCC or indicated by the RCC and capable air traffic service unit (appropriate Flight Information Service sector).



On the basis of: „Plan ASAR i Instrukcja Operacyjna ARCC” document

Fig. 3. ARCC Organisational diagram  
 Source: *Operations Manual ARCC*

Preparations to create the ARCC Centre in the new structure took several years since coordination of aeronautical search and rescue activities required the cooperation of four rescue services subordinated to four Ministers of the government of the Republic of Poland. Agreements and – in consequence – approval of the First Operational Plan of Aeronautical Search and Rescue (PLAN ASAR) by the Ministers of Health, Home Affairs and Administration, National Defence and Infrastructure have been completed on October 2017. The ability to use all rescue forces functioning in the structures of the four Ministers earlier mentioned during the search and rescue actions significantly ease and rationalise activities aiming to provide help to victims of air crashes and accidents. Placement of the ARCC Centre in the Ops Room of the Air Traffic Management Centre in PANSA, where all services managing air traffic over Poland are gathered, is to simplify information flow and – in consequence – to shorten the time needed to commence rescue activities by services capable of providing help for victims.

### 3. EXECUTIVE ELEMENT OF ASAR SERVICE – ASRT

The Aeronautical Search and Rescue Teams (ASRT) conducts search and rescue actions, it consists of aircraft, crews and cabin crew prepared to conduct search and rescue activities. ASRTs are provided by the Minister of National Defence from the Republic of Poland Armed Forces resources. He is responsible for proper accessory of aircraft and training of the ASRTs crews and cabin crews in the scope necessary to perform ASAR service duties. Aircraft of other rescue services, public order enforcement and other services may be called ad hoc to perform search and rescue activities. The Minister of National Defence is also responsible for appropriate dislocation of ASRTs enabling provision of ASAR service in SAR and ASRTs operations 24/7, in a way, enabling immediate SAR action after reception of a call from the ARCC Centre. ASRTs, after authorisation from ARCC, may undertake other activities, especially connected with the provision of defensive capabilities, state safety or human rescue. ASRT consists of aircraft equipped in accordance with item 2.6 of ICAO Annex 12 to the Convention on International Civil Aviation. Technical and operational parameters enable these aircraft take-offs and land safely from/on places other than the aerodrome or airfield. Crews and cabin crews include at least one person authorised for provision of the qualified first aid in accordance with Journal of Law dated 8<sup>th</sup> of September 2008 on State Medical Rescue<sup>8</sup>.

### 4. COOPERATION OF THE CENTRE WITH OTHER SERVICES

In the scope of coordination of search and rescue actions, the ARCC Centre personnel cooperates very closely with the operational services of the Ministry of National Defence, the Maritime Rescue Coordination Centre in Gdynia, the Polish Medical Air Rescue and other medical services, rescue services of the State Fire Service, duty services of the Police and the Border Guard and organisations providing help such as water rescue (MOPR, WOPR) or mountain rescue (GOPR, TOPR).

During operational and routine verification activities, the centre cooperates with its counterparts in the neighbouring states and other RCC Centres in the world. The main element designated to carry out tasks of the aeronautical ASAR service in Poland are chosen by the Minister of National Defence Aeronautical Search and Rescue Teams (ASRT) acting for victims of air or maritime accidents requiring the provision of help from rescue services. The centre is operated 24/7 by professionals of the civil air traffic services (ATS), and experienced experts delegated from the Air Defence Headquarters from the Armed Forces Operational Command (DO RSZ).

Article 140d item 1 of the Journal of Law dated 3rd of July 2002 “Air Law” states that “*Organisational units of the Polish Navy, the State Fire Service, the Border Guard, the Police, Health Facilities and other subjects able to provide help in the scope of search and rescue are obliged to cooperate with ASAR service to conduct its tasks*”. Therefore, other subjects may be asked to participate in search and rescue actions, for example, aeroclubs or private persons, which possess useful measures can be used during SAR action. An integral part of centre activity is the realisation of the SPOC Poland (Search and Rescue Point of

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<sup>8</sup> Journal of Law 2013 Item 757, with later changes *Minister of National Defence equips ASRTs with medical products specified in regulations based on Article 34 of the Journal of Law dated 8th of September 2006 on State Medical Rescue, as minimum equipment for resuscitation position; devices enabling two-way and effective communication with ARCC*

Contact) function. SPOC is an element of the international rescue system using Cospas-Sarsat satellite system, receiving distress signals generated by the aeronautical Emergency Locator Transmitters (ELT), the maritime Emergency Position-Indicating Radio Beacons (EPIRB) or the Personal Locator Beacons (PLB). It also initiates and coordinates search and rescue actions based on data received from the satellite system.

During the first nine months of activity, ARCC personnel participated and coordinated rescue activities in eleven serious aeronautical accidents and incidents and supported actions of rescue services in other three situations requiring the use of ASAR service measures. In the same time, it received 72 messages from the Cospas-Sarsat system. All situations reported in those messages were to be analysed and clarified, proper actions were initiated and return information was expected to be sent to the system.

Most of those situations resulted from improper use of those devices by their owners. Knowledge of the users on proper registration of such devices in the Civil Aviation Authority of Poland (ULC) is also very important; not every user is aware of this. There was 579 information on tests of emergency transmitters prepared and sent to interested services; the number of all these activities quickly increased during the dynamically growing aeronautical season of 2018. Another important issue are activities undertaken by ARCC personnel in cases of the lack of closure of a flight plan by pilots. Each pilot who decided to file a flight plan (FPL) provides for himself/herself – before a flight is commenced – the alerting service, provided for that flight by the air traffic services (ATS). Lack of notification to air traffic services that a flight plan has been completed and an aircraft landed safely requires the ATS to commence alerting activities to such a flight even in a situation when a pilot resigned from a flight or forgot to cancel it in a system. First air traffic services try to clarify such a case by itself but in case of lack of further information on crew status, such data is transferred to the ASAR service – specifically to the ARCC Centre. Then the ARCC personnel on the basis of data collected from the air traffic services, emergency locator transmitter register and all other means of information gathering on the landing of an aircraft commences operational activities which in consequence lead to commencement of SAR action, that is, take-off of SAR helicopter in order to search and locate lost aircraft. Fortunately, most of these 88 reported by the ATS to the ARCC occurrences were caused by the pilot who forgot to close or to cancel a flight plan after safe landing or resignation from a flight. However, such events distract the personnel from real distress situations and significantly increase workload due to a number of actions to be undertaken in order to clarify these situations. The flow of information is depicted in Fig. 4.

On the 8th of June 2018, the biggest rescue action conducted in the new organisational structures took place. It was not an aviation accident but a road accident in the vicinity town of Trenczyn. For the first time for many years, the action was participated by a SAR service helicopter from ASRT of Kraków. Mi-8 helicopter picked up from the crash site and transferred seven lightly injured children and one adult to the Rydygier's hospital in Kraków. The action was coordinated by the Civil-Military Search and Rescue Coordination Centre in the Polish Air Navigation Services Agency with the Voivode Rescue Notification Centre of Kraków and the Polish Medical Air Rescue.

During a relatively short period of functioning of the ARCC Centre in PANSA, there were other serious aeronautical incidents and accidents, including few with fatalities. Information on these events was received by the centre thanks to a very effective operational cooperation with public order services, however, often after their occurrence or after helping the victims by ground rescue services. In such cases, the ARCC becomes a source of information on such events for air traffic services and for the State Commission on Aircraft Accidents



Investigation. The lack of aeronautical occurrences does not necessarily mean lack of ARCC activity.

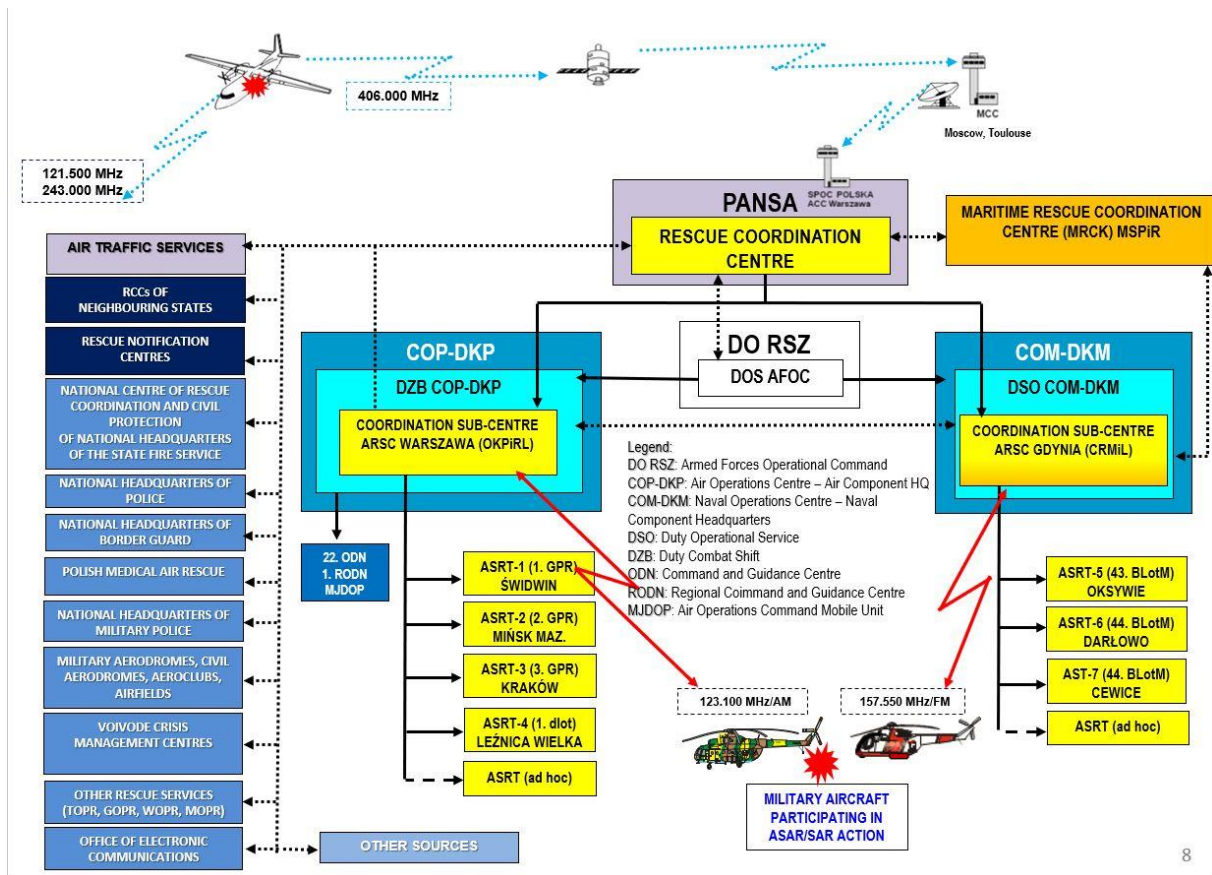


Fig 4. Organisational diagram and ARCC activities idea

Source: *Operations Manual ARCC*

Staying in constant readiness to undertake coordination and rescue actions the crew of ARCC conduct daily the following routine activities:

1. 24/7 supervision over the readiness of ASAR service forces and measures in Poland to undertake operational activities including analysis of meteorological conditions which may influence actions of these services.
2. Receipt, analysis and clarification of information on the use of the emergency locator transmitters and lack of data in air traffic services on safe completion of a flight plan (closure of a flight plan).
3. Receipt, preparation and distribution of notifications of services interested on planned tests of emergency locator transmitters.
4. Preparation and distribution of ARCC reports related to operational activities performed on duty containing simultaneously statistical elements of the Cospas-Sarsat system mentioned earlier. It allows for the latter to support, develop and proper reactions of the system for new threats showing up in the airspace of the entire world.

## 5. SUMMARY

After many years, Poland fulfilled international obligations resulting mainly from the Convention on International Civil Aviation signed on the 7th of December 1944 in Chicago and ratified by Poland together with Annex 12 “Search and Rescue”. According to the Convention, Poland committed to establishing in its airspace aeronautical search and rescue service called ASAR within the Polish region to assure its operation. It does not mean, however, that before search and rescue system that it did not function in the Polish airspace. Quite the opposite, however, as it was functioning earlier on the basis of the Armed Forces of the Republic of Poland in an organisational and executive way. Its location in the Armed Forces was changing but eventually, it was always a subordinate of appropriate Air Forces commanders. Therefore, its functionality and the use of rescue aircraft and other measures was practically limited to the provision of help to crews of disabled military aircraft. The only exception was maritime rescue managed in a different way and regulations. It did not automatically mean that the use of military rescue measures was not allowed for help provision to civil crews of disabled aircraft. However, the procedure to use these measures was quite complicated and it was significantly more easy and faster to use other (civilian) rescue systems. The military system consisted of not only air component but also of appropriately organised command and notification system but – in the first place – ground search and rescue elements. Every air unit maintained so-called “emergency groups” equipped with the proper technical and rescue equipment and “ground search groups” maintained by other types of Armed Forces units, depending on their location in the Polish territory.

Due to the reduction of the Armed Forces of the Republic of Poland, that system was slowly becoming inefficient. In the first place, groups of ground search have been terminated in the units of other types of the armed forces (except air units), there the groups were limited to be on duty only during flights of particular air units. Few years ago, those groups were terminated completely. “Emergency groups” are maintained only in a limited scope during conduction of flights by the unit protecting the flights. Air commanders were ordered to undersign appropriate Letters of Agreements with local units of rescue system which resulted in organisational chaos and rescue system impurity in Poland.

Evidence testifying inefficiency of the system may be, for example, the way of conduction of the last search and rescue action on the 18<sup>th</sup> of December 2017 (before launching the ASAR service), after the failure of MiG-29 fighter in the vicinity of Mińsk Mazowiecki. Despite notification of all possible services and launching search and rescue activities, lack of coordination and appropriate procedures caused the search for a pilot who crashed 7 kilometres away from the aerodrome some hours; the final success was owed to a local community. Moreover, it showed that the rescue helicopter being on duty at that time in the Minsk Mazowiecki aerodrome was not used during the action. Since the State Commission on Aircraft Accident Investigation did not provide the final report of this case, it is very difficult to analyse the reasons the helicopter was not used. The most probable reason was the difficult meteorological conditions which made take-off of rescue helicopter impossible.

Formal launching of ASAR service created the organisational and functional basis for much more effective functioning of the system and the engagement of practically all available national rescue services in potential search and rescue actions. Obviously, it does not mean the solution of all problems related for instance to equipment or training. It strives for constant improvement of rescue procedures, training system as well as rescue equipment,

the air component in particular, which is the most mobile element of the rescue system. It is possible to indicate a few directions of desired improvements either in the short and long term. In a shorter one, in the first place, requirements for crews and rescue helicopters would be verified; then work towards achieving these standards. In a present situation, financing system of rescue forces and measures shall be verified, not only from a budget of the Ministry of National Defence. In the long term, it should strive to be the first place to exchange existing aeronautical rescue equipment to an equipment meeting modern world standards. Another issue is the reorganisation of rescue units structures and restoration of structures of the ground search groups maintained on duty in appropriate regions. These activities are – as mentioned earlier – conducted by the present authorities of ASAR service and hope they will lead to a happy ending in the next year.

Conclusively, the creation of ASAR is the first milestone in direction of the establishment of a reliable aeronautical rescue system in the Polish airspace.

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