



## THE MILITARY INSTITUTE OF AVIATION MEDICINE IN WARSAW IN THE YEARS 2003-2016

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**Source of support:** Own sources

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**Abstract:** The author - reserve colonel, psychologist, director of the Military Institute of Aviation Medicine in Warsaw in 2003-2016, presents his reminiscences on the adaptation of the Institute to NATO standards, both in terms of logistics and science and research. He devotes a lot of attention to new aircraft simulators and diagnostic devices, which increase the scientific and clinical potential of the Institute.

**Keywords:** Military Institute of Aviation Medicine mission, NATO standards in aviation medicine, flight simulators, international scientific cooperation, structural changes

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## INTRODUCTION

The basic mission of the Military Institute of Aviation Medicine (MIAM) in the years 2003-2016 was to conduct effective selection and qualification of candidates of flying staff of the Polish Armed Forces, including early diagnosis and monitoring of medical condition and prevention aimed at maintaining the required psychophysiological condition for as long as possible, as well as aviation and medical training in aviation medicine and undertaking hospital treatment enabling to return to service in the air as soon as possible in the event of diagnosed diseases. The Institute was also to carry out tasks for the benefit of public defense and security, and the remaining resources were to be used for medical activity in the public health care system and in specialist certification conducted within the framework of commercial activities.

It should be noted that these tasks were carried out efficiently, despite various difficulties which occurred constantly. They manifested themselves in the form of numerous systemic and organizational turmoil, resulting mainly from legislative changes (in the form of significant changes in health policy at the national level, concerning not only civilians but also flying staff, as well as the broader military staff of the Polish Armed Forces), as well as in the conditions of operation of the Institute on the health market and scientific research. Examples of this turmoil included, for example, attempts to establish a MIAM consortium with other military institutions.

## UNWANTED TESTS OF CHANGING ORGANIZATIONAL STATUS AND SCIENTIFIC WIML

Luckily, none of these attempts were completed and the Institute survived as an autonomous institution. However, they had negative consequences because qualified medical personnel started to doubt the stability of work at MIAM and if only a sensible job offer was found, they left, leaving a significant human resources gap. In this way, many valuable people left, including independent researchers. It is in this context that I will pay particular attention to the first attempt at merger, since it was widely publicized in the media and, in a sense, "implemented" in the form of the Regulation of the Minister of National Defense of December, 21, 2004. As a result, pursuant to Article 7 sec. 2 of the Act on Research and Development Units of July 25, 1985, the following research and development units are to be merged as of 1

January 2005: The Military Institute of Aviation Medicine with its seat in Warsaw, established on the basis of Order No. 04/MON of the Minister of National Defence dated May 21, 1955, the Military Institute of Hygiene and Epidemiology named after general Karol Kaczkowski with its seat in Warsaw, established on the basis of the Regulation of the Minister of National Defense of September 16, 2002 and the Military Institute of Medicine with its seat in Warsaw, established on the basis of the Regulation of the Minister of National Defense of November 27, 2002 on the establishment of the Military Institute of Medicine. The merger of the units was to take place through incorporation of the Military Institute of Aviation Medicine (MIAM) and the Military Institute of Hygiene and Epidemiology (MIHE) into the Military Medical Institute (MMI). The key to full understanding of the main idea of the considered regulation was the word "inclusion", which meant no less than absorption by MMI of both the Military Institute of Aviation Medicine and the Military Institute of Hygiene and Epidemiology. This meant that the incorporated Institutes lost their subjectivity, and in addition, many important structures and functions performed by MIAM and MIHE were not included in the structure of the newly established institution. As a result of the protest of the employees of MIAM and MIHE, as well as the Directors of these institutions and the negative vote of the Parliamentary Committee for the Ministry of Defense on the regulation in question, an unprecedented situation occurred in which a new regulation of the Minister of National Defense of 21 February 2005 was issued, repealing the previous one on the merger of the Military Institute of Aviation Medicine and the Military Institute of Hygiene and Epidemiology named after general Karol Kaczkowski with the Military Institute of Medical Sciences (MIMS). The further fate of the Institute was a consequence of this repeal, as without it, an independent scientific and research entity would not have existed. It should be noted that there were also other attempts to merge MIAM with e.g. the Polish Air Force Academy in Dęblin, in order to establish the Aviation Academy, as well as with MIHE. There were also ideas of merging MIAM with the Military University of Technology (MUT). Today, from the perspective of many years, it is necessary to consider where such initiatives came from and whether they only concerned the situation in Poland or had wider, international conditions. In some countries, including members of NATO, changes in the manner of operation of the

aviation-medical institutes occurred as well. Indeed, these changes consisted in the abolition of some scientific institutes and creation of centers of aviation medicine, the sole purpose of which was to provide aviation-medical training and selection tests in the field of aviation medicine and psychology for candidates for military aviation. And all research and development activities carried out for the army were taken over by specialized government agencies (e.g. DERPA in the USA and NLR in Netherlands). Also the issues of aviation hospitals were addressed in various ways (either made separate institutions or completely liquidated and the hospital beds were contracted to civil hospitals). It is in this context that the above-mentioned problems should be understood as questioning the traditional concept of operation of the Military Institute of Aviation Medicine, basing its operation on three pillars (hospital part, scientific part as well as medical and certification part) serving mainly the flying staff of the Polish Air Force. Why did such a questioning take place? This happened for many reasons, but the most important of them concerns the introduction of changes mentioned earlier in the health insurance of soldiers, as well as in the idea of the so-called "self-financing" of MIAM (also of other research institutes). In practice, this idea turned out to be difficult to implement because, on the one hand, it consisted in signing financing agreements for specific tasks (so MIAM became in a way a party forced to negotiate agreements with the military) and, on the other hand, it forced MIAM to intensively seek sources of additional revenue for all activities carried out under the statute in order to ensure a positive financial balance and liquid remuneration for both civil and military personnel. It was precisely the provision of remuneration to professional soldiers within MIAM's budget that was the most controversial solution. In this way, an additional type of soldiers was created, in a sense, who were not financed from the budget of the Ministry of National Defense. As part of these systemic changes, it has also become necessary to make the hospital area available to civil society and, consequently, to change the profile of treatment from military to civilian. Health services were provided on the basis of a contract concluded with the National Health Fund (NHF). One of the effects of this change was the lack of obligation to hospitalize flying staff for health reasons in the MIAM hospital area. As a result, patients belonging to the flying staff, military staff in general, constituted only a small percentage of patients admitted to MIAM. The main problem were the existing procedures of the National

Health Fund, which did not meet the needs of the Polish Air Force. There were situations when flying personnel were diagnosed with ailments disqualifying them from provision of service in the air, which at the same time were not included in the procedures of the National Health Fund as a disease. This sometimes led to situations where pilots were not entitled to medical services because, in accordance with the regulations of the National Health Fund, they were healthy and at the same time suffered from ailments which disqualified them (at least temporarily) for health reasons. The soldiers themselves were given the opportunity to choose a "family physician", as well as the possibility of hospitalization in the civil health service, which indirectly resulted in a decrease in the effectiveness of systemic monitoring of the health condition of the Polish flying personnel, as well as other soldiers. This is one of the most important examples of such legal solutions which had negative consequences. This fact was frequently raised as an argument against the existence of MIAM in the present formula. Many military decision-makers, although aware of the legislative changes, did not accept this situation. I remember very well one of the meetings with the flying personnel in Dęblin, where I tried to explain the complexity of the operation of such an institution as MIAM. I have encountered reactions of misunderstanding and sometimes even reluctance towards such complicated rules of the Institute's operation.

## **THE ADAPTATION OF THE MIAM TO NATO STANDARDS**

Therefore, the state of MIAM in 2003, both in terms of human resources and infrastructure, can be described as below an acceptable level, taking into account its importance for both the Air Force and the Polish Armed Forces in general. Hospital and institute buildings were in poor technical condition, needed urgent renovation, medical equipment in the hospital, but also laboratories and aviation-medical simulators were partly obsolete and worn out, not adapted to modern requirements connected to aviation medicine. The situation was aggravated by the fact that the Ministry of Science and Military Education granted the Institute a 5th scientific category (currently category C), which, as it turned out later, was the result of a technical error made at the stage of entering data into the evaluation questionnaire, in which the number of researchers was confused with the number of employees in general. The survey showed that MIAM had more than 300 re-

searchers, and that the proven extent of scientific achievements, with such a large number, was very modest. It proved to be very difficult to correct this mistake because the Ministry, for more than two years, did not want to consider it to be just a mistake. In fact, however, the Institute's scientific staff was largely based on older employees, which in turn was not only related to the systemic perturbations mentioned above, but also to the previous loss of the right to award habilitation degrees by MIAM's Scientific Council, as well as the liquidation in 1999 of the specialization in aviation medicine, replaced by the specialization in transport medicine. All these conditions resulted in the fact that MIAM's "opening balance" in 2003 was unfavorable, which also contributed to the attempts to merge it with other institutions. It should also be mentioned that, later on, the scientific evaluation of the Institute caused problems. MIAM's scientific and research as well as implementation achievements were not taken into account in the scope of evaluation criteria determining the scientific category to be awarded. This also applied to research and adaptation activities, which constituted the State's obligations resulting from the ratification and necessity to implement NATO standardization agreements (STANAG 3114, 3827 and others). Despite these difficulties, in 2013 we managed to

reach the scientific category B, and already during the term of office of col. Ewelina Zawadzka-Bartczak MD - category A.

Going back to the past, however, I must admit that the idea of "self-financing" forced the need to constantly monitor the operating costs of particular MIAM structures and contributed to their reduction, as well as prompted us to look intensively for new sources of revenue. It was then that new opportunities for the development of the Institute emerged, in the form of the possibility of obtaining grants and scientific projects. However, it was connected with the implementation of new tasks. One of the most spectacular projects carried out at MIAM was the project of a new centrifuge, which was constructed at a MIAM of about 65 million PLN. It was, and still is, a thoroughly modern dynamic flight simulator - an overload centrifuge with the ability to carry out controlled training of combat flight elements, under conditions of variable acceleration, also with the use of night vision goggles. The technical and operational assumptions were developed at WIML and the simulator was constructed by AMST GmbH from Austria, which was selected through an international tender. However, also in this case there were some complications, because the implementation of this undertaking was interrupted by the Minister

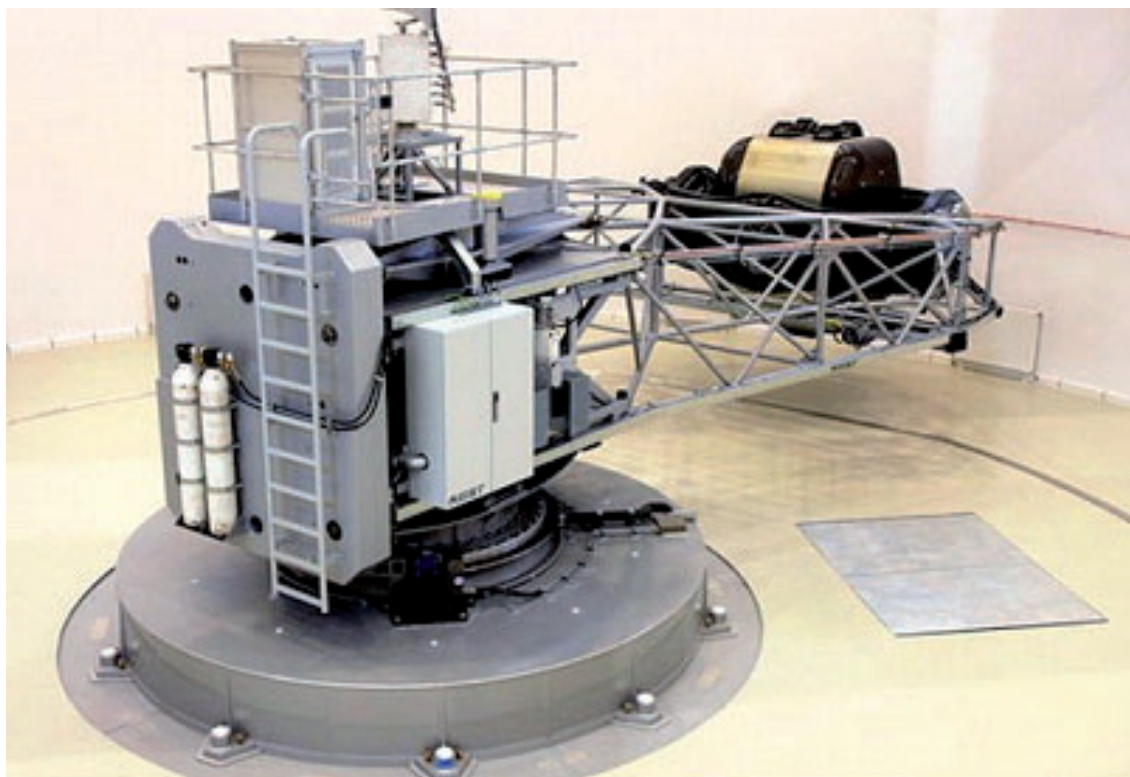


Fig. 1. A new MIAM overload centrifuge built by AMST GmbH from Austria.

of National Defense due to the ongoing financial crisis in Poland in 2008. Fortunately, after many interventions, the same Minister changed his decision and resumed the implementation of the project. As a result of these activities, one of the best devices of this type in the world was created. Training in this simulator was aimed at increasing the safety of flights on MIG-29 and F-16 high performance aircrafts. Aviation training using an overload centrifuge has become necessary to maintain a high level of readiness to perform tasks on high performance aircrafts and to increase overload tolerance, which is one of the essential elements in maintaining the safety of performing tasks in the air. For this reason, it was suggested to include aviation training on the overload centrifuge as part of the individual training of pilots of high performance aircrafts.

However, also in this case it was necessary to contract this task with the Air Force. Initially it was very difficult to conclude such agreements and it resulted in delays in the implementation of the new training. In turn, in 2010, MIAM modernized the power supply system for buildings together with the substations, which enabled the supply of power to the entire complex of buildings from two independent city switching stations in Warsaw and in case of a failure - the power supply from its own power generators. While in 2013, the program of adaptation to the requirements and modernization of MIAM hospital was completed. The building project worth PLN 34 million was completed with a grant from the Ministry of National Defense and, which should be emphasized, with MIAM's own funds (approx. PLN 11.5 million). The Institute obtained these funds by deciding to sell a part of its land. It was a very difficult decision, but in hindsight it was rational and right, because it managed to complete the prolonged renovation and gain important negotiating arguments when concluding the agreement for the hospital part with the National Health Fund. As a result a hospital part with 117 patient beds, 5 wards, including the Image Diagnostics Department was constructed, which is equipped with, among others, a 1.5T Philips Magnetic Resonance, 320-row TOSHIBA Computed Tomography and two digital X-ray cameras. The hospital was also equipped with a Central Operating Theater with three very modern operating rooms and a Central Sterilization Room. Other buildings included in MIAM were also successively renovated, which changed the Institute's image completely.

## COOPERATION WITH MULTIPLE SCIENTIFIC INSTITUTIONS

At the same time, activities aimed at activating the scientific part of the Institute were also carried out. Contacts were established with a number of scientific institutions. Cooperation with NASA resulted in the organization of a joint MIAM-NASA conference in September 2011 under the auspices of the National Security Office, the Polish Academy of Sciences and the Ministry of Science and Higher Education. During this forum, the issue of medical and psychological determinants of human activity in space, the impact of an unfavorable environment and high workload on human behavior, medical preventive measures and space crew training procedures as well as aspects of selection of crew for space missions were discussed. Another intention was to initiate international grants with a similar theme, but they have never been implemented. The next important undertaking was the cooperation of MIAM with the Nałęcz Institute of Biocybernetics and Biomedical Engineering of the Polish Academy of Science within the framework of the project "Center for integrated structural and functional research of the central nervous system" in 2012. Funds for its implementation were obtained from the National Center for Research and Development in the amount of approx. PLN 23 million. As a result, a new laboratory building worth PLN 7 million was constructed, equipped with 3T GE Magnetic Resonance together with a hyperpolarization machine and two EEG test offices. Further efforts in the field of science have resulted in the acquisition of many other scientific projects, such as: "Early fatigue symptom detector as part of improving the safety of driving a vehicle", "Mobile lab for investigating air accidents and catastrophes", "Evacuation and rescue system for victims of natural disasters", "Optoelectronic patient monitoring in magnetic resonance", "Psychological profile management system for soldiers with the development and use of "Health-Chips" technology". On the other hand, the implementation of the project "The system of monitoring the psychophysical parameters of patients in dynamic conditions WBAN based on microsystem technologies" within the framework of a joint project of the Institute of Medical Technology and Equipment, Warsaw University of Technology and the Military Institute of Aviation Medicine resulted in the Gold Medal with Honors at the 64th International Fair of Innovation, Scientific Research and New Technologies BRUSSELS INNOVA 2015. A test stand for Psychophysiological Testing

of Drivers with a truck cab was also constructed. Implementation of these and other research and development issues resulted in the creation of new workshops and laboratories (e.g. night vision laboratory, LBNP laboratory, CNS laboratory), and the equipment of scientific institutions with modern equipment (e.g. the Department of Aviation Psychology acquired the Vienna Psychological Test System (including equipment for peripheral examination, coordination and cognitive process examination, as well as equipment for psychophysiological measurements, including: Hi-Speed EyeTracking (SMI) and JAZZ-novo Multisensor). Particularly noteworthy is the Individual Warfare System Titan (ZISW Tytan), known as the "soldier of the future", which many people may imagine as a shield from science fiction films and laser weapons, but the Project Tytan would not have much to do with the comic book Iron Man. The creation and delivery of the system was the responsibility of a consortium of 13 Polish companies, including the Military Institute of Aviation Medicine, which was responsible, among others, for the construction of the soldier life monitoring module (MMZ).

Extremely significant structural changes initiated already in October 2002 concerned the certification part. As a result of legal changes, the Main Military Aviation and Medical Commission, which is an integral part of the Military Institute of Aviation Medicine in Warsaw (operating in a single instance) was replaced by the Military Medical Commission of the Air Force, independent of MIAM, as a second instance certification committee, and the Military Aviation and Medical Com-

mission in Warsaw, acting as the first instance. In doing so, MIAM has lost the possibility of making commission decisions on the fitness of flying staff for service. Therefore, it became necessary to establish the Aeronautical and Occupational Medicine Certification Center (AOMCC), the main task of which was to conduct aviation and medical examinations of candidates and members of the aviation personnel in terms of their usefulness to perform the duties of aircraft pilot. In addition, the staff of the AOMCC was obliged to conduct prevention examinations within the scope of occupational medicine for the benefit of various entities interested in cooperation with MIAM in this field. It should be emphasized that since this center was established, it has generated significant financial resources contributing to the positive financial balance of MIAM. The decision to liquidate Military Aviation and Medical Commission - MIAM and create AOMCC aroused great controversy and opposition among many aviation physicians. Today, however, it has to be said that, due to legal changes in the field of certification, it has been correct and has allowed many jobs for specialized medical staff to be recreated.

At the end of this short section, selected in my memory from 90 years of the history of Polish aviation medicine and psychology at Military Institute Of Aviation Medicine, I will make "Polish Journal Of Aviation, Bioengineering and Psychology" readers aware of the structural and organizational conditions of the scientific, research and clinical institution important for Polish aviation.

## AUTHORS' DECLARATION:

**Study Design:** Olaf E. Truszczyński; **Data Collection:** Olaf E. Truszczyński; **Manuscript Preparation:** Olaf E. Truszczyński. The Author declares that there is no conflict of interest.