SELECTED ASPECTS OF CRM (CREW RESOURCE MANAGEMENT) IN THE TRAINING OF LAND FORCES

Kamil RYGIEL

Abstract:
The aim of the article is a theoretical analysis of the possibilities of using CRM in the training of land forces, identifying selected areas in which the implementation of such an approach seems to be justified. A case of implementing crew resource management (CRM) in aviation is presented, indicating the key importance for ensuring flight safety and effective operation of the crew in dynamic conditions. In connection with the above, a thesis was formulated according to which the implementation of CRM tools in the training of land forces may contribute to improving the quality of operations, which will ultimately have a significant impact on the safety and effectiveness of the tasks performed by soldiers.

Keywords: CRM, crew resource management, land forces, army training

INTRODUCTION

Military personnel perform an important service for maintaining state security. However, as numerous experiences and literature in this field indicate, it is the human being, with his capabilities and limitations, that is considered the weakest link in the security system. Lowe, 2008) Not only soldiers make mistakes. There are ineffective doctors, accountants, teachers and engineers. But a bad or wrong decision made during warfare has completely different consequences for society. A doctor's mistake can result in the death of a person, a pilot's mistake - hundreds of people, and a general's mistake - tens of thousands of people. The military's mistake has irreversible consequences. (Regan, 1992)

Therefore, special attention should be paid to the operating environment in which the soldier is prepared to perform his duties. Combat conditions, because this is what we are talking about, are so specific that a human being - a soldier taking actions under their influence, and at the same time being one of their elements, is subjected to emotions, motivations, stresses, reactions to stimuli, as well as many other factors that they affect him. Therefore, in an organization such as the army, it is extremely important to properly use the resources available to soldiers. It is not only about military equipment, tactical knowledge or shooting skills, but also about human awareness, understanding occurring phenomena, language skills, problem solving and decision- making. The use of modern solutions in the field of human resources management has significantly improved the effectiveness of the organization, i.e. the ability to achieve set goals through the best use of its resources, including the resources of its individual members.

Of particular importance in the context of improving safety and achieving operational efficiency are training focused on a more precise area such as CRM (crew resource management). (Liszkowska, 2018)

Therefore, research was undertaken to identify the possibilities of using CRM solutions in the training of land forces. At the same time, a thesis was adopted that the implementation of CRM tools in the training of land forces may contribute to improving the quality of operations, which will ultimately have a significant impact on the safety and effectiveness of the tasks performed by soldiers. The research work used the method of reviewing the literature on the subject.

1 CONCEPT OF CREW RESOURCE MANAGEMENT

For a long time, there was a belief that the causes of accidents at work were mainly to be found in technology - in machines, devices and technological processes. The development of research and interest in the subject of accidents has shown that this was a false belief. Researchers emphasize the importance of human influence on accident incidents as an equal or even dominant factor in relation to technical factors. J. Wrzesińska, points out that this influence results from both the extraordinary efficiency of man and his tendency to make mistakes, which often have tragic consequences. (Wrzesińska, 2012)

The area of human activity where the problem of radically eliminating errors and ineffective human behavior is particularly important is the aviation industry. According to analyzes of air accidents, the most unreliable element is still the so-called ,,Human factor". (Grenda et al., 2016)

The mistakes made by an aircraft crew member are most often unintentional, although the consequences are extremely tragic. The causes may be fatigue, lack of appropriate training, monotony of work, or simple, temporary indisposition. (Ilków, 2011) The role and concept of the "human factor" in the flight safety system were noticed already during World War II, when aviation operations were carried out on a large scale. At this time it was noted that the losses suffered by the British Air Force in combat against the enemy were comparable to those caused by various human errors. From that moment, air accidents began to be observed and analyzed more closely, taking into account the human factor, and in the 1970s and 1980s, it was given its proper importance in the context of flight safety. (Grenda, Turzyńska, 2016) Thus, in June 1979, at a conference organized by the National Space Administration (NASA), its organizers, based on the results of research into several hundred aviation incidents, indicated the need to define and implement corrective actions aimed at counteracting the effects of the lack of crew cooperation skills, including communication, lack of ability to assess the situation in the air and lack of ability to make appropriate decisions. The conference, which was entirely devoted to the issues and psychological aspects of resource management in the pilots' cockpit, did not indicate ready-made solutions, but made its participants and the entire aviation community aware of a problem important for the safety of air operations, which could only be solved with their participation. It is assumed that the NASA conference in 1979, and, above all, the activities resulting from it, contributed to the birth of aviation training, which in the aviation world is known as Crew Resource Management

(CRM). (Gałązkowski, Tomaszewski, 2015) Over the years, training in the field of CRM has evolved, currently its fifth generation training is being conducted (Liszkowska, 2018), and many practitioners and scientists in the field of aviation psychology and physiology, doctors, pilots, instructors and trainers have been involved in the search for appropriate methods of action to improve this condition. (Smolicz, et al., 2020)

CRM is defined as a set of rules of conduct resulting from both knowledge and observation of many aviation events. It is also a training aimed at increasing the crew's capabilities by using all the resources contained in the team organization, available information, aircraft performance and professional skills of its individual members. CRM trains an individual how he should act in a team, shapes his attitudes and behaviors, and thus influences effectiveness and safety. [1]

It was noticed that the wide popularization of knowledge about problems related to the "human factor" in the aviation community allowed for a slow but constant reconstruction of human awareness and knowledge about their own capabilities, weaknesses and limitations, as well as a better understanding of the errors made by humans and their causes.

CRM training has also gained recognition in other areas where people have to make dangerous decisions in a short time. CRM principles have been modified and adopted, among others, in the fire service (Okray, Lubnau 2004), health care (known as TeamSTEPPS) (Sheppard, Williams, Klein, 2013), in the railway sector (Roop, Morgan, Kyte, Arthur, Villado, Beneigh, 2007), on offshore oil platforms (O'Connor, Flin, 2003) and in maritime industry (Wahl, Kongsvik, 2018).

The essence of Crew Resource Management (CRM) training in aviation is the maximum use of all resources available to the crew, including the cognitive and interpersonal skills of individual crew members, both in normal and, above all, in extreme situations. Cognitive skills are interpreted here as thought processes used to continuously, properly analyze and assess the situation, as well as make adequate decisions at every stage of the flight and in every (normal, abnormal, emergency) situation on the aircraft board. Interpersonal skills are defined as key skills for the quality of communication in the crew, which directly affects the effectiveness of teamwork. In the time before CRM training was incorporated into the aviation training system, the concepts of situational awareness, planning and decision-making, as well as communication and cooperation within the crew were not foreign concepts in the aviation environment. However, the new perspective on the dependences between them offered as part of CRM training has given these concepts a new, special meaning.

CRM training concerns areas such as situational awareness, decision-making, communication, and crew cooperation. (Gałązkowski, Tomaszewski, 2015)

In the context of aviation and situational awareness, when performing a task to properly assess the situation, the pilot, in addition to his knowledge and experience, obtains a number of information by observing the space around the ship, uses available equipment, and also uses information received via radio. Factors that may influence the loss of situational awareness include: an abundance of information (or lack of it, or misunderstanding of at least

---

[1] Ibidem, p. 204.

one piece of information, which is necessary at a key moment for the correct assessment of the situation), ignorance, fatigue, stress, lack of focus on the task, boredom, relaxation, ignoring warning signals, excessive stimulation or euphoria.

The purpose of CRM in the aspect of situational awareness is to make trainees aware of its enormous importance for the safety of performed tasks, to present the mechanism for building situational awareness and threats resulting in its partial or complete loss, and (importantly) to make commanders aware of the existence of a resource, which are the other members of their teams who are available in the process of maintaining situational awareness at all time while performing the task.

Decision-making in a pilot's work is the second key area. If it is realized incorrectly, it may cause huge negative consequences. Aviation is a complex environment, characterized by a large flow of information and a significant number of variables, which create an almost unlimited number of potential threats.

However, as it has been proven, the attitudes presented by decision-makers play an important role in the decision-making process. In terms of decision-making processes, CRM concerns aspects related to ADM (Aeronautical Decision Making). It is analyzing and perceiving these processes, primarily through the prism of individual human attitudes, mainly their risk assessment and stress management skills.

It was researched scientifically that crew commanders had attitudes that led to unsafe decisions. ADM distinguishes five of them: Authoritarian (*"what are you telling me, I know what I know")* - an attitude found among people who do not like to listen to other people's advice on what to do and how to do it. Impulsive (*"do something... as quickly as possible")* - this attitude is found among people who feel the need to do anything, anywhere, according to the principle that it is better to make even a bad decision than no decision at all. Risky (*"it can never happen to me* ") - such people take excessive risks because they believe that accidents only happen to others and never to them. Superman (*"I am great, the world belongs to the brave"*) - making decisions that involve excessive risk in order to prove themselves and confirm that they are the best. Resignation (*"why should I get into such trouble? Why me?")* - an attitude common among people who prefer to leave the initiative in the hands of others and do not fully believe that they can achieve great things by themselves. (Smolicz, Makarowski, P., Makarowski, R. 2020)

CRM makes you aware of these attitudes but at the same time emphasizes that they can be modified. The training also places emphasis on awareness of the need and understanding of the need to include all crew members in the planning and decision-making process.

The communication aspect is the third area regarding CRM training. It is an exchange of verbal and non-verbal signals undertaken in a specific context in order to achieve a better level of cooperation. Factors that may influence on improper understanding of each other, which in turn will transform into ineffectiveness of action, especially when working in a group, are: incorrect formulation of information or the use of inappropriate (or inappropriate) means of communication, communication barriers, noise, a stream of various (visual and sound) information, information received via radio may be distorted (contradictory, incomplete, ambiguous or unreliable), language barriers (they become particularly important in international cooperation) or environmental conditions in which crews perform their duties.

CRM in communication training puts emphasis primarily on trainees' understanding of the tragic (most often) consequences of its lack in the crew's work, their understanding of the need to perceive good communication as a condition determining the proper, effective use of resources, especially in abnormal and emergency situations, understanding that improper communication can even cause these situations, emphasizing elements such as the ability to ask questions, the ability to listen, assertiveness, the ability to resolve conflicts and the ability to express constructive criticism.

Cooperation as the fourth important element of CRM concerns the ability to create bonds and cooperate with others, the ability to work in a group to achieve common goals. It is also the ability to perform tasks as a team and solve problems together.

To achieve cooperation, you need the willingness of all team members to cooperate, understanding of their role by all team members, determination of all to perform the task as best as possible, as well as a sense of responsibility of all group members for the effects of work. A group created in this way will work better, more efficiently and effectively than any other. However, to achieve this level of the group, its members need to be familiar with each other and time. This is not always possible. Therefore, CRM emphasizes the standardization of crew behavior.

For this reason, the training pays a lot of attention to areas related to organizational culture, positive work atmosphere, social sensitivity, clarity in understanding the task, the possibility of full involvement in the task of all team members, transparency of expectations of the commander and team members, recognition for making efforts and the possibility of free speaking out.

It is emphasized that in creating a positive emotional climate in the crew, the main role is played by the attitude of the captain - commander of the flight crew, as well as the proper attitude of each crew member.

2 SELECTED ASPECTS OF CRM FOR TRAINING IN LAND FORCES

Theoretical analysis of examples of CRM use in aviation allowed us to isolate key areas of possible applications in the training of land forces. It was assumed that CRM training methods and techniques should be used in areas such as: developing situational awareness, decision-making skills, communication skills and team cooperation.

As in aviation, in land forces, having clear situational awareness by commanders at all levels is a necessary condition for the effective performance of tasks or the performance of them at all. It becomes particularly important in the context of new concepts of conducting military operations, called network-centric operations. (Chmielewski, 2018)

Moreover, combat and operational activities are full of numerous stressors, most of which are not experienced anywhere else in such concentration. These may include: noise, lack of sleep, dehydration, weather conditions, lack or excess of information, ambiguous and changing tasks, boredom or monotony. They are accompanied by constant anxiety and stress, which is a state that disturbs the balance in the perception of the environment. (Piotrowski, 2012)

A very big problem in the context of military combat operations and situational awareness is friendly fire. One of the main reasons for this phenomenon is the lack or loss of the situational awareness by soldiers. (Cruz, 1996) In this aspect, the efficiency of communication is crucial, because its lack inhibits the team's ability to act consciously. (Mrówka , 2009)

Therefore, shared situational awareness between the commander and his soldiers is extremely important. However, it requires the mentality of soldiers focused on cooperation and a common understanding of the goal or intentions of the superior. Failure to communicate key information, whether up or down the chain of command, can lead to errors with catastrophic consequences. The level of situational awareness increases with soldiers experience performing tasks together. However, the problem in this matter is finding the answer to the question of how to increase the level of experience gained by the commander and the team in less time. The answer here may be the so-called shared mental models. They can significantly increase the level of communication and coordination in the team. Team members who have the same knowledge and are aware of the cognitive mechanisms that occur at the individual level, and in interpersonal interaction enable them to better understand the situations around them and function more effectively in various situations. When examining and comparing teams, as well as factors influencing team processes linked by shared situational awareness, it was noticed that in terms of effectiveness, the following elements were important: checking each other by all team members at every stage of performing tasks, mutual acquisition of information between each other, joint setting of priorities in case of unforeseen situations. Ineffective groups, however, were characterized by one team member misleading others, important information not being shared, team members following their own paths, and over-reliance on expectations of others. (Hiller, Wampler, 2001)

In aviation, as well as in land forces (especially on the battlefield), the main source of success is developing an appropriate action plan. To perform this activity effectively, it is necessary to properly understand the situation and process information coming from various sources. These cognitive processes make up *situational awareness*. It is the commander's responsibility to have this situational awareness, and the team's responsibility to understand that having it is not only the commander's responsibility and if he lost it, for various reasons, team will be able to restore it.

Decision-making is another area that CRM training emphasizes and is a key factor in how soldiers perform their tasks on land. Commanders of different levels, while commanding their soldiers, must make decisions and implement them. According to the Regulamin Działań Wojsk Lądowych[2], command is the activity of a commander who imposes his will and intentions on his subordinates. What is important in this statement is the word "impose". It is defined by the Dictionary of the Polish Language as "*forcing someone to accept something or to act in a certain way.*"[3] While the army, as a hierarchical organization, requires obedience based on the specific rigor of implementing official orders (Łydka, 2015), command

---

[2] *Regulamin Działań Wojsk Lądowych*. DWLąd. Warszawa 2008, p. 271.
[3] Polish dictionary [online] https://sjp.pwn.pl/slowniki/narzut%C4%87.html [2024-04-29]

understood only through the prism of imposing decisions and forcing acceptance of one's point of view, or not accepting negative responses from subordinates, will not find resonance in their involvement in the tasks performed. The low level of employee commitment is the result of a culture of obedience. (Marquet, 2021)

Moreover, supervisors coercive behavior has been considered a characteristic of toxic leadership (Reed, Bullis, 2009), which results in a negative impact on subordinates, organization and the success of performed tasks. (ADP 6-22)

The changing battlefield environment requires great flexibility in decision-making. For many leaders, this means leaving from proven methods of operation and consistently searching for new solutions. In military circles, the idea that commanders should go beyond of the horizon of usual patterns and uncritically repeated solutions is gaining more and more appreciation.[4] So far, it is believed that the command process[5], i.e. what the decision-making process in the army actually is, is only the individual responsibility of the commander.

Meanwhile, high-quality decision-making is difficult to achieve alone. Teamwork plays a significant role here. It is a matter of diversified knowledge, skills, experience and cognitive processes of all team members. Responsibility for the decision should be divided equally between the commander and the team. It is the commander who ultimately makes and communicates the decisions for which he is formally responsible, but the team should also participate in developing ideas and ways to implement them. Effective commanders take into account not only their experience, but also the experience of their soldiers when making decisions. (ADP 6-0) Already in the 1970s it was written that: "*It is very important to notice the significant influence of subordinates on the work, behavior and conduct of the commander. Subordinates not only provide important information to the commander (staff), but also express the social opinion of the collective, convey conclusions, ideas, and new solutions. They react to the influence of their superior, to other stimuli from the environment, and they reveal these reactions in their statements, behavior and actions*. (Cendrowski, Swebocki , 1973)

Unfortunately, the army, due to its hierarchical structure, is not a place that favors taking into account the opinions of subordinates. In such cultures and environments, due to the type of activities performed in specific situations, the autocratic management style will be more desirable because it will be the most effective in a given specific situation. On the other hand, even in crisis situations, outstanding leaders find time to listen to the opinions of their subordinates, realizing that a person can provide a lot of important information in one minute. (Adair, 2007) However, taking advantage of the team's work and using its potential cannot be perceived as a sign of the commander's weakness, and unfortunately, this is how it is perceived in organizations characterized by a high power index. (Gałązkowski, Tomaszewski, 2015) When commanders admit they don't know something, they allow team members to admit they don't know something either. Moreover, a leader admitting that he doesn't know something also allows the team or its members to admit that they know something. (Marquet

---

[4] *Koncepcja. Model kształtowania kompetencji przywódczych w Siłach Zbrojnych RP*. Centrum Doktryn i Szkolenia Sił Zbrojnych. Bydgoszcz 2023, p. 5.
[5] *Regulamin Działań Taktycznych Pododdziałów Wojsk Pancernych i Zmechanizowanych*. DWLąd. Warszawa 2009, p. 228.

2021) However, until there is an increase in awareness among soldiers in this respect, unfortunately, the implementation of CRM will be much more difficult. The training pays particular attention to the ability to develop optimal decisions in a collegial manner, especially in unusual, complex and ambiguous situations. (Makarowski, Smolicz, 2016) However, at the core of hierarchical organizations is the belief that participative management is stupid. (Laloux, 2016)

An example of an army that allows all soldiers to participate in the decision-making process on a semi-formal basis is the Israel Defense Forces. Such practices result from the belief that strategic commanders cannot introduce new strategies without agreeing them with the frontline soldiers who will implement these strategies on the battlefield. On the other hand, privates and non-commissioned officers have an official duty to express their opinions on the plans developed by their superiors. Thanks to two-way communication, it is possible to develop high-quality decisions. (Zygo, 2019)

The third competence area in which CRM-compliant training should be recommended is communication. In a hierarchical structure such as the army, proper communication has a significant impact on the process of formulating tasks, planning, agreeing and coordinating activities, maintaining communication, organizing work and monitoring. Therefore, it is important that the communication process is as effective as possible. (Lipińska, 2016)

However, as Z. Ciekanowski and W. Załoga point out in a study conducted among the command staff of junior officers of the Land Forces in the Polish Armed Forces, they do not have sufficient skills in the field of social competences. In terms of communication skills, the expected level index was 4.71, while the declared level index was only 3.72. (Ciekanowski, Załoga, 2020)

In turn, G. Predel, in a study conducted in 2014 among soldiers performing command functions, writes that commanders: "*attach less importance to their non-verbal messages and checking whether they are well understood.*"

What is equally important in the aspect of communication and a hierarchical organization such as the army is that in an organization based on traditional hierarchy, it is more difficult to easily flow information. (Mrówka, 2009) An example here is the study conducted by N. Bienefeld and G. Grote. It analyzed the reasons for not speaking up on safety-related issues among 1,751 airline crew and cockpit members. It was found that the hierarchy of power was a factor that influenced the reluctance of lower-ranking airline crew members to express their opinions. For example, 11% of junior officers did not express their opinions when necessary due to the power hierarchy. Equally important, the greater the difference in power, the stronger this effect was. As many as 40% of stewardesses and stewards cited the hierarchy of authority as a factor that prevented them from expressing their own opinions. In turn, there was not a single case where the captain remained silent due to the hierarchy. Not a single captain chose to remain silent for fear of punishment, although this factor played an important role in the case of 81% of stewardesses and stewards. The reason for this disproportion is simple: punishments are meted out down the hierarchy, not up. The hierarchy of power gets in the way of proper communication. (Bienefeld, Grote, 2012) The biggest problem was considered to be the so-called captainosis, i.e. the lack of assertiveness of first

officers and the authoritarianism of experienced captains. Those lower in rank were afraid to question the commander's authority, even when he made a mistake that turned out to have tragic consequences. (Danecka-Łatka, 2011)

Due to the fact that the army is a hierarchical organization, the same problem occurs in it. Moreover, as the research presented above has shown, the steeper the hierarchy, the more difficult it is to pass information that may be crucial up the chain of command.

A. Edmondson, conducting research, showed that in teams in which the authority hierarchy is flattened, mutual communication is observed more often, errors are better corrected, and learning is greater. At the same time, he emphasizes that leaders have a key influence in creating such an environment. (Edmondson, 2002)

CRM elements that increase the level of communication competences raise the issue of hierarchy and its importance in communication. They realize the role of assertiveness and even the need to question the superior's orders when he makes wrong decisions. In addition, such training is focused on the ability to listen to other team members, body language, clarity of messages and communication using the so-called closed loop, i.e. a method of communication in which the message received by the recipient is confirmed to the sender (making sure that the information has reached the interlocutor and has been understood). This is especially important in situations where we work under stress and our perception is very limited. This promotes the creation of a shared mental model and situational awareness. CRM in the context of communication also indicates the importance of commanders conducting briefings in which they involve all team members.

The effective functioning of the commanding staff of officers in social relations in the organizational units of the Polish Armed Forces is based primarily on cooperation with people and the implementation of tasks with the help of people. The growing role of social competences in the professional career of officers is therefore necessary for effective functioning in professional Armed Forces, adapted to Allied requirements. The commanding staff of officers must cooperate closely with soldiers to achieve a synergy effect in the process of carrying out official tasks. (Załoga, Nowicka, Ciekanowski, 2018) A modern commander faces challenges that require appropriate skills in contacting the environment, the ability to understand the perspective of subordinates, and dealing with non-standard, often conflict situations that do not have one simple solution.

A commander's high professional effectiveness depends on, among other things, interpersonal effectiveness.[6] Research has shown that activities aimed at managing the social competences of officers at junior levels in the command staff of the Land Forces of the Polish Armed Forces are ineffective. The management of social competences should focus on their full use in the process of performing duties in a given job position.[7]

Building a solidly cooperating and understanding team is the key to increasing the team's capabilities and achievements, by using the collective potential of qualifications and

---

[6] Ibidem, p. 210.
[7] Ibidem, p. 212.

skills, mental and physical resources, and, above all, through effective work organization, communication and distribution of information. (Makarowski, Smolicz, 2016)

In this aspect, creating a positive atmosphere of service is important. Performing difficult tasks by soldiers puts their psyche to a severe test. Therefore, optimism and a cheerful mood encourage soldiers, protecting them from longing and distracting their thoughts from the atrocities of war. Moreover, it is important that none of the soldiers in the subunit, especially if it is to constitute a coherent and well-coordinated combat unit, should not be the subject of humiliating jokes. In turn, in terms of clarity in understanding the task by all team members, the content of orders often requires explanations and comments are necessary to make the orders more understandable in relation to individual tasks. (Cendrowski, Swebocki, 1973)

Thus, in research conducted mainly among Polish soldiers participating in the mission in Afghanistan and Iraq, A. Zygo distinguished ineffective command practices used by tactical level commanders, which are of key importance in the context of situational awareness, decision-making, communication and team cooperation. The researcher proved that commanders did not conduct briefings or carried them out carelessly. As a consequence of this behavior, soldiers did not receive full information about the task being performed. On the other hand, it happened that they provided too extensive information, overloading their soldiers with information. There were commanders who did not coordinate combat activities due to lack of situational awareness, and also did not show contact with soldiers, which was manifested by the inability to answer questions and provide instructions to their subordinates. Moreover, the author distinguished other ineffective command practices. They seem to have a lot in common with the attitudes distinguished by ADM (authoritarian, impulsive, risk-taking, superman, resignation) that influence decision-making. The author distinguished: lack of flexibility (authoritarian - KR), authoritarian command system (authoritarian - KR), hyperactivity, lack of self-control (impulsive - KR), recklessness during combat operations (superman, risk-taking - KR) and passivity shown on the battlefield (resignation). – KR). These similarities indicate the possibility of examining the occurrence of attitudes distinguished in ADM and present in commanders of land forces in order to create the foundation necessary to implement training based on CRM principles.

In turn, as indicated in the aspect of communication and cooperation, commanders gave irrelevant or unclear orders, did not listen to their soldiers, demotivated them with intimidating information, and even insulted them. (Zygo, 2019)

CRM elements that increase competences in team building and management raise issues related to preventing and resolving conflicts, ensuring comfort of cooperation among all team members (creating an appropriate atmosphere), as well as human ego, which is often the cause of lack of cooperation between people. Leadership also plays a major role in training. Commanders are made aware of how their attitudes, speech and actions affect others. Ultimately, training helps standardize human behavior, enabling a synergy effect to be achieved.

CRM indicates directions for improvement, including fewer errors caused by the human factor, but also efficiency, which concerns the functioning of individuals, teams and

entire organizations. What is extremely important, they also raise the level of human consciousness, necessary to move to the next stage of human development. (Laloux, 2016)

SUMMARY

This article discusses only a small part of the possibilities of using and adapting Crew Resource Management (CRM) training in land forces. The author's intention was to interest the problem of people involved in the broadly understood training of soldiers, but also of the soldiers themselves. The practice of the near-universal CRM concept by leading airlines has saved thousands of lives. Similarly, in other areas, the introduction of this type of training has gained recognition around the world and more and more organizations are interested in this topic.

The presented study was of a pilot and theoretical nature. However, the thesis was confirmed that the implementation of CRM tools in the training of land forces may contribute to improving the quality of operations, which will ultimately have a significant impact on the safety and effectiveness of the tasks performed by soldiers. Therefore, a broader identification of areas in which the use of CRM tools would be of key importance also among land forces soldiers seems justified. Therefore, a research gap for future empirical research was also identified, in which the effectiveness of individual CRM training solutions in shaping and developing competencies necessary for soldiers and commanders of land forces should be verified.

REFERENCES

ADAIR, J. 2007. Rozwijanie umiejętności przywódczych. Wolters Kluwer Polska. Warszawa 2007, p.30.

ADP 6-22. Army Leadership and the Profession. Army Doctrine Publication. July 2019. Headquarters, Department of the Army, p. 8-7.

ADP 6-0. Mission Command. Command and Control of Army Forces. Army Doctrine Publication. July 2019. Headquarters, Department of the Army, p. 2-5.

BIENEFELD, N., GROTE, G. 2012. *Silence That May Kill. When Aircrew members Don't speak Up and Why*. Aviation Psychology and Applied Human Factors 2(1) 2012, p. 6. https://doi.org/10.1027/2192-0923/a000021

DANECKA-ŁATKA, E. 2011. Zarządzanie zasobami załogi (CRM) w dobie globalizacji rynków pracy. Problemy Zarządzania, vol. 9, nr 4 (34) 2011, p.98.

CIEKANOWSKI, Z., ZAŁOGA, W. 2020. *Kompetencje społeczne kadry kierowniczej w organizacji zhierarchizowanej.* Wojskowa Akademia Techniczna. Warszawa 2020, p.172.

CENDROWSKI, J., SWEBOCKI, S. 1973. Psychologia walki i dowodzenia. Wydawnictwo Ministerstwa Obrony Narodowej. Warszawa 1973, p. 192-193.; 108-109

CRUZ, E. E. 1996. Fratricide in air-land operations. Institutional Archive of the Naval Postgraduate School. California, USA 1996, p. 5.

EDMONDSON, AC 2002. Managing the risk of learning: Psychological safety in work teams. International Handbook of Organizational Teamwork. London 2002, p. 20. https://doi.org/10.1002/9780470696712.ch13

GAŁĄZKOWSKI, R., TOMASZEWSKI, M. 2015. Bezpieczeństwo lotów a szkolenie w zakresie zarządzania zasobami załogi w zarobkowym przewozie lotniczym. Zeszyty Naukowe AON nr 2(99) 2015, p. 110-116.

GRENDA, B., TURZYŃSKA, H. 2016. Czynnik ludzki i jego wpływ na bezpieczeństwo lotów. Wydawnictwo Akademii Sztuki Wojennej. Warszawa 2016, p 71.

HILLER, J. H., WAMPLER, R. L. 2001. Assessing and Measuring Training Performance Effectiveness. United States Army Research Institute for the Behavioral and Social Sciences. USA 2001, p.18. https://doi.org/10.21236/ADA396424

CHMIELEWSKI, M. 2018. Zastosowanie metod wnioskowania w dziedzinie wojskowego wspomagania decyzji i identyfikacji sytuacji kryzysowych. Wojskowa Akademia Techniczna 2008, p. 1.

ILKÓW, A. 2011. Czynnik ludzki w systemie bezpieczeństwa ruchu lotniczego. Prace Instytutu Lotnictwa 211. Warszawa 2011, p.99

ISZKOWSKA, W. 2018. *Zarządzanie zasobami załogi, czyli jak uniknąć błędów zarządczych*. Zeszyty Naukowe Politechniki Łódzkiej Nr 1222. Lodz 2018, p. 69.

LALOUX, F. Pracować Inaczej. Wydawnictwo Studio EMKA. Warszawa 2016, p. 32.

LISZKOWSKA, W. 2018. Zarządzanie zasobami załogi, czyli jak uniknąć błędów zarządczych. Zeszyty Naukowe Politechniki Łódzkiej Nr 1222. Lodz 2018, p. 73.

LIPIŃSKA, J. 2016. *Komunikacja w wojsku w sytuacjach niepewności*. Doctrina. Studia Społeczno Polityczne 13/2016, p. 101.

LOWE, CH. 2008. *A Human Factors Perspective on Safety Management Systems*. Bristol, United Kingdom 2008, p. 2. https://doi.org/10.1007/978-1-84800-100-8_9

ŁYDKA, W. 2015. *Doskonalenie kompetencji przywódczych oficerów*, Akademia Obrony Narodowej, Warszawa 2015, p. 56.

MAKAROWSKI, R., SMOLICZ, T. 2016. Czynnik ludzki w procesie szkolenia lotniczego. Wydawnictwo Wyższej Szkoły Oficerskiej Sił Powietrznych. Dęblin 2016, p. 181; 208.

MARQUET LD 2021. Język Przywództwa. OSMPOWER. Warszawa 2021, p. 152.; 248

MRÓWKA, R. 2009. *Przywództwo w organizacjach. Analiza najlepszych praktyk*. Wolters Kluwer Polska. Warszawa 2009, p. 56; 84.

O'CONNOR, P., FLIN, R. 2003. Crew Resource management training for offshore oil production teams. Safety Science v. 41(7), United Kingdom 2003, p. 591. https://doi.org/10.1016/S0925-7535(02)00013-9

OKRAY, R. LUBNAU, T. 2004. Crew Resource management for the Fire Service. PennWell. USA 2003.

PIOTROWSKI, A. 2012. *Psychospołeczne konsekwencje stresu operacyjno-bojowego*. Zeszyty Naukowe WSOWL nr 2(164) 2012, pp. 134-135.

REED, G. E., BULLIS, R. C. 2009. The Impact of Destructive Leadership on Senior Military Officers and Civilian Employees. Armed Forces & Society v.36 (1). October 2009, p. 12. https://doi.org/10.1177/0095327X09334994

REGAN, G. 1992. *Błędy militarne*. Vasco International. Warsaw 1992, p.1.

ROOP, S.S., MORGAN, C.A., KYTE, T.B., ARTHUR, W., VILLADO, Jr. AJ, BENEIGH T. 2007. Rail Crew Resource Management(CRM): The business case for CRM Training in the Railroad Industry, US Department of Transportation Federal Railroad Administration. Springfield, USA 2007.

SHEPPARD, F., WILLIAMS, M., KLEIN VR 2013. TeamSTEPPS and patient safety in healthcare. Journal of Healthcare Risk Management v.32(3). USA 2013, p. 6. https://doi.org/10.1002/jhrm.21099

SMOLICZ, T., MAKAROWSKI, P., MAKAROWSKI, R. 2020. Czynnik ludzki w lotnictwie. Podręcznik pilota. AKAM. Gdańsk 2020, p. 203.; p.276-277.

WAHL, AM, KONGSVIK T. 2018. *Crew Resource Management training in the maritime industry: a literature review*. WMU Journal of Maritime Affairs. Norway 2018, p. 378. https://doi.org/10.1007/s13437-018-0150-7

WRZESIŃSKA, J. 2012. *Czynnik ludzki jako determinanta występowania wypadków przy pracy.* Bezpieczeństwo zdrowia publicznego w zagrożeniach środowiskowych. Postępy metodologii badań. Garmond Oficyna Wydawnicza. Poznań 2012, p. 574.

ZAŁOGA, W., NOWICKA, J., CIEKANOWSKI, Z. 2018. Kompetencje społeczne kadry dowódczej oficerów Sił Zbrojnych RP w systemie bezpieczeństwa militarnego Polski. Zeszyty Naukowe Wyższej Szkoły Zarządzania Ochroną Pracy w Katowicach Nr 1(14)/2018, p. 208.

ZYGO, A. 2019. Przywództwo wojskowe w warunkach bojowych, Wydawnictwo Adam Marszałek. Toruń 2019, p. 301-302.; p. 269-277.

Kamil RYGIEL