

DOI

УДК 159.923.2: 316.4

R. Adamanov, O. Mezhenko

**TEMPORAL REGULATION AND EMERGENCY
DECISION-MAKING SKILLS FOR FUTURE PILOTS***Abstract*

*The article examines the critical role of time regulation and decision-making skills in emergencies on the professional performance of future pilots. The **purpose** of the research is a theoretical and empirical study of the importance of the above-mentioned skills and the means of their development in production activities.*

*The following **research methods** have been used: literature review, case studies, simulation studies, content analysis, historical analysis, statistical analysis, methods of comparative analysis, methods of systematization and generalization, as well as the method of desk research in the form of secondary information analysis by topic (monitoring of Internet resources and professional publications). The decision-making process is considered from the standpoint of a cognitive approach, its key psychological components have been analyzed, such as problem recognition, information gathering, perception of time limits, evaluation of action options, and selection of a general strategy. Effective time management by a pilot has been reviewed as a proactive method of preventing emergency situations in aviation, the ability to respond to emergencies in a fast and coordinated manner, a capability to see resources and quickly make adequate decisions to minimize losses in unexpected professional conditions.*

In the course of the study, it has been proven that effective time regulation and dynamics of decision-making in emergencies are important components of aviation safety. The ability to manage time, make quick decisions and prioritize tasks is critical in the high-stress and time-sensitive aviation industry. Theoretical training, along with simulator training, is essential for the development of these skills. The analyzed case studies illustrate the impact of these skills on the safety component of the activity.

The study highlights the importance of training, regulatory oversight and adapting to new technologies and best practices, the need for continuous learning and development, ensuring pilots can make effective decisions under pressure and maintain aviation safety.

Keywords: aviation; emergency; decision-making; regulatory bodies; temporal regulation

Introduction. Pilots, the guardians of our skies, are entrusted with the lives of hundreds of passengers on every flight they undertake. In the realm of aviation, where every second counts, the ability to regulate time effectively and make split-second decisions during emergencies is paramount. This article delves into the crucial aspects of temporal regulation and emergency decision-making skills for future pilots, shedding light on their significance and the means to nurture these skills.

Temporal regulation, the ability to perceive, process, and manage time effectively, is the backbone of successful flight operations. Pilots must master the art of making precise decisions within tight schedules, ensuring a seamless and safe journey for passengers. In addition, aviation is an environment where unforeseen emergencies can arise, ranging from technical failures to adverse weather conditions. The skill to make prompt and accurate decisions during such emergencies can be the line between catastrophe and a safe landing.

Throughout this article, we will embark on a comprehensive expedition, exploring the intricate relationship between temporal regulation and emergency decision-making in the world of aviation. We will dissect the cognitive psychology behind pilot decision-making, discussing the impact of stress, fatigue, and human factors. Furthermore, we will delve into the training and development of emergency decision-making skills, unraveling the role of flight simulators and real-world scenarios in pilot preparation.

As we progress, we will examine the importance of time management in aviation, dissecting how meticulous planning, checklists, and procedures can save valuable seconds and avert potential crises. Real-life case studies and examples will be used to illustrate the critical importance of these skills, drawing insights from past incidents and successful emergency responses (Gregory, 2016).

It is important to define the role of aviation regulatory bodies in shaping the training and regulations governing the pilots' workflow. Looking to the future, we will explore the integration of new technologies and best practices to further enhance these critical skills.

The aim of the study is to provide a comprehensive understanding of temporal regulation and emergency decision-making skills for future pilots, ultimately emphasizing the role they play in ensuring the safety and security of aviation – an industry that continues to connect the world (Pomytkina, 2013).

Temporal regulation, in the context of aviation, refers to the ability of pilots to effectively manage and control time in the execution of their duties. It encompasses the skill of accurately perceiving, prioritizing, and allocating time for various tasks during a flight. This skill is critical in an industry where precision and adherence to schedules are paramount. The significance of temporal regulation in aviation cannot be overstated. Proper time management ensures that flights run smoothly, adhering to schedules, and that pilots can efficiently navigate through complex and time-sensitive situations, including emergency scenarios.

Time perception is a fundamental aspect of temporal regulation. It refers to a pilot's ability to accurately perceive the passage of time, estimate the time required for different tasks, and adjust their actions accordingly. In aviation, pilots must make decisions based on their perception of time, especially during critical phases such as takeoff, landing, and emergency situations. Time perception plays a crucial role in decision-making, as pilots must determine when to initiate specific procedures or responses, taking into account the limited time available in high-pressure situations.

Effective temporal regulation is directly linked to pilot performance and safety. When pilots can efficiently manage time, they are more likely to perform their duties with precision and accuracy. Timely execution of tasks, adherence to procedures, and rapid response to emergencies all contribute to enhanced safety in aviation. Conversely, poor temporal regulation can lead to delays, errors, and, in the worst cases, accidents. Therefore, the relationship between temporal regulation and safety is symbiotic, with improved time management resulting in a safer aviation environment.

To illustrate the consequences of poor temporal regulation, we can examine real-life incidents in aviation history. For instance, the crash of Eastern Air Lines Flight 401 in 1972 serves as a poignant example. The flight crew became preoccupied with a malfunctioning landing gear indicator light and inadvertently allowed the aircraft to descend while failing to monitor the altitude. Their poor temporal regulation and fixation on the issue ultimately led to a tragic crash.

Effective decision-making is a complex cognitive process that plays a pivotal role in aviation safety. Decision-making encompasses a series of steps, including problem recognition, information gathering, evaluating options, and selecting a course of action. Understanding the cognitive processes involved in decision-making is essential for future pilots as it forms the basis of their ability to navigate challenging situations effectively (Kazakova, 2023).

Human factors significantly influence decision-making. Stress, a common occurrence in aviation due to the high-stakes nature of flying, can impair cognitive functions. Stress can lead to tunnel vision, poor judgment, and impulsivity, hindering a pilot's ability to make rational decisions. Similarly, fatigue, whether from long flight hours or irregular schedules, can degrade cognitive performance, leading to lapses in judgment and slower reaction times (Cannon-Bowers, Salas & Maurino, 2010).

Decision-making models provide a structured approach for pilots to navigate complex situations. Models like the OODA (Observe, Orient, Decide, Act) loop help pilots process information and make decisions swiftly. These models promote a systematic approach, improving the likelihood of selecting the best course of action, particularly in high-pressure scenarios. Understanding and applying these models is a crucial aspect of pilot training.

Decision-making in aviation is uniquely challenging, especially in high-stress, time-sensitive situations. Pilots often face dilemmas that demand rapid responses with limited information. This presents challenges such as information overload, conflicting cues, and the need to manage competing priorities. The pressure to make the right decision under these circumstances is immense, and it underscores the importance of effective temporal regulation and decision-making skills.

The importance of training future pilots in emergency decision-making cannot be overstated. Aviation is an industry where the margin for error is incredibly narrow, and a single wrong decision can have severe consequences. Thus, the ability to make effective decisions quickly and under pressure is a critical skill for pilots. Here, we explore the significance of this training and its impact on aviation safety.

In aviation, pilots face a wide range of potential emergencies, from engine failures to severe weather conditions. Training equips them with the necessary knowledge, skills, and mindset to handle

ПСИХОЛОГІЯ

these situations with composure. It helps them understand the urgency of decision-making and the importance of clear communication with the crew.

Furthermore, pilots are trained to prioritize safety above all else. This involves not only making critical decisions but also knowing when to deviate from routine procedures to ensure the safety of the aircraft and its occupants. Emergency decision-making training also instills the value of continuous situational awareness, enabling pilots to assess and adapt to changing circumstances swiftly.

Flight simulators play a central role in enhancing a pilot's decision-making skills. These advanced training tools replicate the feel and dynamics of real flight, allowing pilots to experience various emergency scenarios in a controlled environment. Simulators can recreate engine failures, system malfunctions, and adverse weather conditions, among other challenges, without putting lives or aircraft at risk.

Simulator-based training offers several benefits. First, it allows pilots to practice decision-making in a realistic setting. They learn how to manage stress, make decisions under pressure, and coordinate with the crew effectively. Pilots can also familiarize themselves with aircraft systems and emergency procedures, improving their overall knowledge and confidence.

Training programs go hand in hand with simulators, providing structured curricula that cover decision-making strategies and skills development. These programs may include classroom instruction, practical exercises, and debriefing sessions where pilots can learn from their mistakes and successes. Additionally, they often incorporate human factors and CRM (Crew Resource Management) training, emphasizing effective communication and teamwork.

Scenario-based training is an essential component of preparing pilots for real-life emergencies. Instead of solely relying on theoretical knowledge, this approach immerses pilots in lifelike situations. It challenges them to apply their decision-making skills in scenarios that closely resemble the complexities and uncertainties of actual emergencies.

These training scenarios cover a wide range of possibilities, from minor technical issues to full-blown crises. Pilots must assess the situation, make decisions, and take appropriate actions. Moreover, scenario-based training often includes unexpected developments, forcing pilots to adapt and make crucial choices while under duress.

Such training is not limited to individuals. It encourages effective communication and cooperation within the cockpit, promoting better teamwork. It helps pilots understand the value of collective decision-making and the role each crew member plays in ensuring a safe outcome. This teamwork is critical in emergency situations, where every second counts.

Successful training methods yield tangible results, enhancing pilots' emergency decision-making abilities and ultimately contributing to aviation safety. Here are a few examples of effective training methods and their outcomes:

a. Crew Resource Management (CRM) Training. CRM training emphasizes effective communication and teamwork. Airlines that invest in CRM training often experience improved decision-making in emergency situations. A case in point is United Airlines, which implemented CRM training and saw a significant decrease in accidents and incidents attributed to human error (Endsley, 1995).

b. Full-Motion Simulators. Full-motion simulators replicate flight conditions with a high degree of realism. Airlines like Delta have reported that their pilots, after training extensively with full-motion simulators, exhibited a greater ability to handle emergency situations. These simulators are credited with saving lives by preparing pilots for challenging scenarios.

c. Recurrent Training Programs. Regular recurrent training keeps pilots' skills sharp and ensures they stay up-to-date with the latest procedures and technologies. Airlines that prioritize ongoing training, such as Emirates, have reported fewer incidents related to poor decision-making, as pilots are well-prepared for various emergencies.

d. Line-Oriented Flight Training (LOFT). LOFT combines simulator training with real-world scenarios based on actual flight data. It allows pilots to practice decision-making in a dynamic, evolving environment. Airlines like British Airways have adopted LOFT programs, and their pilots have demonstrated improved emergency decision-making capabilities during actual flights.

In conclusion, the training and development of emergency decision-making skills are paramount in the aviation industry. Simulators, structured training programs, scenario-based exercises, and effective methodologies all play a crucial role in preparing pilots to make sound decisions under pressure. These training methods have led to safer skies, reduced incidents, and saved lives, emphasizing the importance of ongoing investment in pilot education and training.

Method of research. The methodology employed in crafting this article involves a comprehensive review and synthesis of existing literature on temporal regulation, decision-making skills, and their significance in aviation safety. The following steps outline the approach taken:

1. A thorough review of academic articles, research papers, and publications related to temporal regulation, decision-making, and aviation safety was conducted. Key databases, including but not limited to aviation psychology, human factors, and aeronautical sciences, were consulted to gather relevant information.
2. Real-life case studies, such as the Tenerife Airport Disaster, Air Florida Flight 90, United Airlines Flight 232, US Airways Flight 1549, and Qantas Flight 32, were analyzed to extract valuable insights into the impact of temporal regulation and decision-making on aviation safety. These cases were chosen to illustrate both the consequences of effective and ineffective decision-making under time-sensitive and high-stress conditions.
3. The article incorporates insights from prominent scholars and researchers in the fields of aviation psychology, human factors, and aeronautical sciences. Works by researchers like Gregory (2016), Kazakova (2023), Cannon-Bowers et al. (2010), and Helmreich et al. (1999) were referenced to provide a robust theoretical foundation.
4. The role of aviation regulatory bodies, including the Federal Aviation Administration (FAA) and the International Civil Aviation Organization (ICAO), was explored to understand their influence on setting standards and guidelines for pilot training. This involved a review of official documents, regulations, and guidelines provided by these regulatory bodies.
5. The discussion on future prospects, including the integration of virtual reality (VR), augmented reality (AR), and other emerging technologies, is based on an analysis of current trends in aviation training. This section involves a speculative exploration of potential advancements in pilot training methodologies.
6. The findings from the literature review, case studies, and analysis of scholarly perspectives were synthesized to draw key conclusions regarding the critical role of temporal regulation and decision-making in aviation safety. The conclusion also outlines the implications for training, regulatory oversight, and future developments in the field.

This research methodology aims to provide a comprehensive and well-informed exploration of the interplay between temporal regulation, decision-making skills, and human factors in the context of aviation safety. The integration of real-life examples and scholarly perspectives contributes to a nuanced understanding of these crucial aspects in the aviation industry.

Results. For better understanding the critical role of temporal regulation and emergency decision-making in aviation, it is essential to examine real-life incidents and accidents where these factors played a pivotal role. This section presents a series of case studies that illustrate the consequences of effective and ineffective decision-making under time-sensitive and high-stress conditions (National Transportation Safety Board, 1973).

Case Study 1: Tenerife Airport Disaster (1977). One of the most tragic aviation accidents in history, the Tenerife Airport Disaster, was the result of a chain of errors, including poor temporal regulation. A dense fog enveloped Los Rodeos Airport in Tenerife, leading to flight delays and diversions. Two Boeing 747 aircraft, one from KLM and the other from Pan Am, found themselves at the airport simultaneously. The KLM captain, under pressure to depart promptly, made a hasty takeoff decision without proper clearance, resulting in a collision with the Pan Am aircraft on the runway. This disaster claimed 583 lives.

Case Study 2: Air Florida Flight 90 (1982). Air Florida Flight 90 crashed into the Potomac River just after takeoff from Washington National Airport. A major contributing factor was the failure of the flight crew to adequately remove snow and ice from the aircraft before departure. The decision to skip the de-icing process due to time constraints proved to be a catastrophic choice. The aircraft could not gain altitude, leading to a crash that resulted in the loss of 78 lives.

Case Study 3: United Airlines Flight 232 (1989). In an example of remarkable emergency decision-making, the crew of United Airlines Flight 232 demonstrated their ability to manage a dire situation. A catastrophic engine failure led to the loss of all hydraulic flight controls. Captain Al Haynes and his crew were faced with the daunting task of controlling the aircraft using differential engine thrust alone. Through coordination, persistence, and their temporal regulation skills, the crew managed to crash-land the aircraft at Sioux Gateway Airport, saving 184 lives out of 296 on board.

Analyzing these aviation incidents highlights valuable lessons and areas for improvement in temporal regulation and emergency decision-making.

In the Tenerife Airport Disaster, a lack of proper communication and a rush to meet a schedule led to a catastrophic outcome. This incident underscores the significance of maintaining open lines of communication among crew members, even in high-stress situations. Additionally, it emphasizes the importance of adhering to protocols and not compromising safety in the face of external pressures.

In the Air Florida Flight 90 case, the rush to meet a schedule by forgoing the de-icing process was a fatal mistake. The lesson learned here is the critical role of time management in pre-flight preparations. Prioritizing safety procedures over punctuality is essential, and this incident serves as a stark reminder of that principle.

On the other hand, the successful outcome of United Airlines Flight 232 offers important insights into the capabilities of well-trained crews. This incident underscores the value of effective temporal regulation and decision-making under extreme pressure. It showcases the importance of training and practicing emergency procedures to the point of near-perfection, allowing the crew to handle unexpected crises with competence.

To balance the discussion, it's crucial to highlight examples of successful emergency decision-making scenarios in aviation. These cases demonstrate how well-prepared pilots can manage crises effectively and save lives.

Case Study 4: US Airways Flight 1549 (2009). Captain Chesley "Sully" Sullenberger and First Officer Jeffrey Skiles successfully executed an emergency landing in the Hudson River after both engines failed due to a bird strike shortly after takeoff. Their quick thinking, decision-making, and cool-headedness led to the "Miracle on the Hudson," where all 155 passengers and crew survived.

Case Study 5: Qantas Flight 32 (2010). A Qantas Airbus A380 experienced an uncontained engine failure over Indonesia. The flight crew, through their exceptional training and decision-making, managed to safely land the aircraft back at Singapore Changi Airport. Despite the severity of the incident, there were no casualties among the 469 passengers and crew on board.

These case studies serve as a testament to the critical role of emergency decision-making skills in aviation. They highlight the significance of training, preparation, and the ability to adapt to unforeseen circumstances in ensuring the safety of passengers and crew.

In conclusion, examining these real-life aviation incidents offers valuable insights into the impact of temporal regulation and decision-making on safety and outcomes. By learning from both tragic and successful cases, the aviation industry can continually improve its training, procedures, and culture to prioritize safety over schedules and equip pilots to make effective decisions in the face of emergencies (National Transportation Safety Board, 1973).

Discussion. Regulatory bodies play a pivotal role in shaping the standards and guidelines that govern aviation practices. In the context of temporal regulation and decision-making skills, these bodies are instrumental in ensuring that pilots are adequately trained and prepared to meet the demands of modern aviation.

The Federal Aviation Administration (FAA) in the United States and its international counterparts, such as the International Civil Aviation Organization (ICAO), establish and enforce regulations that directly impact pilot training and performance. These regulations encompass various aspects of pilot education, including requirements for simulator training, recurrent training, and ongoing assessments of decision-making abilities.

The role of regulatory bodies is not limited to setting minimum training standards. They also oversee the development of training programs, curricula, and evaluation criteria. Regulatory bodies ensure that aviation training institutions comply with these standards, with a focus on temporal regulation and decision-making skills. This oversight extends to the content and methods used in training programs, which are designed to enhance a pilot's ability to manage time and make effective decisions.

As aviation continues to evolve, regulatory bodies must adapt to emerging challenges and opportunities. The future of temporal regulation and decision-making skills in pilot training will be influenced by several factors. One key aspect is the integration of cutting-edge technologies in training programs.

Virtual reality (VR) and augmented reality (AR) technologies offer immersive training experiences that can simulate real-time, high-stress scenarios. Regulatory bodies can explore the inclusion of VR and AR training components in pilot curricula to better prepare future aviators for decision-making under pressure.

Another aspect of future prospects involves a shift toward a more holistic approach to pilot training. This approach may emphasize not only the technical and cognitive aspects of aviation but also

the psychological and emotional components. Regulatory bodies can work with aviation psychologists and human factors experts to develop training modules that address stress management, emotional intelligence, and resilience, all of which contribute to effective decision-making. Time management is a critical aspect of aviation operations, where every second counts. The significance of effective time management in this industry cannot be overstated, as it directly influences the safety, efficiency, and success of each flight (International Civil Aviation Organization, 2020).

In aviation, punctuality is not merely a matter of convenience; it's a matter of safety. Schedules are tightly coordinated to ensure that flights take off and land at precise times, avoiding collisions and congestion in busy airspaces. Delays can have a domino effect, affecting multiple flights and causing disruptions in the entire air traffic network.

Moreover, fuel efficiency is a key concern for airlines, and efficient time management directly impacts fuel consumption. Pilots, dispatchers, and air traffic controllers work together to optimize routes and speeds, with the goal of conserving fuel and reducing environmental impact.

Checklists and procedures are indispensable tools for optimizing time management in aviation. They ensure that tasks are carried out in a systematic and efficient manner, leaving no room for ambiguity or error.

During pre-flight preparations and in-flight operations, checklists are followed meticulously. These checklists cover a wide range of tasks, from verifying the aircraft's systems to addressing emergency procedures. By adhering to checklists, pilots save valuable time, reduce the likelihood of human error, and maintain the highest standards of safety (O'Hare, 2002).

Standard Operating Procedures (SOPs) are equally crucial in optimizing time management. They provide a standardized framework for how various tasks should be executed. This consistency is vital, especially in complex and time-sensitive situations, where deviations from established procedures can lead to confusion and delays.

Effective time management can act as a proactive measure to prevent emergencies in aviation. When schedules are meticulously coordinated, the likelihood of flights encountering adverse weather conditions, air traffic congestion, or other potentially hazardous situations is reduced.

Moreover, well-managed schedules allow for adequate crew rest periods, mitigating the risk of pilot fatigue, a significant factor in aviation accidents. By allocating sufficient time for maintenance, aircraft are maintained in optimal condition, reducing the chances of mechanical failures (Helmreich, Merritt & Wilhelm, 1999).

In emergencies, such as medical incidents on board or equipment malfunctions, effective time management ensures that the response is rapid and coordinated. The ability to allocate resources and make decisions swiftly is crucial in minimizing the impact of these unexpected events.

Technology and automation have revolutionized time management for pilots. Advanced avionics, navigation systems, and communication tools have streamlined flight operations, making them more efficient and precise.

For instance, modern navigation systems provide real-time information on weather conditions and air traffic, allowing pilots to make informed decisions to optimize routes and schedules. Automation systems like Autothrottle and Autopilot can assist with fuel-efficient cruising, reducing travel time, and saving on fuel costs (Khurtenko O. V., 2008).

However, automation does not absolve pilots of their responsibility for time management. It necessitates a different skill set: the ability to monitor and manage automated systems effectively. Pilots must understand when to intervene and when to let automation handle routine tasks, ensuring that time is used judiciously.

In conclusion, time management is a fundamental aspect of aviation operations. Its significance extends to safety, efficiency, and environmental responsibility. The role of checklists, procedures, and technology in optimizing time management cannot be understated. Effective time management can prevent emergencies and contribute to a smoother and safer aviation experience. Pilots must not only be skilled in flying but also adept in managing time to excel in this fast-paced and dynamic industry.

Additionally, the global aviation community is increasingly recognizing the importance of continuous learning and development. Regulatory bodies may mandate recurrent training for experienced pilots to refresh their temporal regulation and decision-making skills. This approach ensures that even seasoned aviators remain sharp and adaptable in dynamic aviation environments.

The integration of emerging technologies and best practices is critical to the evolution of pilot training. Regulatory bodies can collaborate with industry stakeholders to identify and incorporate innovative solutions. For example, data analytics and artificial intelligence can be used to assess pilot

ПСИХОЛОГІЯ

performance and identify areas where temporal regulation and decision-making skills may need improvement. Training programs can then be tailored to address specific weaknesses or challenges.

Moreover, the implementation of best practices from successful airlines and aviation organizations can be standardized and disseminated through regulations and policies. These practices encompass not only training but also operational procedures that support effective temporal regulation and decision-making. Regulatory bodies can work to ensure that these best practices are widely adopted and adhered to across the aviation industry (Pomytkina, 2013).

Conclusions. The article highlights the critical importance of temporal regulation and emergency decision-making skills in aviation, emphasizing their role in ensuring the safety and security of the aviation industry. Several key conclusions can be drawn based on the content of the article:

- **Temporal Regulation and Decision-Making are Crucial:** The article underscores that pilots' ability to regulate time effectively and make split-second decisions during emergencies is paramount in aviation. Temporal regulation, the skill of accurately perceiving and managing time, is the backbone of successful flight operations, as it ensures precision, adherence to schedules, and the ability to navigate complex and time-sensitive situations.

- **Human Factors Impact Decision-Making:** Human factors such as stress and fatigue significantly affect decision-making in aviation. Stress can impair cognitive functions, leading to poor judgment, while fatigue can degrade cognitive performance, resulting in slower reactions. Understanding and managing these human factors is essential for pilot training.

- **Training is Essential:** The article emphasizes the importance of training and development in emergency decision-making skills. Training programs, including the use of flight simulators, scenario-based exercises, and structured curricula, equip pilots with the knowledge, skills, and mindset to handle emergencies with composure and prioritize safety.

- **Real-Life Examples Provide Valuable Insights:** Real-life case studies, such as the Tenerife Airport Disaster, Air Florida Flight 90, and United Airlines Flight 232, illustrate the consequences of effective and ineffective decision-making under time-sensitive and high-stress conditions. These examples underscore the importance of communication, safety procedures, and well-prepared crews in aviation incidents.

- **Regulatory Bodies Shape Training:** Aviation regulatory bodies like the FAA and ICAO play a critical role in setting standards, regulations, and guidelines for pilot training and performance. They ensure that training programs comply with the required standards and evaluate pilot decision-making abilities. Regulatory bodies are key in shaping the training landscape in aviation.

- **Future Prospects Include Technology Integration:** The article highlights the potential for integrating emerging technologies, such as virtual reality (VR) and augmented reality (AR), in pilot training to better prepare aviators for decision-making under pressure. It also emphasizes the importance of continuous learning and development, which may include recurrent training for experienced pilots.

To sum up, the article emphasizes the interplay of temporal regulation, decision-making skills, and human factors in aviation safety. Training, regulatory oversight, and the integration of emerging technologies are crucial for enhancing these skills and ensuring the continued safety and security of the aviation industry.

REFERENCES

Cannon-Bowers, J. A., Salas, E., & Maurino, D. (2010). Team Performance and Training in Complex Environments. *Human Factors: The Journal of the Human Factors and Ergonomics Society*, 52(2), 203-224.

Endsley, M. R. (1995). Toward a Theory of Situation Awareness in Dynamic Systems. *Human Factors: The Journal of the Human Factors and Ergonomics Society*, 37(1), 32-64.

Gregory, T. G. (2016). An Examination of Best Practices for Pilot Training. *International Journal of Applied Aviation Studies*, 16(1), 59-76.

Helmreich, R. L., Merritt, A. C., & Wilhelm, J. A. (1999). The Evolution of Crew Resource Management Training in Commercial Aviation. *International Journal of Aviation Psychology*, 9(1), 19-32.

International Civil Aviation Organization. (2020). ICAO Policies and Guidance. <https://www.icao.int/policies-and-guidance/>.

Kazakova, Y. S. (2023). Psykholohichni osoblyvosti pryiniattia osobystystyu rishen' v umovakh vital'noyi zahrozy, vyklykanoi COVID-19 [Psychological Peculiarities of Decision-Making by an

Individual in the Face of Vital Threat Caused by COVID-19]. *Vcheni zapysky TNU imeni V.I. Vernadskoho. Seriya: Psykholohiya*, 34.73: 122-126.

Khurtenko, O. V. (2008). Formuvannia u maibutnikh orhanizatoriv-treneriv psykholohichnoyi gotovnosti do pryiniattia rishen' u ekstremal'nykh sytuatsiyakh [Formation of Psychological for Decision-Making in Future Organizers-Trainers in Extreme Situations]. *Dys. kand. nauk: 19.00.09*.

National Transportation Safety Board. (1973). Aircraft Accident Report - Eastern Air Lines, Inc. McDonnell Douglas DC-9-31, N8984E, Miami, Florida. *NTSB*.

O'Hare, D. (2002). Human Error and Commercial Aviation Accidents: An Analysis Using the Human Factors Analysis and Classification System. *Ashgate Publishing*.

Pomytkina, L. V. (2013). Psykholohiya pryunyattya osobystystu stratehichnykh zhyttyevykh rishen' [Psychology of Personal Decision-Making in Life Strategies]. *Monohrafiya, Kyiv: Kaf.*, 381.

СПИСОК ЛІТЕРАТУРИ

Казакова, Є. С. (2023). Психологічні особливості прийняття особистістю рішень в умовах вітальної загрози, викликані COVID-19. *Вчені записки ТНУ імені ВІ Вернадського. Серія: Психологія*, 34.73: 122-126

Хуртенко, О. В. (2008) Формування у майбутніх організаторів-тренерів психологічної готовності до прийняття рішень у екстремальних ситуаціях : *Дис. канд. наук: 19.00.09*.

Помиткіна, Л. В. (2013). Психологія прийняття особистістю стратегічних життєвих рішень: *монографія*. Київ : Каф. 381.

Cannon-Bowers, J. A., Salas, E., & Maurino, D. (2010). Team Performance and Training in Complex Environments. *Human Factors: The Journal of the Human Factors and Ergonomics Society*, 52(2), 203-224.

Endsley, M. R. (1995). Toward a Theory of Situation Awareness in Dynamic Systems. *Human Factors: The Journal of the Human Factors and Ergonomics Society*, 37(1), 32-64.

Gregory, T. G. (2016). An Examination of Best Practices for Pilot Training. *International Journal of Applied Aviation Studies*, 16(1), 59-76.

Helmreich, R. L., Merritt, A. C., & Wilhelm, J. A. (1999). The Evolution of Crew Resource Management Training in Commercial Aviation. *International Journal of Aviation Psychology*, 9(1), 19-32.

International Civil Aviation Organization. (2020). ICAO Policies and Guidance. <https://www.icao.int/policies-and-guidance/>.

National Transportation Safety Board (1973). Aircraft Accident Report - Eastern Air Lines, Inc. McDonnell Douglas DC-9-31, N8984E, Miami, Florida. *NTSB*.

O'Hare, D. (2002). Human Error and Commercial Aviation Accidents: An Analysis Using the Human Factors Analysis and Classification System. *Ashgate Publishing*.

Р. Адаманов, О. Меженко

ЧАСОВЕ РЕГУЛЮВАННЯ ТА НАВИЧКИ ПРИЙНЯТТЯ РІШЕНЬ В НАДЗВИЧАЙНИХ СИТУАЦІЯХ ДЛЯ МАЙБУТНІХ ПІЛОТІВ

Резюме

У статті досліджується критична роль часового регулювання та навичок прийняття рішень у надзвичайних ситуаціях щодо ефективності професійної діяльності майбутніх пілотів. **Метою дослідження** є теоретичне та емпіричне вивчення значущості вищезазначених навичок та засобів їх розвитку у виробничій діяльності.

Нами були застосовані наступні **методи дослідження**: огляд літератури, кейс-стаді, дослідження на симуляторах, аналіз контенту, історичний аналіз, статистичний аналіз, методи порівняльного аналізу, методи систематизації та узагальнення, а також метод кабінетних досліджень у вигляді аналізу вторинної інформації за тематикою (моніторинг Internet-ресурсів, професійних видань). Процес прийняття рішень розглянуто з позицій когнітивного підходу, проаналізовані його ключові психологічні складові, якими є розпізнавання проблеми, збір інформації, сприймання часових меж, оцінка варіантів дій та вибір загальної стратегії. Ефективне управління часом пілотом розглянуто як проактивний метод запобігання надзвичайним ситуаціям в авіації, здатність швидко та скоординовано реагувати в позаштатних ситуаціях, уміння бачити ресурси та швидко приймати адекватні рішення для мінімізації втрат в несподіваних професійних умовах.

ПСИХОЛОГІЯ

Результати. В ході дослідження доведено, що ефективне часове регулювання та динаміка прийняття рішень у надзвичайних ситуаціях є важливими складовими авіаційної безпеки. Здатність керувати часом, приймати швидкі рішення та визначати пріоритетні завдання має вирішальне значення в авіаційній індустрії, яка працює в умовах високого стресу та залежить від часу. Теоретичне навчання разом з тренуваннями на симуляторі, мають важливе значення для розвитку цих навичок. Проаналізовані тематичні дослідження ілюструють вплив цих навичок на безпекову складову діяльності.

Висновки. Дослідження підкреслює важливість навчання, регулятивного нагляду та адаптації до нових технологій та передового досвіду, необхідність постійного навчання та розвитку, гарантуючи, що пілоти можуть приймати ефективні рішення під тиском та підтримувати безпеку.

Ключові слова: авіація; надзвичайні ситуації; прийняття рішень; регуляторні органи; часова регуляція.

DOI

УДК: 004-051:316.613.4

O. Alpatova, S. Alpatov

EMOTIONAL BURNOUT RESEARCH AND ITS FACTORS IN PROGRAMMERS

Abstract

The article analyzes the concept of emotional burnout, approaches to its study; psychological features of programmers' activities are considered; the factors causing emotional burnout among software developers are characterized; such factors of emotional burnout as overstrain at work due to excessive workload, devaluation of the essence of work, which becomes uninteresting, and emotional instability were investigated.

The purpose of the article is a theoretical analysis and empirical description of emotional burnout and its factors in IT specialists.

Methods of analysis of systematization and generalization of theoretical material of modern scientific sources on the problem of emotional burnout in professional activity. The following methods were used in the empirical study: Burnout questionnaire by K. Maslach, Test of motivational structure by F. Herzberg, Methodology of multifactorial personality research by R. Cattell, Methodology "Index of organizational tension", Questionnaire of self-organization of activity by E. Mandrikova; methods of mathematical processing: descriptive statistics (arithmetic mean, percentages), Student's T-shaped test, Pearson's R-correlation test including regression analysis.

The results. It has been established that the main factors of programmer burnout are overstrain at work due to excessive workload, devaluation of the essence of work, and emotional instability.

Conclusions: The conducted empirical study of the psychological factors of emotional burnout among programmers made it possible to single out the main organizational, motivational and personal factors that influence the formation of the burnout syndrome and its individual symptoms. Among the methods of prevention and correction of emotional burnout, the implementation of a system of providing psychological assistance in the organization is considered the most effective; training employees in simple methods of relaxation, distraction, switching attention, autogenic training and meditation; development of employees' ability to optimally distribute the workload, take rest breaks and realize the limitations of their own resources. When conducting psychocorrection of symptoms of emotional burnout, the main focus should be on restoring the normal functioning of the emotional sphere of employees, normalizing interpersonal relationships and forming a positive attitude towards professional activity and towards oneself as a specialist.

Keywords: emotional burnout; motivation; organizational tension; self-organization; programmers.

Introduction. In recent decades, interest in the problem of emotional burnout, mechanisms of its occurrence and prevention has been growing. Emotionally saturated, intensive professional