

saercosafety

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Ready...

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The editorial

Ground incidents and accidents

Safety is one of SAERCO's top priorities. This newsletter addresses a crucial topic: ground incidents and accidents (excluding runway excursions and incursions). Although runway incursions often receive more attention, a variety of other incidents can also compromise operational safety, from collisions between aircraft and vehicles to taxiing errors or inadequate signage.

From the perspective of air traffic services, effective ground traffic management requires clear communication, constant vigilance, and precise coordination with all involved parties. This newsletter discusses the most common challenges in ground operations and the strategies ATC/AFIS employs to prevent incidents, ensuring a safe and efficient environment for all.

In this edition, we focus on the causes and consequences of ground incidents and accidents and analyze how proper management of these situations can make a difference in operational safety. Early risk identification, standardized procedures, and effective communication are essential to minimize ground incidents.

In daily airport operations, ground safety plays a fundamental role in ensuring the efficiency and integrity of all aeronautical procedures. Although in-flight incidents often raise greater concern, ground incidents represent significant risks to the safety of both aircraft and the personnel involved in airport operations.

These events can occur in various areas of the airport, from the apron to the taxiways, directly impacting the coordination between aircraft, vehicles, and ground staff.

Proper synchronization among all these elements —aircraft, service vehicles, cargo equipment, and ground personnel— is essential to minimize ground risks. Even a minor misunderstanding or communication failure can trigger a serious incident, such as an aircraft collision, infrastructure damage, or significant operational delays. The efficiency and safety of ground operations depend on a chain of fluid and precise interactions. Next there are examples of types of ground incidents that may occur in the airside areas of an airport.



Collisions

Two aircraft, or an aircraft and a vehicle/service equipment, come into physical contact. Causes often include uncoordinated movements, poor signage, insufficient lighting, or lack of attention.



Taxiing errors

An aircraft deviates from its assigned taxi route or enters a restricted area without authorization. These typically occur due to incorrect or misinterpreted instructions, difficulty navigating complex airports, or pilot fatigue or inattention.



Obstruction

This involves the presence of objects interfering with the safe movement of aircraft on taxiways, runways, or aprons (Foreign Object Damage).



Maneuvering errors

For example, during aircraft pushback from parking positions, whether assisted by a pushback vehicle or using engine power (power-back). These errors can result from lack of communication or coordination between agents, incorrect use of signals, or procedural errors.

Ground incidents and accidents

Several factors can contribute to ground incidents and accidents. If not properly managed, these factors can significantly increase the risk of such events:

One of the contributing factors may be human error. Poor coordination between controllers, pilots, and ground personnel can lead to misunderstandings that result in incidents, such as maneuvers in unauthorized areas or collisions. Aeronautical phraseology is designed to avoid ambiguities, but its misuse or misinterpretation can cause confusion.

One of the main causes of ground incidents and accidents is misunderstandings during pushbacks or taxiing. Communication between the tower, ground coordinator, and tractor driver does not always work effectively.

Another contributing factor is technical failures, such as equipment and vehicle malfunctions. For example, the malfunctioning of service vehicles can lead to collisions, delays, or damage to aircraft. Another issue is inadequate signage, as a lack of clarity in taxiway markings, air traffic signs, or lights can confuse both pilots and ground personnel. Among other failures are issues with guidance systems; ground navigation systems may fail or not be used correctly, increasing the risk of incidents or accidents.

Environmental conditions can also contribute to an increase in ground incidents and accidents. Fog, heavy rain, or darkness can make it difficult to identify signs, pavement markings, or moving aircraft. Similarly, the presence of water, snow, ice, or debris on operational surfaces (FOD) can cause aircraft to lose traction or vehicles to lose control.

Intense sunlight can also impair visibility of signs, pavement markings, and nearby aircraft or vehicles.

Role of ATC/AFIS in Preventing Ground Incidents and Accidents

Air Traffic Control (ATC) and Aerodrome Flight Information Service (AFIS) personnel play a crucial role in preventing ground incidents and accidents as they act as the primary link between aircraft and airside operations.

At controlled airports, ATC issues clearances and actively monitors the movements of aircraft and vehicles in critical areas such as runways, taxiways, and aprons. Their ability to provide clear and precise instructions is key to avoiding collisions, deviations, or any ground incidents.

At uncontrolled airports, although AFIS personnel are not authorized to issue clearances, they provide essential information to pilots about the aerodrome's status, ground traffic, and environmental conditions. This helps pilots make safe decisions during maneuvers.

Both ATC and AFIS operators are responsible for maintaining constant and effective communication with pilots and ground staff, using standardized phraseology to minimize misunderstandings. For example, a misunderstood instruction during taxiing could result in an aircraft entering the wrong

taxiway, interfering with other ground movements.

Clarity in their messages is essential. For example, a misunderstood instruction during a taxiing maneuver could result in an aircraft entering the wrong taxiway, interfering with other ground movements.



Another important aspect is the active monitoring they perform. ATS services continuously oversee the movement of aircraft and vehicles in operational areas, allowing them to quickly identify any anomalies, such as a vehicle outside its authorized zone or an aircraft deviating from

its assigned route. If a potentially dangerous situation is detected, they can respond promptly.

The work of ATC and AFIS is not limited to daily operations. They also play a crucial role in risk prevention during adverse conditions, such as low visibility or heavy rain. Additionally, they coordinate with other airport stakeholders to ensure safety.

Finally, in the realm of operational safety, they actively contribute to the safety culture by collecting data on incidents and accidents and providing feedback to all parties involved in airport operations. This helps identify risk patterns and develop best practices. Experience and knowledge are essential for continuously improving procedures and raising awareness about the importance of ground safety.

Ground safety is not solely the responsibility of ATS services but rather the result of the coordinated effort of the entire airport community. Only through effective communication, the use of advanced technology, and a proactive mindset can risks be minimized and safe, efficient operations ensured at all airports.

A vertical photograph on the left side of the page shows a helicopter with red and white markings on a tarmac. The background is a hazy sky. A large, light gray wireframe graphic, resembling a grid or a stylized landscape, is overlaid on the right side of the page, extending from the bottom left towards the right edge.

The article

Recommendations for Improving Ground Safety

The Airport Ramp Safety Regulations outline the rules and procedures aimed at ensuring the safe and efficient execution of ground operations. These rules and procedures guarantee smooth, secure, and efficient operations.

The purpose of these regulations is to prevent accidents and ensure a safe environment for all personnel and equipment operating in these critical areas. Compliance with these regulations is mandatory for all stakeholders operating on airport ramps.

The regulations provide clear guidelines for the use of vehicles and equipment on the ramp, such as adhering to speed limits, using designated routes, and ensuring drivers are properly authorized.

During maneuvers such as parking, refueling, and similar operations, strict protocols must be followed to minimize risks. Communication between teams and the use of personal protective equipment are prioritized.

Additionally, specific procedures are outlined for handling incidents such as fuel spills, fires, or adverse weather conditions. All personnel on the ramp are required to be familiar with contingency plans.

Lastly, it is important to note that penalties are imposed on those who violate the regulations, ranging from fines to the revocation of operating authorizations on the ramp. Regular audits and inspections are conducted to ensure ongoing compliance with the rules.

The statistics: reporting

When reviewing the statistics, it becomes evident that the number of notifications in 2024 (January to October) shows a certain upward trend and will likely reach or even exceed the figures recorded in 2023. The observed increase in the number of reports at SAERCO over the years reflects not only the continuous growth in managed operations but also a heightened awareness and commitment among operational personnel to the importance of documenting these events. This evolution in the reporting and recording culture translates into more comprehensive documentation of incidents, ensuring that every incident is recorded and assessed.

At the same time, the average notification times have been monitored, confirming that the deadlines set by AESA are rigorously adhered to.

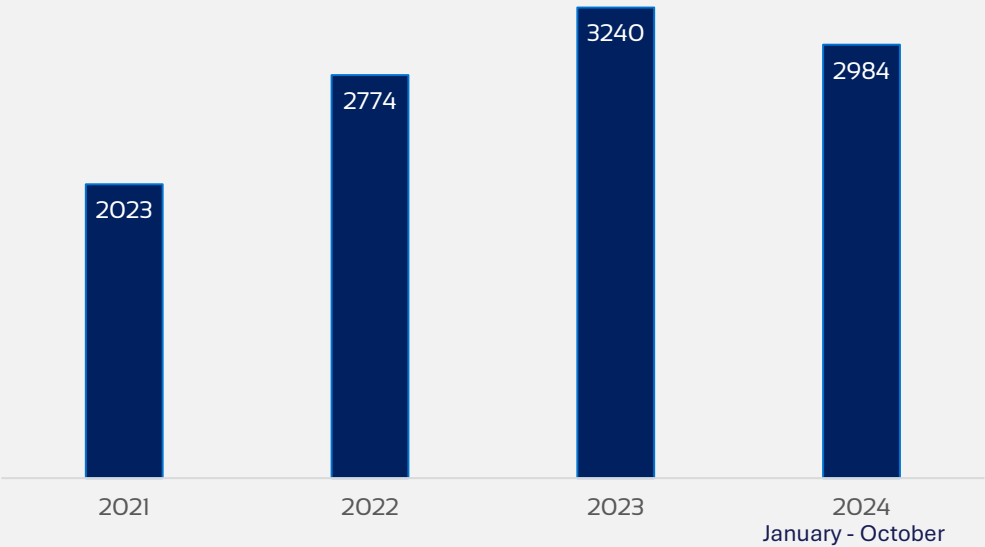
This progress is a clear indicator of SAERCO's commitment to strengthening its recording processes and promoting a reporting culture that is reflected year after year in the results achieved. The comparison with previous years demonstrates a clear trend toward more transparent and efficient event management, which significantly contributes to the continuous improvement of operational safety and internal processes.

“Achieving a notification system where proactivity is the usual practice is not easy; it requires the effort and commitment of the entire organization, especially the operational staff.”

MOR: Mandatory Report
VOR: Voluntary Report

Safety reports ATS SAERCO 2024		
MOR/VOR	Average time to report	Average time to MOR/VOR
2984	2:11:48	29:57:44

Reports evolution ATS 2021 - 2024



Lessons learned

Ground Accidents/Incidents

Ground accidents, although less visible than airborne ones, represent significant risks to operational safety. Analyzing real cases allows for the identification of common mistakes and the reinforcement of preventive measures. Below are two notable incidents that highlight the importance of coordination, communication, and adherence to procedures in the airport environment.

Collision between two aircraft at Toronto International Airport (2018)

In January 2018, a WestJet Boeing 737 was parked on the ramp at Toronto Pearson International Airport when it was struck by a Sunwing Airlines aircraft being towed. The wing of the Sunwing aircraft hit the tail of the WestJet plane, causing a small fire on the towed aircraft's wing. Passengers on the WestJet flight were evacuated emergency slides, with no serious injuries reported.

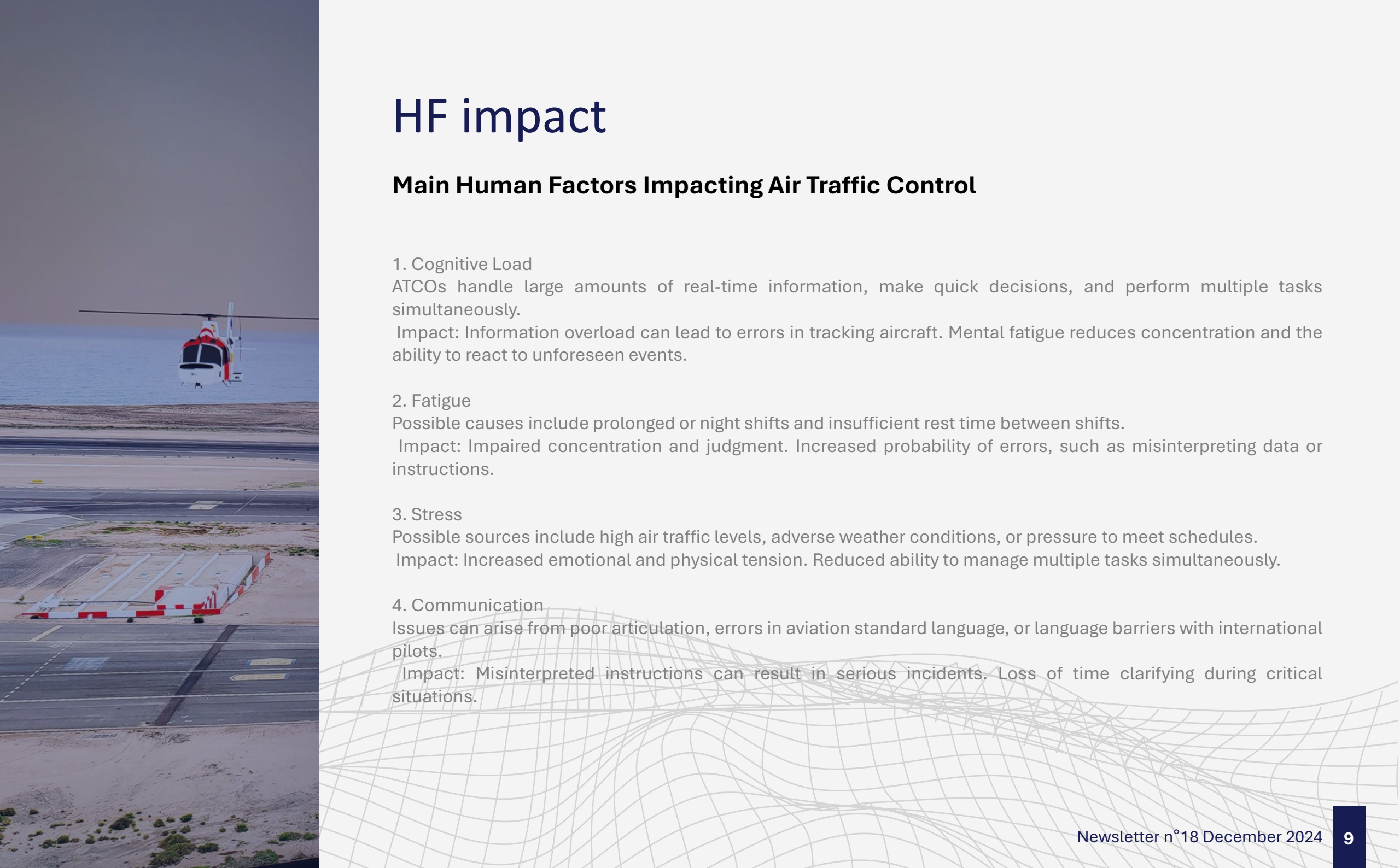
The main cause of the incident was a lack of proper supervision during the towing process, coupled with an error by the ground operator during the maneuver. This accident highlighted the need for strict procedures for aircraft movement in congested areas and effective communication among all parties involved.

Error during taxiing at Newark International Airport (2023)

A United Airlines Embraer E175 mistakenly crossed a closed taxiway while taxiing toward the runway for takeoff. Although there were no collisions or serious consequences, the incident caused a delay in operations as the aircraft had to stop and wait for air traffic control assistance to safely redirect it.

The subsequent investigation revealed that the pilots had misunderstood the taxi clearance due to a misinterpretation of the temporary signage placed during maintenance work at the airport. This incident highlighted the importance of ensuring that temporary signage is clear and visible, especially during construction on taxiways.

These incidents highlight how failures in supervision and the interpretation of operational conditions can create significant risks on the ground. In the case of the towing incident in Toronto, the lack of coordination in a congested environment led to material damage and the evacuation of passengers, while the taxiing error in Newark emphasized the importance of clear signage to prevent confusion on taxiways. Both underscore the need to strengthen communication, personnel training, and adherence to strict procedures to prevent incidents and accidents, ensuring safety in ground operations.

A vertical photograph of a helicopter on a runway, with a wavy grid pattern overlaid on the right side of the image.

HF impact

Main Human Factors Impacting Air Traffic Control

1. Cognitive Load

ATCOs handle large amounts of real-time information, make quick decisions, and perform multiple tasks simultaneously.

Impact: Information overload can lead to errors in tracking aircraft. Mental fatigue reduces concentration and the ability to react to unforeseen events.

2. Fatigue

Possible causes include prolonged or night shifts and insufficient rest time between shifts.

Impact: Impaired concentration and judgment. Increased probability of errors, such as misinterpreting data or instructions.

3. Stress

Possible sources include high air traffic levels, adverse weather conditions, or pressure to meet schedules.

Impact: Increased emotional and physical tension. Reduced ability to manage multiple tasks simultaneously.

4. Communication

Issues can arise from poor articulation, errors in aviation standard language, or language barriers with international pilots.

Impact: Misinterpreted instructions can result in serious incidents. Loss of time clarifying during critical situations.

A vertical photograph of a helicopter on a runway, with a wavy grid pattern overlaying the right side of the image.

HF impact

Main Human Factors Impacting Air Traffic Control

5. Teamwork and Coordination

Key factors include collaboration among controllers, pilots, and airport personnel, as well as the effective use of technological support tools.

Impact: Lack of synchronization can lead to route conflicts or delays. Effective teamwork enhances efficiency and reduces errors.

6. Physiological Factors

Examples include visual fatigue from prolonged screen observation and physical problems due to static postures or workplace conditions.

Impact: Reduced precision and operational speed. Challenges in screen monitoring and decision-making.

7. Ergonomics and Workplace Design

Issues may arise from poorly designed workstations or confusing interfaces of technological systems.

Impact: Increased cognitive load and errors. Physical and mental fatigue.

8. Psychological Factors

Common examples include anxiety during emergencies or critical situations, risk perception, and self-confidence.

Impact: Difficulties in decision-making under pressure. Inadequate responses to non-standard situations.

Mitigating the Impact of Human Factors

1. Training and Simulation

Continuous training to manage complex scenarios and emergencies.

Use of simulators to recreate real air traffic conditions.

2. Fatigue Management

Implementation of schedules allowing adequate rest.

Monitoring the duration and sequence of shifts.

3. Support Technology

Automation to reduce cognitive load (e.g., conflict detection systems).

Improved human-machine interface design.

4. Promoting Effective Communication

Strict use of aviation standard language.

Training in communication skills and active listening.

5. Psychological Support

Stress management programs.

Access to emotional support services.

6. Ergonomic Improvements

Ergonomic workstation design.

Implementation of breaks to reduce physical and visual fatigue.

7. Fostering Teamwork

Training in collaborative work skills.

Joint simulations with other actors in the aeronautical ecosystem.

Conclusion

Human factors have a significant impact on the safety and efficiency of air traffic control.

Effectively mitigating these factors through training, technology, and appropriate design can reduce errors and improve ATCO performance, ensuring safer and more efficient air operations.

At SAERCO, tools addressing fatigue and stress have been developed to protect the health and performance of ATCOs while also strengthening the safety of the aviation system as a whole.

All of this is carried out in full compliance with current regulations, with the application of programs approved and supervised by AESA, as well as interdepartmental monitoring and both global and individual case management.



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