

APPENDIX 8

ADVANCED

STATISTICS FOR

ATM/ANS



Appendix 8

Advanced statistics for ATM/ANS

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This appendix covers the advanced statistics for Air Traffic Management or Air Navigation Services (ATM/ANS) in EASA Member States.

The first section outlines the safety risks, that have been derived from occurrence data from the European Central Repository (ECR). They provide per domain, and per type of operation as necessary, the relative safety risk level and frequency of each key risk area (KRA). The KRA is the most likely type of accident that would have resulted if an occurrence had escalated into an accident. It is one element of the European Risk Classification Scheme (ERCS). In terms of safety performance, they are the Tier 2 safety performance indicators for the domain. The KRAs are prioritised based on their aggregated risk contribution using the ERCS, as applied by the competent authorities from 2023 onwards in accordance with the Commission Implementing Regulation (EU) 2021/2082 published in November 2021. The timespan of the 2024 edition is, therefore, limited to one year (i.e., 2023, the first year of ERCS implementation), and will be expanded on a yearly basis until a five-year timespan is achieved. The frequency of occurrences and the related aggregated ERCS numerical equivalent scores are determined per KRA, considering accidents, serious incidents and incidents, where the KRA and the ERCS safety risk score have been completed by the competent authority. An ERCS completion rate per domain, and operation type as necessary, complements therefore the presented data for the contextualisation.

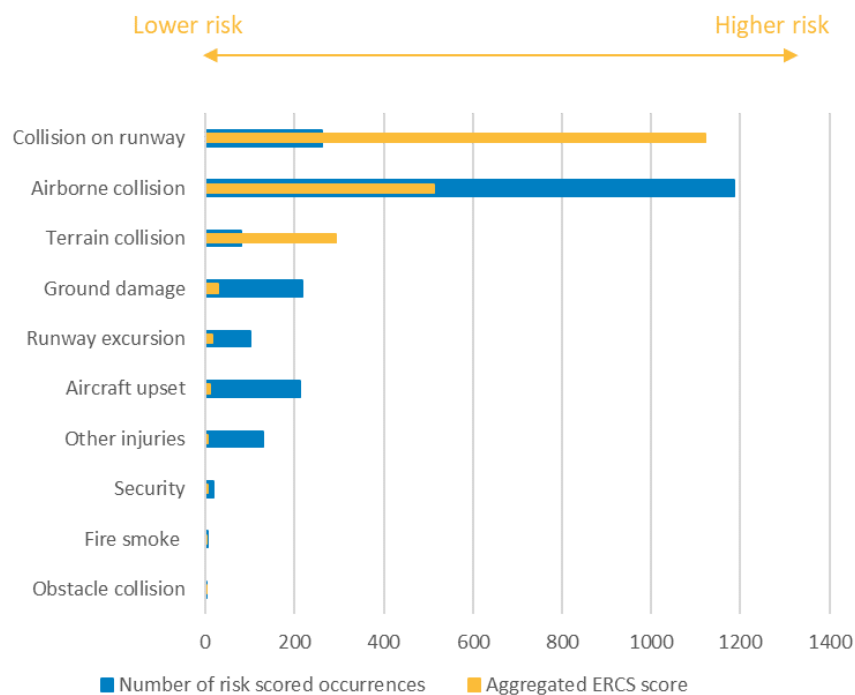
The other section provides an overview of the Human Factors (HF) and Human Performance (HP) issues. The term HF describes human characteristics, abilities, and limitations. The knowledge of HF is used throughout the aviation industry to design systems, equipment and work in ways that support humans in performing at their best. HP refers to how people perform their tasks. Following safety occurrences, HF and HP knowledge can also be used diagnostically to better understand what went wrong, what went right and, more importantly, to understand how to prevent such occurrences from happening again. The same European Co-ordination Centre for Accident and Incident Reporting Systems (ECCAIRS) taxonomy that helps us to identify our safety issues and KRAs also provides us with HF and HP codes. This taxonomy groups event types at different levels, so that all the issues relating to personnel are grouped at the highest level into 'personnel'. The personnel issues are then further subdivided into four categories: experience and knowledge events, physiological events, situational awareness and sensory events, and personnel task performance events. A further two levels of subdivision exist, providing increasing granularity on the type of HF or HP issues identified. The presented data consider all occurrences of a domain, i.e., accidents, serious incidents, and incidents.

1 Safety risks

The safety risks for ATM/ANS are derived from occurrences data recorded in the ECR, covering the one-year period 2023. From the 8 789 occurrences in 2023, only 2 221 occurrences were completed with the KRA and ERCS safety risk score, representing an ERCS completion rate of 25% for the domain. The hereafter information is solely based on this restricted dataset.

The KRAs for ATM/ANS are shown in **Appendix 8 Figure 1**. KRAs and occurrence categories (refer to core document Figure 8.3) have different purposes. While occurrence categories describe actual factors and outcomes of an occurrence, KRAs describe the potential outcome of an occurrence. The KRA is defined by the most likely type of accident that an occurrence could have escalated to. Unlike occurrence categories, where multiple categories may be assigned to a single occurrence, there can only be one KRA per occurrence. The KRA is one element of the ERCS. This scheme is applied when determining the safety risk score of an occurrence and is further detailed in the ASR introduction.

It can be stated that the occurrences with the KRA collision on runway had the highest risk score. 262 out of 8 789 occurrences were reported with this KRA. The occurrences with the second highest risk score are occurrences with the KRA airborne collision. 1 187 out of 8 789 occurrences were reported with this KRA. Occurrences with the KRA terrain collision had the third highest risk score. 79 occurrences were reported with this KRA. The KRAs ground damage, runway excursion, aircraft upset and other injuries had more occurrences than terrain collision, however their risk score was rated lower.



Appendix 8 Figure 1 KRAs by aggregated ERCS score and number of risk-scored ATM/ANS occurrences

The top KRAs in the ATM/ANS domain are collision on runway and airborne collision reflecting the role of ATM/ANS in guiding and separating aircraft.

The top KRAs in the ATM/ANS domain are defined as:

- **Collision on runway.** This includes all occurrences involving actual or potential runway collisions between an aircraft and another aircraft, vehicle or person that occur on the runway of an aerodrome or other designated landing area. This includes occurrences involving the incorrect presence of an aircraft, vehicle, or person on

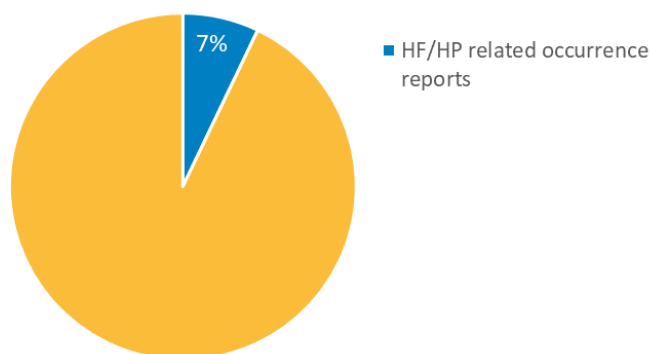
the protected area of a surface designated for the landing and take-off of aircraft. It does not include occurrences involving wildlife on the runway.

- **Airborne collision.** This includes occurrences involving actual or potential airborne collisions between aircraft, and occurrences involving an aircraft and other controllable airborne objects, such as drones, thereby excluding birds. Therefore, it includes all separation-related occurrences regardless of the cause. It does not include false TCAS/ACAS alerts that are caused by equipment malfunctions or loss of separation with at least one aircraft on the ground.

2 Human factors and human performance (HF/HP)

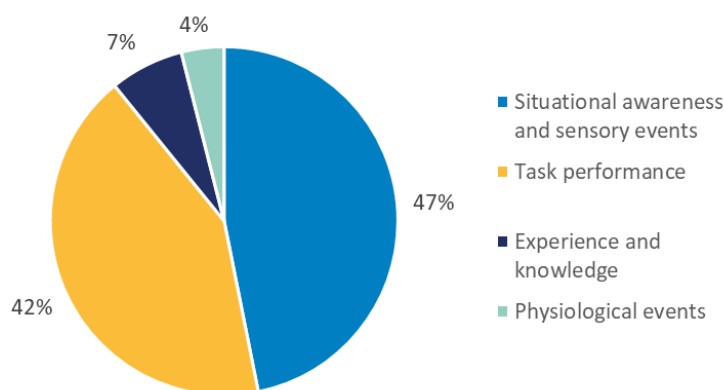
This section provides an overview of the HF/HP issues for all operations involving ATM/ANS in EASA Member States.

There were 34 460 occurrence records over the period 2019-2023 involving ATM/ANS in EASA Member States. From this dataset extracted from the ECR on April 15, 2023, 2 453 occurrence records identified HF/HP as contributing factors, including one accident and 36 serious incidents. These occurrences are labelled as personnel occurrences in the ECCAIRS taxonomy. It is important to highlight that HF/HP issues are often not recorded within the initial occurrence report and may become evident at a later date. **Appendix 8 Figure 2** indicates the percentage of HF/HP related occurrence records from the total number of occurrence records for the past five years. The statistics for ATM/ANS domain solely examine occurrences with ATM/ANS contribution.



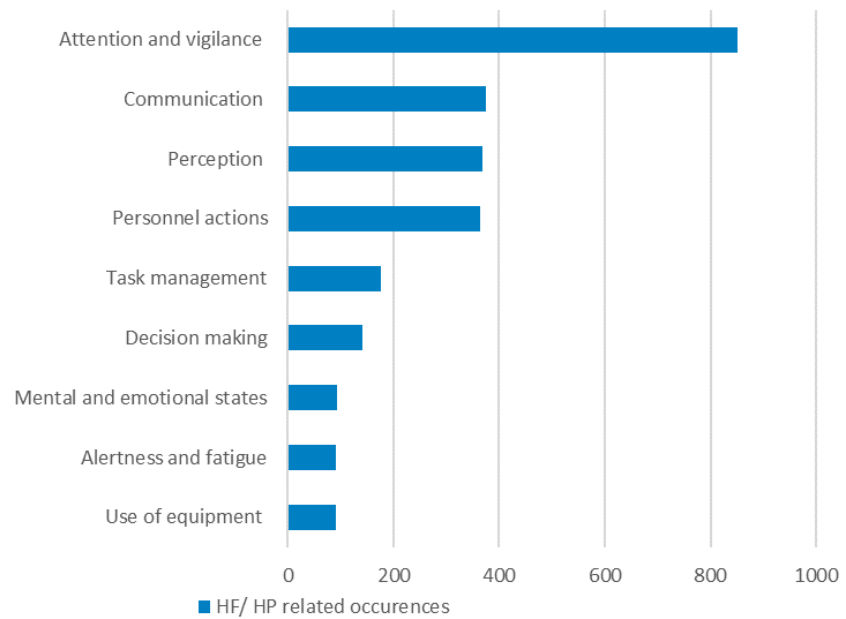
Appendix 8 Figure 2 HF/HP occurrences involving ATM/ANS

The application of the first-level HF/HP codes for the past five years can be seen in **Appendix 8 Figure 3**. Out of the 2 453 HF/HP related occurrence records, 1 287 were coded under situational awareness events, 1 162 under task performance events, 189 under experience and knowledge events and 109 under psychological events. Note that one occurrence may indicate more than one HF/HP event. As in the last year ASR edition, issues relating to situational awareness and to task performance events remain more commonly recognised, experienced, and reported following an occurrence than the factors that cause them. As in most other chapters of this review, physiological events remain less recognised, experienced, or coded in the ATM/ANS community.



Appendix 8 Figure 3 High-level HF/HP event codes applied to occurrences involving ATM/ANS

Appendix 8 Figure 4 provides the number of occurrences per detailed HF/HP event codes. Notably, issues related to attention and vigilance that have been reported in 851 records, are the most prevalent, indicating it as an area with most HF/HP related safety concerns for ATM/ANS operations.



Appendix 8 Figure 4 Detailed HF/HP event codes by number of occurrences involving ATM/ANS