Transport Malta

Malta Civil Aviation Safety Report

Transport Malta **Civil Aviation Directorate**

Year 2022

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Contents

Abbreviations

ADREP	Accident/Incident Data Reporting
AOC	Air Operator Certificate
ATC	Air Traffic Control
BAAI	Bureau of Air Accident Investigation (Malta)
CA	Competent Authority
CAD	Civil Aviation Directorate (TM-CAD)
CAT	Commercial Air Transport
CFIT	Controlled Flight into or Toward Terrain
EASA	European Aviation Safety Agency
ECCAIRS	European Co-ordination centre for Accident and Incident Reporting Systems
EPAS	European Plan for Aviation Safety
EU	European Union
FOD	Foreign Object Debris / Foreign Object Damage
GA	General Aviation
GH	Ground Handling
GHSP	Ground Handling Service Provider
ICAO	International Civil Aviation Organisation
LOC-I	Loss of Control In-flight
MAC	Mid-Air Collision
MOR	Mandatory Occurrence Report
NoA	Network of Analysts
RA	Resolution Advisory
RE	Runway Excursion
RI	Runway Incursion
RNO	Return to Normal Operations
SAFA	Safety Assessment of Foreign Aircraft
SCU	Safety and Compliance Unit (TM-CAD)
SMS	Safety Management System
SPAS	State Plan for Aviation Safety
SPI	Safety Performance Indicator
SPT	Safety Performance Target
SSP	State Safety Programme
TA	Traffic Advisory
TCAS	Traffic Collision Avoidance System
TMA	Terminal Manoeuvring Area
TM-CAD	Transport Malta Civil Aviation Directorate (CAD)
UAS	Unmanned Aircraft Systems

Executive Summary

The Malta Civil Aviation Safety Report provides an overview of the Maltese Civil Aviation safety data of 2022 and includes comparisons to similar data from the 2018-2021 period. The content and analysis of this report is based on data extracted from the Transport Malta Civil Aviation Directorate (TM-CAD) occurrence reporting system and as required by regulation (EU) 376/2014. Additionally, this report also provides a status on the Civil Aviation Directorate (CAD) actions mentioned in the Malta State Plan for Aviation Safety.

Following the reduction in air operations in 2020, 2021 provided the industry with glimpses of hope. This led to a noticeable steady increase through 2022. This meant that aviation is surely getting to the numbers that the industry is used to, with stakeholders' confidence of growth, some changes to their operations was inevitable. With operational changes, new risks emerge, and it is therefore very important that operators and organisations pre-empt, to the best extent possible, the risks related to their operation. Safety risk assessments serve as the initial caution to what is necessary for safe operation and basis for growth.

With the ramp-up in commercial scheduled airlines, strong business-aviation segment and a busy local general aviation activity, the CAD evaluated over 5,800 reports. Around 5,400 reports were classified as MOR. Since each event might have multiple reports submitted as follow-ups and/or closures and/or submission from multiple reporters, for clarity of analysis, this document will distinguish between an 'MOR event' or else 'number of reports' as appropriate.

The data is being presented as an additional tool for aviation users and the public to have a snapshot of the safety levels of the Maltese Civil Aviation environment and present the main safety issues as identified by the CAD and information provided at European and Global (ICAO) levels.

The Malta Civil Aviation Safety Report is compiled by the Safety and Compliance Unit (SCU) within TM-CAD. The data analysis will help assist in the identification of Safety Performance Indicators (SPIs) and Safety Performance Targets (SPTs) for the Malta State Plan for Aviation Safety (SPAS).

Occurrence Reports

Occurrence reporting is one of the active systems that contributes towards identifying safety-related issues and help develop pro-active approaches and strategies to mitigate undesired outcomes while enhancing overall aviation safety. Along the years the CAD has seen a steady increase in the amount of occurrence reports it received and analysed. The increase can be attributed to three main drivers:

- the introduction of an EU-wide legal framework for mandatory reporting through regulation EU 376/2014;
- the work done by the Civil Aviation Directorate (CAD) to inspire a safety reporting culture among aviation users, and;
- the continuous growth of aviation activity in Malta and new organisations under the oversight of the CAD.

Occurrence reports may be submitted to the CAD via a web-based portal which is publicly available on the Transport Malta website and can be accessed by any individual or organisation interested in submitting a safety concern or safety observation. The European Commission's aviation reporting portal (ECCAIRS 2.0) redirects the user to the TM-CAD occurrence reporting portal whenever a report is intended to be submitted to the CAD. All reports submitted to the national database are stored and managed with strict confidentiality.

Exhibit 1 shows the number of Mandatory Occurrence Report (MOR) events submitted to the national database and analysed by TM-CAD between 2019 and 2022. One can note the increase in occurrence report submissions, along the years, which is mainly attributed to the growth experienced in that year within the Maltese aviation cluster. Following 2021 increase, due to the restrictive approach adopted in its MOR evaluation, this year a slight increase was noted. The occurrence categories for these events are shown in Exhibit 9.

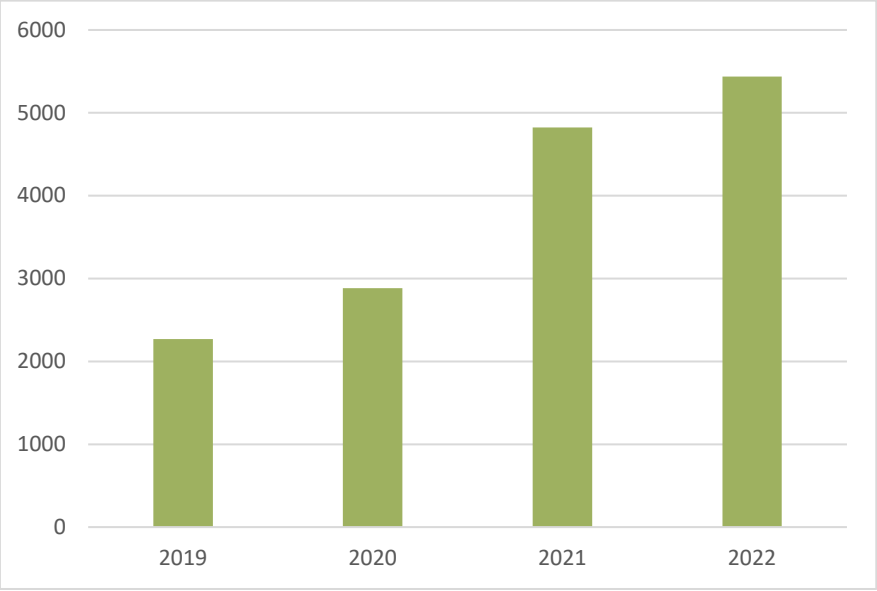

***Exhibit 1** – Number of MOR events submitted to TM-CAD (2019-2022)*

Exhibit 2 provides a monthly view of the number of events submitted on the National database during each month of 2022. From these events, the CAD has classified 5,439 events as MORs. Following the pandemic, as restrictions were eased off and the vaccine was widely available, the resumption

of air was already noticeable as from the second quarter of last year. This increase was kept at a steady state throughout 2022, with a recorded peak of 591 reports in the month of July. Such increase might be due to a busy travelling summer season. On average, there were about 490 reports per month.

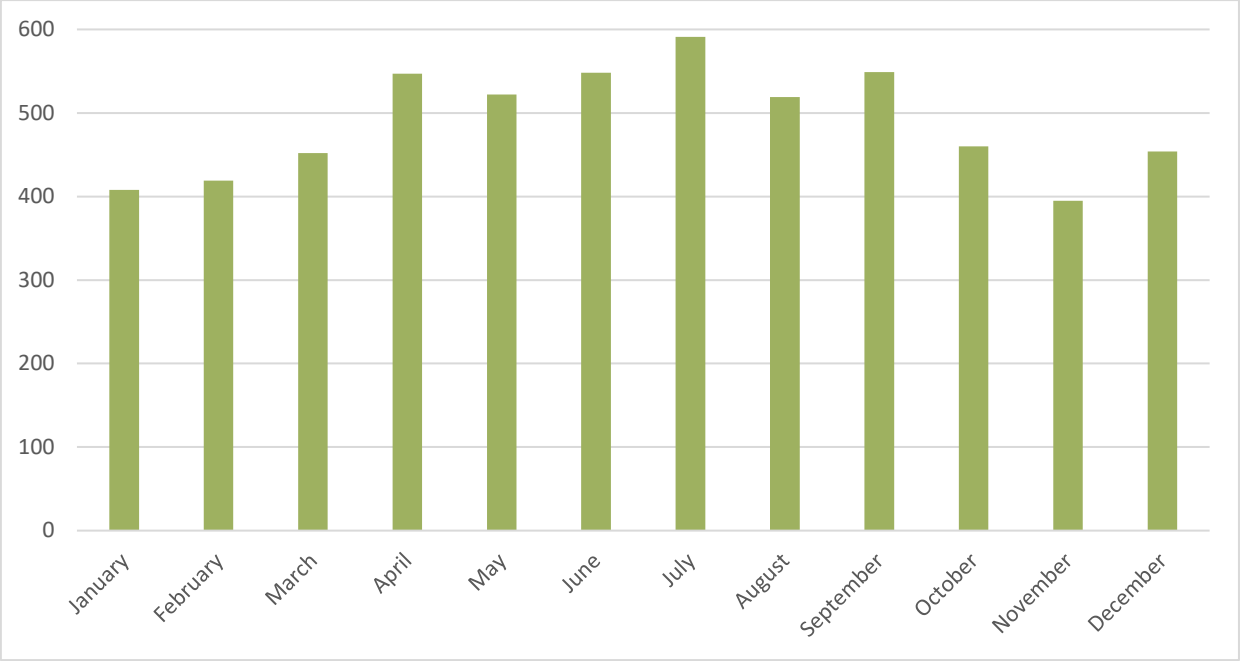

Exhibit 2 *– Monthly reports recorded by TM-CAD in 2022*

Exhibit 3 shows the total flying hours (commercial) operated by Air Operator Certificate (AOC) holders under TM-CAD oversight. The exhibit shows a yearly increase in operational activity year on year. Similar flight hour numbers were achieved in 2020 when compared to 2019, however 2021 has seen a considerable increase in flight hours. This is mostly attributed to a ramp-up in operations across all segments of operations which stayed consistent through this year 2022. Whilst large organisations continued to increase considerably their flying rate, this increase might also be attributed to the increase of new AOC holders.

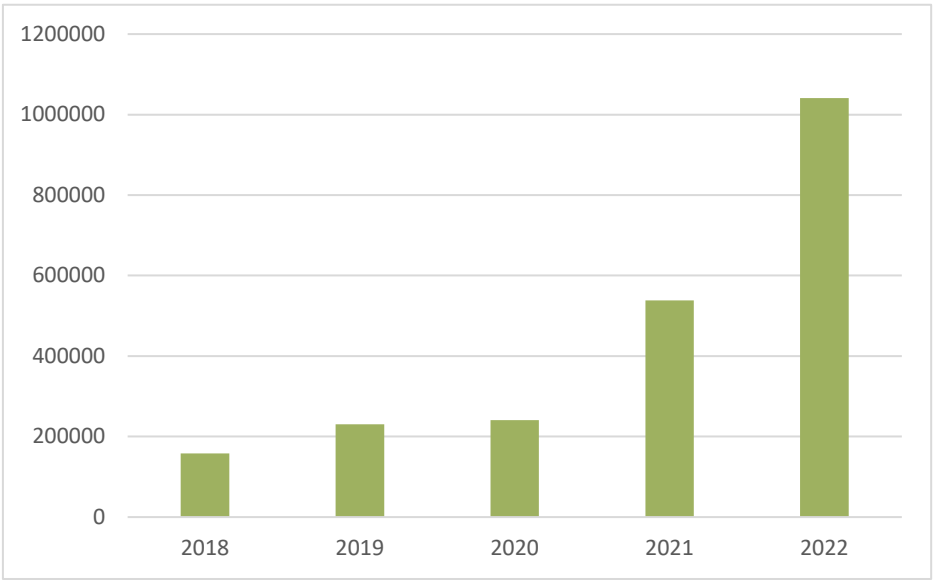

Exhibit 3 *- Flying hours of AOC holders per year (2018-2022)*

In addition to these yearly figures, Exhibit 4 provides a relative value of MOR submissions per 1,000 flying hours (commercial). This value is relevant to the MORs submitted by aircraft operators. One can note a decline from 2021 in the relative value of MORs submitted by aircraft operators and is currently standing at 4 reports per 1,000 flying hours. This relative value has decreased due to the substantial addition in flight hours whilst slightly limiting operators to report with relevance to regulations.

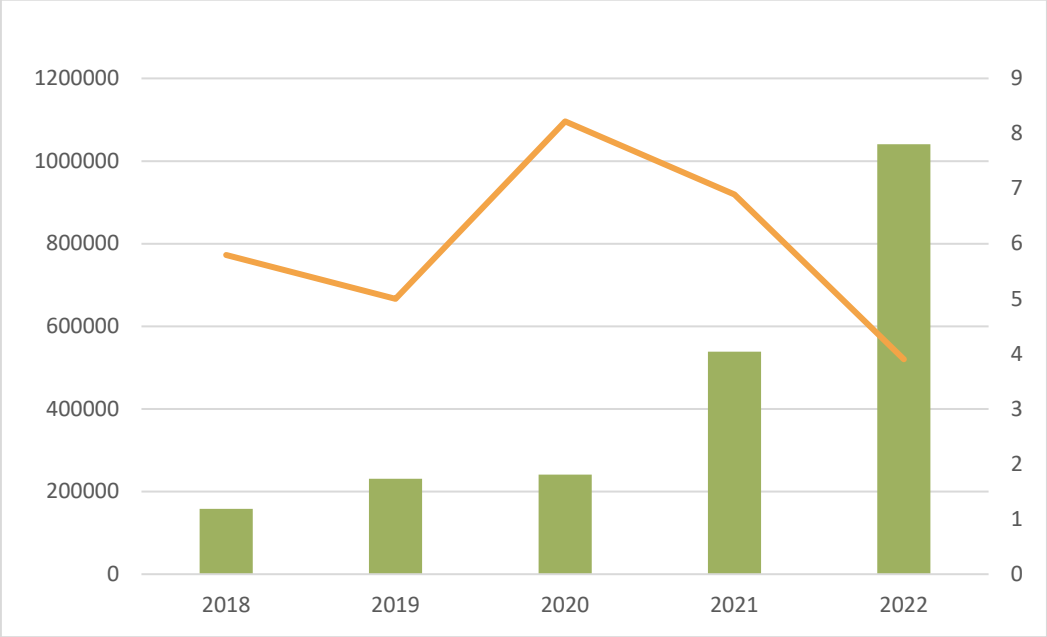

Exhibit 4 *- MOR submissions by Aircraft Operators relative to flying hours (2017-2021)*

In conjunction with flight hours, Aircraft movements at Luqa aerodrome was another important parameter that was considered. For the second time in a row, aircraft movements have experienced another increase when compared to 2020. The increase was mostly attributed to additional scheduled and local flights. The five-year trend in aircraft movements at Luqa aerodrome is shown in Exhibit 5.

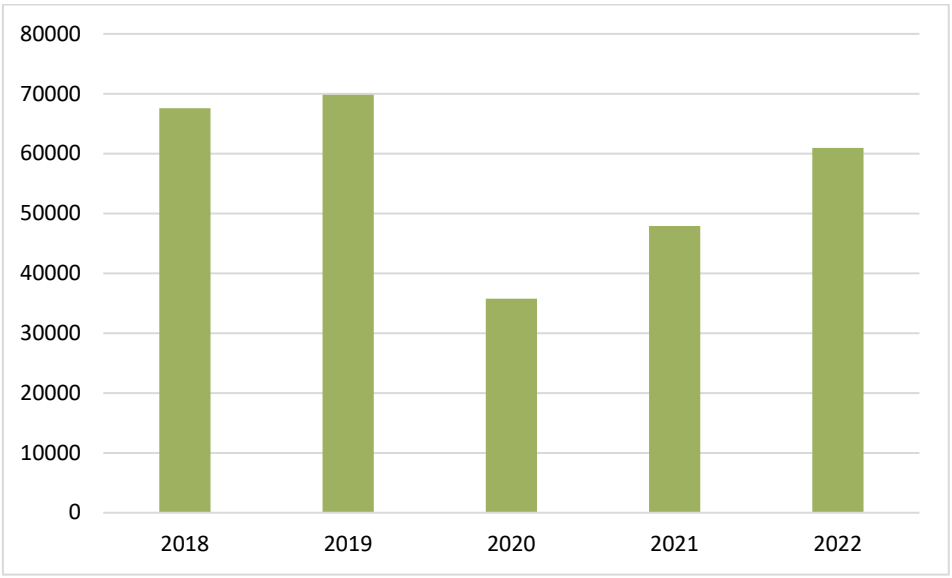

Exhibit 5 *- Aircraft movements (excl. Military) at Luqa aerodrome (2018-2022)*

The source of the Occurrence Reports submitted in 2022 is shown in Exhibit 6. It is important to point out that the same event may have been reported from multiple sources. In such cases, the CAD Safety and Compliance Unit (SCU) will merge duplicate reports to reflect one event.

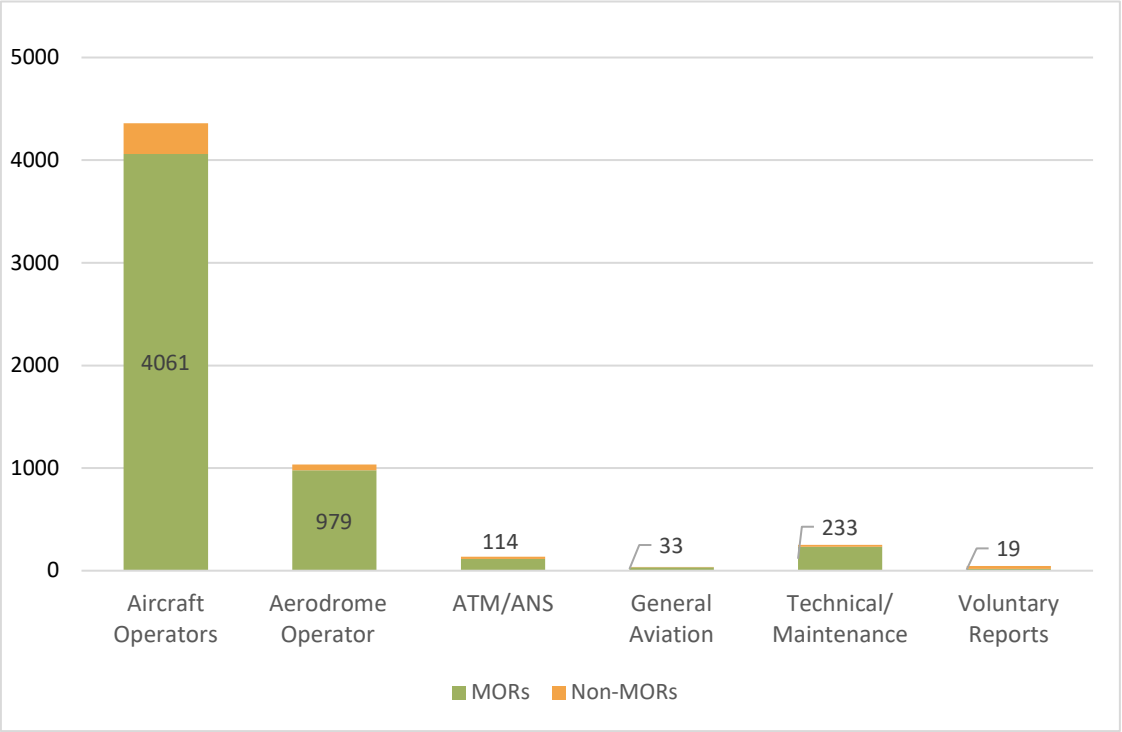

***Exhibit 6** - Source of Occurrence Reports (2022)*

Occurrence Class

As part of the analysis process conducted by the CAD, each occurrence report submitted to the national database is classified under one of the following occurrence classes:

- Accident
- Incident
- Serious incident
- Occurrence without safety effect
- Occurrence with no flight intended

Such classification is based on the ICAO ADREP taxonomy guidance material and reference to the definitions deriving from regulation (EU) 996/2010, of which 'accident', 'incident' and 'serious incident' are presented in Appendix I of this report.

The majority of MOR's received are generally classified as an 'incident'. Exhibit 7 provides a percentage value of the occurrence classes namely. The 'Others' incorporates event classes commonly related to EUROCONTROL terminology (ex: Occurrence without safety effect) and 'Occurrence with no flight intended' which are events identified or occurred during maintenance.

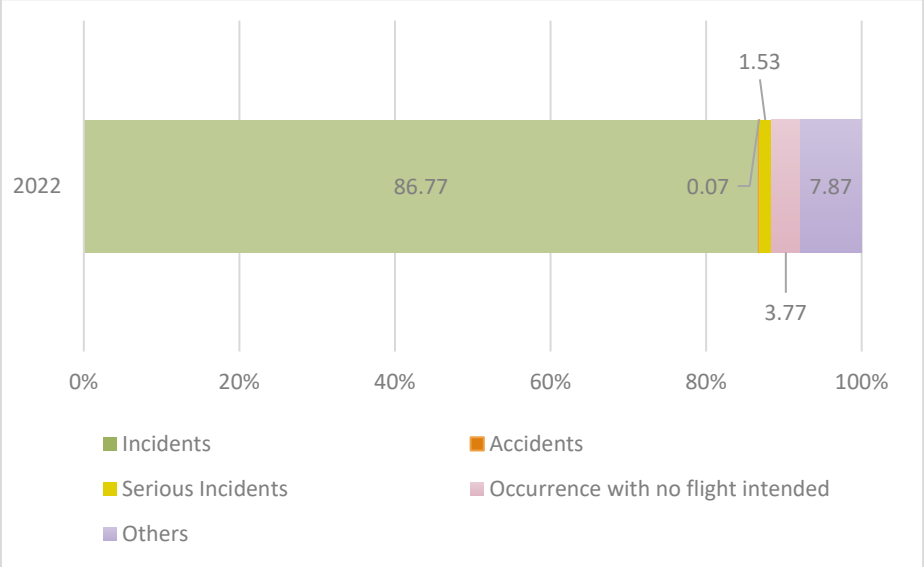

***Exhibit 7** - Occurrence Class (% of total)*

In comparison to last year there was a slight increase of almost 10% in the reports classified as 'Incident' whilst there was a decrease in the reports marked as 'Others'. Other than the slight increase in the total number of reports when compared to last year, this change might be due to the reduction in the reports which were previously classified as 'occurrence without safety effect' which are included as 'Others'. Furthermore, there were lower reports classified as occurrence with no flight intended. which were not captured in 2020 values. Most reports classified as 'serious incidents' are related to the MAC category, and which led to a 'TCAS RA' message. Events in this occurrence class normally involve the activation of the last layer of protection which if failed, could result in an accident. Nevertheless, this does not mean that each serious incident has been investigated by the appropriate investigation agency/body.

Occurrence Categories

As part of the analysis process managed by the CAD, each occurrence report received in the national database is categorised to allow for a top-level visibility of events. In order to select the correct category and reflect as closely as possible the event, TM-CAD utilises the ICAO and Commercial Aviation Safety Team (CAST) resources, namely the document prepared by the CAST/ICAO Common Taxonomy Team (CICTT) *'Aviation Occurrence Categories – Definitions and Usage Notes'*. These common taxonomies and definitions are intended to improve the aviation community's capacity to focus on common safety issues.

The categories presented in Exhibit 8 are based on the ICAO ADREP taxonomy and are provided as follows:

Taxonomy abbreviation	***Description***	***Taxonomy abbreviation***	***Description***
ARC	Abnormal Runway Contact	**LOC-G**	Loss of Control-Ground
AMAN	Abrupt Manoeuvre	**LOC-I**	Loss of Control-Inflight
ADRM	Aerodrome	**LOLI**	Loss of Lifting Conditions En-Route
MAC	Airprox/TCAS Alert/Loss of Separation/Near Mid-Air Collisions/Mid-Air Collisions	**LALT**	Low Altitude Operations
ATM	ATM/CNS	**MED**	Medical
BIRD	Bird strike	**NAV**	Navigation Errors
CABIN	Cabin Safety Events	**OTHR**	Other
CTOL	Collision with Obstacle(s) during Take-Off and Landing	**RE**	Runway Excursion
CFIT	Controlled Flight Into or Toward Terrain	**RI**	Runway Incursion
EVAC	Evacuation	**SEC**	Security related
EXTL	External Load Related Occurrences	**SCF-NP**	System/Component Failure or Malfunction (Non-Powerplant)
F-NI	Fire/Smoke (non-impact)	**SCF-PP**	System/Component Failure or Malfunction (Powerplant)
F-POST	Fire/Smoke (post-impact)	**TURB**	Turbulence Encounter
FUEL	Fuel related	**USOS**	Undershoot/Overshoot
GTOW	Glider Towing related events	**UIMC**	Unintended Flight in IMC
GCOL	Ground Collision	**UNK**	Unknown or Undetermined
RAMP	Ground Handling	**WILD**	Collision Wildlife
ICE	Icing	**WSTRW**	Wind Shear or Thunderstorm

***Exhibit 8** - Occurrence Categories based on ICAO ADREP taxonomy*

Exhibit 9 shows the occurrence categories submitted to the national database between 2019 and 2022. This visual provides a snapshot of the ADREP categories reported and provides the basis for further analysis within that specific category as addressed in this document.

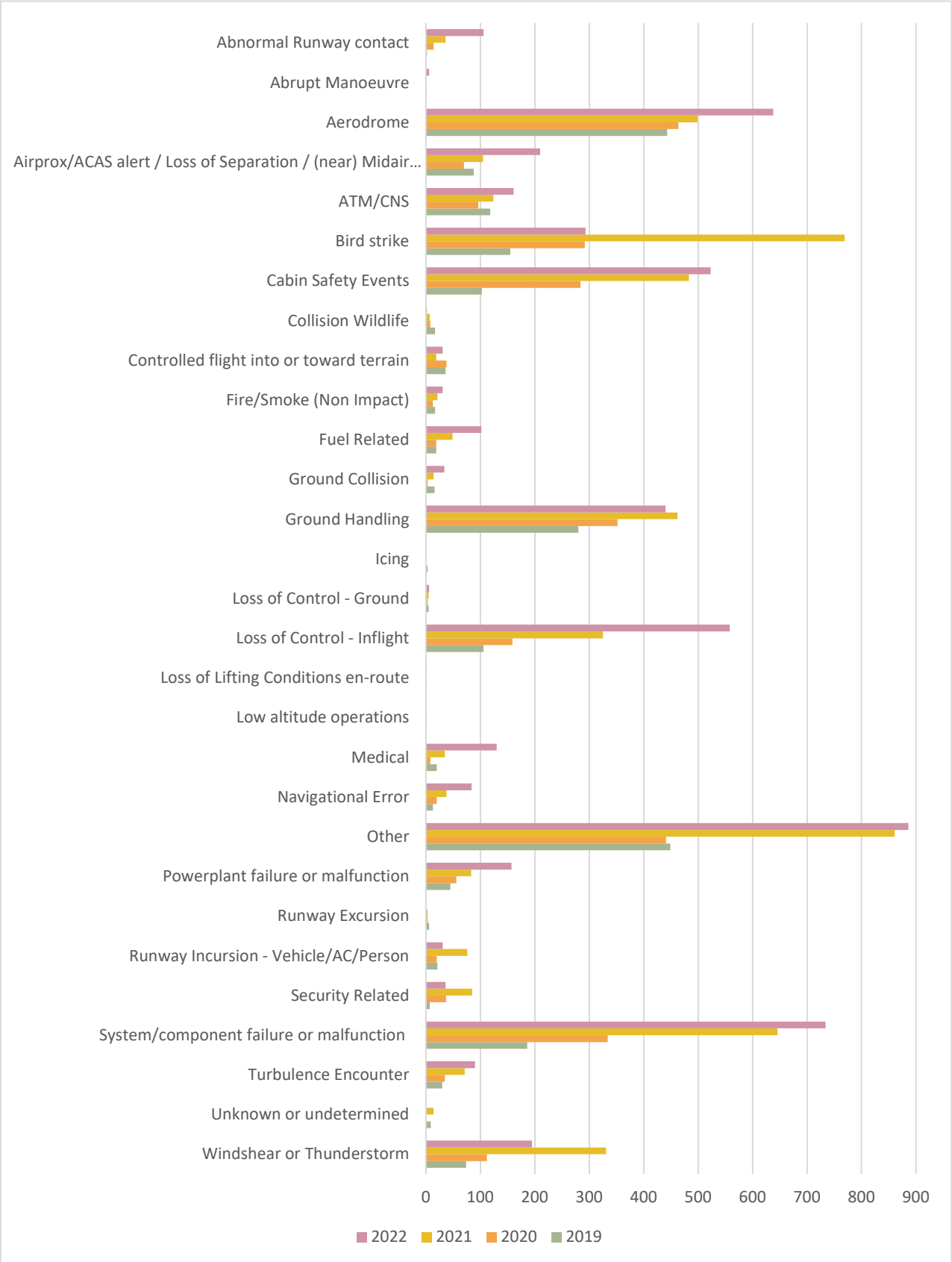

***Exhibit 9** - Occurrence categories of MOR events (2019-2022)*

Exhibit 10 lists the occurrence categories reported in 2022, in descending order. The most common categories reported in Exhibit 9 are once again present. Nevertheless, the most common event category does not necessarily constitute the highest safety risk. The CAD is monitoring these specific categories to ensure that this increase does not constitute a negative impact on operational safety and help identify and address realistic Safety Performance Indicators (SPIs) and Targets (SPTs) by the respective operators/organisations.

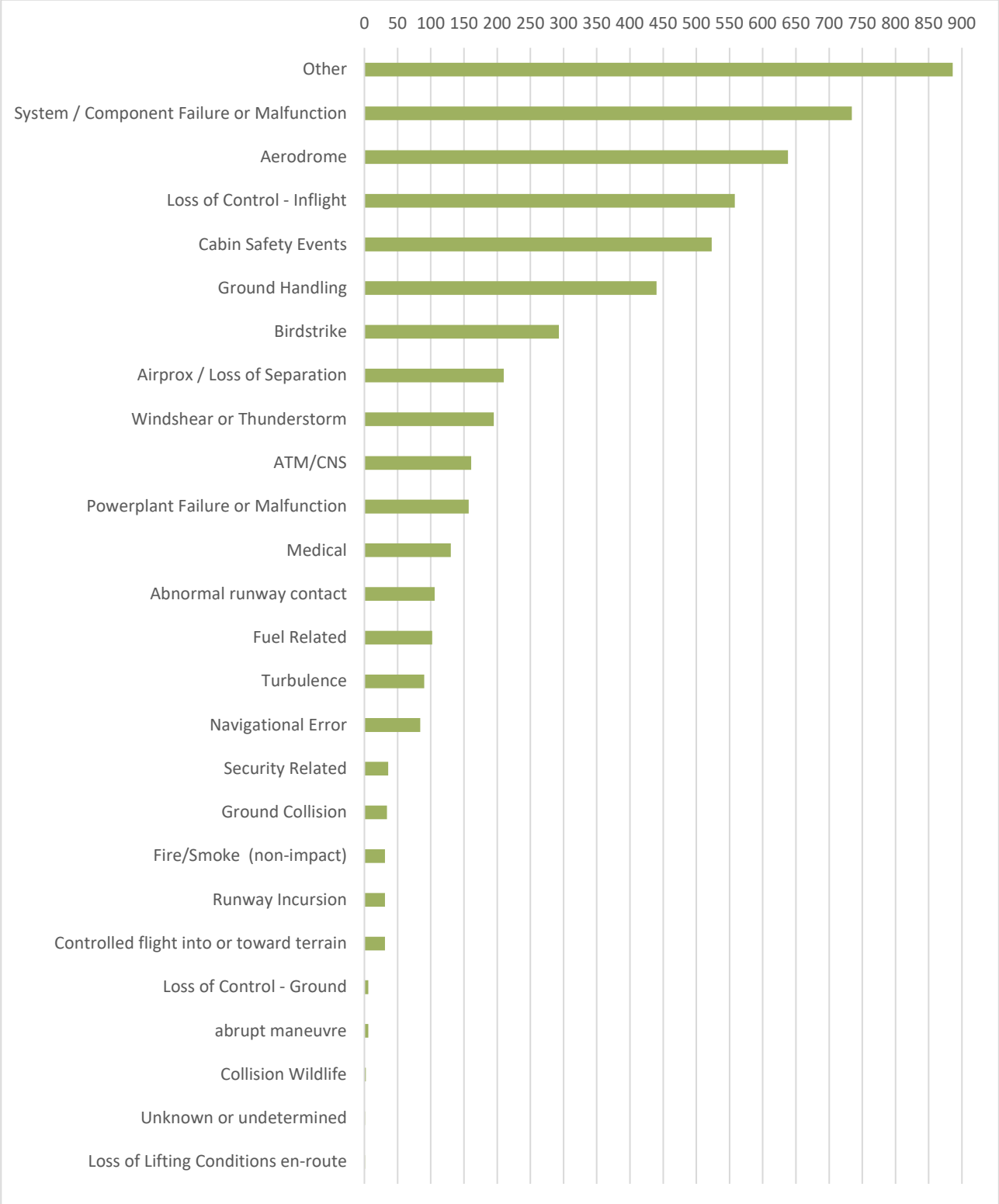

***Exhibit 10** - Occurrence categories of MOR events (2022) in descending order*

Specific Occurrence Category Analysis

The following occurrence categories are being monitored and analysed as part of the threats deriving from the EPAS, SPAS in Malta and due to commonality of events which require addressing.

The analysis will highlight the following categories:

- Aerodrome (ADRM)
- Airprox/TCAS Alert/Loss of Separation/Near Mid-Air Collisions/Mid-Air Collisions (MAC)
- Bird strike (BIRD)
- Cabin safety events (CABIN)
- Controlled Flight Into or Toward Terrain (CFIT)
- Fire/Smoke (non-impact) (F-NI)
- Loss of Control Inflight (LOC-I)
- Ground handling (RAMP)
- Runway Excursion (RE)
- Runway Incursion (RI)

Moreover, the analysis also sheds light on the number of events for specific local occurrences related to Fireworks, UAS, Laser attacks, and General Aviation reports. Information about Fatigue-relevant reports is also being monitored.

Exhibit 11 provides a visual aid of the number of reports received between 2020 and 2022 for these specific events.

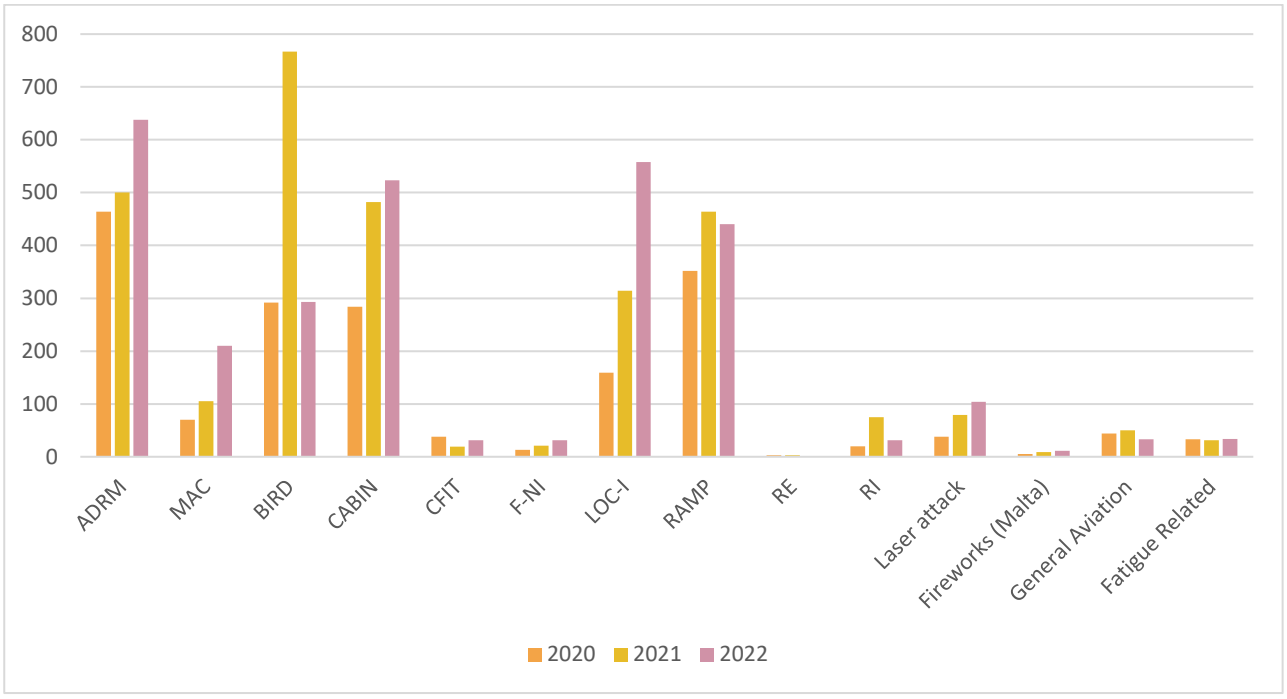

Exhibit 11 *- MOR events per category/domain under review (2020-2022)*

Each of these specific categories will have different levels of data analysis which will contribute towards a better comparison and aggregation of data supported with a brief description of the outcome from the analysis. When looking into the categories, there seems to be an increasing trend into half of the categories, two comparatively steady whilst the rest on a decline. As the flight hours,

AOCs and number of reports consequently increased one must still consider that 2020 operations were heavily affected by the pandemic with the industry's recovery over the last 2 years. Hence, the trend shown might look skewed. Nevertheless, Exhibit 11 provides information on areas that might require deeper analysis, possibly shown as an increase as a consequence of the reduction in operations of 2020.

Aerodrome (ADRM)

The largest number of events categorised under ADRM are derived from the Luqa aerodrome operator. Apart from FOD control and aerodrome lighting and surfaces, this category incorporates occurrence events involving Aerodrome design, service, and other functionality issues. Bird strikes at aerodromes are classified under BIRD and are not included in this category.

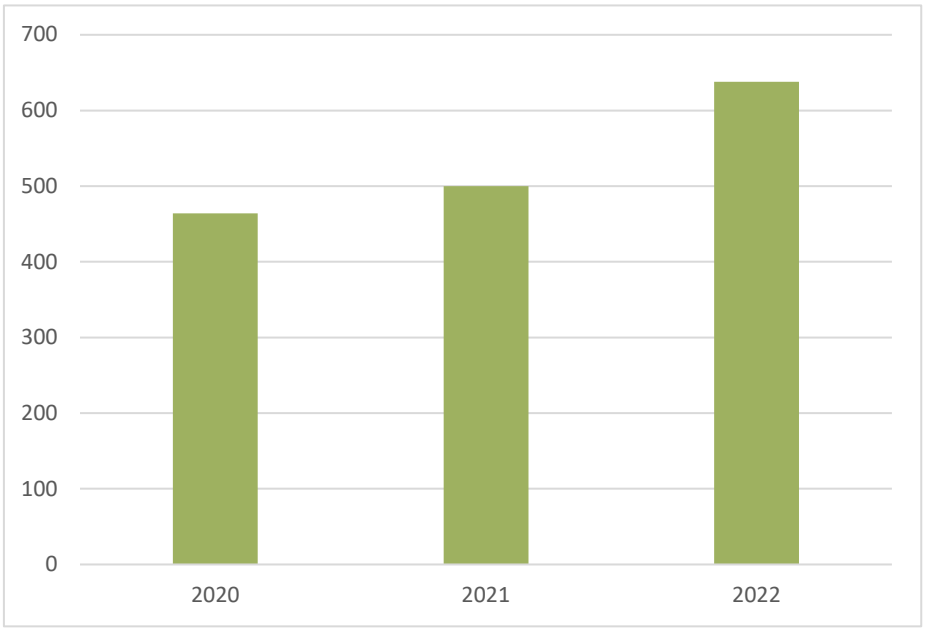

***Exhibit 12** - Aerodrome (ADRM) category events (2020-2022)*

Exhibit 12 shows an increase in this category and the three-year trend confirms that this increase is related to the improvement in CAD evaluation and awareness by submitters. As far as Luqa aerodrome is concerned, areas that require attention are mostly related to FOD-related events, aerodrome maintenance (surface maintenance and general upkeep such as grass cutting), ground handling equipment spillages and Ramp activities.

Airprox/TCAS Alert/Loss of Separation/Near Mid-Air Collision/Mid-Air Collision (MAC)

This category includes occurrence events related to Airprox, TCAS alerts, loss of separation as well as near collisions or collisions between aircraft in flight. This aspect is of crucial importance towards a safe aviation environment. TM-CAD treats such events seriously and considers the occurrence class as a Significant Incident. Nevertheless, each event has its own impact of safety whereby separation criteria and resolution actions are taken into consideration when analysing each case.

Due to the operational nature of 2020, it is difficult to compare and achieve trends of MAC reports from 2021 to previous years. In addition, following the optimisation in categorisation during the previous years, some MAC were also considered as very low risk and hence classified as incidents. This was especially done in the events were there was just a slight loss in separation and the flight crew was well aware of the situation following procedure. In 2022, two-hundred and ten events were classified as MAC, which might be double of the reported incidents compared to the previous year as illustrated in Exhibit 13. However, this increase is relatively minor when considering the total number of reports and flight hours significant increase.

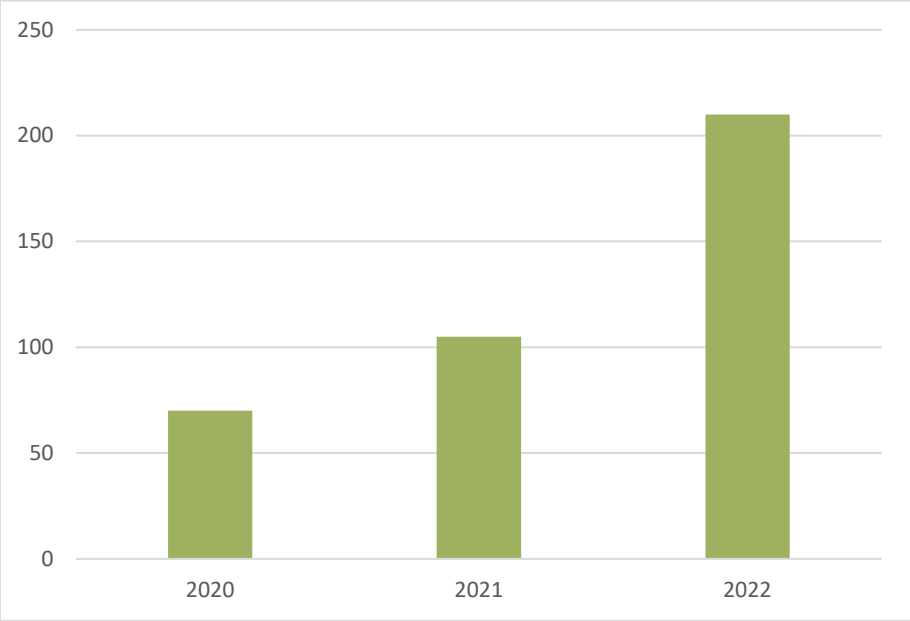

***Exhibit 13** - Total MAC category events per year (2020–2022)*

Unmanned Aircraft Systems (UAS)

Given that UAS related categories are limited in the current ADREP taxonomy, TM-CAD is also presenting events where a MAC could have occurred between an aircraft and a UAS. This data also includes sightings of UAS by the crew of an aircraft, in which case no action might have been necessary. The sighting/encounters with UAS is a phenomenon on the rise and which the aviation industry must accept and address systematically. Exhibit 14 provides percentage values of UAS related MAC events from the total reported. Similar percentage proportions were recorded in 2021.

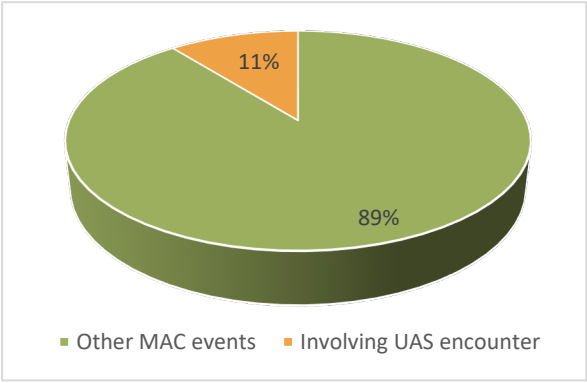

***Exhibit 14** - Total MAC category events (% by event type, 2018–2022)*

Exhibit 15 provides percentage values about UAS related events, segregating events which occurred in Maltese airspace from those of Maltese-registered aircraft in foreign airspace. Due to the nature of a UAS operation, and as things currently stand, there is limited enforcement the authorities can implement. However, the CAD is working with all stakeholders involved to increase awareness about the obligations and responsibilities of UAS users on the Island. In fact, when considering the percentage of last year, the local UAS related events decreased by 13%.

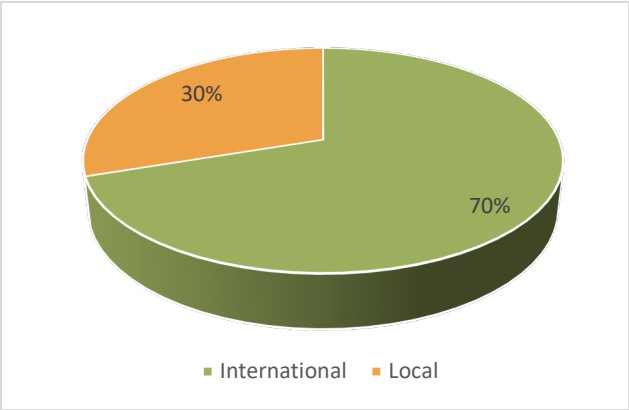

Exhibit 15 *- UAS related events (% by location, 2018-2022)*

Bird strikes (BIRD)

This category includes occurrences involving collisions/near collisions with bird(s)/wildlife. This natural phenomenon is highly dependent on the location of the aerodrome and surrounding areas. To aid our analysis, such events are separated into two sections, namely bird strikes reported at the only CAD certified aerodrome (Luqa) and bird strikes reported by Malta-registered operators at foreign locations. The data related to Luqa aerodrome is further compared against the number of aircraft movements between 2018 and 2022 as illustrated in Exhibit 16.

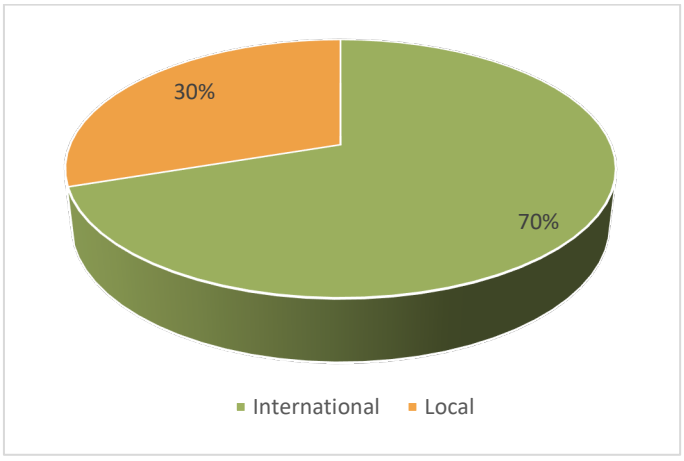

Exhibit 16 *- Bird strike (BIRD) category events (% by location, 2018-2022)*

Additionally, a significant decrease in reported bird strikes was clearly noted during 2022 as shown in Exhibit 17. Whilst in the previous year a spike in the number of birdstrikes or near collisions were reported, this number mainly contributed from foreign aerodromes. This phenomenon was previously raised by EASA Member State including Malta, as one of the risk factors once the resumption of air operations continued. This led to greater situational awareness with a sudden drop in the number of recorded events.

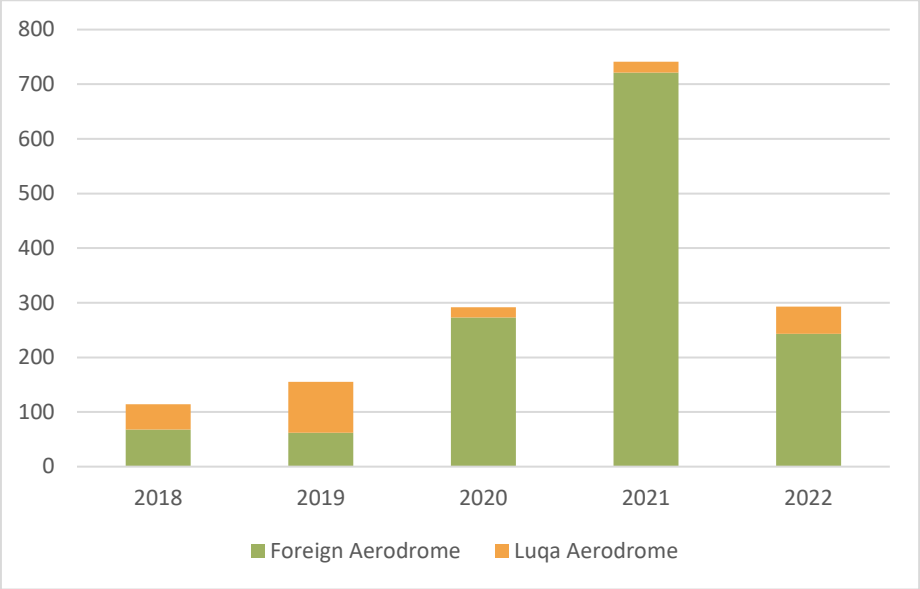

Exhibit 17 *- Bird strike (BIRD) category events (number by location, 2018-2022)*

When considering the number of birdstrikes for Luqa aerodrome in relation to the total amount of aircraft movements across the year there is a slight increase. Exhibit 18 and Exhibit 19 provide an annual trend of bird strikes at Luqa aerodrome per 1,000 movements which also correlates with this increase. Whilst bird strike reports from operators decreased during 2022, the relative value to 1,000 movements at Luqa aerodrome has inclined, hence, with increasing aircraft movement the number of local reporting inclined as well.

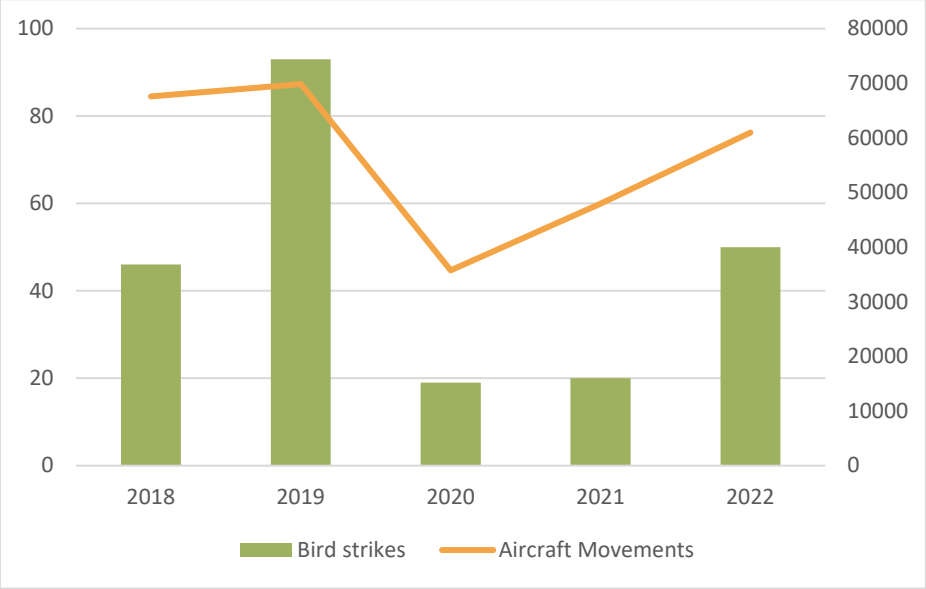

Exhibit 18 *- Bird strike (BIRD) events at Luqa Aerodrome vs Aircraft Movement (2018-2022)*

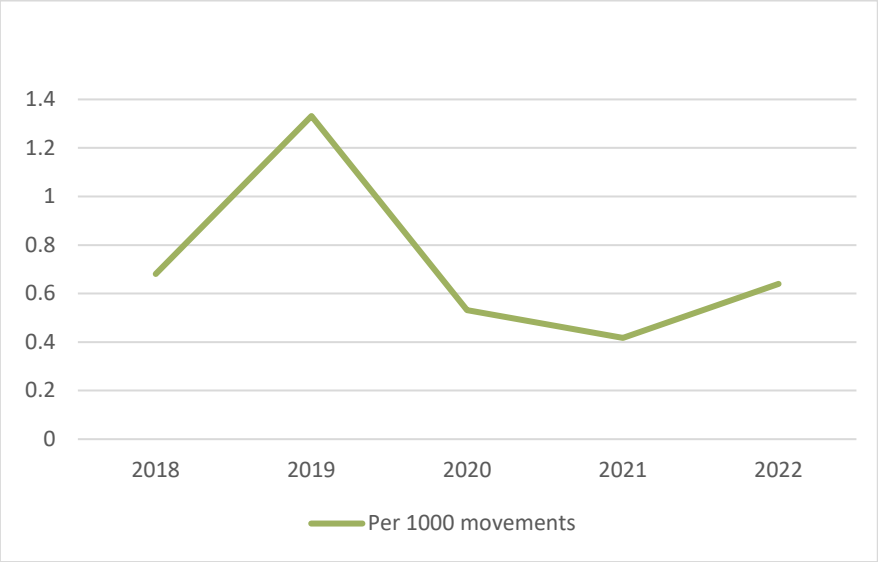

Exhibit 19 *- Bird strike (BIRD) events at Luqa Aerodrome per 1,000 Aircraft Movements (2018-2022)*

Exhibits 20 and 21 provide a monthly view of the bird strike events as reported in 2022 to the National Database. Exhibit 20 shows the monthly bird strike events reported at Luqa aerodrome, while Exhibit 21 shows a monthly view of all the bird strike events reported to the National database.

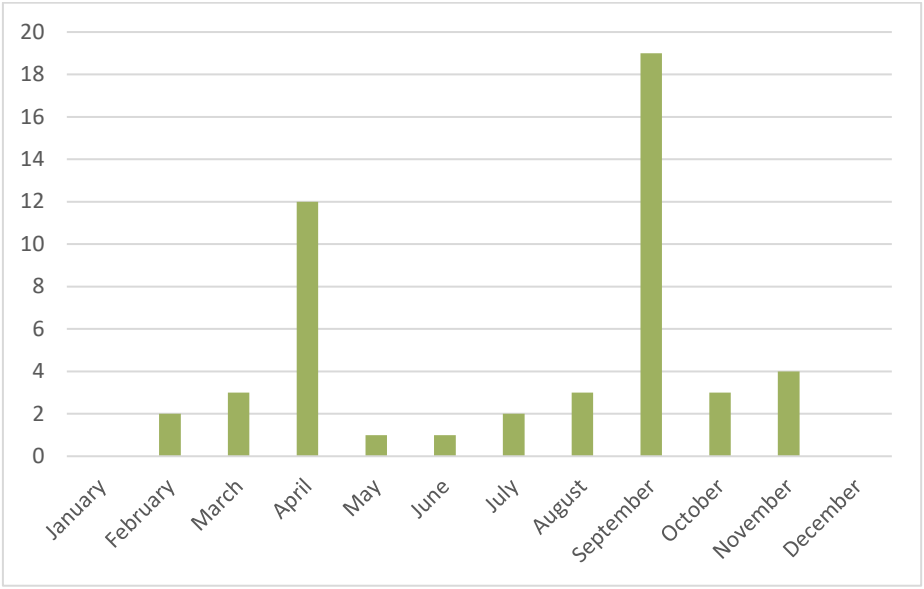

Exhibit 20 *– Bird Strike events reported monthly at Luqa Aerodrome (2022)*

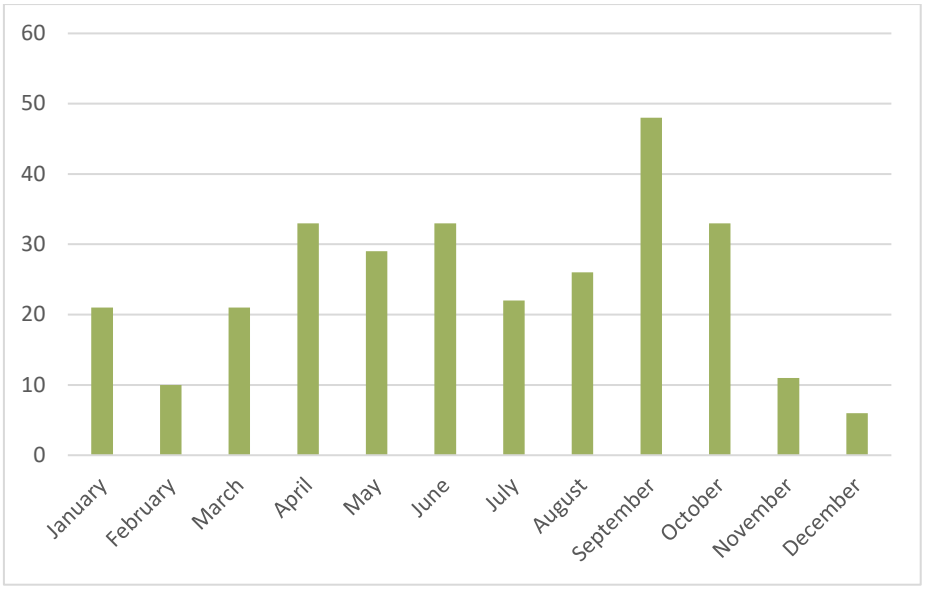

Exhibit 21 *– Bird Strike events reported monthly to the National database (2022)*

Cabin Safety Events (CABIN)

This occurrence category includes miscellaneous occurrences in the passenger cabin of transport category aircraft. From the analysis it has been noticed that this category is mostly attributed to unruly/disruptive passenger events and smoking in aircraft lavatories. This behaviour concern is a widespread problem in the aviation industry and airlines, together with ground-handling agents, are doing their utmost to prevent such scenarios.

Cabin safety events are on a steady increase as shown in Exhibit 22. The three main drivers for this category, are namely 'Difficult/Unruly passengers', 'Drunk Passengers' and 'Smoking in Cabin/Toilet' which when grouped together result in the most cases making up this category. This will be discussed further in Exhibit 23.

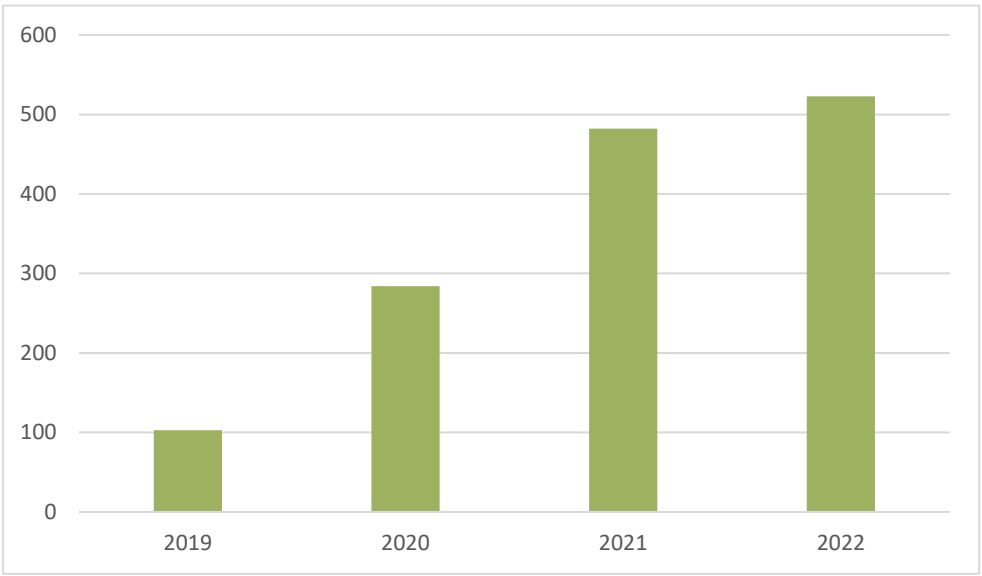

Exhibit 22 *- Cabin Safety Events (CABIN) category (2019-2022)*

There is no trend related to a specific departure location for unruly passengers, and it has been noticed that the threat levels of such events vary. This industry wide challenge was also discussed at the EASA Network of Analysts (NoA) plenary meeting and is high on the safety agenda amongst various EASA working groups and sections. Even though the rise in the previous year was contributed by the passengers not following the mandatory 'mask wearing' protocol, there was still a slight increase in this category. This might be explained by the exponential increase of travel which might have added extra delays and contributed to passengers' irritation. In fact, TM-CAD together with local aerodrome operations will keep on contributing towards recommending measures to help contain and reduce such events.

In 2022, the three main drivers mentioned earlier contributed to 59% of reports in the Cabin Safety Events category which also correlates with the data of the same category spread over a four-year term as shown in Exhibit 23. This supports the trend that these three categories are the main drivers contributing towards this category. About 28% of the remaining percentage is mainly made-up from events related to medical illness of passengers which arose during the flight. Nonetheless, they were looked after and imposed no cabin safety threat to the flight. The rest of the reports consisted of other minor cabin crew matters, use of portable oxygen and other medical equipment.

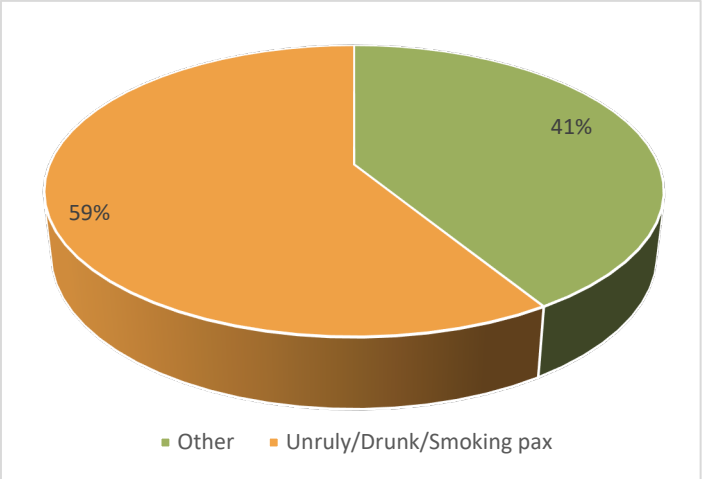

***Exhibit 23** - Cabin Safety Events (CABIN) category (% by event type, 2019-2022)*

Controlled Flight Into or Toward Terrain (CFIT)

Controlled Flight into Terrain (CFIT) occurs when an airworthy aircraft under the complete control of the pilot is inadvertently flown into terrain, water, or an obstacle. This category includes events only occurring during airborne phase and covers events which could have potentially led to an accident (ex: Ground-proximity warning).

A total of 31 reports were categorised as CFIT in 2022. The event type for these reports were further expanded and presented in Exhibit 24. One serious incident stemming from incorrect altimeter setting is currently being investigated by the French Safety investigation Authority (BEA). The 'Flight operations outcome' incorporates aircraft handling situations such as unstabilised approaches, go-arounds and missed approaches which normally follow the warning trigger. In fact, most of the other events selected as part of this category are part of the 'Warning' drop down. This is broken down as shown in Exhibit 24. Other equipment or their interpretation events also contributed towards this category.

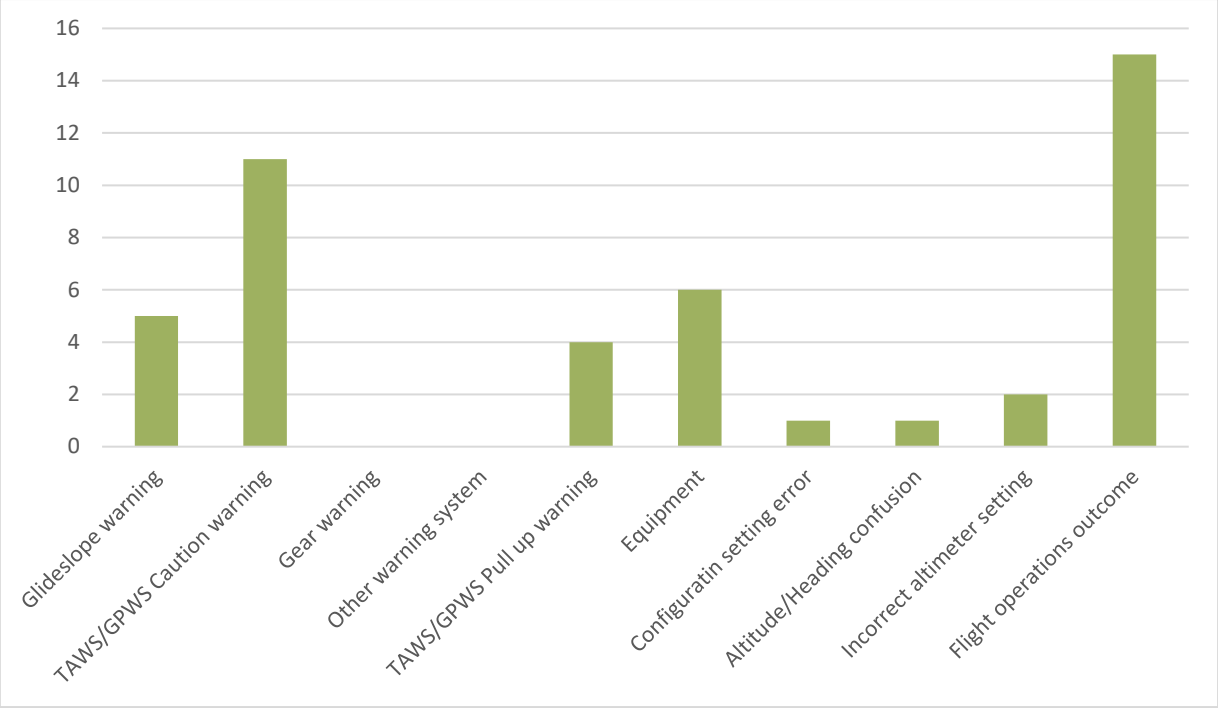

Exhibit 24 *- CFIT category related events (2022)*

Fire/Smoke (non-impact) (F-NI)

This category includes occurrences where fire or smoke was reported in or on the aircraft, in flight, or on the ground, which was not the result following impact of the aircraft. The events differed from contaminated air in the aircraft air-conditioning system, component failure and galley appliance failures.

Each case has been investigated for its root-cause and, where necessary, involved the manufacturer of the part/component which was the cause of smoke or fire. There were no injuries of fatalities in all the events under this category. As evidenced in Exhibit 25, a slight increase has been experienced in 2022.

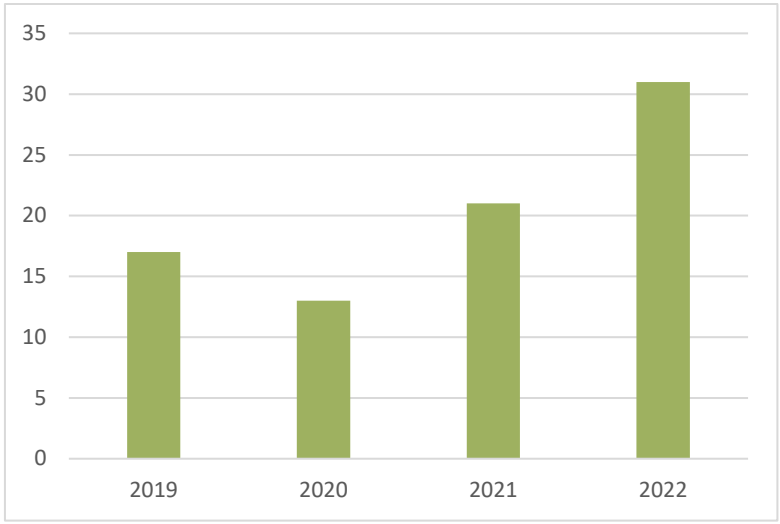

Exhibit 25 *- Fire/Smoke (N-I) category events (2019-2022)*

While the majority of these warnings were related to minor smoke or fires in the galley area, on deeper analysis of the reports, one event was identified as a potential threat to flight safety. This involved an A320 aircraft which returned for landing shortly after take-off due to fumes/vapour in the cockpit and cabin. In fact, this serious incident is currently being investigated by the Maltese BAAI.

Ground Handling (RAMP)

These include occurrences during (or because of) ground handling operations. The following analysis includes RAMP events in Malta and those under this category that were reported by Maltese-registered operators. Currently, ground handling agents in Malta report events to the aerodrome operator and manage them as part of their SMS. The aerodrome operator submits reports to TM-CAD in line with occurrence reporting obligations.

Exhibit 26 provides data related to reported RAMP category events. The CAD's approach towards this annual increase is by taking into consideration the severity of the events. This is part of the strategy to keep encouraging reporting from Ground Handling Service Providers (GHSP) and Aerodrome operators whilst ensuring that reports are submitted and address those of high safety concern/s and/or latent issues.

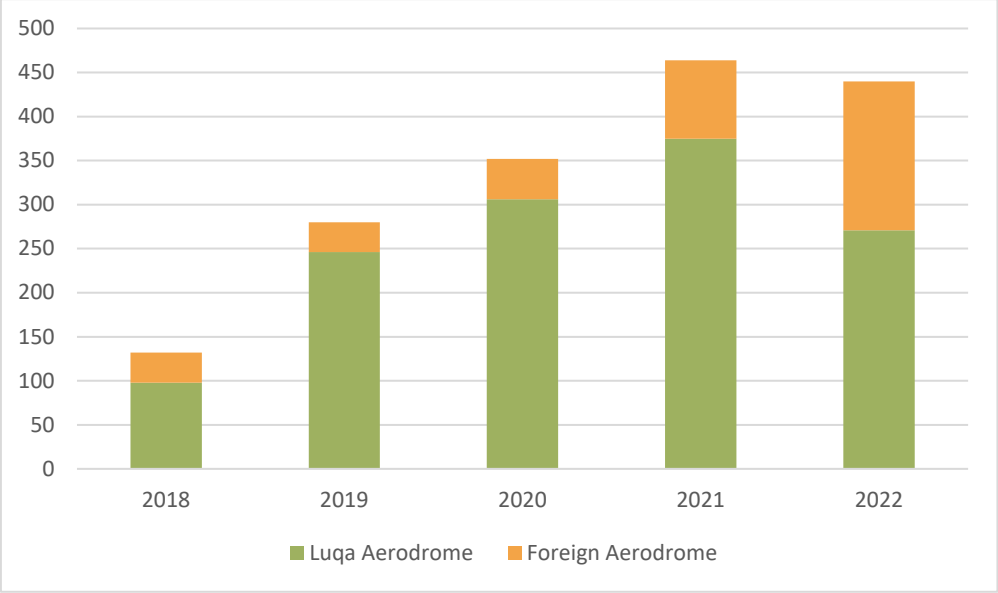

***Exhibit 26** – RAMP category events (2018-2022)*

The trends identified in previous years are still the major contributors to the RAMP category events at Luqa aerodrome in 2022, i.e. related to FOD/potential FOD, ground handling service equipment failures (including oil/fluid spillages) and non-adherence to driving procedures on aircraft movement areas. These matters have been brought to the attention of the Aerodrome operator and active measures were implemented. The impact of such measures seems to have contributed to this reduction in reports by Luqa aerodrome in 2022.

At international locations, areas of concern are loading, passenger handling procedures (especially when computerised systems fail) and turnaround/pre-flight preparation matters. These matters are being addressed via the SMS of the operators involved in such events.

Loss of Control-Inflight (LOC-I)

This category is quite vast and include occurrences where there was a loss of aircraft control, or deviation from intended flight path inflight. LOC-I remains one of the most significant contributors to fatal accidents worldwide. LOC-I can result from a range of interferences including engine failures, icing, or stalls. It is one of the most complex accident categories, involving numerous contributing factors that act individually or, more often, in combination. This category is also one of the highlights of the EPAS.

When compared to previous years, year 2022, has provided another increase in the LOC-I category as shown in Exhibit 27. This has been attributed to the increase in operators under TM-CAD oversight. This category is mostly related to unstabilised approach and flight parameter exceedance and configuration warnings. Upon delving into the reports these events about a third of the events were attributed due to weather and environmental encounters. No injuries, fatalities or near accidents were reported in such category.

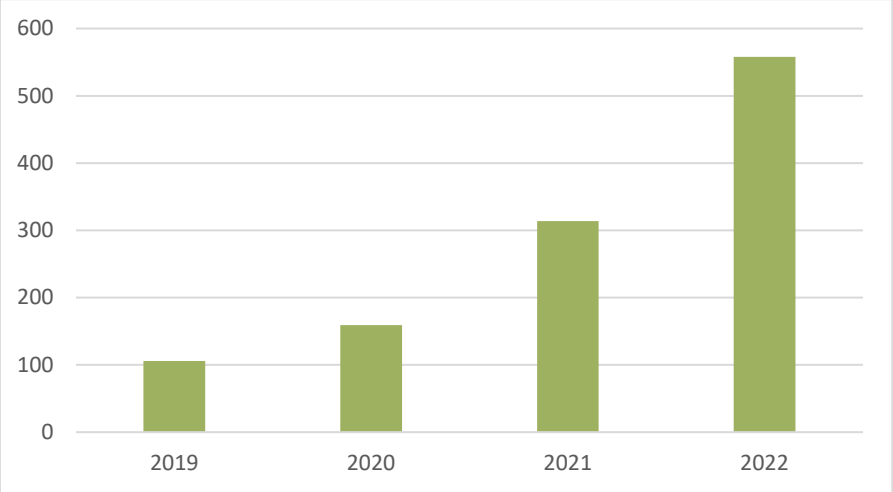

***Exhibit 27** - LOC-I category events (2019-2022)*

Runway Excursion (RE)

These events occur when an aircraft veers-off or overruns-off the runway surface. Runway excursion can potentially result in loss of life, and/or injury to persons either on board the aircraft or on the ground. Moreover, such events can easily lead to damage to aircraft, and airfield, surrounding equipment, or buildings. Runway excursions can be attributed to one or multiple factors ranging from unstable approaches, failure to go-around, and/or the condition of the runway surface.

In 2022, there were no recorded Runway Excursions as illustrated in Exhibit 28.

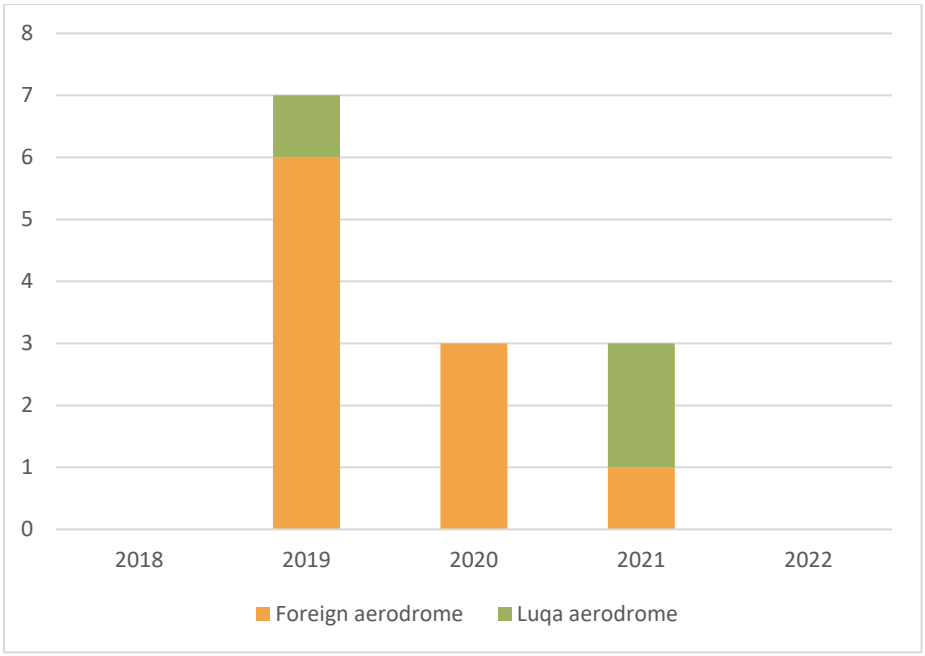

***Exhibit 28** – RE category events at location (2018-2021)*

Runway Incursion (RI)

These are occurrences at an aerodrome 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.

In 2022, the CAD received 31 reports of RI events of which 10 occurred at Luqa aerodrome. This is a slight decrease from last year and these events did not result into an accident or near accident. The small number of local events where mostly related to slow moving aircraft, vehicle infringements which led to few go arounds when aircraft were on approach.

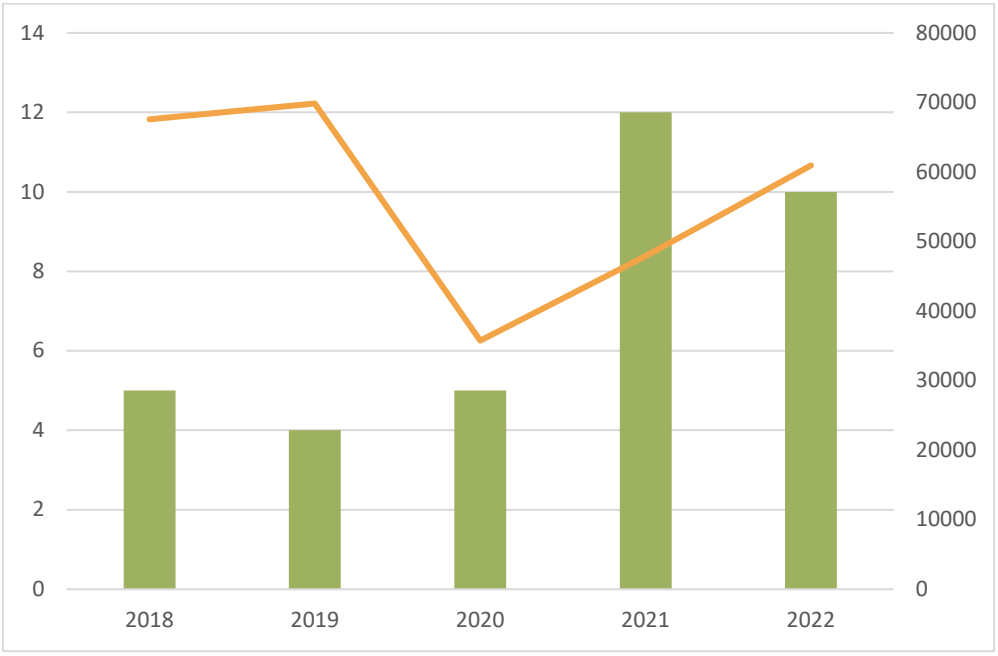

***Exhibit 29** - RI category events at Luqa aerodrome vs Aircraft movements (2018-2021)*

Numerically, the RI events at Luqa are relatively low and when compared to aircraft movements, this year there were 2 RI per 1,0000 aircraft movements. This constituted a decrease when compared to last year's ratio but nonetheless still reporting an increasing trend in relation to the number of aircraft movements when considering the three previous years.

Fatigue

Fatigue is the general term used to define physical and/or mental exhaustion which extends beyond normal individual tiredness. This exhaustion may lead to reduced standards of safe operation with an increased possibility of error. TM-CAD monitors such reports and follows-up with the respective operator on reported occurrences. It is noticed that fatigue reporting is more common to the business-aviation community, mostly attributed to the operation model adopted by the industry.

Exhibit 30 shows the number of fatigue-related reports submitted to the National database on a yearly basis. This number does not necessarily mean that each report constituted a breach of regulations or crew-time rest periods/rostering.

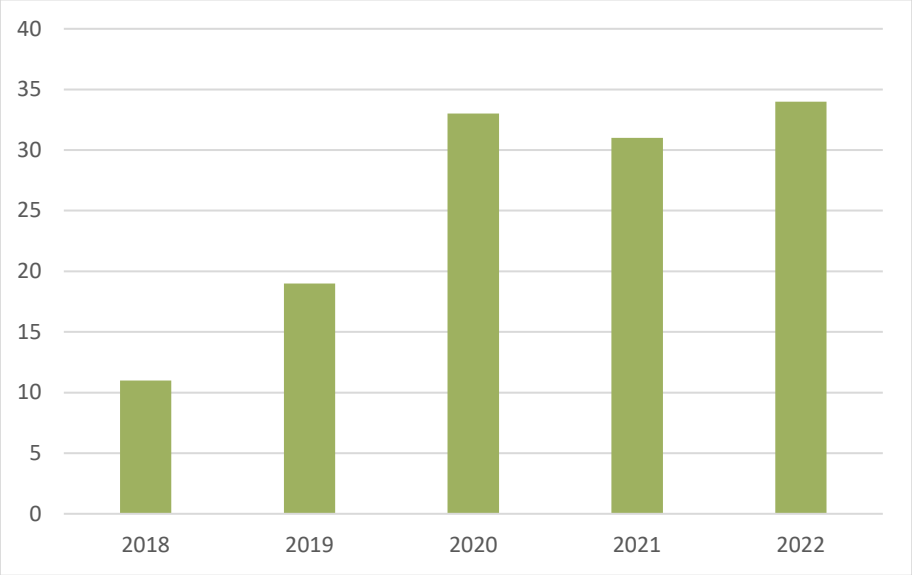

***Exhibit 30** - Fatigue-related events (2018-2022)*

Most of the analysed reports were related to multiple-leg flights with different time zones which impact the level of alertness of the crew. Crew rostering rest periods and accommodation challenges also contributed to accumulation of fatigue. Elements of fatigue were mostly noted during the busy schedule period, mostly due to operations being maxed-out due to the operational increase experienced in the industry. This matter was monitored during continuous oversight as when considering the increase in flight operations a steady state of fatigue reports reached TM-CAD.

General Aviation

General Aviation aircraft in Malta depart and land from the Luqa aerodrome. Such scenario provides greater challenges to the GA community and airspace management, especially due to the operations taking place within and around the international aerodrome. GA is regulated in a hybrid framework of national and regional regulations. The focus is mainly related to standards of airworthiness, pilot licensing and to promote high standards of safety.

The activity of General Aviation in Malta pursued a strong trend whereby Exhibit 31 shows a slight decrease in local movements when compared to the last two years. The decrease in activity resulted in a decrease in reported MOR events. The rate of MORs for GA per 1,000 aircraft movements stands at 2.39 (2 reports), which is a slight decline when compared to 2021. Exhibit 32 illustrates General aviation occurrence categories compared to previous years.

The CAD evaluates each report separately and addressed any concerns deriving from such event. Safety notices were published depending on the trends or risks identified following evaluation of such reports. Safety notices were also issued following the recommendations deriving from safety investigations conducted by the BAAI.

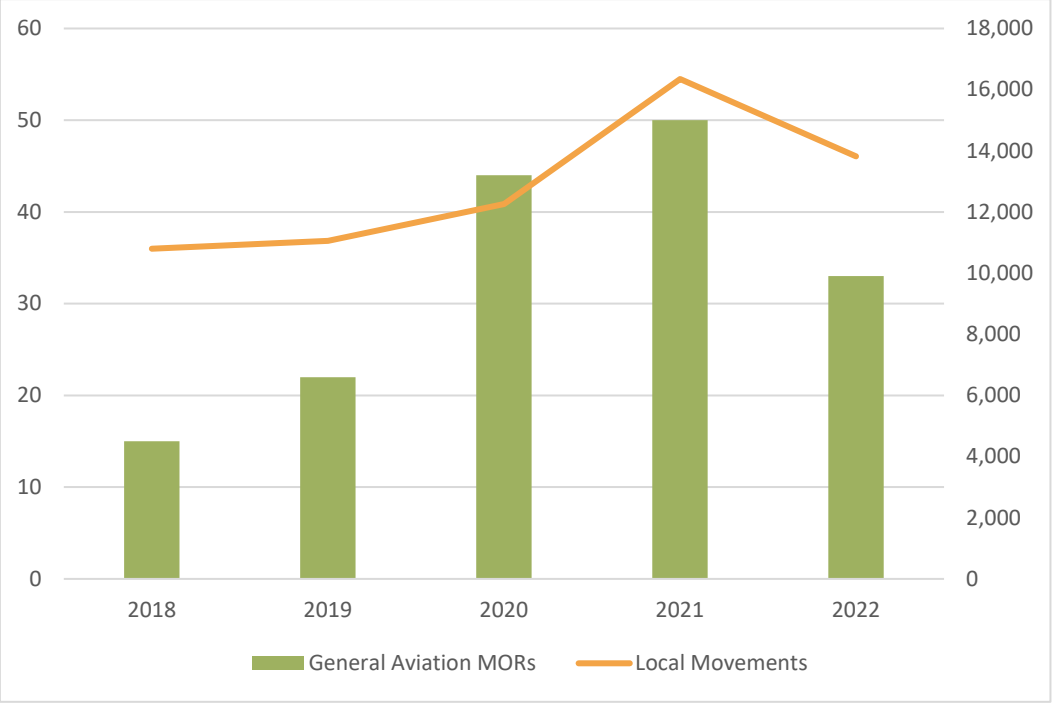

Exhibit 31 *- General Aviation MORs vs Local movements (2018-2022)*

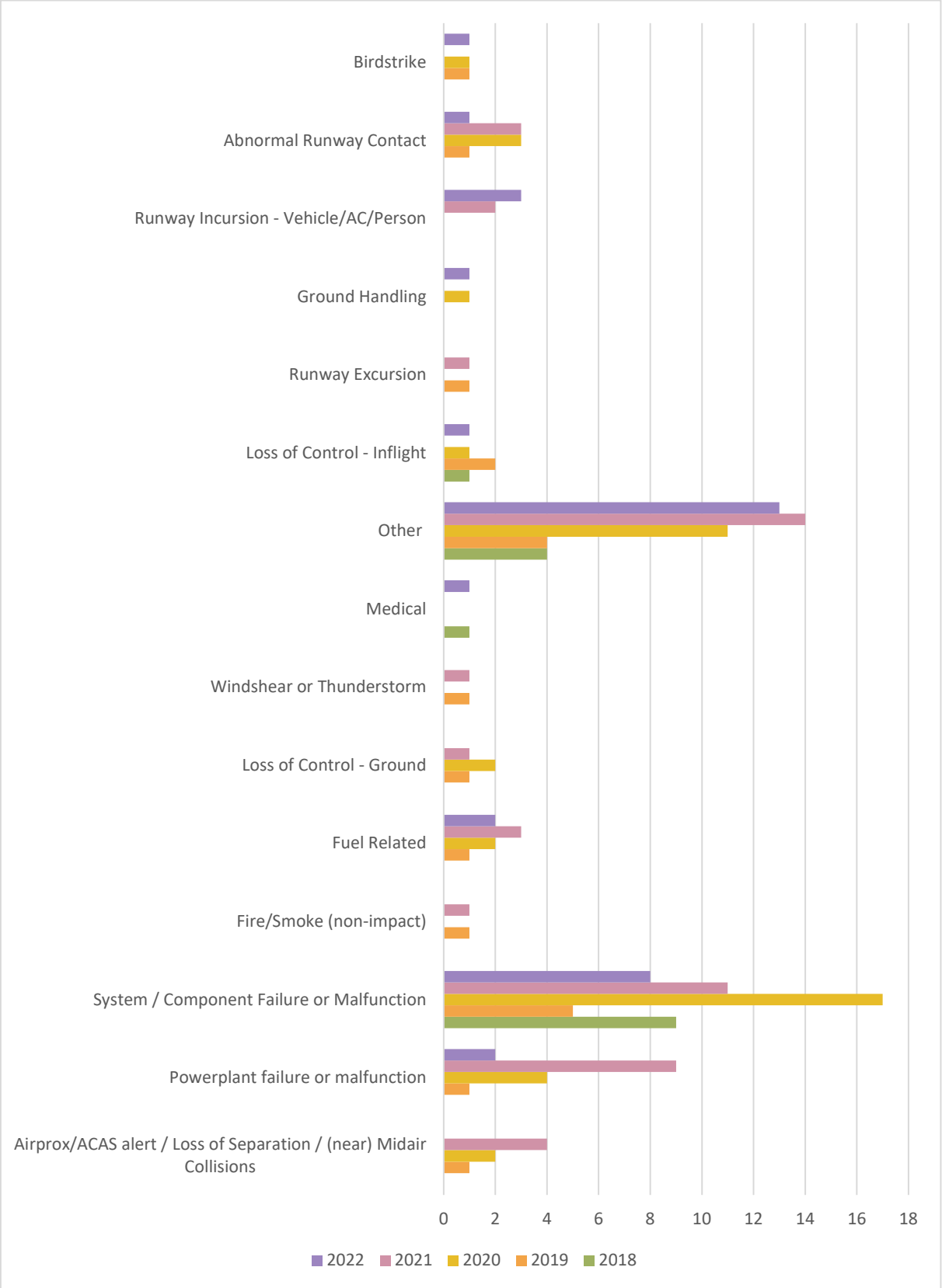

***Exhibit 32** - General Aviation Occurrence Categories (2018-2021)*

Laser Attacks

It is a known fact that laser pointers have become easily available to the public in recent years. This is considered as one of the contributing factors towards the global increase in the deliberate use of laser pointers against aircraft's cockpit when approaching or departing an aerodrome. Laser attacks are of considerable threat to flight crew and can create potentially hazardous effects during the critical stages of flight particularly take-off and approach/landing.

While it is evident that there is a considerable increase in Laser Attacks in 2022, Exhibit 33 shows that such events in Malta are stable with a downward trend compared to previous years. There is no specific Country or area of operation that this increase has been noticed.

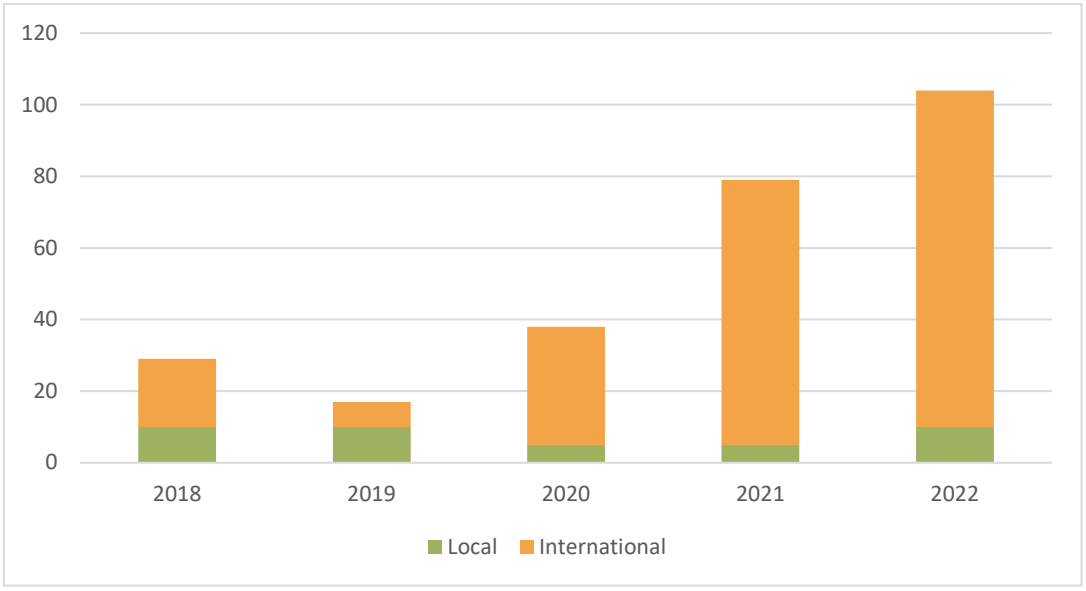

***Exhibit 33** - Laser Attack events (2018-2022)*

Fireworks

Malta's traditions include firework displays as part of large-scale celebrations and in local Patron Saint feasts. Taking into consideration the location of the Luqa aerodrome, the take-off and landing paths of flight, fireworks may pose a threat to aviation users. Procedures are currently in place to ensure the safe coordination between stakeholders involved in such activity. Depending on the nature of events, these procedures are evaluated for effectiveness and enhanced as necessary. To date, there were no circumstances whereby aircraft safety was jeopardised due to firework displays.

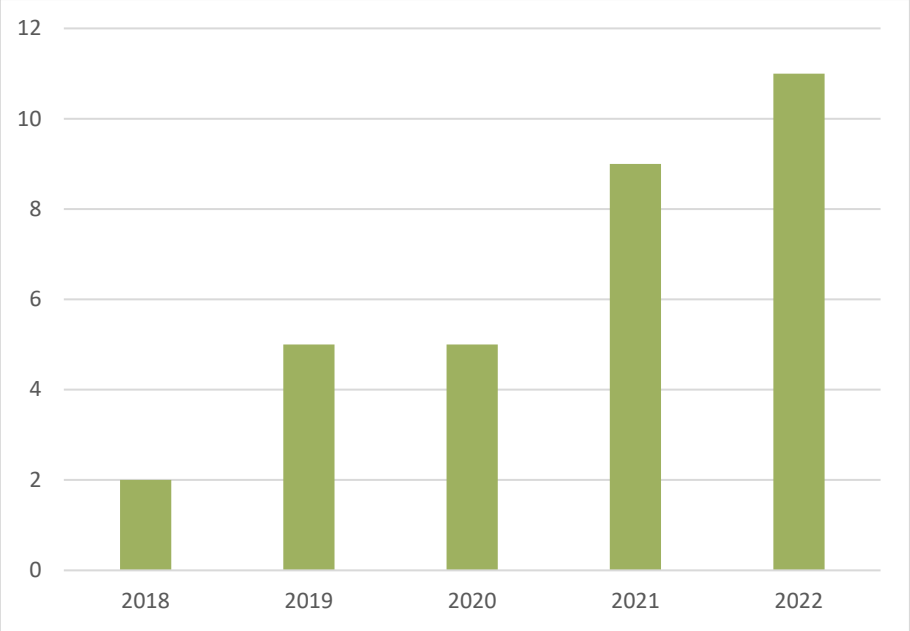

Exhibit 34 *- Firework related events (2018-2022)*

Occurrence Report Events

Event Type

Each MOR submitted to TM-CAD is attributed an event type which will help in occurrence reporting analysis in identifying pre-cursors and outcome of the cause. Regulation (EU) 376/2014 mandates that this field is populated to aid in data gathering.
The event-type list is based on the ECCAIRS ADREP taxonomy and is quite comprehensive, containing reference to multiple domains and services. Exhibit 35 only shows the high-level of this comprehensive list:

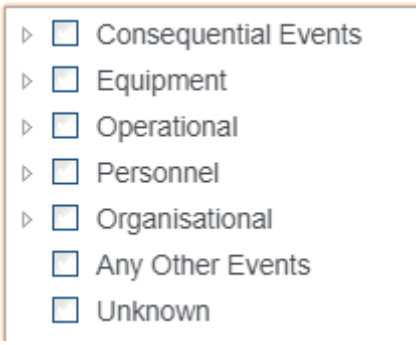

Exhibit 35 *- Event Type drop-down menu headers*

For simplicity purposes, a bar graph in Exhibit 36 shows the seven top-tier headers. It is important to note that one occurrence report can have multiple event types.

Even though there is an increase in reports, there is no specific event type that can be attributed towards this rise. The increase follows the same pattern of previous years.

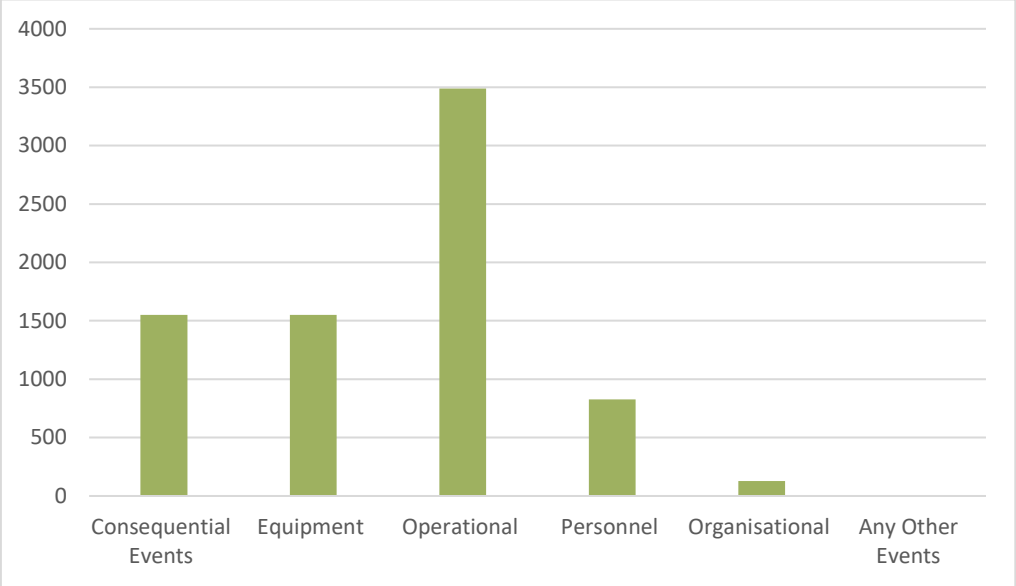

Exhibit 36 *- Event Types (2022)*

Event Phase

Each different operation has its own set of event phases as presented in Exhibit 37. The occurrence reports received by TM-CAD were related to the 'Powered fixed-wing aircraft', 'Helicopter' and 'Maintenance phases'.

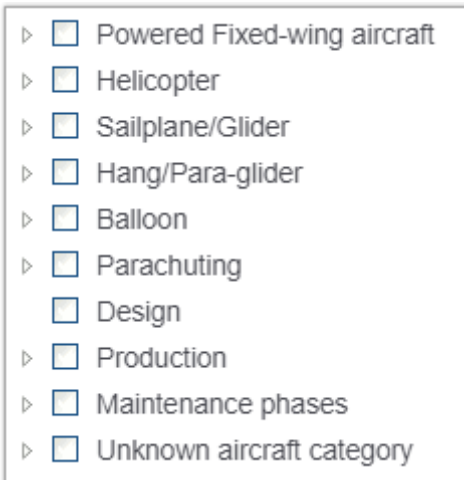

Exhibit 37 *- Event Phase drop-down menu headers*

For the 'Powered Fixed-wing aircraft' and 'Helicopter' events in 2022, the phases are shown in Exhibits 38 and 39 respectively:

The event phase tally reflected the increase in amount of reports and follows the same pattern of previous years, with no spike to a specific event phase.

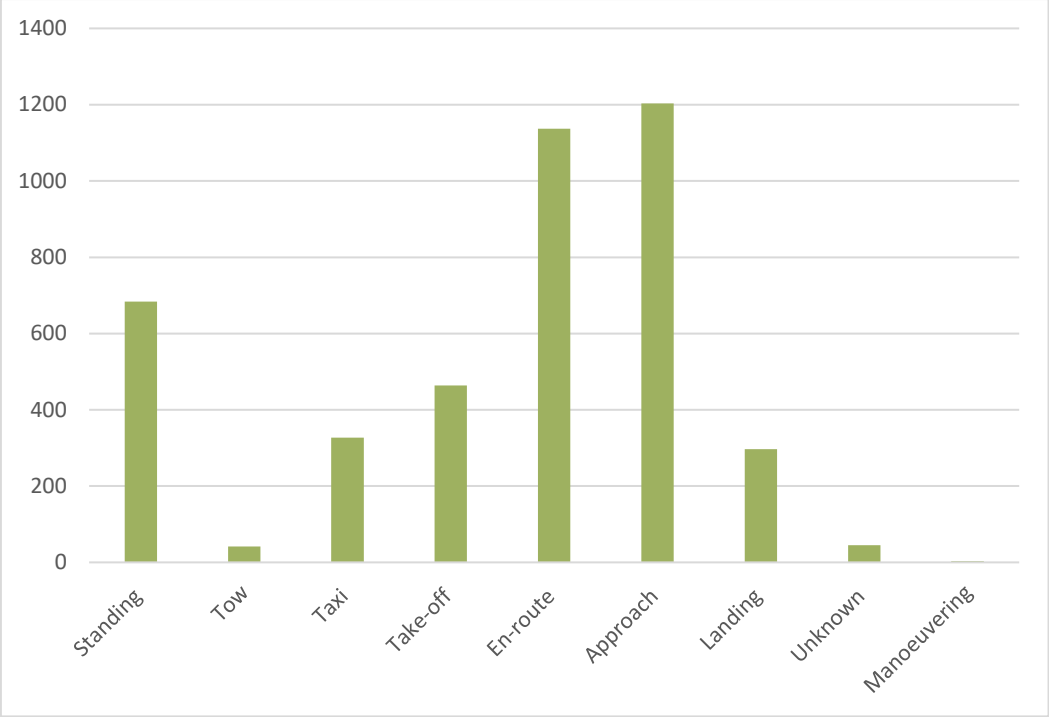

Exhibit 38 *- Event Phase: Powered fixed-wing aircraft (2022)*

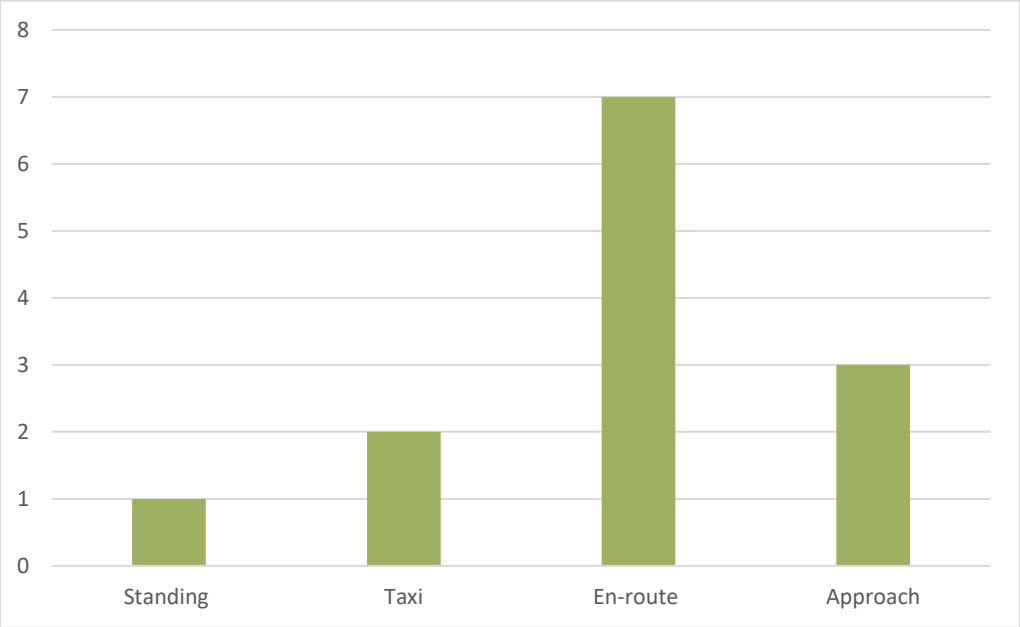

Exhibit 39 *- Event Phase: Helicopter (2022)*

For the ‘Maintenance phases’ related events in 2022, the phases are shown in Exhibit 40:

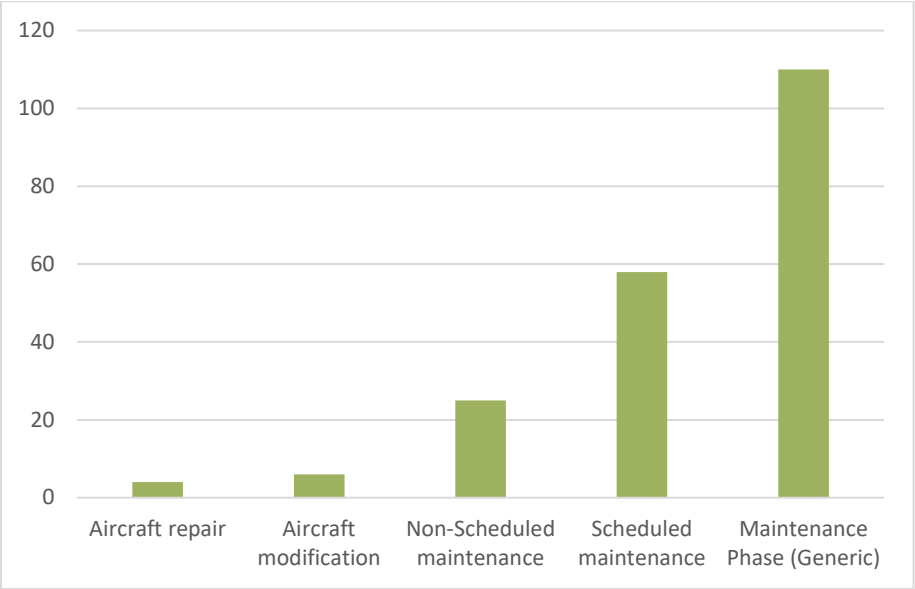

Exhibit 40 *- Event Phase: Maintenance phases (2022)*

Occurrence Report Follow-up

The aim of safety occurrence reporting is to improve the safe operation of the aviation industry, thus making this mode of transport safer than yesterday. TM-CAD fosters the notion of Just Culture and it is not the intention of the CAD to attribute blame to an event on an individual. In addition, based on the occurrence reports received, the CAD may conduct its own fact-finding and/or issue any relevant Safety Information/Notice. Exhibit 41 provides information on the reporting flow of an Occurrence Report as implied by regulation (EU) 376/2014.

As part of the analysis, the CAD expects that organisations provide a follow-up report especially if the event has revealed an actual or potential aviation safety risk. The SCU manages this follow-up process in liaison with the respective inspector/inspecting officer from the other Units within the CAD. The goal is to identify operational hazards and system deficiencies which must be addressed by means of added mitigation measures and actions as necessary.

Hence, operators/organisations are expected to conduct an effective root-cause analysis and/or identification of causal factors and introduce any possible mitigation measures. This process must be an integral part of the organisations' SMS and approach towards improving aviation safety.

Additionally, the CAD may opt to issue Safety Information and Advisory Notices (SIAN) or other means of information sharing to stakeholders if a potential safety concern or trending is noticed.

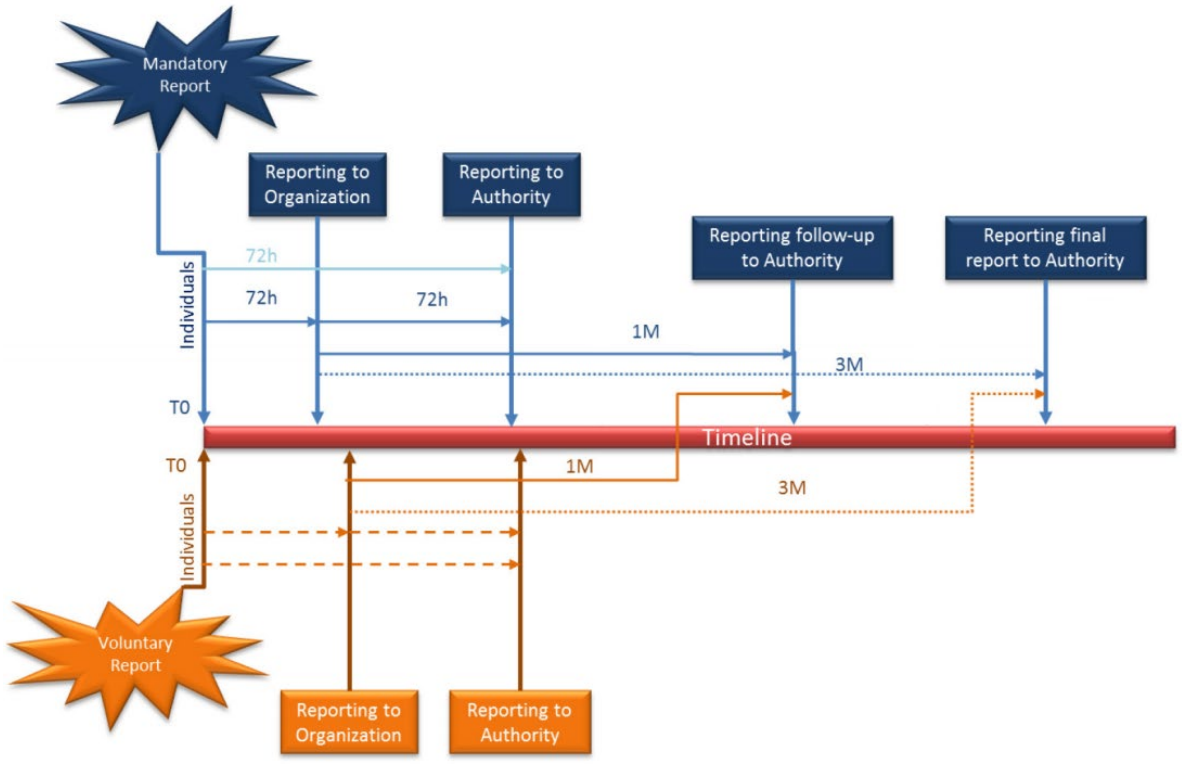

Exhibit 41 *- Reporting flow implied by Regulation (EU) 376/2014*
Source: Guidance Material - Regulation (EU) No 376/2014 - Version 1 (December 2015)

National and International Safety Investigations

The Maltese Bureau of Air Accident Investigation (BAAI) is the body responsible to carry out safety investigations in accordance with Subsidiary Legislation 499.22 of the Laws of Malta.

In 2022, the BAAI commenced three investigations for serious incident/accident events which occurred at Luqa airport.

From the three events being investigated, the BAAI has published two Basic Reports and one Preliminary Report as below respectively:

- Tecnam P2002 commenced take-off roll without having received ATC take-off clearance leading to a B737-800 GA RWY 13.
- Tecnam P92 crashed during a 3-point touchdown which led to a hard landing with the nose gear touching the RWY surface first.
- A320-214 return to Malta shortly after take-off due to fumes/vapour in the cockpit and forward passenger cabin.

These reports can be accessed from the BAAI website *https://baai.gov.mt/*

In addition to these, the BAAI:

- Is currently, serving as an Accredited Representative (ACCREP) with the Bureau of Enquiry and Analysis for Civil Aviation Safety (BEA – France) following a serious incident during approach at Paris-Charles de Gaulle Airport, France.

Safety Information and Advisory Notice (SIAN)

TM-CAD issued three Safety Information and Advisory Notices (SIAN) following safety recommendations.

SIAN 01-23 and 04-22 were issued following the final safety investigation report by the BAAI, SIAN 06-22 was issued as an initial reaction by TM-CAD following the serious incident at Charles de Gaulle airport.

- SIAN 01-23 Guidance on the Design of Checklists
- SIAN 04-22 General Aviation- Avoiding Airspace Infringements
- SIAN 06-22 Importance of correct QNH setting with respect to the risk of Controlled Flight Into Terrain (CFIT) has been issued following the serious incident during approach phase at Paris-Charles de Gaulle Airport, France.

During 2022, the SCU issued other Safety Information and Advisory Notices including safety awareness on the Ukraine/Russia border tensions and war. All SIANs are available on the TM-CAD website.

EU Ramp Inspection Programme

The EU Ramp Inspection Programme is a tool for the surveillance of foreign operators, which monitors safety compliance through ramp inspections on the aircraft. One of the pillars of the programme are SAFA ramp inspections (Safety Assessment of Foreign Aircraft). These involve all ramp inspections performed by any of the States participating in the programme, including Malta, taking ICAO standards as the regulatory reference.

The inspections are carried out by authorised personnel checking many items such as licenses, procedures, manuals, and compliance. Without hindering aircraft operations and schedules, random inspections are carried out. The absolute number of inspection findings represent an important outcome of the inspecting process which provides valuable information on the subject aircraft or its responsible operator. The severity of such findings are also assessed accordingly as:

- Category 1 finding as a minor finding
- Category 2 finding as a significant finding
- Category 3 finding as a major finding

Depending on the nature of the findings corrective actions might need to be taken immediately otherwise the aircraft may be authorised to depart under operational restrictions. Following inspections and associated findings, a rating per country is assessed. This rating is calculated according to many criteria such as the number of operators, the number of aircrafts inspected, number of inspections and the number of findings and their finding category.

Exhibit 42 illustrates, Malta's SAFA Ratings per quarter of this year. In 2022, Malta scored an average rating of 0.45. This implies that Malta has considerably a very good rating as in this rating the lowest score is the better with most findings were reported as Category 1 minor findings.

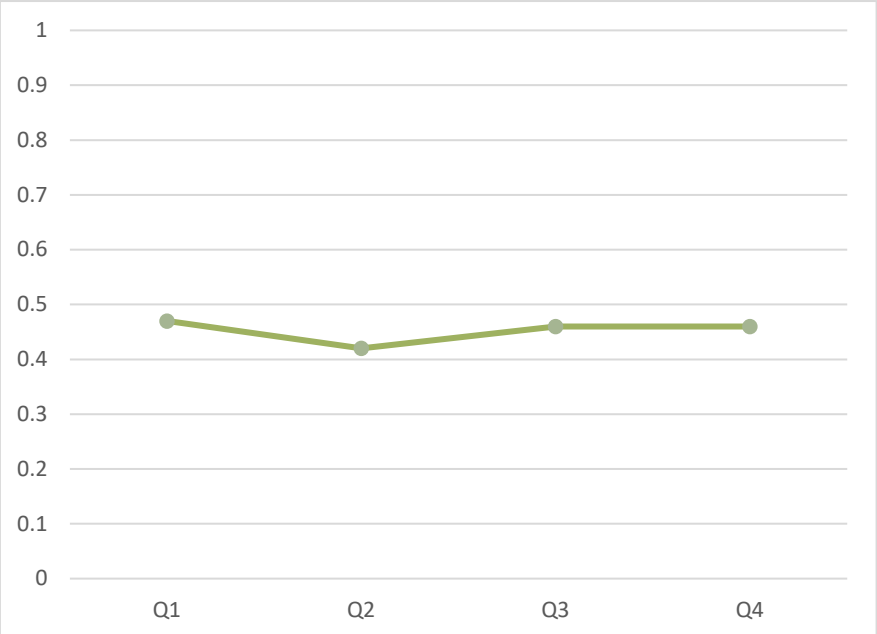

***Exhibit 42** – SAFA Ratings per Quarter (2022)*

Tensions along Ukraine/Russia border and war

Following the latest developments of the conflict between Russia and Ukraine several NOTAM's and restrictions have taken place and hence, SIAN 03/2022 was issued by TM-CAD. The NOTAM's and restrictions at the time may not only be affecting the country specific FIR's but also neighbouring countries, which may decide to impose immediate restrictions at short notice.

Following this, another revised SIAN 02/2022 was issued in May. In view of the extreme tensions and new developments in Eastern Europe, Transport Malta Civil Aviation Directorate (TM-CAD) issued NOTAM A0411/22 for Maltese registered air carriers or operators operating with Maltese registered aircraft.

TM-CAD is continuously monitoring the situation and adopting industry-wide, guidance and standards. For the latest information and recommendations, the Conflict Zone Information Bulletin CZIB-2022-01 as published by the European Union Aviation Safety Agency (EASA) can be accessed at: https://www.easa.europa.eu/en/domains/air-operations/czibs

SPAS Actions - Status

The actions listed hereunder are extracted from the SPAS in Malta 2022-2026. All actions listed are specific to 2022 or is part of a phased-implementation approach.

Actions marked as 'continuous' in the EPAS (2022-2026) are not listed in this status table.

Reference	Deliverable/Action	Target Date	Accomplished
SYS.MST.026 MST.002	TM-CAD to improve its SMS evaluation tool, taking into consideration SMICG tools and EASA Management System assessment tool.	On-going	On-going[1]
SYS.MST.028	SPAS established and publicly available. Review annually.	2022	2022
SYS.MST.034	Monitor the progress on standardisation in the OPS domain, specifically on the effective implementation of operators' flight time specifications schemes.	2022/2023	On-going
SYS.CAD.071	Strategy for Cybersecurity in aviation and risks	On-going	On-going
SYS.CAD.039	Safety promotion to support ramp-up / safe return to operations	2021/2022	2022
SYS.CAD.040	Establish a coordination mechanism between authorities/agencies as appropriate and in respect to regional local legislation.	2022/2023	On-going
ADR.MST.029	Include the requirement in Appendix I of the SPAS in Malta and review as necessary.	2022	2022

Notes:

[1] The EASA management System Assessment Tool has been introduced in the Flight Operations Inspectorate and will be phased-in as part of their SMS oversight function.

Appendix I – Occurrence Class definitions

These definitions derive from Regulation (EU) No 996/2010 of the European Parliament and of the Council on the investigation and prevention of accidents and incidents in civil aviation as amended to the date of publication of this document.

'accident' means an occurrence associated with the operation of an aircraft which, in the case of a manned aircraft, takes place between the time any person boards the aircraft with the intention of flight until such time as all such persons have disembarked, or in the case of an unmanned aircraft, takes place between the time the aircraft is ready to move with the purpose of flight until such time it comes to rest at the end of the flight and the primary propulsion system is shut down, in which:

(a) a person is fatally or seriously injured as a result of:
- being in the aircraft, or,
- direct contact with any part of the aircraft, including parts which have become detached from the aircraft, or,
- direct exposure to jet blast, except when the injuries are from natural causes, self-inflicted or inflicted by other persons, or when the injuries are to stowaways hiding outside the areas normally available to the passengers and crew; or

(b) the aircraft sustains damage or structural failure which adversely affects the structural strength, performance or flight characteristics of the aircraft, and would normally require major repair or replacement of the affected component, except for engine failure or damage, when the damage is limited to a single engine, (including its cowlings or accessories), to propellers, wing tips, antennas, probes, vanes, tires, brakes, wheels, fairings, panels, landing gear doors, windscreens, the aircraft skin (such as small dents or puncture holes) or minor damages to main rotor blades, tail rotor blades, landing gear, and those resulting from hail or bird strike, (including holes in the radome); or

(c) the aircraft is missing or is completely inaccessible.

'incident' means an occurrence, other than an accident, associated with the operation of an aircraft which affects or could affect the safety of operation.

'serious incident' means an incident involving circumstances indicating that there was a high probability of an accident and is associated with the operation of an aircraft, which in the case of a manned aircraft, takes place between the time any person boards the aircraft with the intention of flight until such time as all such persons have disembarked, or in the case of an unmanned aircraft, takes place between the time the aircraft is ready to move with the purpose of flight until such time it comes to rest at the end of the flight and the primary propulsion system is shut down. A list of examples of serious incidents is set out in the Annex of Regulation (EU) 996/2010.

Transport Malta - Civil Aviation Directorate
Safety and Compliance Unit

w: https://www.transport.gov.mt/aviation
e: aviationsafety.tm@transport.gov.mt

March 2023

Transport Malta