MALTA CIVIL AVIATION SAFETY REPORT

Year 2020

Transport Malta Civil Aviation Directorate

March 2021

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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
RA	Resolution Advisory
RE	Runway Excursion
RI	Runway Incursion
RNO	Return to Normal Operations
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 2020 and includes comparisons to similar data from the 2017-2019 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.

Year 2020 has been a very difficult for aviation. Air travel has been heavily impacted due to the COVID-19 pandemic leading to a significant decline of air travel and closure of airports worldwide. This new operational scenario brought with it a fair share of new challenges and required the operators and authorities to revisit their safety risk assessments to reflect their change in operations and the environment. Even though flying for scheduled airlines was heavily reduced, the business-aviation segment and general aviation remained relatively busy. In 2020, the CAD evaluated over 3,000 reports of which more than 2,900 were submitted to the MOR database. 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 general 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, Transport Malta Civil Aviation Directorate (TM-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 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 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 2017 and 2020. 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. Even though 2020 was an odd year for aviation, an increase in MOR submissions was still noticed. The occurrence categories are shown in Exhibit 9.

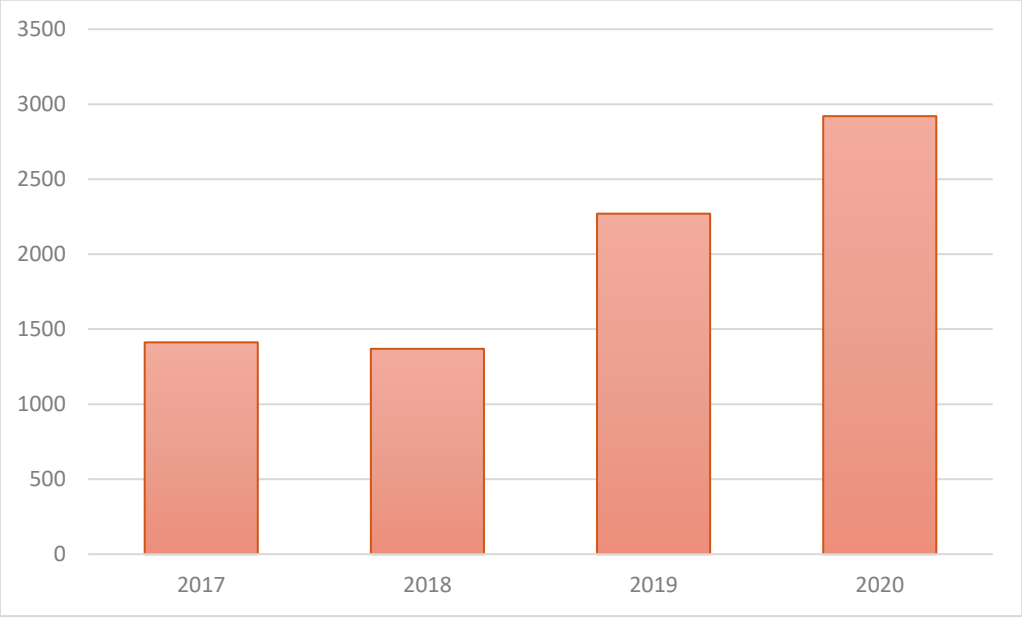

Exhibit 1 *– Number of MOR events submitted to TM-CAD (2017-2020)*

Exhibit 2 provides a monthly view of the number of events submitted on the National database during each month of 2020. From these events, the CAD has classified 2,920 events as MORs. The decline in MOR submissions between the months of March and June is attributed to the COVID-19 pandemic

due to its widespread impact on the aviation industry. The chart shows an increase in events during Q3 and Q4 of 2020 following the opening of certain routes and airports and the will for 'Return to normal Operations' (RNO) by the airline industry.

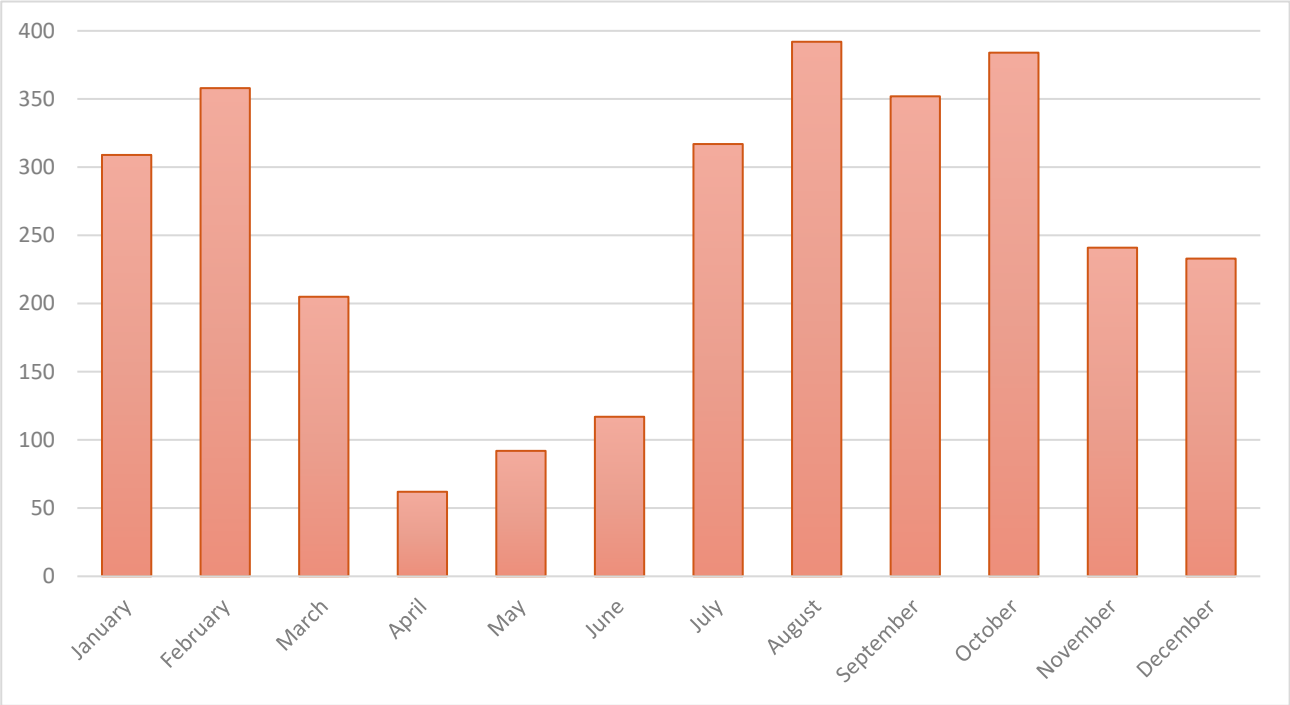

Exhibit 2 *- Monthly events reported to TM-CAD in 2020*

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. Even though 2020 had a negative impact on the aviation industry, the increase in total flight hours is due to a full-year operation of one of our largest AOC holders, following its introduction to the Malta AOC list in late in 2019.

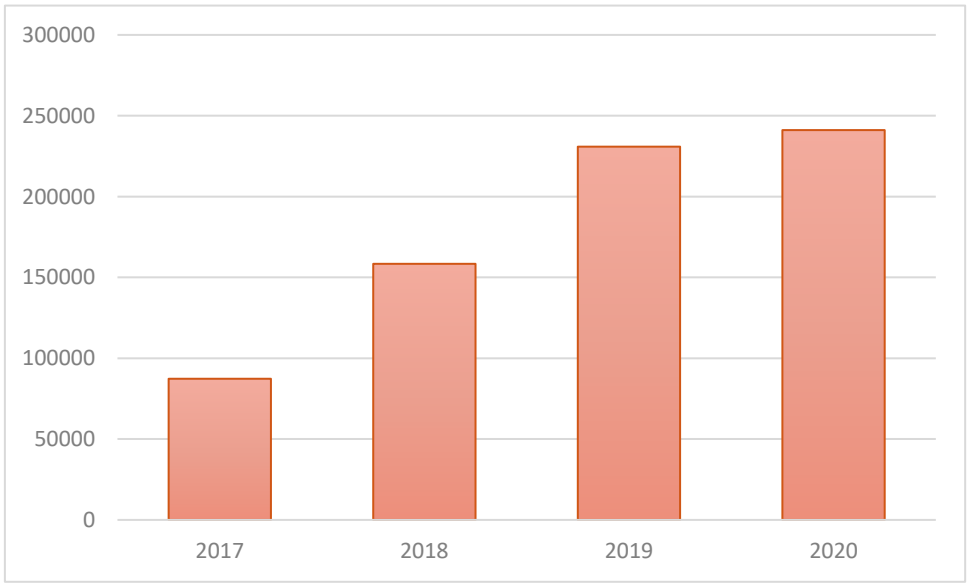

Exhibit 3 *- Flying hours of AOC holders per year (2017-2020)*

Notwithstanding 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. When compared to 2019, an increase is noted in the relative value of MORs submitted by aircraft operators and is currently standing at 8 reports per 1,000 flying hours. This relative value is being monitored by the CAD and will be analysed over a set period to provide better representation.

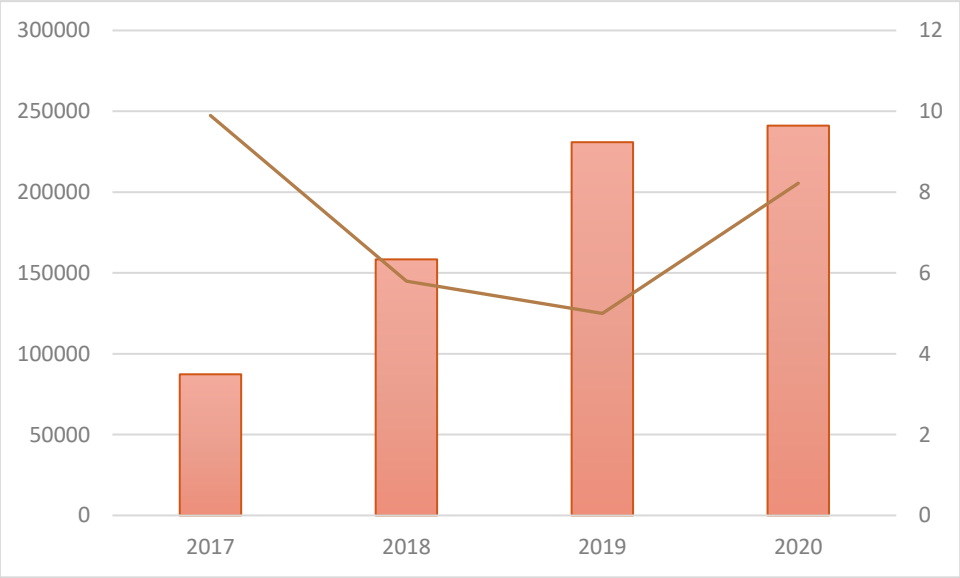

Exhibit 4 *- MOR submissions by Aircraft Operators relative to flying hours (2017-2020)*

As expected for 2020, the yearly increase in aircraft movements at Luqa aerodrome has been halted and aircraft movements were reduced by more than half when compared to 2019. The four-year trend in aircraft movements at Luqa aerodrome is shown in Exhibit 5.

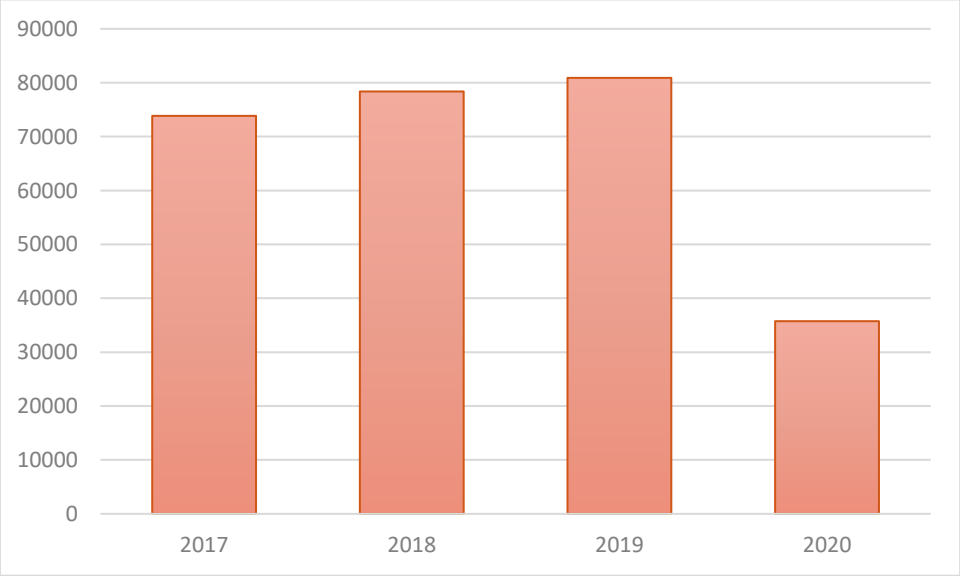

Exhibit 5 *- Aircraft movements (excl. Military) at Luqa aerodrome (2017-2020)*

The source of the Occurrence Reports submitted in 2020 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.

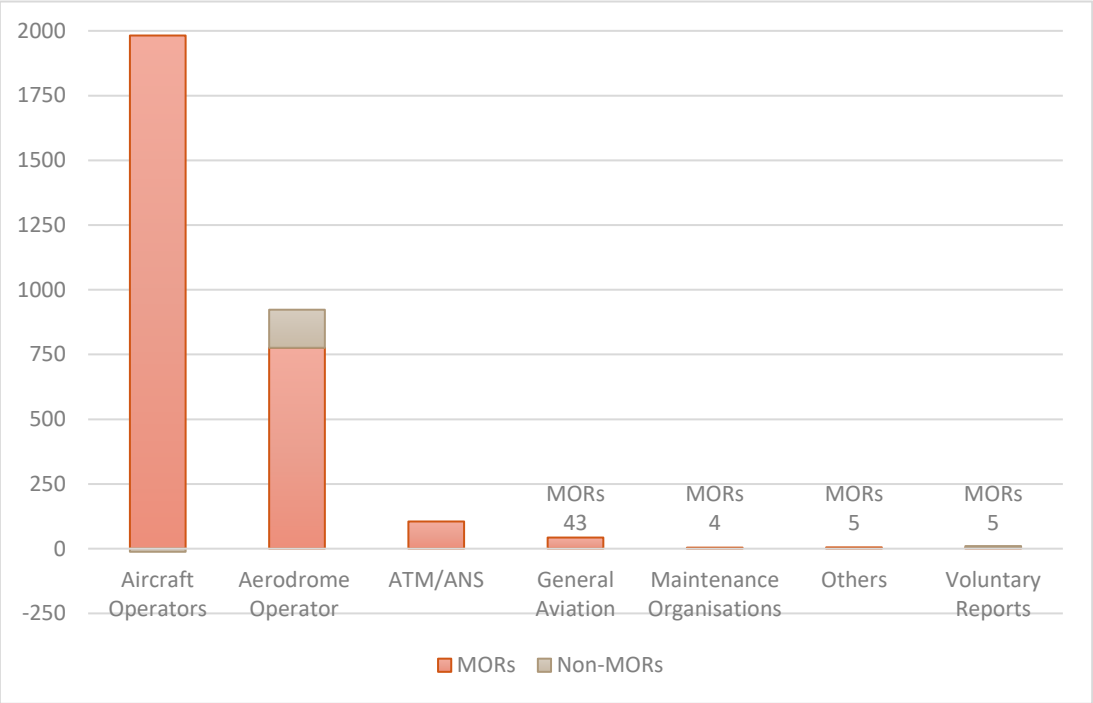

Exhibit 6 *- Source of Occurrence Reports (2020)*

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.

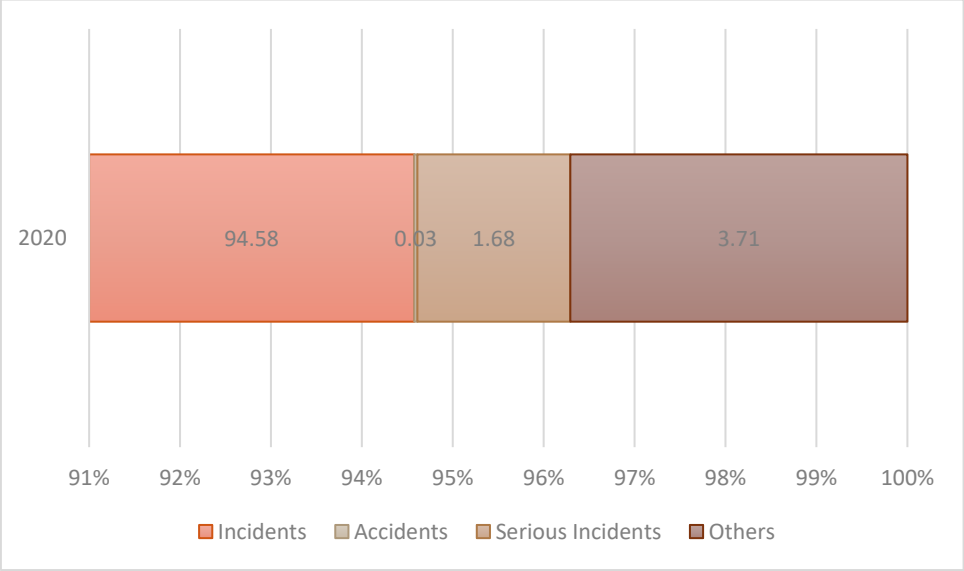

Exhibit 7 *- Occurrence Class (% of total)*

Three local events were/are being investigated by the Maltese Bureau of Air Accident Investigation (BAAI) in 2020. One is classified as 'accident' and involved a loss of control on landing, leading to nose landing gear collapse and subsequent wing and propeller strike. The other two events are considered 'serious incidents' related to aircraft loss of separation, specifically a TCAS RA event between a GA aircraft and a Commercial aircraft; and the other event is related to possible separation loss between two GA aircraft. The CAD is closely monitoring the outcome of the BAAI investigations and will take the necessary actions in-line with the recommendations issued in such reports.

Most of the 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 2017 and 2020. 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.

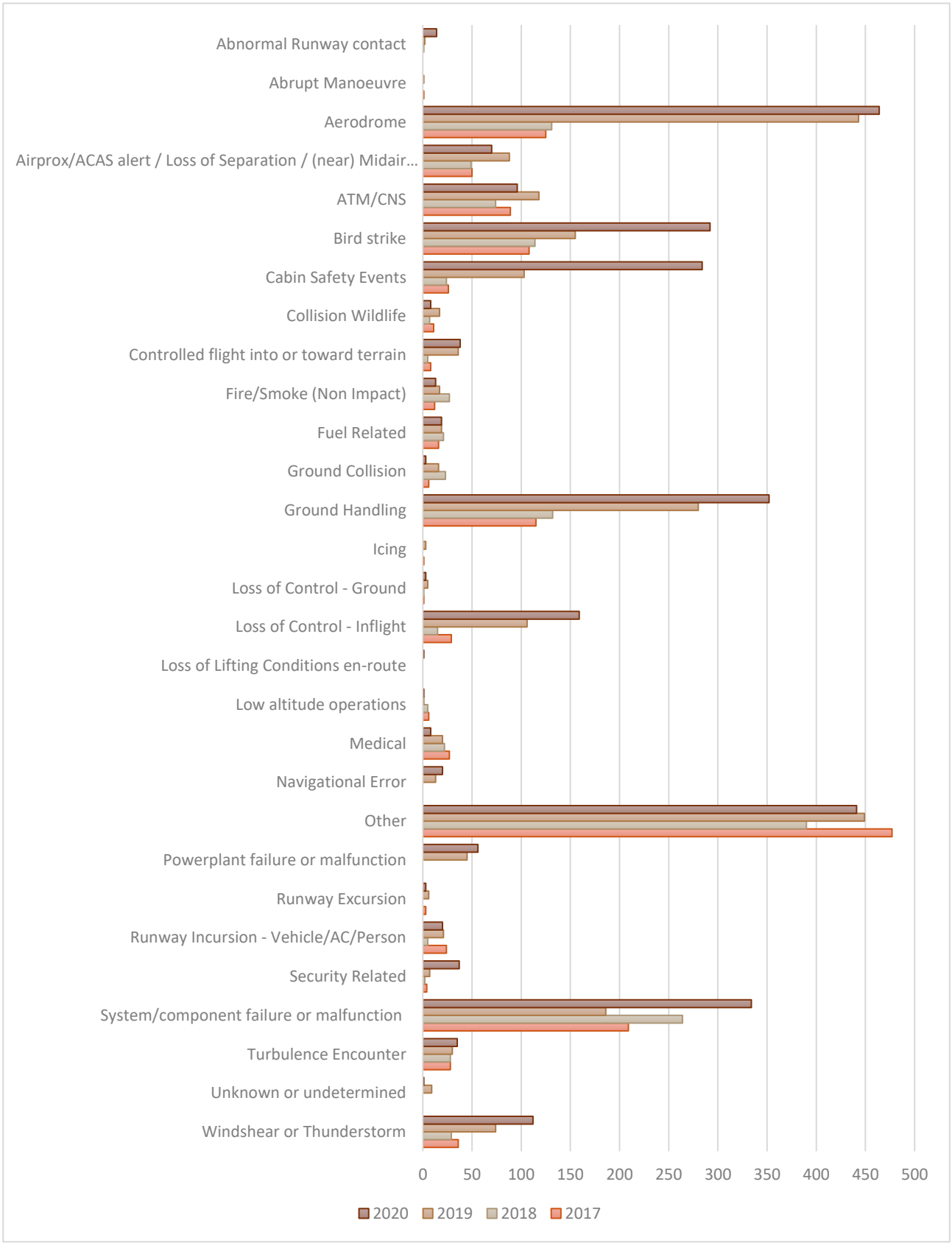

Exhibit 9 *- Occurrence categories of MOR events (2017-2020)*

Exhibit 10 lists the occurrence categories reported in 2020, 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.

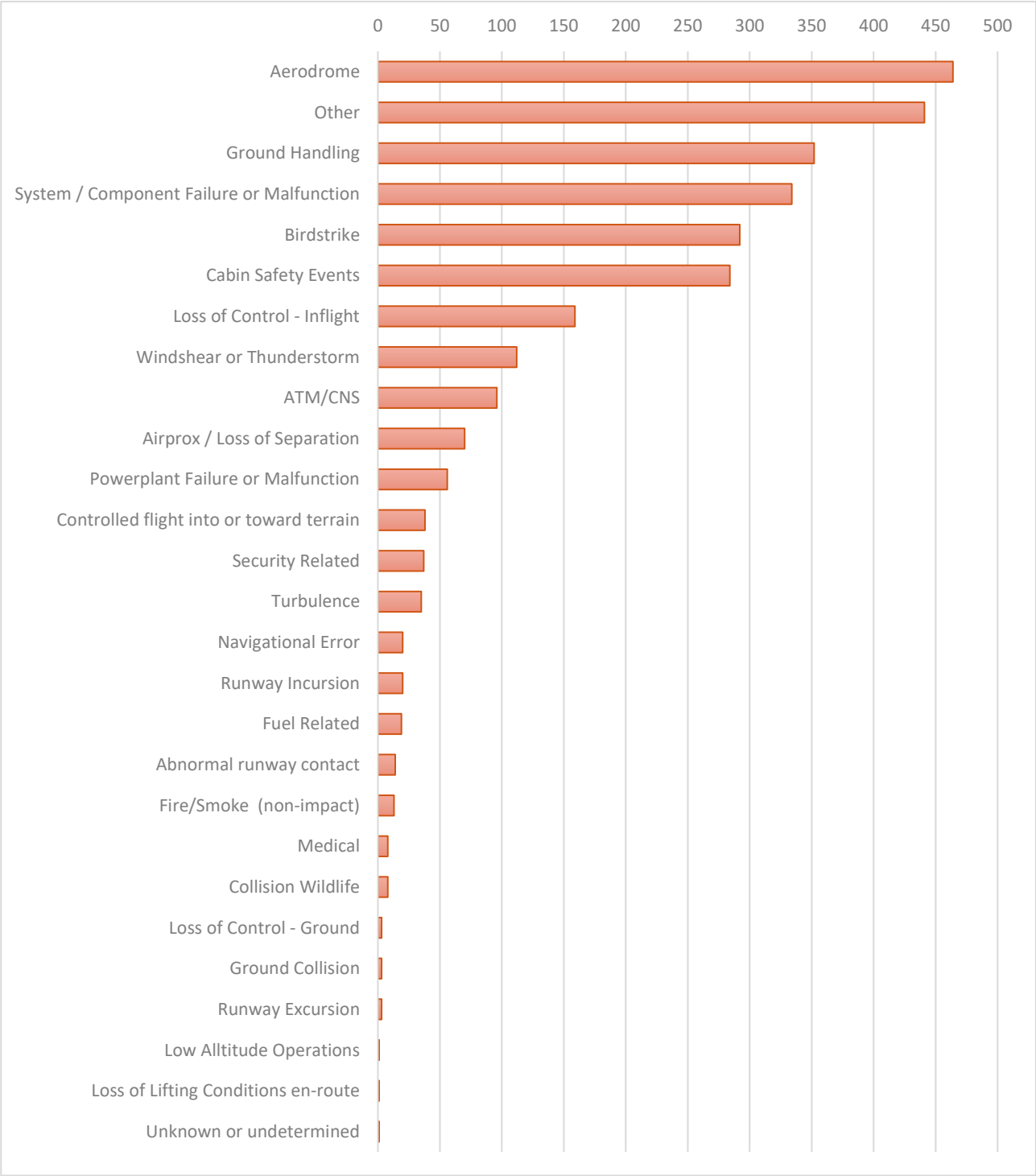

Exhibit 10 *- Occurrence categories of MOR events (2020) in descending order*

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 will also shed 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 amount of reports received between 2017 and 2020 for these specific events.

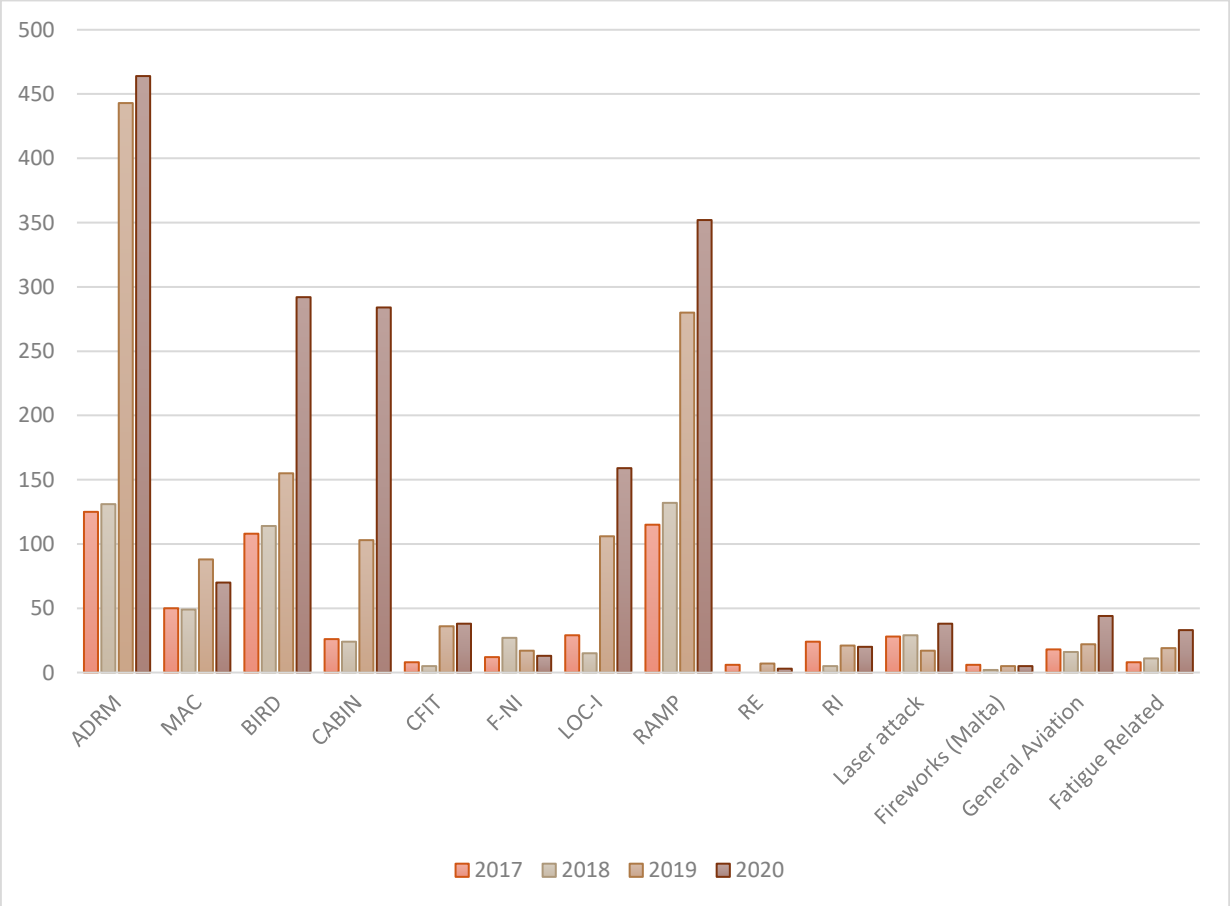

Exhibit 11 *- MOR events per category/domain under review (2017-2020)*

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. One must not ignore the fact that 2020 was characterised with a considerable decrease in aircraft operations. Due to such, trend analysis might be skewed and provide incorrect numerical count when taken at face-value.

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.

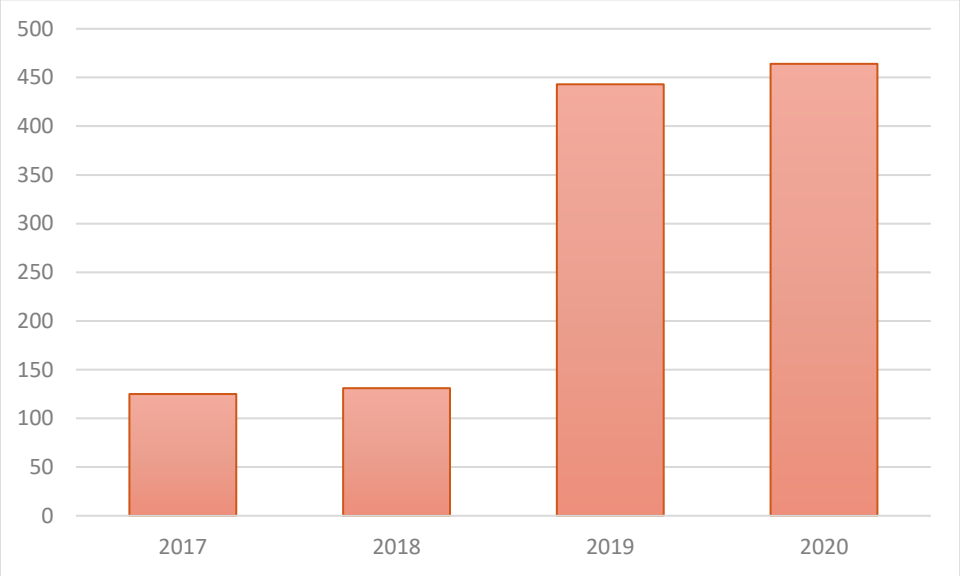

Exhibit 12 *- Aerodrome (ADRM) category events (2017-2020)*

Exhibit 12 shows an increase in this category and the trend for 2020 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) and reported spillages from ground handling equipment/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 MAC reports to previous years. In addition, following the optimisation in categorisation introduced in late 2019, the data cannot provide

a relative mean. In 2020, the CAD classified seventy events as MAC, compared to the eighty-eight from the previous year. One local MAC event from 2020 is being investigated by the BAAI.

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 13 provides percentage values of UAS related MAC events from the total reported

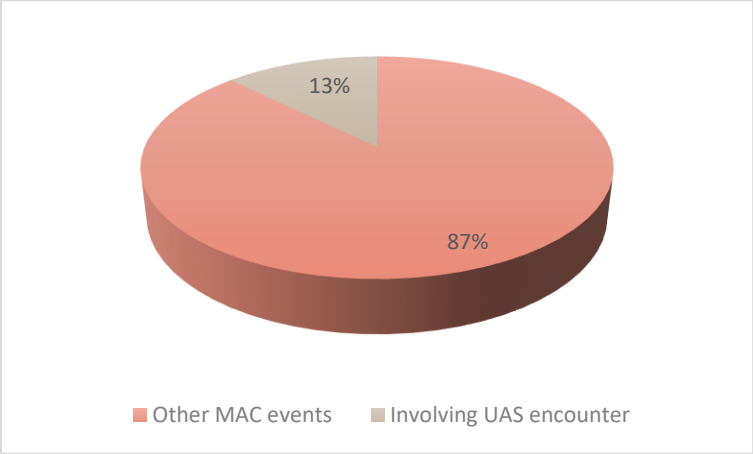

Exhibit 13 *- Total MAC category events (% by event type, 2017–2020)*

Exhibit 14 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.

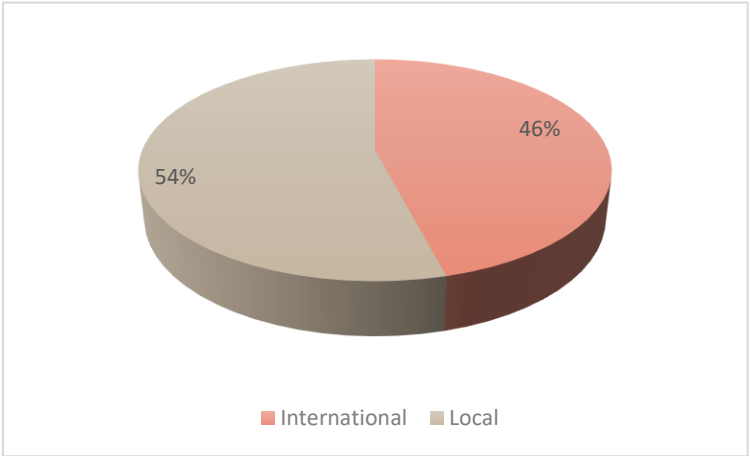

Exhibit 14 *- UAS related events (% by location, 2017-2020)*

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 2017 and 2020.

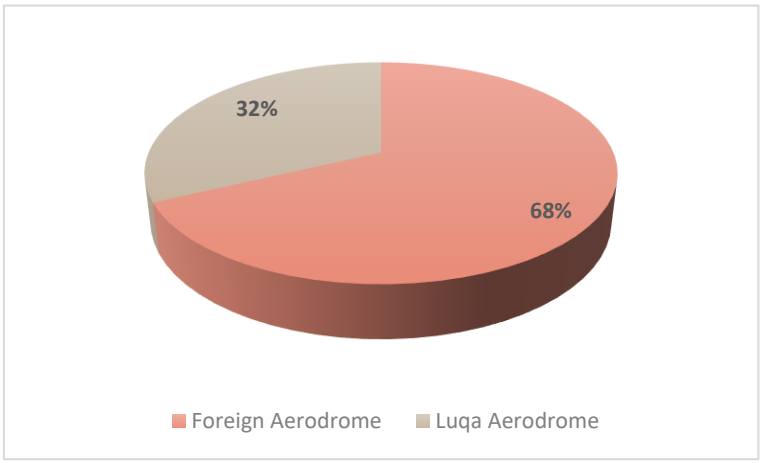

Exhibit 15 *- Bird strike (BIRD) category events (% by location, 2017-2020)*

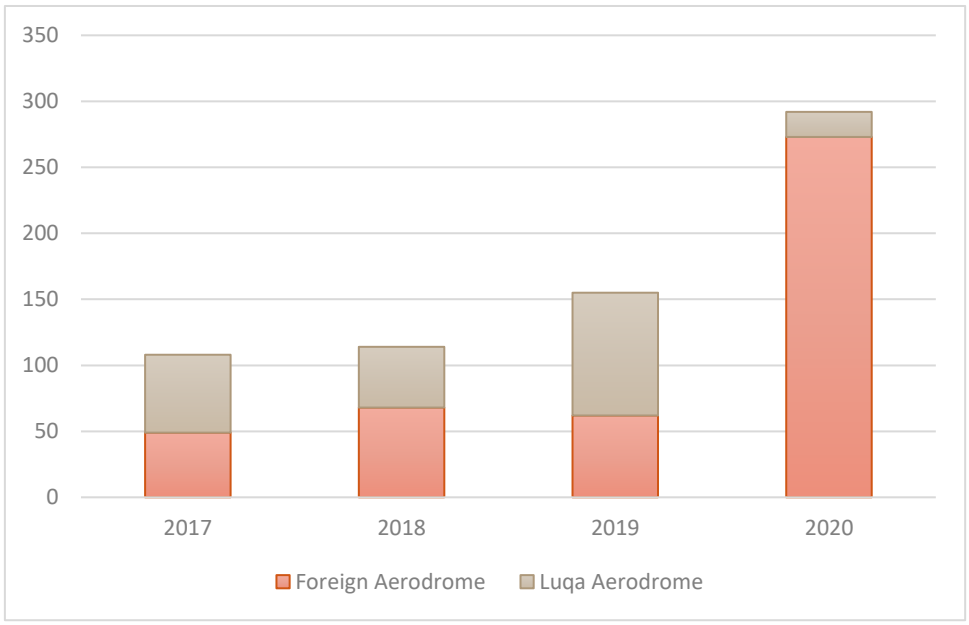

Exhibit 16 *- Bird strike (BIRD) category events (number by location, 2017-2020)*

Exhibit 16 clearly shows a significant increase in reported bird strikes during 2020. While there was a large decrease in such type of events at Luqa Aerodrome, the reported events of bird strikes at foreign aerodromes has spiked. This phenomenon has been discussed during EASA meetings/working groups and is attributed to the lower activity at airports, allowing for birds and wildlife to use such open spaces for rest and nesting.

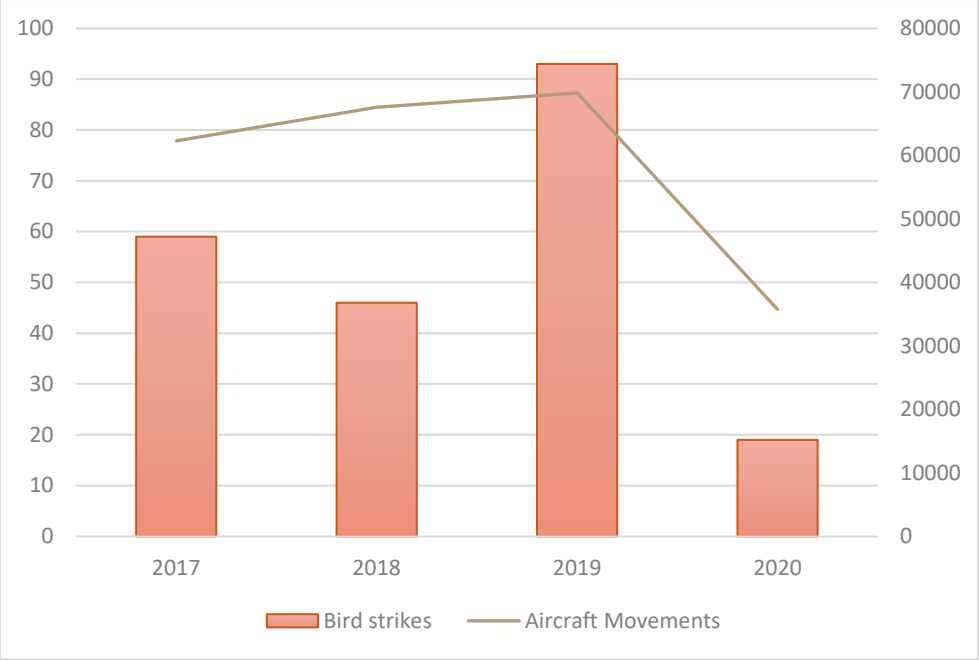

Exhibit 17 *- Bird strike (BIRD) events at Luqa Aerodrome vs Aircraft Movement (2017-2020)*

Transposing the bird strike values for Luqa aerodrome and taking them relative to the amount of aircraft movements across the year (Exhibit 17), one can notice the decline. Exhibit 18 provides an annual trend of bird strikes at Luqa aerodrome per 1,000 movements. Nonetheless, one must keep in mind that 2020 was an unusual operational year for the aviation sector.

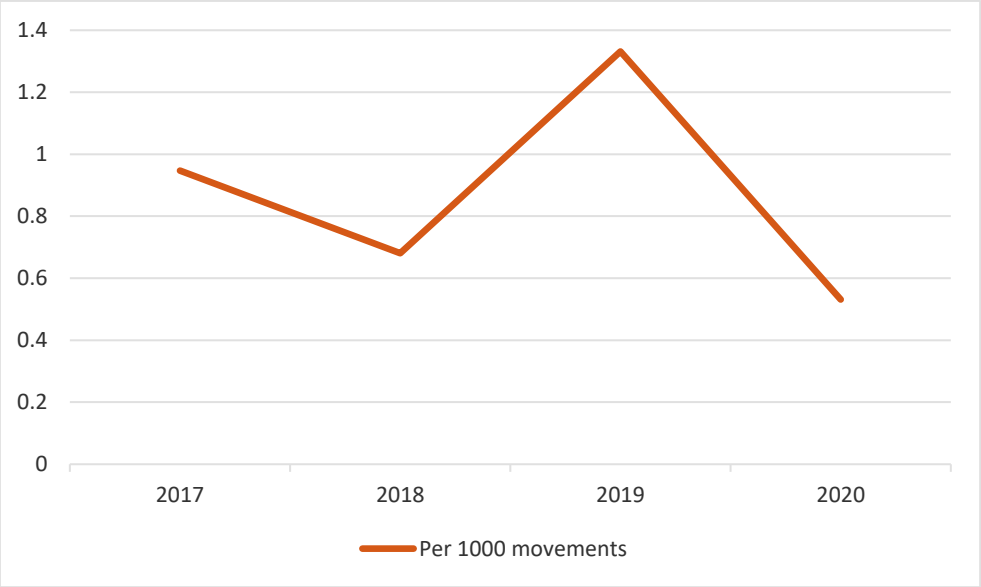

Exhibit 18 *- Bird strike (BIRD) events at Luqa Aerodrome per 1,000 Aircraft Movements (2017-2020)*

Exhibits 19 and 20 provide a monthly view of the bird strike events as reported in 2020 to the National Database. Exhibit 19 shows the monthly bird strike events reported at Luqa aerodrome, while Exhibit 20 shows a monthly view of all the bird strike events reported to the National database. It is evident that the most reported months are during the attempted revival of air transports' 'Return to Normal Operations' (RNO) in July.

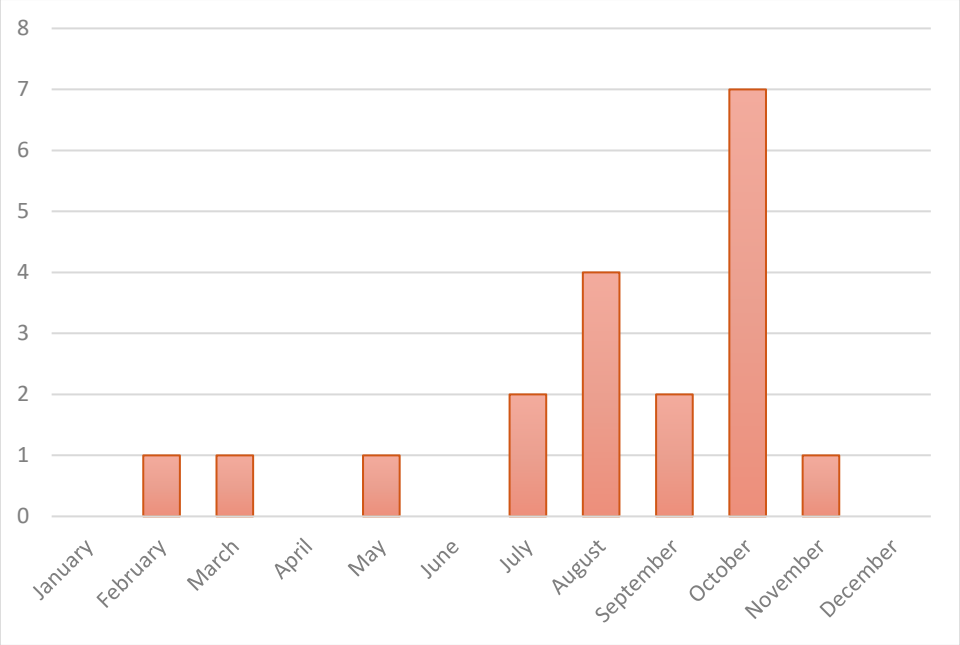

Exhibit 19 *– Bird Strike events reported monthly at Luqa Aerodrome (2020)*

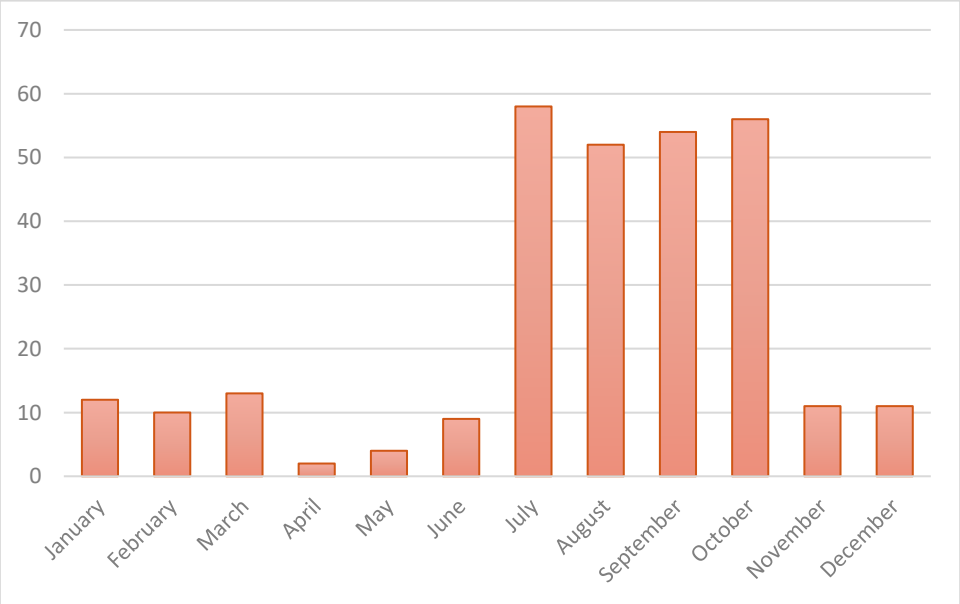

Exhibit 20 *– Bird Strike events reported monthly to the National database (2020)*

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 21. As identified during the end of 2019, the increase in this event category is mostly driven due to the increase in scheduled CAT operators during the same year. Hence, to obtain a relative mean value, this category must be

monitored over a longer period. The three main drivers for 'Cabin Safety Events', namely 'Difficult/Unruly passenger', 'Drunk Passenger' and 'Smoking in Cabin/Toilet' are grouped together as most cases are linked together.

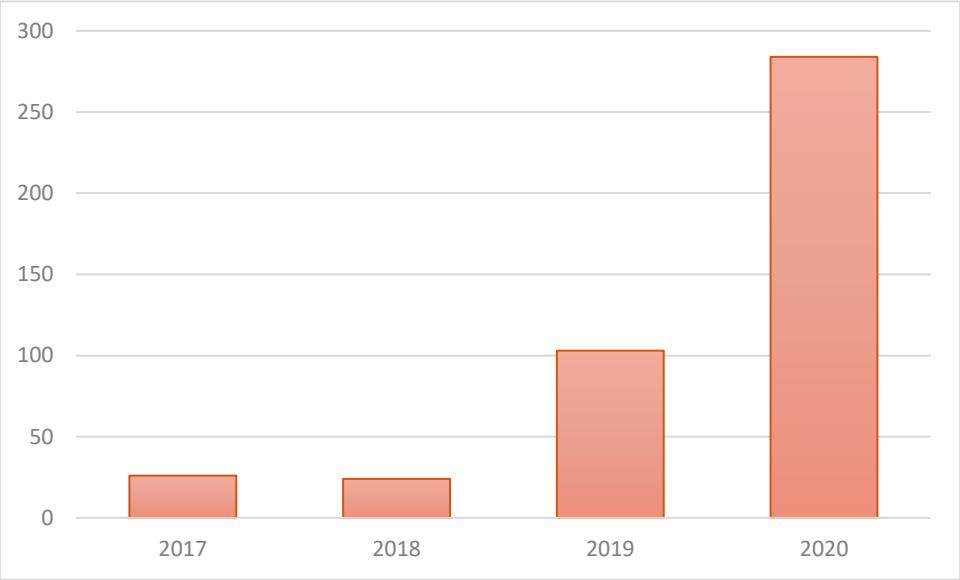

Exhibit 21 *- Cabin Safety Events (CABIN) category (2017-2020)*

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 is an industry wide challenge and TM-CAD together with regional agencies will keep on contributing towards recommending measures to help contain and reduce such events. In addition, this category has also included counts of passengers that did not follow COVID-19 mask wearing protocols.

In 2020, 'Difficult/Unruly passenger', 'Drunk Passenger' and 'Smoking in Cabin/Toilet' constituted 58% of reports in the Cabin Safety Events category. This has seen a decline when compared to 2019. Exhibit 22 provides a percentage value of such events types under the Cabin Safety event category.

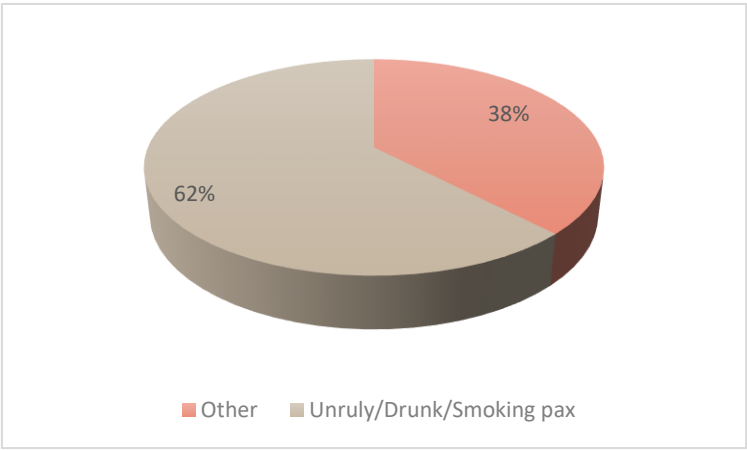

Exhibit 22 *- Cabin Safety Events (CABIN) category (% by event type, 2017-2020)*

Other Cabin-safety related events were due to passenger boarding issues, galley equipment events and use of emergency equipment (portable oxygen) by passengers for medical reasons during the flight.

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 38 reports were categorised as CFIT in 2020. The event type for these reports were further expanded and presented in Exhibit 23. The 'Flight operations outcome' incorporates unstabilised approaches, go-arounds and missed approaches following the warning trigger.

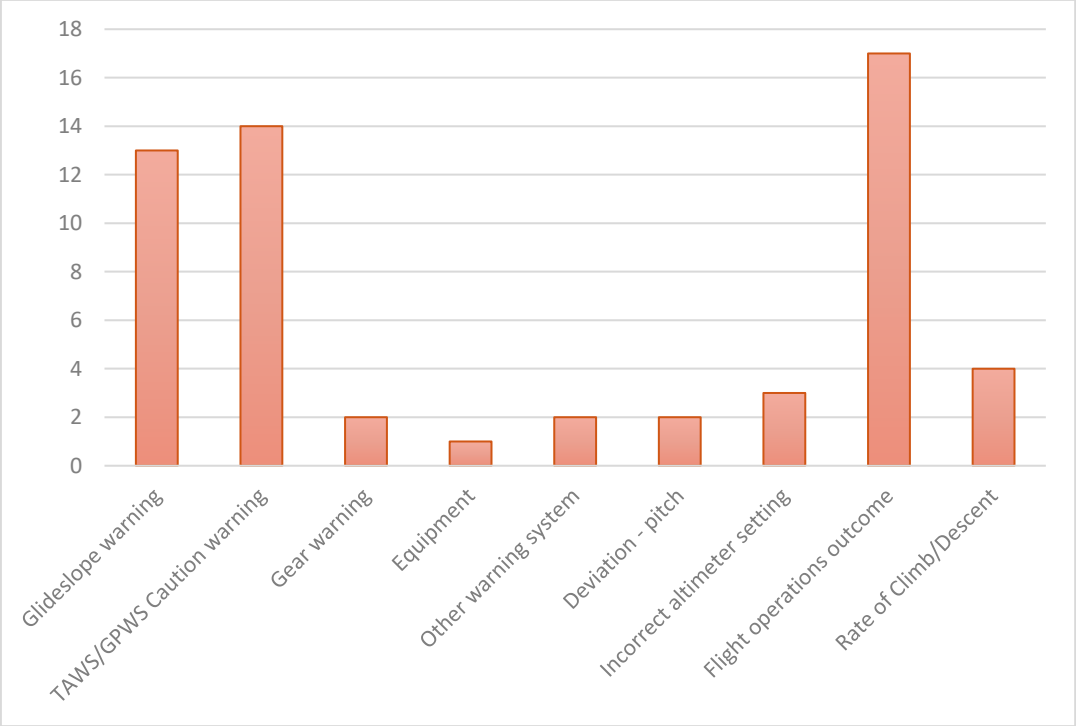

Exhibit 23 *- CFIT category related events (2020)*

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.

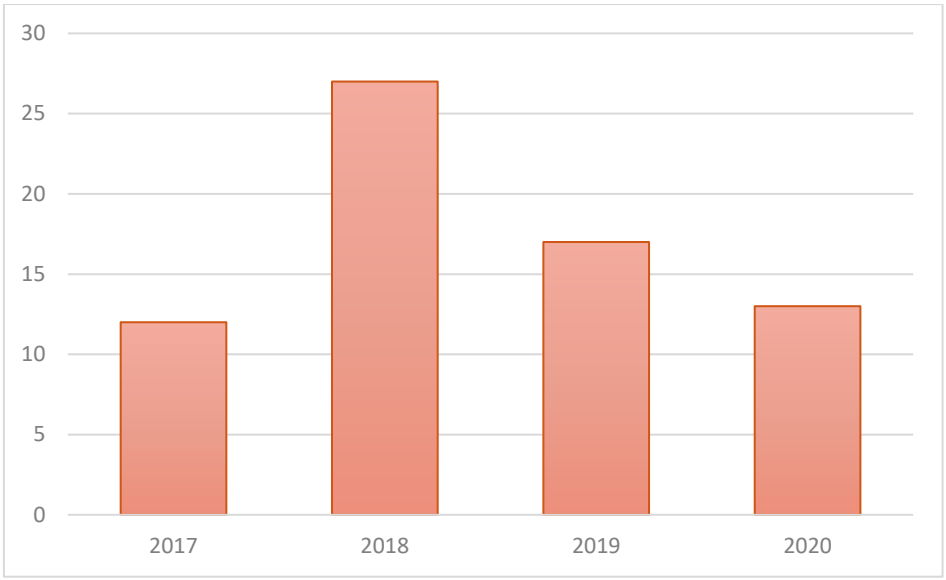

Exhibit 24 *- Fire/Smoke (N-I) category events (2017-2020)*

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 24, this event is on a downward trend and will further be monitored for root-causes and new threats.

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 regulation obligations. An increase in the RAMP category is mainly attributed to the increase in reporting awareness among Ramp users.

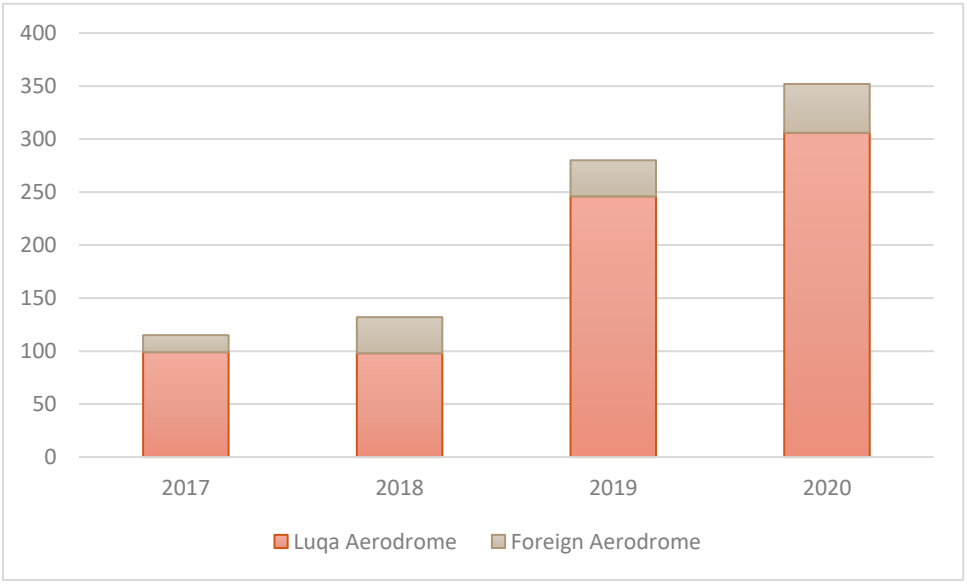

Exhibit 25 *– RAMP category events (2017-2020)*

Exhibit 25 provides data related to reported RAMP category events. One can immediately notice the increase in reported events for this category, even when considering the reduced aviation activity. The CAD's approach towards this 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.

The trends identified in 2019 are still the major contributors to the RAMP category events at Luqa aerodrome, i.e. related to FOD/potential FOD, ground handling service equipment failures (including 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 are being implemented. The impact of such measures will be analysed over a set period.

An increase in reported events is noticed during the second half of the year (in-line with an increase in operational activity following easing of COVID-19 restrictions). Whilst not excluding other possible underlying factors, this reporting increase can be partially attributed to the ability to identify shortcomings from RAMP activities (due to lower Apron movements) and personnel inattention to detail during/following a task. Additionally, the Aerodrome operator has increased its monitoring function during the year and a strong reporting culture amongst its employees.

At international locations, areas of concern are passenger handling procedures (especially when computerised systems fail) and turnaround/pre-flight preparation matters. These matters were/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. Reducing this accident category, through understanding of causes and possible intervention strategies, is an industry priority. This category is also one of the highlights of the EPAS.

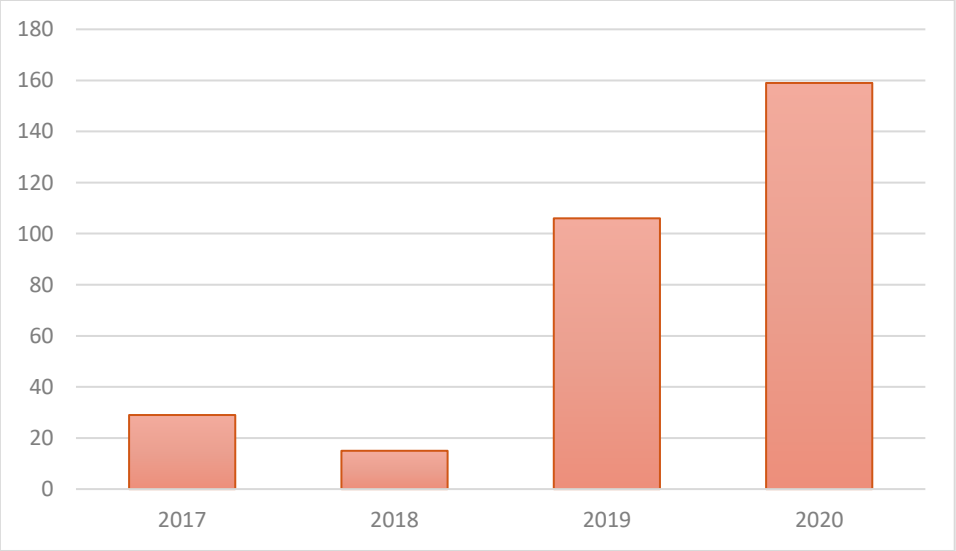

Exhibit 26 *- LOC-I category events (2017-2020)*

As shown in Exhibit 26, the year 2020 has provided another increase in the LOC-I category when compared to previous years. This has been thoroughly looked into by CAD and it is been concluded that this can be attributed to three main factors: the correct categorisation for specific events (ex: level bust, unstabilised approaches, incorrect configuration in flight), increase in operators under TM-CAD oversight and effects of COVID-19 RNO. This category is mostly related to unstabilised approach and flight configuration warnings. No injuries, fatalities or near accidents were reported in such category.

Runway Excursion (RE)

These are events where an aircraft veered-off or overrun-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.

Exhibit 27 shows that in 2020 there were three events categorised as RE, and all occurred at foreign locations. Nevertheless, these events were not actual REs but were reported events which could have led to an RE.

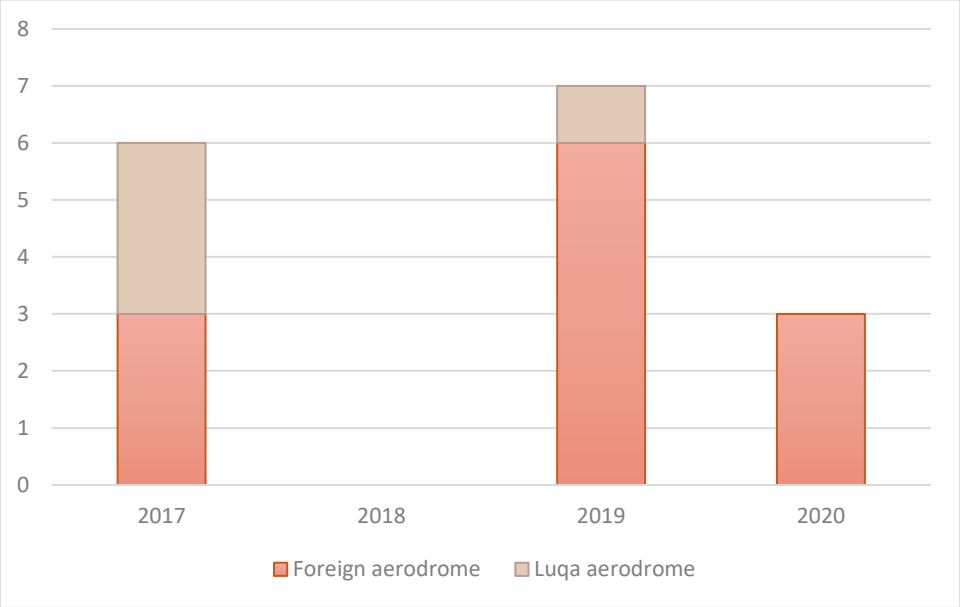

Exhibit 27 *– RE category events at location (2017-2020)*

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 2020 the CAD received twenty reports of RI events of which four occurred at Luqa aerodrome. Three of these RI's were due to an aircraft slowly exiting the runway with the inbound aircraft resorting to conduct a go-around and one was a vehicle and aircraft beyond holding point.

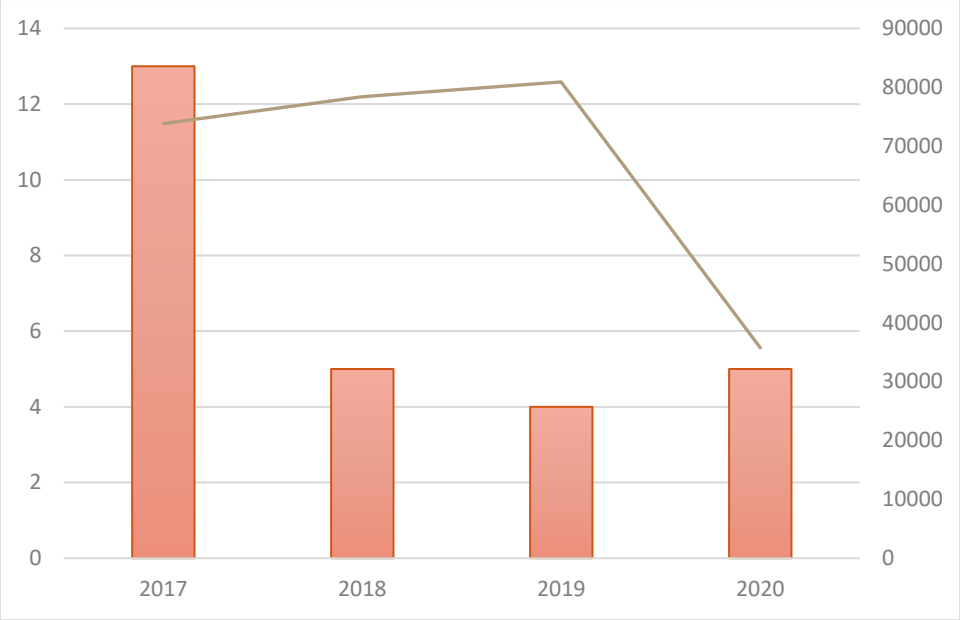

Exhibit 28 *- RI category events at Luqa aerodrome vs Aircraft movements (2017-2020)*

Numerically, the RI events are still low. However, when compared to aircraft movements, this constitutes an increase. The RI events did not result into an accident or near accident.

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 29 shows the amount 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.

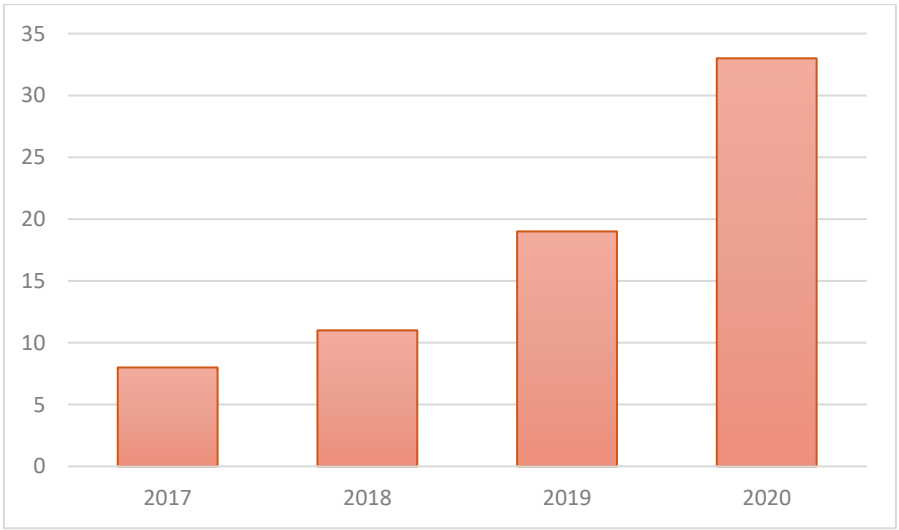

Figure 29 *- Fatigue-related events (2017-2020)*

Most of the analysed reports were related to multiple-leg flights with different time zones which impact the level of alertness of the crew. Also, an additional contributing factor to reporting increase was due to the COVID-19 protocol delays (and coordination) at various airports.

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 COVID-19 pandemic does not seem to have impacted the activity numbers of General Aviation in Malta whereby Exhibit 30 clearly shows that local flights increased when compared to previous years. A probable cause to this effect is that the reduction in commercial air traffic at the aerodrome allowed for more GA activity. The increase in activity resulted in an increase in reported MOR events. The rate of MORs for GA per 1,000 flight hours stands at 3.6 (4 reports).

The CAD is not yet able to commit itself that this increase is attributed to a particular safety concern since the increase in reporting can also to be due to the increased Occurrence Reporting awareness among the GA community. Nevertheless, the CAD evaluates each report separately and addressed any concerns deriving from such event. In addition, the CAD is also monitoring the identified increase in reported component failures and the effectiveness of root-cause and corrective actions taken.

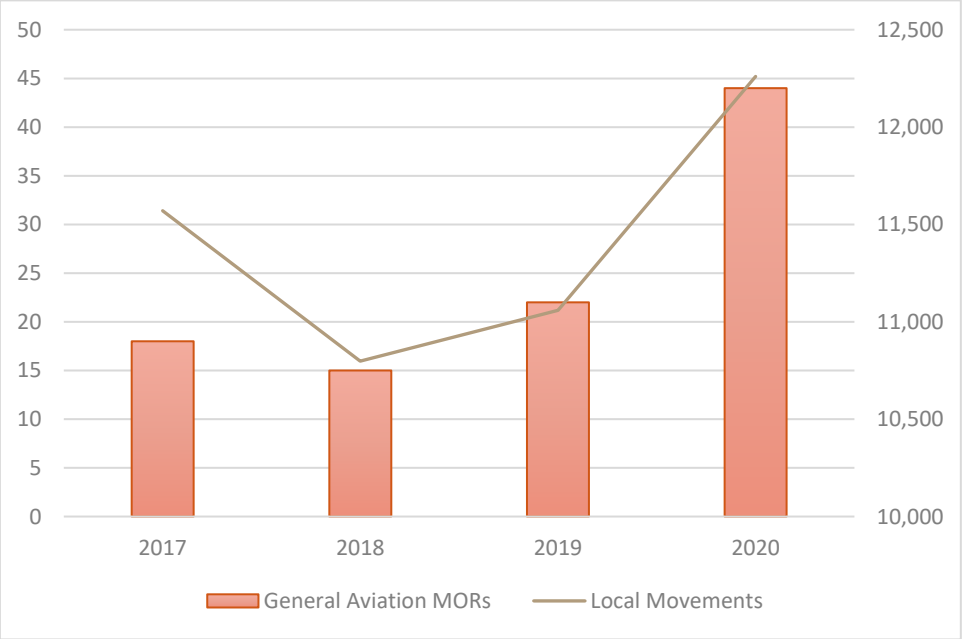

Exhibit 30 *- General Aviation MORs vs Local movements (2017-2020)*

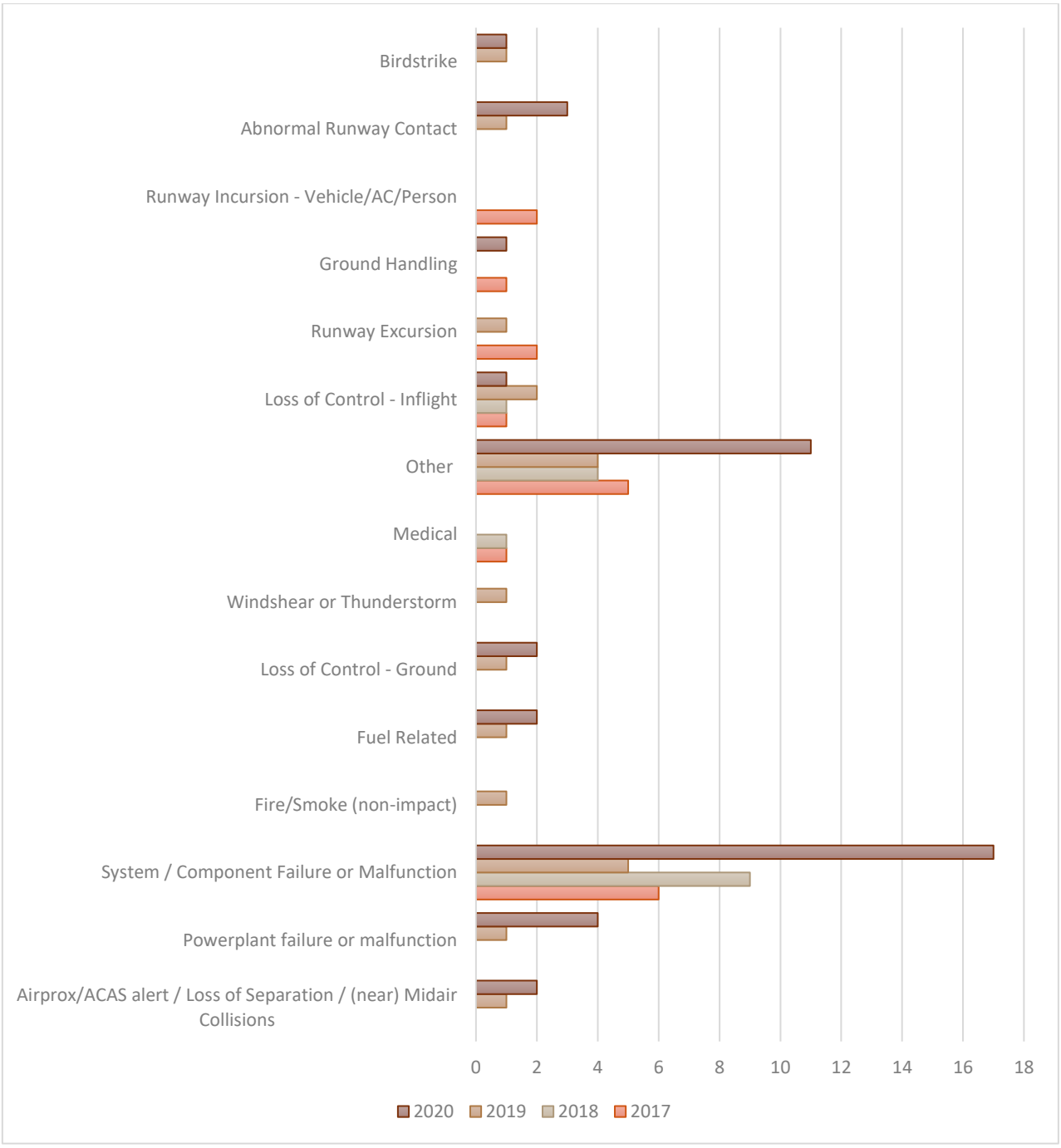

Exhibit 31 *- General Aviation Occurrence Categories (2017-2020)*

During year 2020 TM-CAD continued increasing occurrence reporting awareness among the GA community. This was mainly conducted in liaison with the management of relevant training organisations. Additionally, guidance support was provided by the CAD to ensure that effective follow-up of reports and related actions are taken. However, the CAD still believes that there are margins of improvement in relation to the reporting of an occurrence event experienced by the GA user.

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.

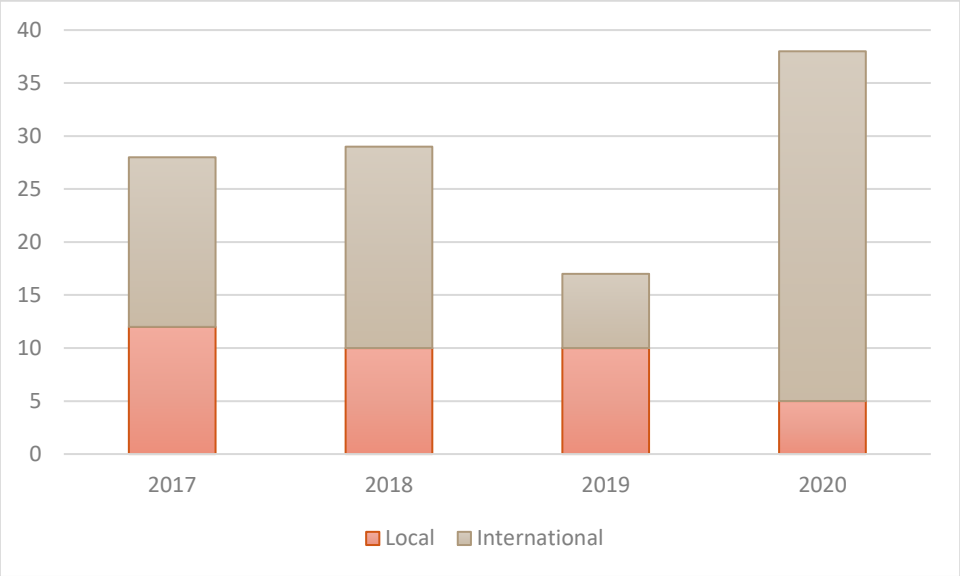

Exhibit 32 *- Laser Attack events (2017-2020)*

While it is evident that there is a considerable increase in Laser Attacks in 2020, Exhibit 32 shows that such events in Malta are stable with a slight downward trend. In 2020 laser attacks on aircraft in approach/landing or take-off phase constitute to 17.5% of reported events.

Fireworks

Malta's traditions include firework displays as part of large-scale celebrations and during local Patron Saint feasts. Taking into consideration the location of the Luqa aerodrome and the take-off and landing paths of flight, fireworks may pose a threat to aviation users. Hence, even though number of reports are relatively low, TM-CAD monitors occurrence reports related to this event for safety purposes.

Currently there are procedures 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 33 provides annual reporting of firework related events which were submitted to the National database.

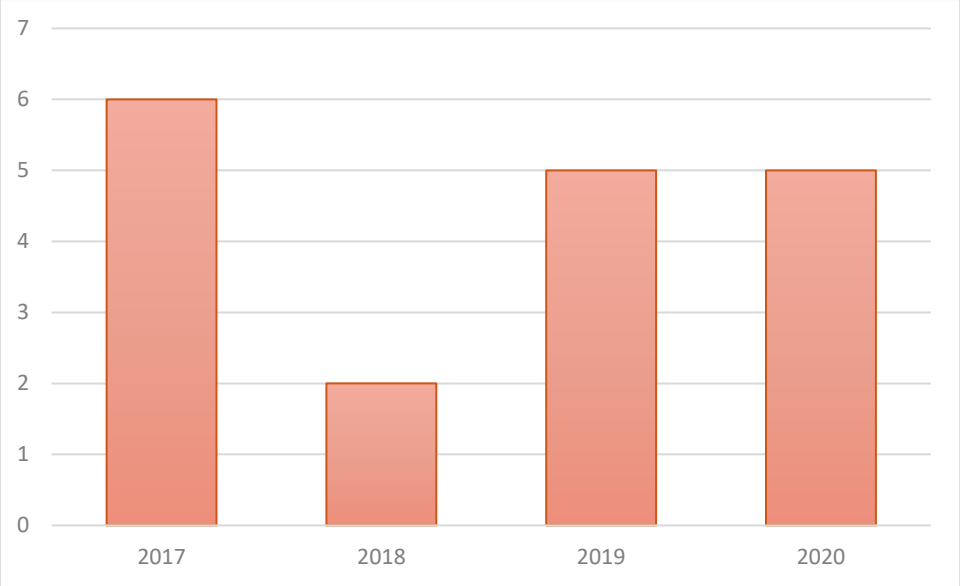

Exhibit 33 *- Firework related events (2017-2020)*

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 34 only shows the high-level of this comprehensive list:

Exhibit 34 *- Event Type drop-down menu headers*

For simplicity purposes, a bar graph in Exhibit 35 shows the seven top-tier headers. It is important to note that one occurrence report can have multiple event types.

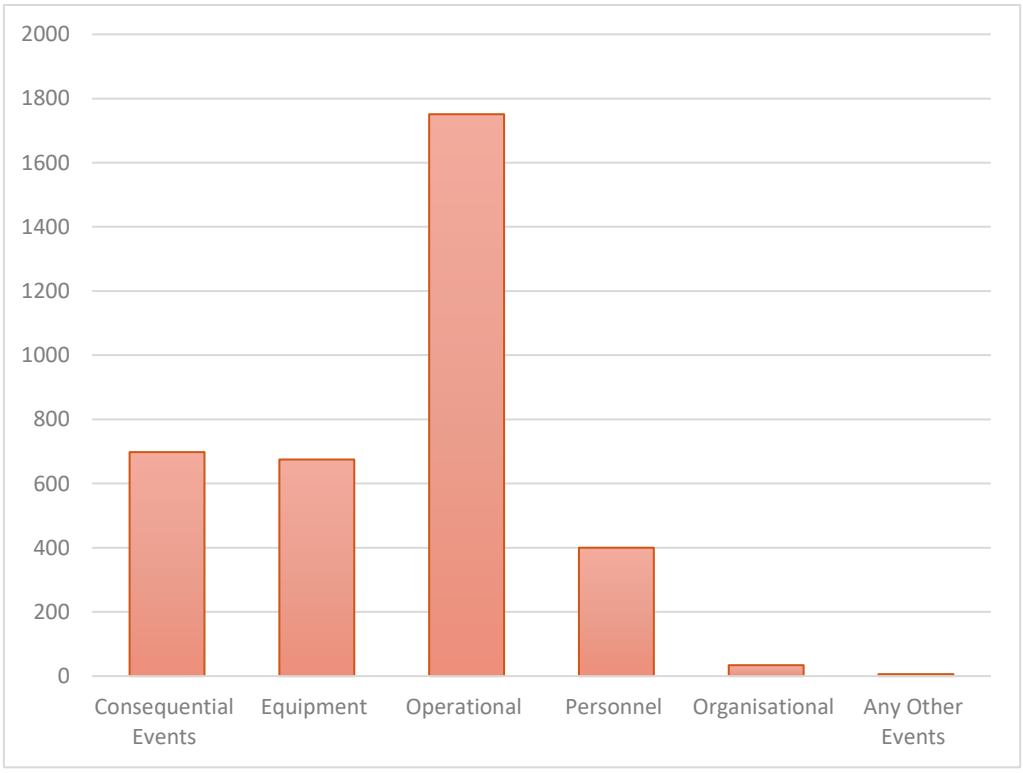

Exhibit 35 *- Event Types (2020)*

Event Phase

Each different operation has its own set of event phases as presented in Exhibit 36. The occurrence reports received by TM-CAD were related to the 'Powered fixed-wing aircraft', 'Helicopter' and 'Maintenance phases'.

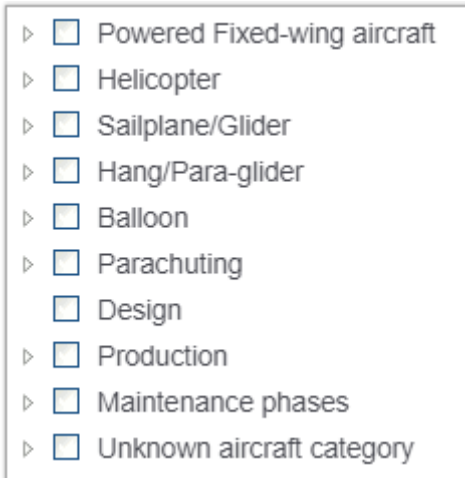

Exhibit 36 *- Event Phase drop-down menu headers*

For the 'Powered Fixed-wing aircraft' and 'Helicopter' events in 2020, the phases are shown in Exhibits 37 and 38 respectively:

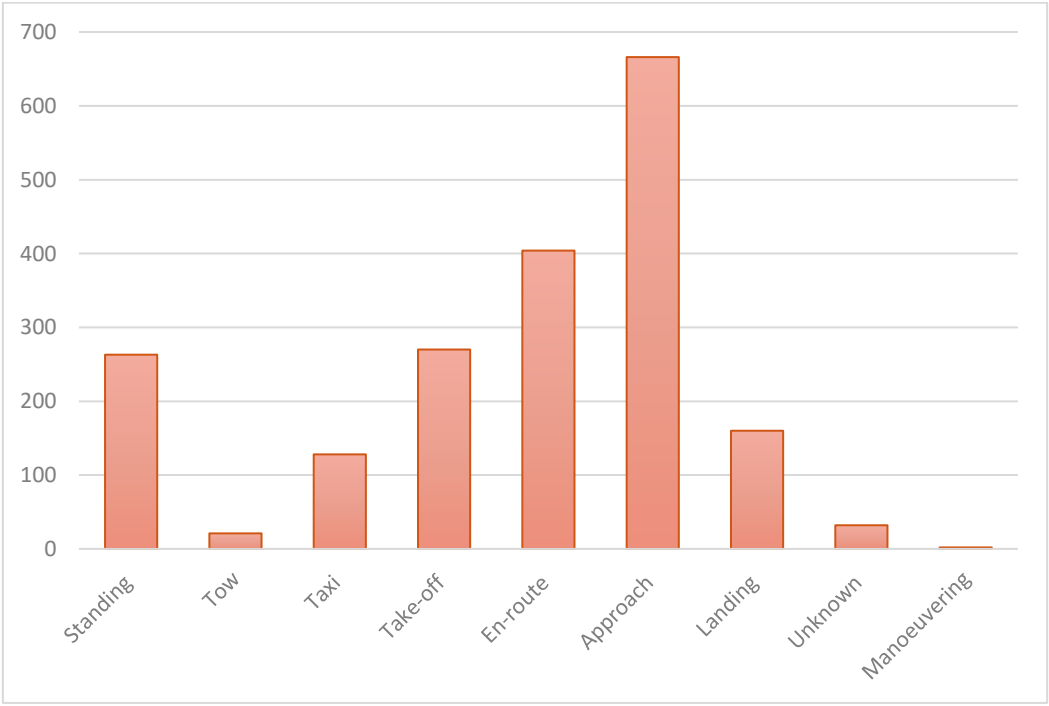

Exhibit 37 *- Event Phase: Powered fixed-wing aircraft (2020)*

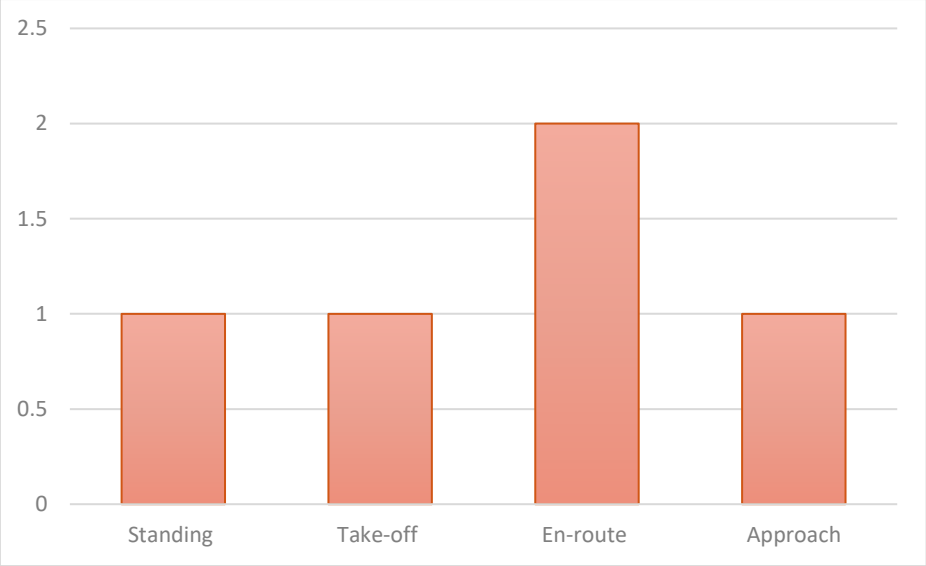

Exhibit 38 *- Event Phase: Helicopter (2020)*

For the 'Maintenance phases' related events in 2020, the phases are shown in Exhibit 39:

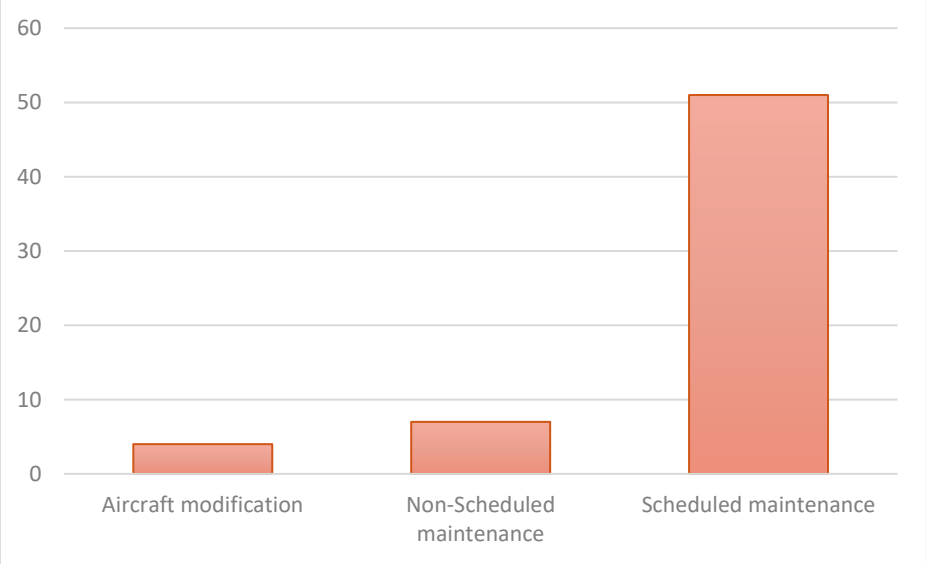

Exhibit 39 *- Event Phase: Maintenance phases (2020)*

MOR Observations: Impact of Reduced Operations due to COVID-19

The disruption in air operations due to the COVID-19 pandemic has brought with it a change in the safety-identification and analysis scenario within the industry. The disruption has affected all aspects of aviation operation and this was noticed in the analysis conducted when reviewing the MOR's.

During the Malta Aviation Conference and Expo (MACE) 2020, the SCU provided insight on the safety concerns the COVID-19 pandemic brought on the industry. The data derived from the MOR's submitted to the National database up-to a cut-off date prior to the event.

In terms of human performance (crew/personnel actions) an increase has been noticed with regards to:

- Unstabilised approaches
- High Speed approaches/Overspeed
- Crew responsiveness events/Aircraft Configuration errors
- Specific ramp personnel errors
- Situational awareness/attention

As for aircraft returning to operation/parked aircraft, it has been noticed that there was an increase in reporting of flight instrument discrepancies which were mostly related pitot probe blockages due to longer periods on the ground. Mitigation measures were introduced to reduce the safety implications of such cause.

A new category of 'Unruly passengers' has been recorded when such individual does not observe COVID-19 health protocols and subsequently becomes aggressive towards the crew. This data does not include reports of passengers who obeyed instructions following crew intervention.

The CAD noticed that specific fatigue related, and Flight Time Limitation exceedances were reported following excessive delays due to COVID-19 restrictions/Country protocols resulting in a domino effect on operations.

During operation in such extraordinary times, the CAD emphasised with organisations under its oversight to review their operational risk scenario and identify any abnormal increase/trends and manage them as part of their SMS.

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 40 provides information on the reporting flow of an Occurrence Report as implied by regulation (EU) 376/2014.

For the year under review, the CAD issued a NOTAM following the reported increase in GPS signal losses within the Malta terminal manoeuvring area (TMA). Even though the NOTAM's period has not been extended, the CAD is still monitoring such events and is liaison with local communication authorities on the matter.

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.

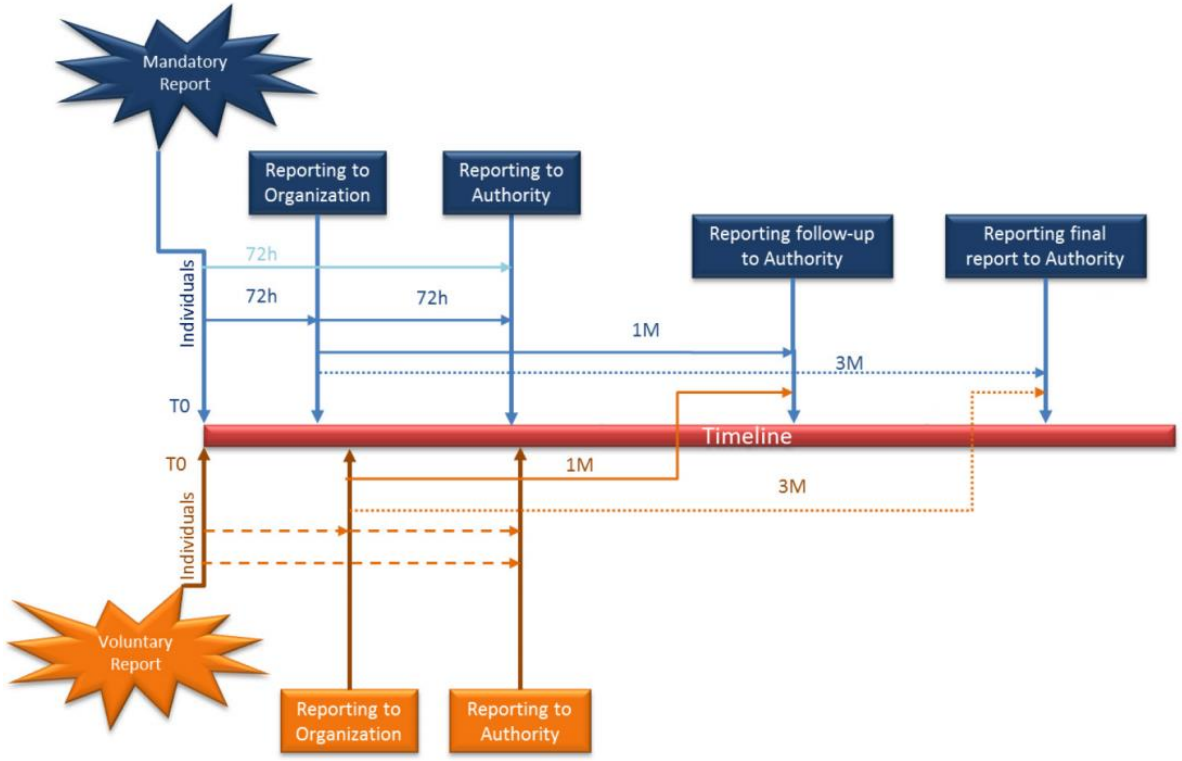

Exhibit 40 *- Reporting flow implied by Regulation (EU) 376/2014*
Source: Guidance Material - Regulation (EU) No 376/2014 - Version 1 (December 2015)

SPAS Actions - Status

The actions listed hereunder are extracted from the SPAS in Malta 2020-2024. All actions listed are specific to 2020 or is part of a phased-implementation approach.

Actions marked as 'continuous' in the EPAS (2020-2024) are not listed in this status table.

Reference	Deliverable/Action	Target Date	Accomplished
SYS.MST.001	Update Malta SSP document	2020	Aug 2020
SYS.MST.026 MST.002	TM-CAD to improve its SMS evaluation tool, taking into consideration SMICG tools and EASA Management System assessment tool.	2021	On-going [1]
SYS.MST.028	SPAS established and publicly available	2020	Dec 2020
ADR.MST.029	Include the requirement (SESAR runway safety solutions) in Appendix I of the SPAS in Malta	2020	Dec 2020

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

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