

Malta Civil Aviation Safety Report

Year 2021

Transport Malta Civil Aviation Directorate

Publisher: Civil Aviation Directorate Safety and Compliance Unit, Malta Transport Centre, Pantar Road, Lija. LJA 2021

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

March 2022

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Abbreviations

Accident/Incident Data Reporting
Air Operator Certificate
Air Traffic Control
Bureau of Air Accident Investigation (Malta)
Competent Authority
Civil Aviation Directorate (TM-CAD)
Commercial Air Transport
Controlled Flight into or Toward Terrain
European Aviation Safety Agency
European Co-ordination centre for Accident and Incident Reporting Systems
European Plan for Aviation Safety
European Union
Foreign Object Debris / Foreign Object Damage
General Aviation
Ground Handling
Ground Handling Service Provider
International Civil Aviation Organisation
Loss of Control In-flight
Mid-Air Collision
Mandatory Occurrence Report
Resolution Advisory
Runway Excursion
Runway Incursion
Return to Normal Operations
Safety and Compliance Unit (TM-CAD)
Safety Management System
State Plan for Aviation Safety
Safety Performance Indicator
Safety Performance Target
State Safety Programme
Traffic Advisory
Traffic Collision Avoidance System
Terminal Manoeuvring Area
Transport Malta Civil Aviation Directorate (CAD)
Unmanned Aircraft Systems

Executive Summary

The Malta Civil Aviation Safety Report provides an overview of the Maltese Civil Aviation safety data of 2021 and includes comparisons to similar data from the 2018-2020 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, the year 2021 provided the industry with glimpses of hope. Even though aviation is still far away from the numbers that the industry is used to, stakeholders are confident of growth, albeit with some changes to their operations. With operational changes, new risks emerge, and it is therefore very important that operators and organisations preempt, 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 5,000 reports. Around 4,800 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 <u>Transport Malta website</u> 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 2018 and 2021. 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. The 2021 increase is also due to the restrictive approach adopted by TM-CAD in its MOR evaluation and data gathering. The occurrence categories for these events are shown in Exhibit 9.



Exhibit 1 – Number of MOR events submitted to TM-CAD (2018-2021)

Exhibit 2 provides a monthly view of the number of events submitted on the National database during each month of 2021. From these events, the CAD has classified 4,811 events as MORs. The relatively low MOR submissions between the months of January and April is attributed to the effects

of the COVID-19 pandemic on the aviation industry. The chart shows an increase in events in Q2 and kept on a constant amount throughout 2021. This reflects the resumption of air travel as more countries were easing-off restrictions and vaccination roll-out was gaining momentum, making travellers willing to travel again.



Exhibit 2 – Monthly MOR events reported to TM-CAD in 2021

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, with large organisations increasing considerably their flying rate. Furthermore, the 2021 flight hours also include new AOC holders.



Exhibit 3 - Flying hours of AOC holders per year (2017-2021)

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. One can note a decline from 2020 in the relative value of MORs submitted by aircraft operators and is currently standing at almost 7 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 (2017-2021)

Aircraft movements at Luqa aerodrome have experienced a slight increase when compared to 2020. The increase was mostly attributed to additional scheduled and local flights. The four-year trend in aircraft movements at Luqa aerodrome is shown in Exhibit 5.



Exhibit 5 - Aircraft movements (excl. Military) at Luqa aerodrome (2017-2021)

The source of the Occurrence Reports submitted in 2021 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 (2021)

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)

A considerable decline in the 'Incident' class has been noted from 2020. The change is due to the increase in events classified as 'Occurrence without safety effect'. Furthermore, better statistics are captured for the 'Occurrence with no flight intended' which were not captured in 2020 values.

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.

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 2021, the BAAI commenced three investigations for serious incident/accident events which occurred at Luqa airport. In addition to these, the BAAI:

- Conducted two preliminary investigations and on another two events, however no full investigation has been deemed necessary by the BAAI;
- One investigation was performed in conjunction with the Malta Air Traffic Services (MATS) Safety, Quality, Security and Compliance office;
- Served as an Accredited Representative (ACCREP) with the Bureau of Enquiry and Analysis for Civil Aviation Safety (BEA France) following a runway excursion of a corporate jet after landing at Paris-Le Bourget Airport, France.

From the three events being investigated, the BAAI has concluded one investigation report:

• GA aircraft veered of RWY 23 on take-off, coming to rest on the grass area adjacent to the port RWY 23 edge abreast apron 5, without visible consequences and engine running.

And a preliminary report has been issued for event:

• Aircraft towing incident.

The conclusive and/or preliminary reports of the investigations mentioned can be found on the BAAI website https://baai.gov.mt/

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 2018 and 2021. 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 (2018-2021)

Exhibit 10 lists the occurrence categories reported in 2021, 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 (2021) 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 2017 and 2020 for these specific events.



Exhibit 11 - MOR events per category/domain under review (2018-2021)

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 analysing these numerical values, one must keep in mind that 2020 operations were badly hit due to the COVID-19 pandemic, hence trend analysis might be skewed and provide incorrect impressions when taken at face-value. Nevertheless, Exhibit 11 provides information on areas that might require deeper analysis, possibly increased 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 (2018-2021)

Exhibit 12 shows an slight 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 introduced in late 2019, the data cannot provide a relative mean. In 2021, the CAD classified one-hundred and five events as MAC, an increase when compared to the seventy events from the previous year.

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, 2018–2021)

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, 2018-2021)

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 2021.



Exhibit 15 - Bird strike (BIRD) category events (% by location, 2018-2021)



Exhibit 16 - Bird strike (BIRD) category events (number by location, 2018-2021)

Exhibit 16 clearly shows a significant increase in reported bird strikes during 2021. While there was a large decrease in such type of events at Luqa Aerodrome, the reported bird strike events at foreign aerodromes have spiked. This phenomenon has been discussed during EASA meetings/working groups and is one of the risks that require due attention following the resumption of air operations. Nevertheless, the increase in the number of reports did not translate into major events.



Exhibit 17 - Bird strike (BIRD) events at Luqa Aerodrome vs Aircraft Movement (2018-2021)

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. An interesting factor is that, while bird strike reports from operators increased during 2021, the relative value to 1,000 movements at Luqa aerodrome has declined.



Exhibit 18 - Bird strike (BIRD) events at Luqa Aerodrome per 1,000 Aircraft Movements (2018-2021)

Exhibits 19 and 20 provide a monthly view of the bird strike events as reported in 2021 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.



Exhibit 19 – Bird Strike events reported monthly at Luqa Aerodrome (2021)



Exhibit 20 – Bird Strike events reported monthly to the National database (2021)

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 (2018-2021)

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 2021, 'Difficult/Unruly passenger', 'Drunk Passenger' and 'Smoking in Cabin/Toilet' constituted 57% of reports in the Cabin Safety Events category. The remaining percentage is made-up from events related to cabin crew matters, use of portable oxygen and other medical equipment.



Exhibit 22 provides a percentage value of Unruly/Drunk/Smoking passenger related reports over a four-year term.

Exhibit 22 - Cabin Safety Events (CABIN) category (% by event type, 2018-2021)

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 19 reports were categorised as CFIT in 2021. 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. The 'Gear Warning', 'Equipment', and 'Rate of Climb/Descent' have values of '0' but have been left part of the exhibit since these categories were measured in 2020.



Exhibit 23 - CFIT category related events (2021)

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 (2018-2021)

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, a slight increase has been experienced in 2021. However, on deeper analysis of the reports, it can be noticed that 25% of the reports where related to spurious messages. Nevertheless, all F-NI events will be monitored for root-causes and potential new threats based on operations.

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 (2018-2021)

Exhibit 25 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.

The trends identified in 2020 are still the major contributors to the RAMP category events at Luqa aerodrome in 2021, 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.

At international locations, areas of concern are loading, 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. This category is also one of the highlights of the EPAS.



Exhibit 26 - LOC-I category events (2018-2021)

As shown in Exhibit 26, the year 2021 has provided another increase in the LOC-I category when compared to previous years. This has been thoroughly looked at by the CAD and it has been concluded that this can be attributed to the 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 2021 there were three events categorised as RE. One RE occurred as a result of an accident at a foreign location, and the two at Luqa were related to GA events.



Exhibit 27 – 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 2021 the CAD received seventy-three reports of RI events of which four occurred at Luqa aerodrome. This is a considerable increase, which is mostly attributed to slow-moving aircraft on the runway surface, leading for inbound traffic to perform a go-around. The twelve reports of events at Luqa aerodrome where mostly related to slow moving aircraft and infringements by vehicles. However, there have been reports of crew failing to adhere to assigned holding points. These events have been reviewed to identify any shortcomings from ATC and/or Aerodrome infrastructure.



Exhibit 28 - RI category events at Luqa aerodrome vs Aircraft movements (2018-2021)

Numerically, the RI events at Luqa are still relatively 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 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.



Figure 29 - Fatigue-related events (2018-2021)

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. Additionally, COVID-19 protocols (and coordination issues) at various airports is still being mentioned as one of the causal factors for certain fatigue reported events.

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 30 clearly shows that local flights continued to increase when compared to previous years. 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 3.05 (3 reports), which is a decline when compared to 2020.

The CAD evaluates each report separately and addressed any concerns deriving from such event. Safety notices are published depending on the trends or risks identified following evaluation of such reports. Additionally, the CAD is in liaison with the BAAI in implementation of the recommendations issued following the conclusion of an investigation involving GA aircraft.



Exhibit 30 - General Aviation MORs vs Local movements (2018-2021)



Exhibit 31 - 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.



Exhibit 32 - Laser Attack events (2018-2021)

While it is evident that there is a considerable increase in Laser Attacks in 2021, Exhibit 32 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.

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. 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 33 - Firework related events (2018-2021)

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.

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 35 - Event Types (2021)

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 2021, the phases are shown in Exhibits 37 and 38 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 37 - Event Phase: Powered fixed-wing aircraft (2021)



Exhibit 38 - Event Phase: Helicopter (2021)





Exhibit 39 - Event Phase: Maintenance phases (2021)

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

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. The CAD has participated and shared information with European counterparts in its mission to ensure that aviation safety remains a priority even in such difficult times. This has been more important in the ramp-up of operations stage. The interconnected nature of aviation relies on organisations working together and, if start-up strategies are aligned, the better focus to address safety challenges.

As part of our continuous oversight, the CAD ensured that organisations under its oversight to review their operational risk scenario and identify any abnormal increase/trends and manage them as part of their SMS.

While it has been noticed that certain threats have now been normalised, it is still evident that delays due to bureaucratic processes (COVID-19 restrictions/Country protocols) are resulting in fatigue related events and Flight Time Limitation exceedances. Nevertheless, threats deriving from the reduction of operations, and staff turnover across various levels within the industry are still high on the operational risk table. The operational changes experienced by the industry in the past two years have created new challenges and underlying effects that need to be monitored over a time period. The CAD is still monitoring and sharing data with EASA and related counterparts to ensure that no new risks emerge without being addressed.

Be Ready - Stay Safe: For Organisations

The importance of an industry-wide campaign



Aviation services are interconnected and rely upon organisations working together seamlessly.



Start-up strategies need to be addressed by all organisations to ensure the safe delivery of services.



We all need to focus on key behaviours during the ramp-up of operations over the coming months.

Be Ready means

Ensuring that you have the right tools, equipment and infrastructure in place.

Having enough skilled, trained and qualified people who are operationally ready and fit for duty.

Putting your staff and their wellbeing at the heart of a people centred ramp-up.

Stay Safe means

Encouraging people to follow recognised processes, procedures and practices.

Knowing your risks and mitigating them effectively as part of a resilient management system.

Setting a culture of trust that encourages reporting and for people to talk openly about safety and wellbeing.

Exhibit 40 - Ramp-up - Be Ready, Stay Safe Campaign

Source: (Full Presentation PPT) https://www.easa.europa.eu/community/topics/ramp-be-ready-stay-safe-resources

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)

SPAS Actions - Status

The actions listed hereunder are extracted from the SPAS in Malta 2021-2025. All actions listed are specific to 2021 or is part of a phased-implementation approach.

Actions marked as 'continuous' in the EPAS (2021-2025) are not listed in this status table.

Reference	Deliverable/Action	Target Date	Accomplished
SYS.MST.001	Review Malta SSP document and amend as necessary	2021	2021
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.	2021	2021
SYS.MST.036	PPL/LAPL learning objectives, with related question bank	Q4 2021	2021
OPS.MST.024	Report any loss of separation between civil and military aircraft	2021	On-going ²
OPS.MST.003	Information on EOFDM published on TM-CAD website	2021	2021
OPS.MST.034	Flight time specification schemes: Report on actions implemented to foster capabilities	Q4 2021 / Q1 2022	2021

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.
- ² The reporting is done as part of the sharing of information of Occurrence reports.

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, selfinflicted 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 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.

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March 2022

tm Transport Malta