Ministry of Transport, Communications and Works
Department of Civil Aviation

Cyprus DCA

Annual Safety Review

2020

Edition Number: 1.0

Edition Date: 7 December 2021

TITLE
Annual Safety Review 2020

Document Identifier	Edition Number:	1.0
Annual Safety Review 2020	**Edition Date:**	07-12-2021

Abstract

This review presents the status of aviation safety in Cyprus, on the basis of data collected with respect to safety occurrences in the year 2020. It is prepared and published in line with Article 13(11) of Regulation (EU) 376/2014.

Keywords

safety review, categorization of reports, mandatory reports, voluntary reports, State Safety programme

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STATUS, AUDIENCE AND ACCESSIBILITY					
Status		**Intended for**		**Accessible via**	
Working Draft	☐	General Public	☑	DCA Intranet	☐
Draft	☐	DCA personnel (internal)	☐	DCA website	☑
Proposed Issue	☐	Restricted Audience	☐		☐
Released Issue	☑				

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EXECUTIVE SUMMARY

The Department of Civil Aviation of Cyprus (DCA) has established a reporting system to facilitate the collection of details of aviation occurrences that are reportable under Articles 4 and 5 of Regulation (EU) 376/2014. The Department processes the submitted reports and provides access to the Cyprus Safety Investigation Authority for further analysis and investigation of accidents and serious incidents.

This report is prepared and published in line with Article 13(11) of Regulation (EU) 376/2014 and presents the status of aviation safety in Cyprus, on the basis of data collected with respect to safety occurrences in the year 2020. It also serves as an input to the Annual Safety Review of 2020 which will be produced in accordance with the provisions of the State Safety Program in force.

Aviation industry was heavily impacted by the COVID-19 outbreak and the severe air travel restrictions imposed by the State in an effort to contain the pandemic. Consequently, the Nicosia ACC Traffic Movement of 2020 was lower by more than 60% as compared to the traffic demand of 2019, while the Aerodrome Traffic Movement for both aerodromes dropped by 45%. As a result, the number of reports submitted within 2020 was lower by 58% (334 less) as compared to the number of occurrences submitted in the same period within 2019 (575 occurrences).

Out of 241 reports submitted to the DCA in the year 2020, one (1) was classified as an “Accident” and five (5) reports were classified as “Serious incidents”, a percentage of 2.1%.

Analysis has shown that the occurrence categories with the biggest number of occurrences were:

- NAV: Navigational error: Navigation errors - Occurrences involving the incorrect navigation of aircraft on the ground or in the air.
- ATM: Occurrences involving Air traffic management (ATM) or communications, navigation, or surveillance (CNS) service issues
- BIRD: Occurrences involving collisions / near collisions with bird(s)
- SCF-NP: Failure or malfunction of an aircraft system or component - other than the powerplant

Due to the small number of reports received it is difficult to draw reliable conclusions as regards to any trends. It can be concluded however that the safety levels for the year 2020 remained high. The DCA needs to remain vigilant and monitor the safety levels for specific areas such as airspace infringements, taxiway incursions, bird strikes and reciprocating engines reliability.

Contents

1. Background

This report has been elaborated in accordance with the provisions of the Department of Civil Aviation (DCA) "Occurrence Reporting Procedure Edition 1.2, dated 30/06/2021 and prepared and published in line with the requirements of European Union Regulation (EU) 376/2014 Article 13(11) as amended.

Its main goal is to provide a statistical analysis of the safety performance of the past year as well as trends over a longer period. This document helps the Cyprus DCA to identify safety priorities for the upcoming State Safety Plan (SSP).

2. Reporting period

This report covers the year 2020.

3. Sources of information

The analysis is based on the data contained in the National Database of Safety Occurrences. This is the database maintained at national level, where all occurrences reported to the Cyprus DCA are stored. This is done in accordance with Reg. (EU) 376/2014 "on the reporting, analysis and follow-up of occurrences in civil aviation".

It must be noted that, due to the fact that this the second time of issuing this report, the comparison with previous years will be done only for the year 2019.

4. Key Statistics

The cross domain key statistics are illustrated on the tables and Figures below and include comparison of the years 2019 and 2020.

4.1: Number of occurrences reported to the DCA

Occurrence reporting is one of the active systems that enables the identification of safety-related hazards and helps the development of proactive approaches and strategies to mitigate undesired outcomes while enhancing overall aviation safety.

As shown in Table 1, a total of 241 occurrences[1] were reported within 2020, which is lower by 58% (334 occurrences) as compared to the number of occurrences submitted in the same period within 2019 (575 occurrences).

[1] The number of occurrences is at least the same or greater to the number of reports submitted, since a single occurrence may be reported by more than one reporter.

It must be pointed out that the ACC Traffic Movement of 2020 was lower by more than 60%[2] as compared to the traffic demand of 2019, while the Aerodrome Traffic Movement was lower by 45%[3] and the Controlled Flight Hours fell by 60%. This historical drop in air travel demand has been recorded due to the COVID-19 pandemic outbreak and the severe air travel restrictions imposed by States in an effort to contain the pandemic (mid-March 2020).

The comparison of 2020 with 2019 in terms of number of occurrences reported to the DCA and the Traffic Movement is illustrated in the table below:

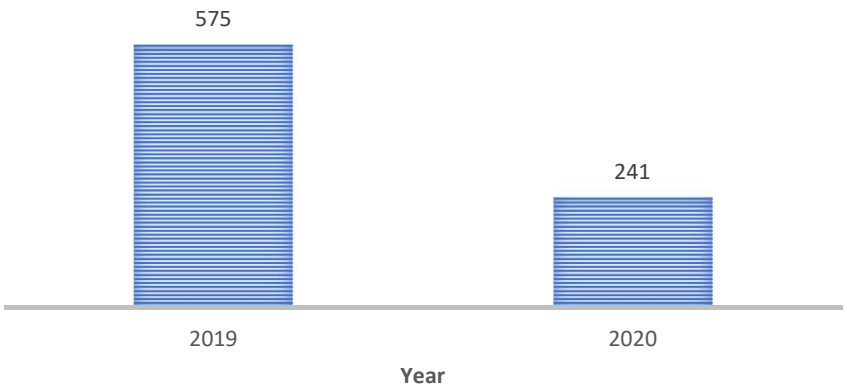

Figure 1: Number of Occurrences reported to DCA per year

The Figure below provides a comparison of the number of occurrences reported on the DCA during each month for 2019 and 2020. The decline in occurrence report submissions for the months of March, April and May (2020) is attributed to the flight ban imposed due to COVID-19 pandemic.

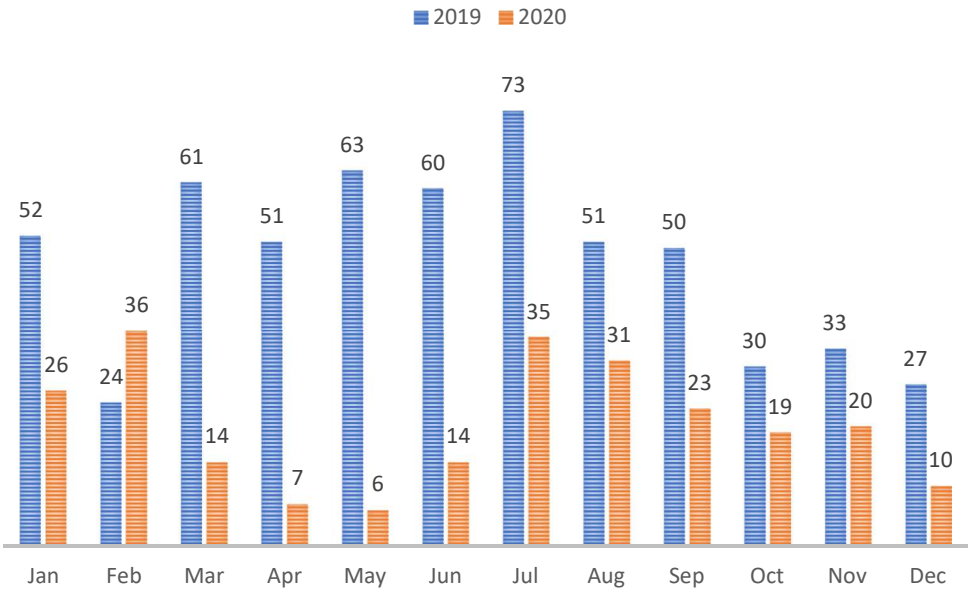

Figure 2: Number of occurrences reported to DCA per month

[2] According to https://ext.eurocontrol.int/analytics/saw.dll?Dashboard

[3] According to the statistics provided by the aerodrome ATC units.

Similarly, traffic movements for 2019 and 2020 are shown in the table below:

2019		2020
11875	Local Aerodrome Flights (VFR)	6054 ⇩
80985	International Aerodrome Traffic Movement (IFR)	44620 ⇩
92860	Total Aerodrome Traffic Movement (VFR & IFR)	50674⇩
411380	ACC Traffic Movement	164125 ⇩
203617	Controlled Flight Hours	70342 ⇩

Table 1: Traffic Movement [5] (2020 vs 2019)

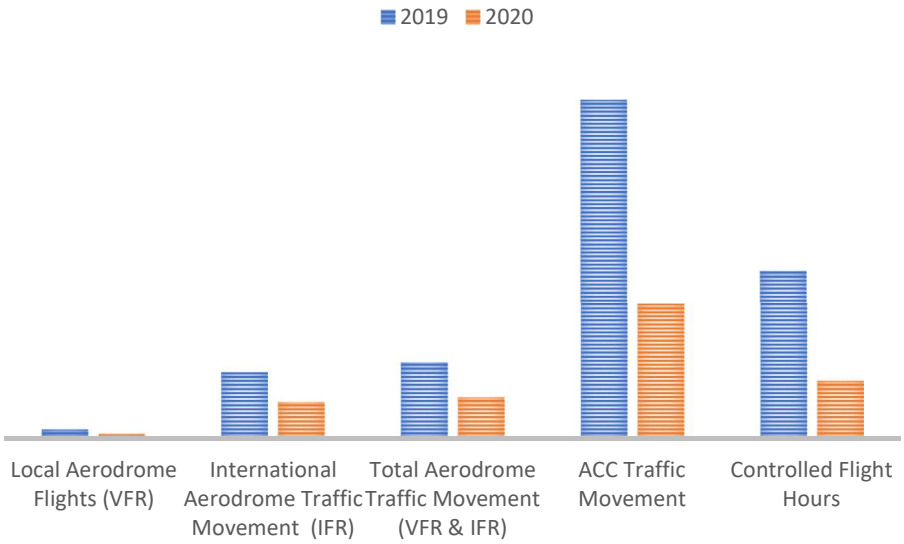

Figure 3: Traffic Movement (2020 vs 2019)

4.2: Number of submitted occurrences in the National Database based on the Occurrence Class

As a part of the analysis process conducted by the DCA, each occurrence report submitted to the national database is classified based on its occurrence class.

The classification of the occurrence is based on the ICAO ADREP taxonomy and the definitions of Accidents, Serious Incident and Incidents derived from Reg. (EU) 996/2010 and are presented in Appendix 1.

The classification of the 241 occurrences entered in the National database within 2020 based on the Occurrence Class is shown on Table 2. The same table shows also the comparison between the years 2019 and 2020.

[5] Sources: PHA and LCA ATC Towers and Eurocontrol

2019		Occurrence Class	2020	
Number	% of total (575)		Number	% of total (241)
0	0,0	Accidents	1	0,4
10	1,7	Serious Incidents	5	2,1
134	23,3	Incidents	92	38,2
5	0,9	Major Incidents	1	0,4
187	32,5	Significant Incidents	62	25,7
61	10,6	Occurrences without Safety effect	20	8,3
17	3,0	Observation	8	3,3
3	0,5	Occurrences without flight intended	4	1,7
158	27,5	Not determined	49	20,3

Table 2: Occurrence Class

(Note: The percentage is calculated on the basis of the total number of occurrences reported on the specific year.)

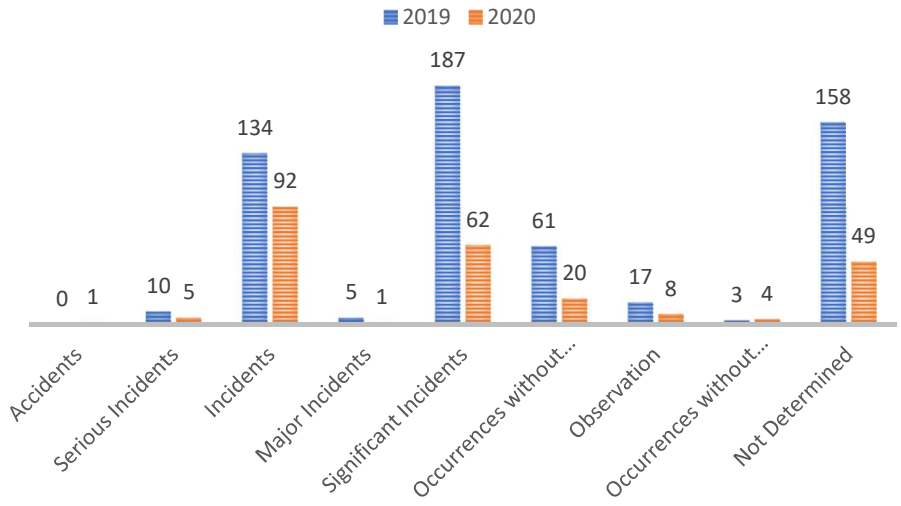

Figure 4: Number of occurrences based on the Occurrence Class (2019 vs 2020)

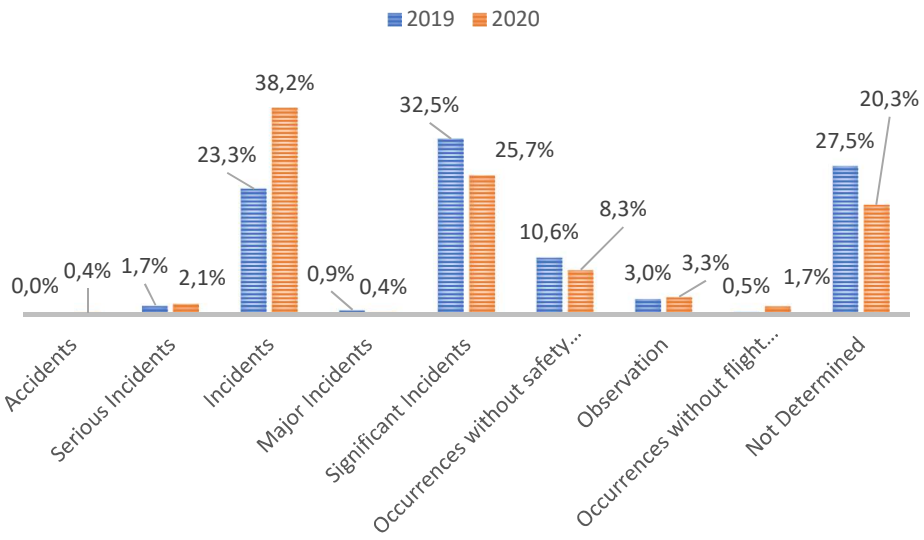

Figure 5: Percentage of occurrences based on the Occurrence Class (2019 vs 2020)

4.2.1: Number of Accidents and Serious Incidents reported to the DCA

One Fatal **Accident** was reported within 2020, with one fatality. The accident involved a sport/recreational category aircraft (powered paraglider). The investigation determined that the accident was due to medical reasons leading to pilot incapacitation and subsequent loss of control in flight.
No further serious injuries were reported in the year 2020.

2019		2020
0	Fatal Accidents	1⇧
0	Non-Fatal Accidents	0
0	Serious Injuries	0

Table 3: Key Statistics for the years 2019 and 2020

Comparing the number of occurrences classified as **Serious Incidents** between 2020 and 2019, there was a reduction by five (5). In 2020, five (5) serious incidents have been reported compared to ten (10) serious incidents reported in 2019. Due to the fact that the number of reports submitted to the DCA was significantly less (by 58%), this result should be considered as an irregularity. However, comparing the percentage of occurrences classified as Serious Incidents to the total number of occurrences reported within the year, the trend can be considered as negative, since the percentage of 2019 and 2020 is slightly increased (2.1%).

2019	Serious Incidents	2020
10	Number of Occurrences classified as Serious Incidents	5 ⇩
1.7%	% to the total number of occurrences within the year	2.1%⇧

Table 4: Number and percentage of Serious Incidents to the total number of occurrences (2019 vs 2020)

Out of five (5) Serious Incidents reported:

- One (1) was related to a dual bleed system failure on a commercially operated aircraft. [SCF-NP: System/component failure or malfunction [non-powerplant].
- One (1) was related to smoke in the cockpit of a military helicopter. [F-NI: Fire/smoke (non-impact)]
- One (1) was related to an ultralight aircraft emergency landing. [SCF-PP: powerplant failure or malfunction.
- One was related to reciprocating engine oil leak on a training aircraft leading to fumes/smoke in the cockpit. [SCF-PP: powerplant failure or malfunction. /F-NI: Fire/smoke (non-impact)
- One (1) was related to low speed rejected take-off due to unreliable airspeed indication. [SCF-NP: System/component failure or malfunction [non-powerplant].

4.3 Number of submitted occurrences reports based on the Occurrence Category

As a part of the analysis process conducted by the DCA, each occurrence report submitted to the national database is categorized based on the ICAO ADREP taxonomy. The Table below shows the occurrence categories submitted to the DCA for the years 2019 and 2020.

2019		Occurrence Category	2020	
Number	% of 575		Number	% of 241
4	0,7	ADRM: Aerodrome	10	4,1
0	0,0	AMAN: Abrupt manoeuvre	0	0,0
0	0,0	ARC: Abnormal RWY contact	1	0,4
195	33,9	ATM: ATM/CNS	87	36,1
73	12,7	BIRD: Birdstrike	40	16.6
0	0,0	CABIN: Cabin Safety events	1	0,4
0	0,0	CFIT: Controlled flight into or toward terrain	0	0,0
0	0,0	CTOL: Collision with obstacles during take-off and landing	0	0,0
0	0,0	EVAC: Evacuation	0	0,0
0	0,0	EXTL: External load related occurrences	0	0,0
2	3,4	F-NI: Fire/smoke non-impact)	2	0,8
0	0,0	F-POST: Fire/smoke (post impact)	0	0,0
1	0,2	FUEL: Fuel related	2	0,8
1	0,2	GCOL: Ground Collision	2	0,8
0	0,0	GTOW: Glider towing related events	0	0,0
0	0,0	ICE: Icing	0	0,0
0	0,0	LALT: Low altitude operations	0	0,0
0	0,0	LOC-G: Loss of control-ground	0	0,0
0	0,0	LOC-I: Loss of control-inflight	1	0,4
0	0,0	LOLI: Loss of lifting conditions en route	0	0,0
10	1,7	MAC: Airpox/ACAS alert/loss of separation/near midair collision	6	2,5
1	0,2	MED: Medical	0	0,0
207	36,0	NAV: Navigation error	91	37,8
205	35,7	OTHR: Other	20	8,3
5	0,9	RAMP: Ground Handling	2	0,8
0	0,0	RE: RWY excursion	0	0,0
0	0,0	RI-O: RWY Incursion-other	0	0,0
0	0,0	RI-VA: RWY Incursion-vehicle or a/c	0	0,0
0	0,0	RI: RWY Incursion-vehicle, aircraft or person	3	1,2
21	3,7	SCF-NP: System/component failure or malfunction [non-power]	23	9,5
9	1,6	SCF-PP: Powerplant failure or malfunction	12	5,0
47	8,1	SEC: Security Related	9	3,7
0	0,0	TURB: Turbulence encounter	1	0,4
0	0,0	UIMC: Unintended flight in IMC	0	0,0
20	3,5	UNK: Unknown/undetermined	2	0,8
1	0,2	USOS: Undershoot/overshoot	0	0,0
10	1,7	WILD: Collision wildlife	8	3,3
1	0,2	WSTRW: Windshear or thunderstorm	0	0,0

Table 5: Occurrence Categories, number and percentage (2019 vs 2020)

The Figures below visualize the ADREP occurrence categories reported and provides the basis for further analysis within that specific category as addressed in this document. Chart 6 is based on the number of occurrences based on the category, while Figure 7 is based on the rate (percentage).

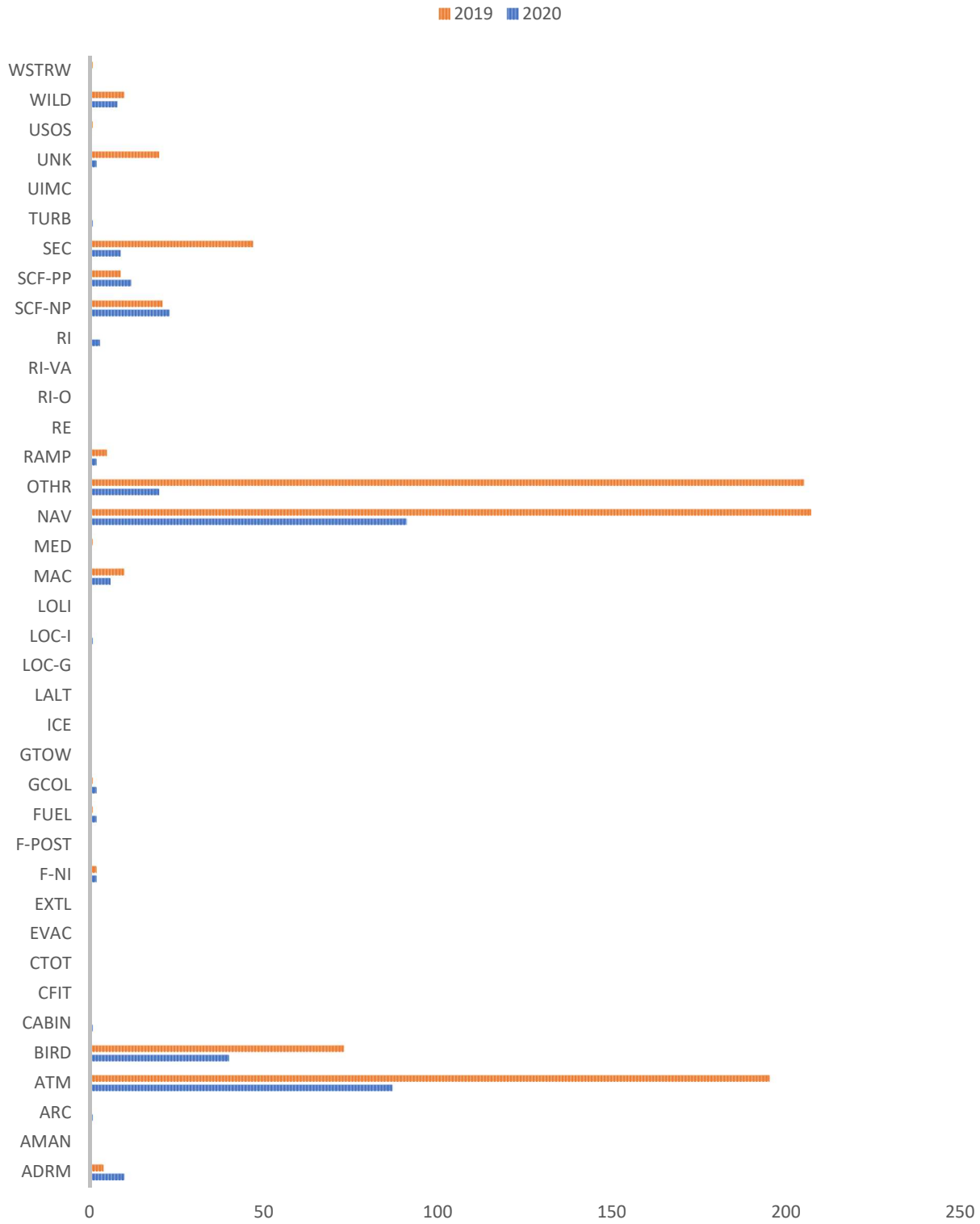

Figure 6: Number of Occurrences by Occurrence Category (2019 vs 2020)

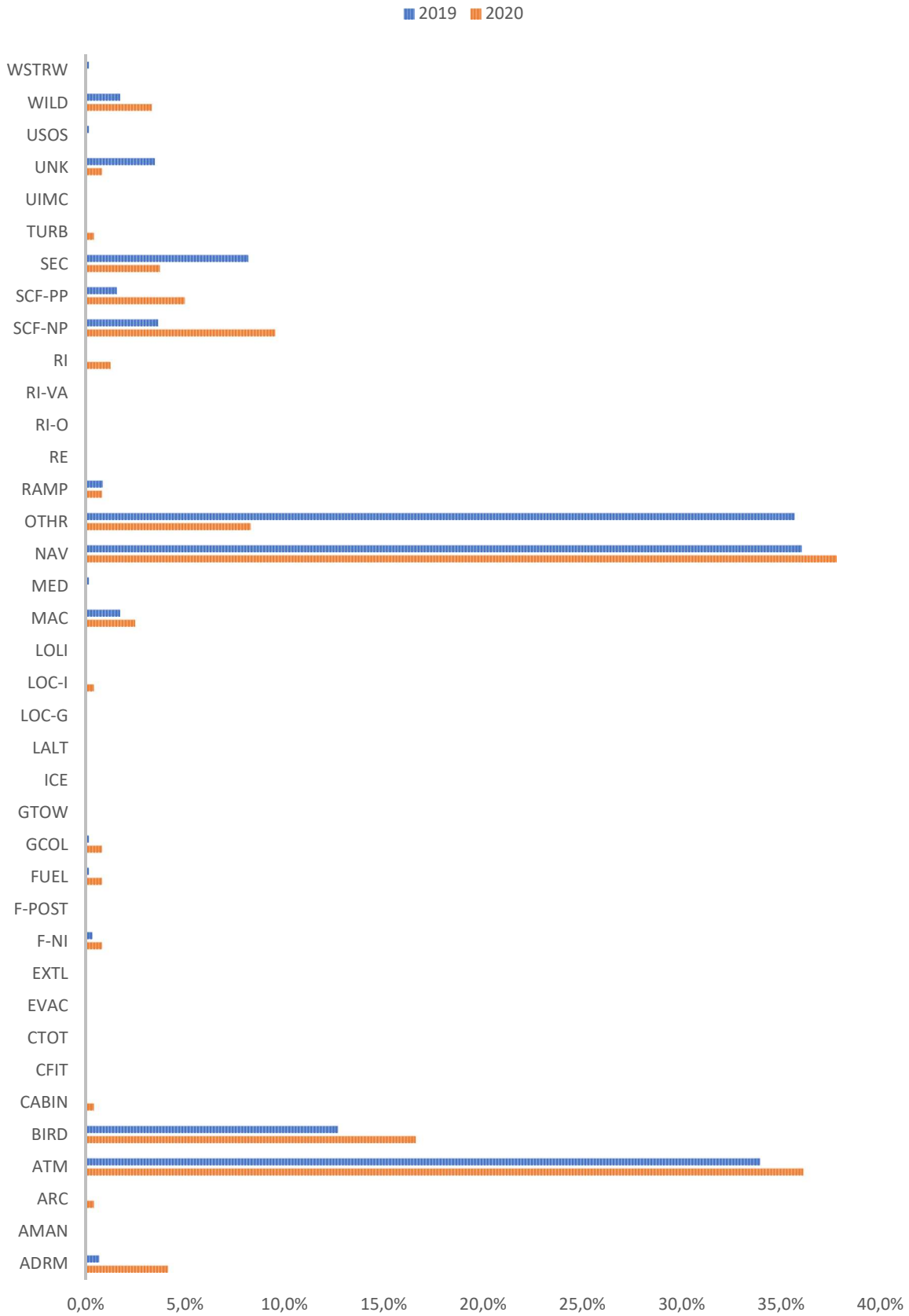

Figure 7: Percentage of Occurrences by Occurrence Category (2019 vs 2020)

It must be noted that some incidents may have been categorized in more than one Occurrence Category.

Figure 8 below lists the occurrence categories reported in 2020, in descending order with regards the number of occurrences reported. It must be noted that the most common category doesn't necessarily constitute the highest safety risk. The DCA is monitoring these specific categories in order to ensure that this increase does not constitute a negative impact on operational safety.

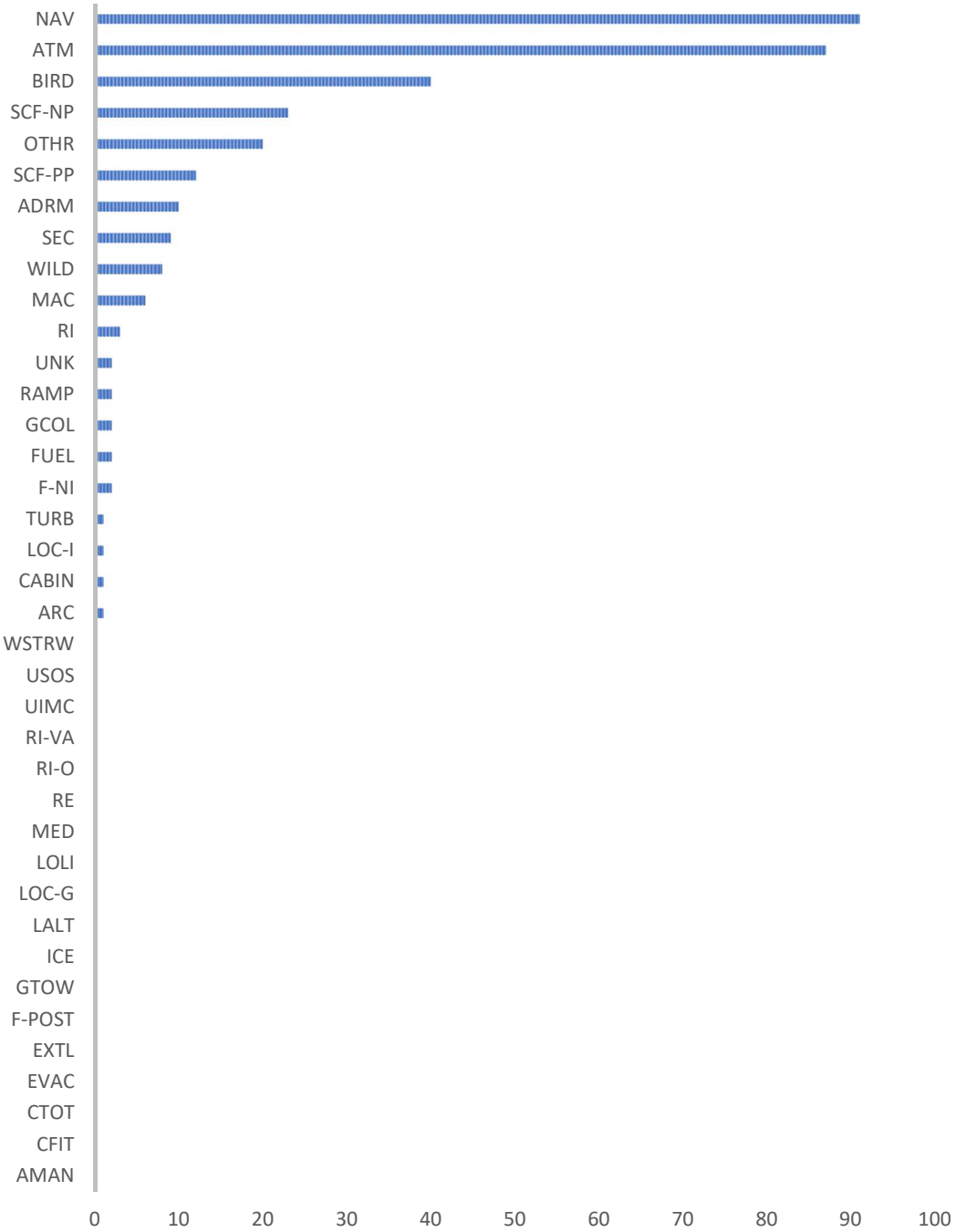

Figure 8: Occurrences reported in 2020 by Occurrence Category, in descending order

Based on the above, the top five occurrence categories identified are the following:

NAV: Navigational error: Navigation errors - Occurrences involving the incorrect navigation of aircraft on the ground or in the air.

Occurrences reported in this category are mostly related to Airspace Infringement incidents and pilots' failure to coordinate their entry clearance to Nicosia FIR from Ankara FIR. This is due to the release by Ankara of outbound traffic to the illegal "ERCAN" station instead of the Nicosia FIR.
For 2020, the percentage of the number of such occurrences to the total number of occurrences reported within the year is higher than 2019 (36.0% vs 37.8%). It must be noted that the ATS provider has already published in the Cyprus AIP and in NOTAM A1133/12 the pilots' responsibilities to coordinate their entry clearance to Nicosia at least 10 min prior the boundary points. With the introduction of Mode-S, most of the traffic inbound Nicosia FIR via Ankara FIR are more easily identified as they are correlated with reference to their unique ID code.
Also included in this category are those incidents related to aerodrome and apron aircraft movement, specifically to pilot's failure to follow ATC instructions during taxiing.

ATM: Occurrences involving Air traffic management (ATM) or communications, navigation, or surveillance (CNS) service issues

The second event category includes occurrences related to ATM facilities, equipment, personnel and procedures involved in the provision of Air Traffic Services. A slight increase has been recorded within 2020 compared to 2019 (33.9% vs 36.1%) with regards to the total number of occurrences reported.

BIRD: Occurrences involving collisions / near collisions with bird(s)

Within 2020, 40 Bird Strike and 8 Wildlife occurrence reports were submitted. However, 3 of the occurrences relate to the same incidents (duplicated incidents), therefore the final number of the occurrence reports related for bird strikes and wild life is 45. No significant trend has been identified compared to the previous year.

SCF-NP: Failure or malfunction of an aircraft system or component - other than the powerplant

23 occurrences categorized as SCF-NP were reported in the year 2020, compared to 37 occurrences of the same category reported during the previous year. However, when adjusted by Controlled Flight Hours (CFH) it can be seen that the reporting rate increased from 0,18 SCF-NP occurrences per 1000 CFH in 2019 to 0,33 SCF-NP occurrences per 1000 CFH in 2019. From the analysis of the 2020 SCF-NP related occurrences no specific area was identified as having a significant impact.

OTHR: Any occurrence not covered under another category

This category includes any occurrence type that is not covered by any other category. There has been a significant drop in occurrences coded in this category, from 205 occurrences (35.7% of the total) in 2019 to 20 occurrences (8.3% of the total) in 2020. This can be attributed to the Department's continuous efforts to educate the organisations on the correct completion of the reports and thus improve the quality of the reports received and entered into the national database.

5. Flight Safety Unit (Airworthiness and Flight Operations domains)[6]

5.1 Key Safety Areas

5.1.1 General

The year 2020 was an exceptional year due to the effects of the COVID-19 pandemic. Controlled flight hours were reduced from 203617 in 2019 to 70342 in 2020, a reduction of 60%. The Cyprus based AOC holders and general aviation aircraft were largely grounded during the year due to the imposed flight restrictions. This inevitably had an impact on the number of occurrences and occurrence reports received.

5.1.2 Key statistics

One fatal accident occurred in the year 2020, with one person fatally injured. The accident involved a sport/recreational category aircraft (powered paraglider). The investigation determined that the accident was due to medical reasons leading to pilot incapacitation and subsequent loss of control in flight.

Five Serious Incidents were reported. Two involved Commercial Air Transport aircraft (dual bleed system failure and rejected take-off due to unreliable airspeed), two involved General Aviation aircraft (reciprocating engine oil leak and propeller damage) and one involved a military aircraft (fumes/smoke in the cockpit).

No serious injuries were reported during the year.

5.1.3 Main safety issues identified

The main safety issue identified in the year 2020 across the Airworthiness and Flight Operations Domains was the effect of the COVID-19 pandemic. Reduction in flights and flight restrictions / lockdowns affected approved organisations and aviation personnel. Both domains acted proactively, adjusted oversight and disseminated information to the AOC operators and approved organisations. The EASA Return to Normal Operations (RNO) guidance, documents and checklists were utilized and assisted the DCA Flight Safety Unit personnel in this task.

With regard specifically to the Airworthiness Domain, the main safety issue identified in 2020 was the reliability of reciprocating engines. However, due to the small number of received reports it is not possible to draw reliable conclusions as regards to any trends.

In the Flight operations domain, the single accident that resulted in one fatality was attributed to pilot incapacitation due to medical reasons. Another safety issue that was identified in this domain was frequent pilot failure to follow ATC instructions when taxiing at LCLK, resulting in taxiway or taxi lane incursions.

[6] Occurrences received from Flight Training Organisations or Declared Training Organisations were processed according to their related domain, either Flight Operations or Airworthiness

5.2 Detailed Analysis

5.2.1 Domain specific analysis – Airworthiness

5.2.1.1 Number of reported occurrences and reporting rate

A total of 46 occurrences related to airworthiness were reported in 2020. The number remained the same as the previous year, however when adjusted by controlled flight hours (CFH) we see an increase of the reporting rate from 0.23 occurrences per 1000 CFH in 2019 to 0.66 occurrences per 1000 CFH in 2020.

The top four reported occurrence areas by ATA[7] Chapter were:

ATA Chapter number	ATA Chapter description	Number of reports (2020)	Number of reports (2019)
72	Engine Reciprocating	9	6
32	Landing Gear	5	4
22	Auto Flight	4	5
21	Environmental Control	4	5

Table 6: Top four reported occurrence areas in the Airworthiness Domain (2019 vs 2020)

The distribution of the Airworthiness Domain related occurrences, by ATA Chapter, is shown in the Figure below:

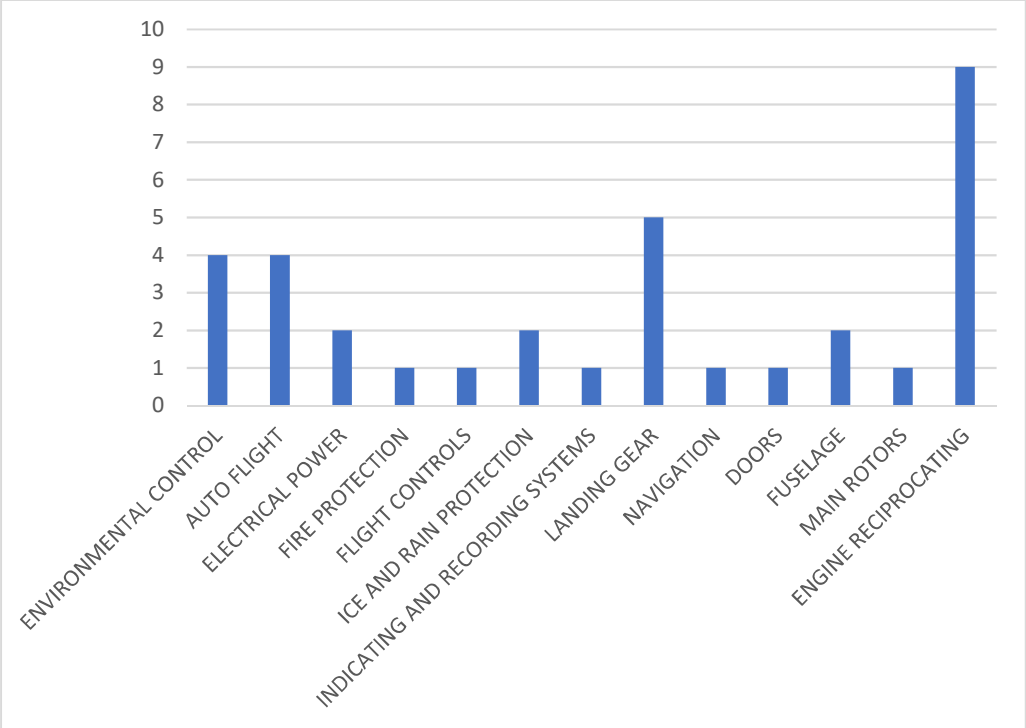

Figure 9: Airworthiness related occurrences for the year 2020

[7] ATA Specification 2200 Numbering System used in aircraft product technical information

5.2.1.2 Occurrence class

There were zero Airworthiness domain related Accidents in 2020, same number as in the previous year. The number of Airworthiness domain related Serious Incidents increased from two in 2019 to five in 2020. Adjusted by the CFH, it is seen that the rate increased from 0.01 Serious Incidents per 1000 CFH in 2019 to 0.07 Serious Incidents per 1000 CFH in 2020. However, due to the small numbers involved it is not possible to draw reliable conclusions as regards to any trends.

The distribution of the number of reported occurrences related to the Airworthiness Domain by occurrence class, for the year 2020 was as follows:

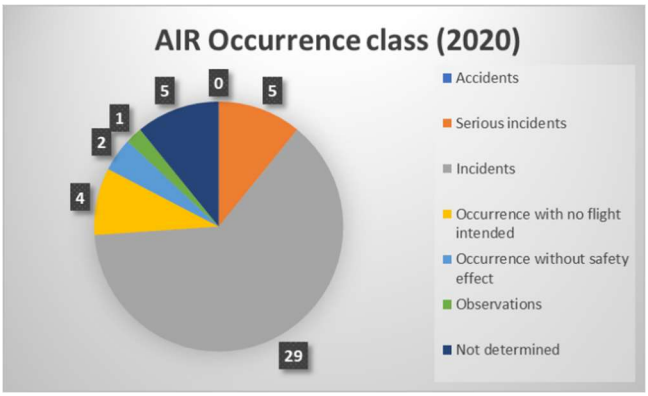

Figure 10: Classification of Airworthiness related occurrences for the year 2020

5.2.1.3 Occurrence category

5.2.1.3.1 SCF-NP: System / component failure or malfunction (non-powerplant)

Half of the Airworthiness Domain related occurrences reported in 2020 were categorized as SCF-NP. From the analysis of those 23 reports no specific ATA chapter was identified as having a significant impact.

5.2.1.3.2 SCF-PP: System / component failure or malfunction (powerplant)

Twelve of the forty-six Airworthiness Domain related occurrences reported in 2020 were categorized as SCF-PP. From the analysis of the data in this category it is established that eight reports, a percentage of 66.7% of the total number, were related to reciprocating engines operated on General Aviation aircraft. This percentage has increased from 56% in the previous year. Adjusted by CFH we see an increase in the reporting rate for reciprocating engine related occurrences, from 0.02 per 1000 CFH in 2019 to 0.11 per 1000 CFH in 2020.

The distribution of the number of reported occurrences related to the Airworthiness domain by occurrence category, for the year 2020 was as follows:

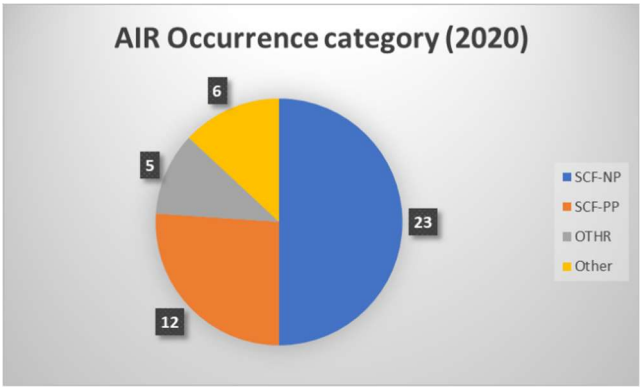

Figure 11: Categorisation of Airworthiness related occurrences for the year 2020

5.2.2 Domain specific analysis – Flight Operations

5.2.2.1 Number of reported occurrences and reporting rate

A total of 21 occurrences related to flight operations were reported in 2020. The number decreased by two occurrences compared to the previous year, however when adjusted by Controlled Flight Hours (CFH) we see an increase of the reporting rate from 0.11 occurrences per 1000 CFH in 2019 to 0.30 occurrences per 1000 CFH in 2020.

5.2.2.2 Occurrence class

There was one Flight Operations Domain related Accident in 2020 compared to zero Accidents in the previous year. One person was fatally injured. The investigation determined that the accident was due to medical reasons leading to the powered paraglider pilot incapacitation and subsequent loss of control in flight.

The number of Flight Operations Domain related Serious Incidents decreased from seven in 2019 to zero in 2020. However, due to the small numbers involved it is not possible to draw reliable conclusions as regards to any trends.

The distribution of the number of reported occurrences related to the Flight Operations Domain by occurrence class, for the year 2020 was as follows:

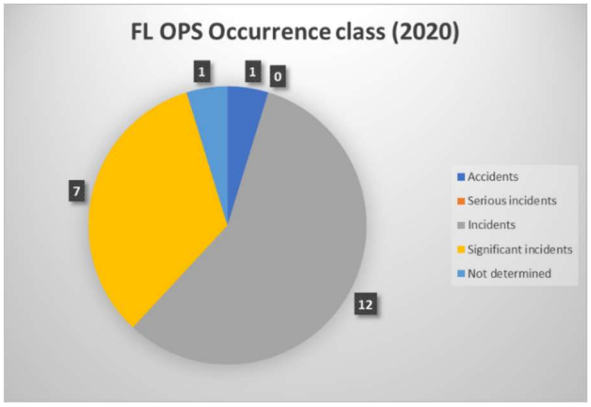

Figure 12: Classification of Flight Operations related occurrences for the year 2020

5.2.2.3 Occurrence category

5.2.2.3.1 NAV: Navigation error

A percentage of 48% (10 out of 21) of the Flight Operations Domain related occurrences reported in 2020 were categorized as NAV. From the analysis of those ten occurrences it can be seen that a total of six relate to taxiway and taxi lane incursions with failure to follow ATC instructions when taxiing at Larnaca International Airport (LCLK), even in cases where read-back was correct.

The distribution of the number of reported occurrences related to the Flight Operations Domain by occurrence category, for the year 2020 was as follows:

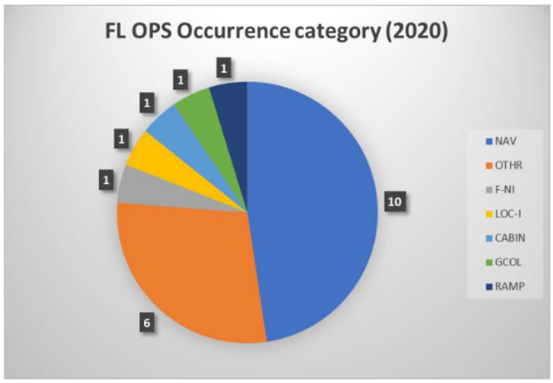

Figure 13: Categorisation of Airworthiness related occurrences for the year 2020

5.3 Additional Safety Areas

From the analysis of the remaining occurrences that were reported in the year 2020, no significant area was identified as having a significant impact to the safety levels.

6. Aerodromes and Ground Handling

6.1 Key Safety Areas:

The analysis of the safety performance includes the number of Birdstrike/Wildlife incidents occurred within the year (2020) and are compared based on the safety performance of previous year (2019).

Out of 45 reports, 28 relate to occurrences outside LCA and PFO airport areas which are not controlled by the aerodrome operator.

17 relate to occurrences within LCA and PFO airports area controlled by the aerodrome operator. These are split, depending on their occurrence location to:

- 13 collisions at LCA airport;
- 4 collisions at PFO airport.

The numbers of reports are illustrated below:

2019		2020
73	Total Birdstrikes/Wildlife	45⇩
28	Outside Airports	28
45	Inside Airports	17⇩

Table 7: Number of reported Birdstrike/Wildlife occurrences (2019 vs 2020)

6.2 Detailed Analysis:

Since Birdstrikes/Wildlife are directly associated with the number of movements, the comparison will be conducted in terms of rates. The rate of Birdstrikes/Wildlife is calculated as the total number of Birdstrikes/Wildlife that occurred divided by the Total Aerodrome Traffic Movement (VFR & IFR) within these airports.

The Total Aerodrome Traffic Movement (VFR & IFR), and Birdstrikes/Wildlife rates, inside and outside of the Larnaca and Paphos Airports, for the two years are as follows:

2019		2020
92860	Total Aerodrome Traffic Movement (VFR & IFR)	50674⇩
7.86×10^{-4}	Total Birdstrikes/Wildlife	8.88×10^{-4} ⇧
3.01×10^{-4}	Outside Airports	5.52×10^{-4}⇧
4.84×10^{-4}	Inside Airports	3.35×10^{-4} ⇩

Table 8: Aerodrome Traffic Movement and Birdstrikes/Wildlife rates (2019 vs 2020)

Comparing the annual rates of the Total number of reports related to Birdstrikes/Wildlife between 2020 and 2019, there was an increase of this particular safety risk. Similarly, a significant increase was recorded on the incidents occurred outside the areas controlled by the aerodrome

operator. On the contrary, **the rates showed a decreasing trend to the incidents related to Birdstrikes/Wildlife occurring within the areas controlled by the aerodrome operators.** Nevertheless, this result should not be considered as a major deviation because the Total Aerodrome Traffic Movements (VFR & IFR) for 2020 were significantly less (by 45%) than the previous year, due to the effects of the COVID-19 pandemic on air traffic.

The aerodrome operator has established a Birdstrike/Wildlife safety performance indicator system for each airport which is also monitored by the DCA Aerodromes Section.

6.3 Additional Safety Areas:

From the analysis of the remaining 15 reports (out of 60), the following items are highlighted as areas deserving closer monitoring:

- One (1) significant incident related to a runway incursion by vehicle without safety effect (not involving an aircraft).
- Four (4) related to a non-adherence to the aerodrome procedures, without safety effect.
- Two (2) related to aviation security (bomb threat) in the terminal.
- One (1) related to FOD in the runway (aircraft part), after runway inspection by Hermes.
- Three (3) related to taxiway incursions by aircraft or vehicles.
- Three (3) related to errors during taxing caused by misinterpretation of ATC instructions.
- One (1) related to fireworks observed at Makenzie beach.

The major occurrences based on their safety severity are as follows:

1. Taxiway incursion: One out of three (3) taxiways incursions reported within 2020, related to an incident of an AMIU vehicle with a light aircraft. The incident was investigated by the aerodrome operator and the corrective actions taken were recurrent training for the AMIU inspector and additional guidelines issued for AMIU inspectors.

2. The FOD occurrence related to a small aircraft component that was found on the taxiway by the AMIU. As advised by engineers, the specific part was a B737 landing gear component.

7. ATM/ANS

7.1 Key Safety Areas:

The analysis of the safety performance will include among others, the number of Runway incursions and Separation Minima Infringements occurred within the year (2020) and will be compared based on the safety performance of previous year (2019).

7.1.1. Runway Incursions

Runway Incursion (RI) is any occurrence at an aerodrome involving the incorrect presence of aircraft, vehicle or personnel on the protected area of a surface designated for the landing and take-off of aircraft.

Three (3) RI have been reported within 2020 and all of these occurred in the second half of the year. No RI has been reported within 2019.

2019		2020
0	Number of RI	3 ⇧

Table 9: Number of Runway Incursions (2019 vs 2020)

One (1) RI took place at Paphos and two (2) RI at Larnaka airport. An Airside Monitoring and Inspection Unit (AMIU) vehicle was involved in the Paphos RI, while in Larnaka airport a light aircraft and the Forest Department aircrafts (Forest Formation) were involved.

The investigations conducted by the ANSP concluded that, for all three cases, there was no ATM contribution. However, the involved persons/organisations were informed by the ANSP accordingly.

The NSA monitors closely the processing of runway incursion incidents, as part of its regular oversight activities.

7.1.2 Separation Minima Infringement

Separation Minima Infringement (SMI), is any occurrence involving the breach of the specified separation minima (vertical or lateral), caused by either air traffic control or cockpit crew.

One (1) SMI has been reported within the 2020. The investigation conducted by the ANSP concluded that there was no ATM/CNS contribution to this event. It is noted that in 2019, five (5) SMIs had been reported, 4 of which had an ATM/CNS contribution.

In this respect, the results for the given reporting period were as follows:

2019		2020
5	Total SMIs	1 ⇩
4	SMIs with ATM/CNS contribution	0 ⇩

Table 10: Number of Separation Minima Infringements (2019 vs 2020)

Since SMIs are directly associated to the number of aircrafts, the comparison will be conducted in terms of rates. The rate of SMIs is calculated as the total number of separation minima infringements that occurred in the Cyprus airspace divided by the total number of controlled flight hours (CFH) within this airspace.

Since the CFH for the two years is as follows,

2019		2020
203617	Number of CFH	70342 ⇩

Table 11: Number of Controlled Flight Hours (2019 vs 2020)

the rates of SMIs are the following:

2019		2020
2.45×10^{-5}	Rate of Total SMIs	1.42×10^{-5} ⇩
1.96×10^{-5}	Rate of SMIs with ATM/CNS contribution	0 ⇩

Table 12: Separation Minima Infringement rates (2019 vs 2020)

Comparing the annual rates of the Total SMIs between 2020 and 2019, there was a significant decrease of this particular safety risk (i.e., there was a reduction of SMIs). Similarly, a significant decrease has been also recorder on the rate of SMIs with ATM/CNS contribution. **Nevertheless, this result should be considered as an irregularity because the controlled flight hours for 2020 were significantly less (by 60.2%) than the previous year, due to the effects of the COVID-19 pandemic on air traffic.**

7.2 Detailed Analysis:

A total of 176[8] reports were submitted within 2020 from the ATS provider, which is lower by 247 when compared to the number of reports submitted in the same period within 2019 (423 reports). It must be noted that the traffic movements for 2020 were lower by more than 60%[9] as compared to the traffic movements for 2019. This historical drop in air traffic movements has been recorded due to the COVID-19 virus outbreak and the severe air travel restrictions imposed by States in an effort to contain the pandemic (mid-March 2020). In view of all this, there are de facto constraints as to the verification of the ATS provider's 2020 safety performance.

Regarding Runway Incursions, no incidents have been reported within 2019. On the contrary, three (3) RI recorded within 2020. This indicates a **negative** performance with respect to this particular safety risk.

With regards the Separation Minima Infringements, only one (1) SMI (with no-ATM/CNS contribution) was reported in 2020, in contrast to 2019 in which five (5) SMIs were reported (four (4) of them had ATM/CNS contribution).

Therefore, by comparing the two periods of 2020 and 2019, a **positive** performance is noted. However, as mentioned before, this result may be considered as an irregularity since the controlled flight hours for the period under scope were significantly less than the corresponding number in the previous year, due to the effects of the COVID-19 pandemic on air traffic.

It must be stressed here that although the ATCOs may not always contribute to the cause of these type of incidents, they can play a vital role in their prevention.

Finally, it should be noted that several audits have been conducted by NSA within 2020 focusing on the causal factors of the SMIs which occurred in 2019, as well as the implementation of the safety recommendations of the investigations.

7.3 Additional Safety Areas:

From the analysis of the 176 reports, the following items are highlighted as areas deserving closer monitoring:

a) With regards to Airspace Infringements incidents, in 2020, there was a reduction of the number of reported Airspace Infringements incidents by 60% (105 reports) comparing with the 1st semester of the same year. The ratio of airspace Infringements to the number of the occurrence reports for 2020 is slightly smaller (better) to the ratio of 2019 (0.392 for 2020 and 0.411 for 2019). However, given the abnormal drop in air traffic this year, no safe conclusions can be drawn.

b) With regards to technical occurrences, in 2020 36 less incidents were reported as compared to 2019 (Total 54). Since technical occurrences are not directly associated with variations in air traffic demand, the trend noted here is positive. The majority of the

[8] Data extracted from the national ECCAIRS database

[9] According to https://ext.eurocontrol.int/analytics/saw.dll?Dashboard

incidents for 2019 were related with TopSky (ATM system) issues, specifically with double tracks and multi-correlations, causing erroneous STCAs. The introduction of the Mode-S, the latest software upgrade of the TopSky system in March 2020 and the resolve of some issues regarding PHA's radar antenna (incorrect azimuth) seem to have contributed to the further reduction of technical incidents.

c) With regards to Aerodrome/Ground related occurrences, in 2020 the number of reports submitted in 2020 was lower by 13 as compared to the number of reports submitted in 2019 (59). Most of the occurrences had to do with taxiway incursions, wrong taxilanes in the apron and wrong stand numbers. Taking into account the reduced airport traffic movement combined with the fact that 30% of those particular occurrences had an ATM contribution the NSA is not able to draw safe conclusions on this issue.

d) With regards to Birdstrike/Wildlife, in 2020 there were 48 incidents reported, as compared to 83 in 2019. Taking into account the reduced airport traffic movements of 2020 the NSA is again not able to draw safe conclusions on this issue.

Other areas where safety issues were identified are:

- Coordination procedures with other sectors/units;
- Navigation problems related with GPS Signal;
- Emergencies/abnormal situations;

8. Trends Identified and Proposed Actions

The unprecedented drop in air traffic, starting in March 2020 had affected the number of incidents reported to the DCA. The level of reporting and the traffic movement are not comparable to previous years. In view of this, the accurate identification of safety risks and their analysis, the evaluation of the trends and the determination of the corrective actions is a very challenging and difficult task. Nevertheless, the trends identified by each Domain are as follows:

8.1 Flight Safety Unit

8.1.1 Trends identified in the Airworthiness Domain

It is evident that the reporting rate has increased compared to the previous year (0.23 occurrences per 1000TCFH in 2019 compared to 0.66 occurrences per 1000TCFH in 2020). This upward trend shows an improvement in the Cyprus aviation industry reporting culture and is the result of the ongoing DCA campaign to inform, educate and assist the industry in the subject of just culture and occurrence reporting.

An increase in reported occurrences related to the reliability of reciprocating engines was noted. The rate of occurrences reported rose from 0.02 per 1000 TCFH in 2019 to 0.11 per 1000 TCFH in 2020. However, due to the small numbers or received reports it is not possible to draw reliable conclusions as regards to any trends.

8.1.2 Proposed actions in the Airworthiness Domain

It is proposed that the Airworthiness Section monitors the rate of airworthiness and maintenance occurrences related to reciprocating engines in the year 2021 and takes appropriate actions where necessary.

8.1.3 Trends identified in the Flight Operations Domain

It is noted that the reporting rate has also increased for the Flight Operations related occurrences compared to the previous year (0.11 occurrences per 1000TCFH in 2019 compared to 0.30 occurrences per 1000TCFH in 2020).

An increase in reported occurrences was noted related to the incorrect navigation of aircraft on the ground at LCLK, failing to follow ATC instructions specifically during taxiing. However, due to the small numbers or received reports it is not possible to draw reliable conclusions as regards to any trends.

8.1.4 Proposed actions in the Flight Operations Domain

It is proposed that the Flight Operations Section monitors the rate of taxiway incursions involving Cypriot operators and Cypriot registered aircraft and takes appropriate actions where necessary. At the same time, taxiway incursions will be the subject of a cross-domain analysis to determine the root cause of this issue.

8.2 ADR

With regards to the ATAS domain, based on the analysis, the Birdstrike/Wildlife trends remain stable and no significant issues have been identified. However, some other occurrences reported are continuously being monitored in cooperation with other DCA sectors and, where needed, further actions will be taken.

8.3 ATM/ANS

Based on the analysis above, with the exception of the Runway Incursion incidents, no any other specific safety issue has been identified. However, as stated before, the historical drop of the traffic movement and the low level of reporting does not allow to draw safe conclusions. For this reason, the NSA will adopt the action decided from the previous year and will continue to monitor closely the investigations of the ANSP with regards SMIs and Runway Incursions having as causal factor the human error.

8.4 Summary of proposed actions

From the analysis of the information on the occurrence reports submitted in the year 2020, the following actions are proposed:

1. A cross-domain DCA team to be assigned to analyse the ground incidents at LCLK (taxiway incursions / failure to follow ATC instructions), identify related safety issues and propose mitigating measures.
2. The Airworthiness Section to monitor the rate of airworthiness and maintenance occurrences related to reciprocating engines and take appropriate actions where necessary.
3. The Flight Operations Section to monitor the rate of taxiway incursions involving Cypriot operators and Cypriot registered aircraft and take appropriate action where necessary.
4. The Aerodromes Section to continuously monitor the reported occurrences in cooperation with other DCA sectors and where needed, further actions to be taken.
5. The Air Traffic National Supervisory Authority to continue to monitor closely the investigations of the ANSP with regards SMIs and Runway Incursions having as causal factor the human error.
6. The DCA (all sections) to conduct promotion activities on Runway Incursion.
7. The DCA to conduct promotion activities with regards to the use of microlights in the Training Areas.

9. Conclusion

The year 2020 was an exceptional year due to the effects of the COVID-19 pandemic. Controlled flight hours were reduced from 203617 in 2019 to 70342 in 2020, a reduction of 60%. The Cyprus based AOC holders and general aviation aircraft were largely grounded during the year due to the imposed flight restrictions. This inevitably had an impact on the number of occurrences and occurrence reports received.

Despite the lower number of reports submitted and the historical drop of air traffic movement, a negative performance has been recorded with regards to Runway Incursion incidents. In other respects, from the analysis of the reported occurrences in the year 2020, it can be concluded that the levels of safety were satisfactory and that improvements compared to the previous year were made. Nevertheless, DCA should continue to monitor the underlying reasons behind the areas of concern and the trends identified and should ensure that effective corrective actions are taken, if and were deemed necessary. The DCA needs to remain vigilant and monitor the safety levels for specific areas such as airspace infringements, taxiway incursions, bird strikes and reciprocating engines reliability.

APPENDIX 1: DEFINITIONS

The following definitions derived from Reg. (EU) 996/2010 on the investigation and prevention of accidents and incidents in civil aviation

'**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;

'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;

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

APPENDIX 2: LIST OF TABLES

APPENDIX 3: LIST OF FIGURES