



Kingdom of Saudi Arabia
Aviation Investigation Bureau



2018

ANNUAL REPORT

رؤية
VISION
2030
المملكة العربية السعودية
KINGDOM OF SAUDI ARABIA



TABLE OF CONTENTS

FOREWORD BY THE DIRECTOR GENERAL	2
OVERVIEW	3
Vision	3
Mission	3
Core Values	3
AIB STRATEGIC GOALS 2018-2020	4
ORGANIZATIONAL STRUCTURE	5
2018 AT A GLANCE	6
STATISTICS	7
Notifications	7
Notification Trends	7
Notifications Culture Rate	8
Significant Notifications	9
FLIGHT RECORDERS DOWNLOADS & ANALYSIS	11
Recorders Download & Analysis of Technical Assistance	12
INVESTIGATIONS	13
AIB Investigations	13
Safety Reports	14
Significant Ongoing Investigations	15
Significant Completed Safety Investigations	22
SAFETY STUDIES	32
SAFETY RECOMMENDATIONS	33
AIB Closing Recommendations achievement	33
AIB COOPERATION	34
2018 Memorandums Of Cooperation (MOC's)	34
REGIONAL	34
INTERNATIONAL	34
AIB PARTICIPATIONS	36
International Recorder Investigator Group (IRIG)	36
Observer's Participation	36
Commercial Air Transport Safety Investigation Training (BEA)	37
4th MID REGION SAFETY SUMMIT	37
MEBAA	38
DEVELOPMENT	39
Administrative	39
LAB Engineering Laboratories Department	40
Upgrades and new Equipment	41
Data analysis tools	43
New Communication Strategy	43
APPENDICES	44
Appendix A Abbreviation	44
Appendix B Occurrences Classification Definitions	45
Appendix C Type of Investigations Definitions	46
Appendix D Records Downloads & Analysis	47
Appendix E Training	48

Foreword by the Director General

On behalf of the AIB team, I am honoured to present to His Excellency, the Minister of Transport and the Chairman of the Board of Directors of the General Authority of Civil Aviation (GACA), the annual report for the year 2018. This is the fifth annual report to be published since the establishment of AIB in 2013 as an independent body reporting directly to the Chairman of the Board of GACA.

This report gives an insight into AIB's activities and accomplishments achieved by its dedicated and passionate team through the year 2018. As a newly established organization with a vision to be recognized as an international leader in advancing global aviation safety, AIB's aim is to focus on building capabilities at all levels. The main three levels AIB focuses on are its workforce, equipment and development of procedures.

Our employees are our most valuable asset. Therefore, the 2018 recruitment strategy was more proactive in its approach to hire well-qualified young Saudi candidates, both male and female, with specific skills and expertise. Our organization also ensures the empowerment of employees by developing and investing in training programs in order to continuously enhance their skills and knowledge, and keep them acquainted with current industry developments.

On the technical front, AIB continues to upgrade its Lab capabilities and strive to achieve State-of-the-art equipment and practices, so that it can establish itself as one of the most sophisticated and self-sufficient investigative authorities in the world.



AIB has meticulously developed its procedures and policies in accordance with national and international standards, and has successfully completed the AIB Operating Manual.

The Bureau is also focusing on building bridges of cooperation with multinational investigative entities and other regional and global agencies to ensure the facilitation of sharing of information, experiences and expertise.

AIB is committed to sustainable growth and development, and with the support of its dedicated team, we will achieve this undertaking.

Thank you

Abdulelah O. Felemban

Director General
Aviation Investigation Bureau



OVERVIEW

The Aviation Investigation Bureau "AIB" of the Kingdom of Saudi Arabia was established in 2013 as an independent government entity under the direct supervision of the Chairman of the Board of Directors of the General Authority of Civil Aviation.

The AIB is financially, administratively and operationally independent from the Regulator and the industry. It cooperates with the Regulator and the industry on issues relating to aviation safety. It also cooperates with international agencies and other States' investigation authorities in conformance with the Standards And Recommended Practices (SARPs) of ICAO Annex 13 and in accordance with the agreements and memorandums of understandings to which the Kingdom of Saudi Arabia is signatory to, in the interest of improving aviation safety.

In discharging its functions of improving aviation safety, the AIB conducts the following:

- Impartial investigation of aviation occurrences.
- Make safety recommendations based on systematic processes.
- Follow up of safety recommendations.
- Studies to enhance Aviation Safety.

Vision

To be recognized as an international leader in advancing global aviation safety.

Mission

To advance aviation safety through independent occurrence investigations and safety studies, promote an effective and comprehensive safety reporting system and communicate risks and safety recommendations.

Core Values

Respect:

Fostering an environment that allows staff to contribute, innovate and excel.

Integrity and impartiality:

In all activities.

Competence:

Continual professional and technical development.

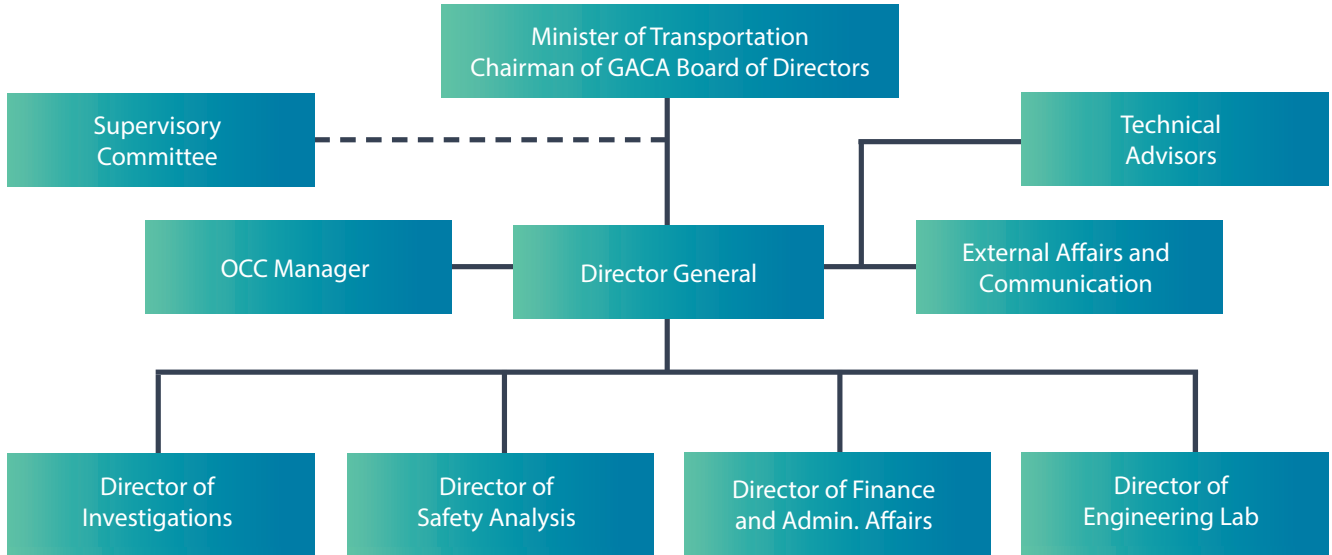
Transparency:

Exchange information to enhance aviation safety.

AIB STRATEGIC GOALS 2018-2020

-  **Achieve the optimal of human resources investment and employment satisfaction in a healthy work environment.**
-  **Sustain and enhance AIB technical capabilities.**
-  **Achieve organizational excellence as a State Investigation Authority(SIA).**
-  **Sustain and Expand national, regional and international cooperation.**
-  **Optimization of AIB business processes.**
-  **Develop AIB infrastructure, facilities and equipment.**

ORGANIZATIONAL STRUCTURE



Abdulelah O. Felemban
Director General



Khalid Y. Benyahya
OCC Manager



Abdulrhman M. Younis
Director of Investigations



Theeb A. Al-Otaibi
Director of Safety Analysis



Khalil A. Nagro
Director of Finance & Admin Affairs



Ismail Y. Kashkash
Director of Engineering Lab



2018 AT A GLANCE

RECEIVED

518

Occurrence Notifications

- 4 Accidents
- 7 Serious Incidents
- 470 Incidents
- 37 Other Occurrences

INITIATED

35

Investigations

- 4 Accidents
- 5 Serious Incidents
- 26 Incidents

RELEASED

110

Reports

- 3 Annex 13
- 23 Limited Scope
- 7 Initial Assessment
- 57 Discontinued
- 3 Safety Concern
- 7 Delegated
- 8 Preliminary
- 2 Interim Statement

ISSUED

60

Recommendations

- 57 SRs
- 3 SAR

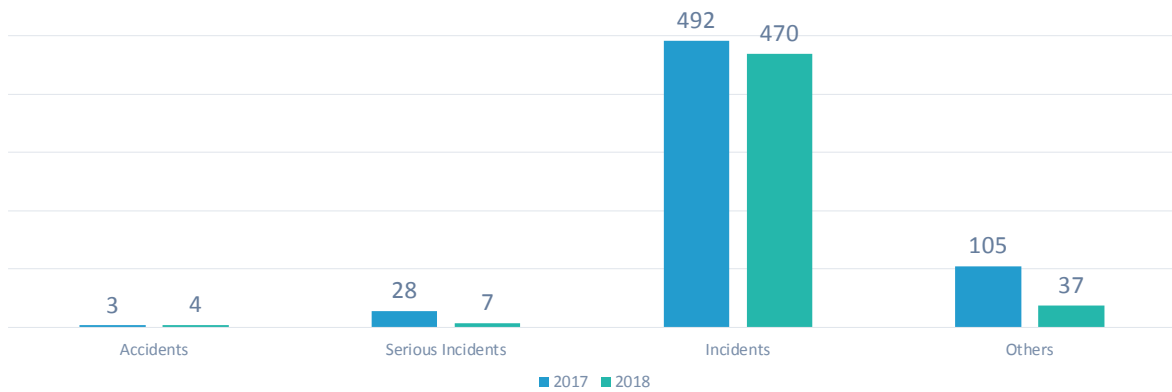
STATISTICS

Notifications

The AIB Operation Control Center “OCC” maintains a 24/7 occurrence notification service receiving all occurrence notifications, such as; telephone calls, e-mails, facsimiles and web forms that are utilized to notify the AIB of aviation occurrences.

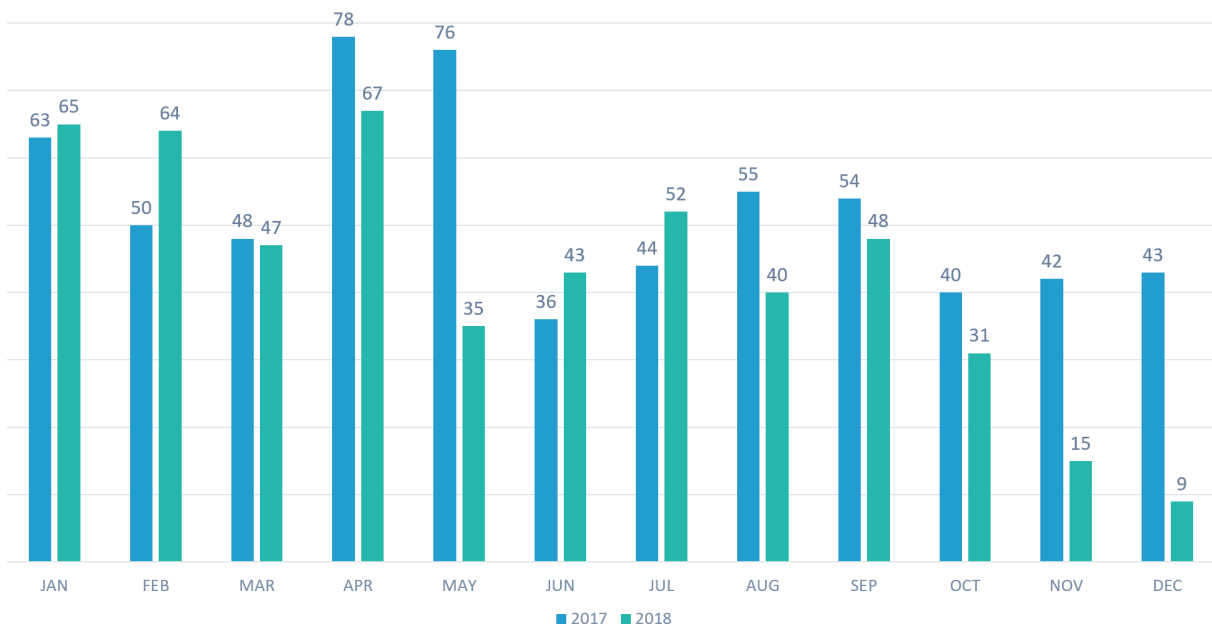
2018 total number of received notifications (518) decreased by 18% compared to 2017 (628), which Classified as follows:

4 ACCIDENTS **7** SERIOUS INCIDENTS **470** INCIDENTS **37** OTHERS



Notifications comparison by classification

Notification Trends



Notifications Comparison by month

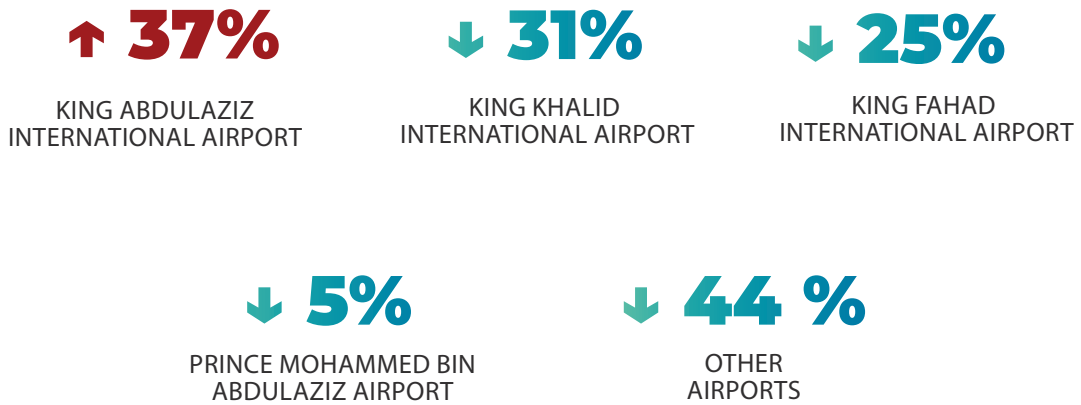
Notifications Culture Rate

The total number of reported notifications in KSA Airports for the year 2018 - compared to 2017 - changed as follows:

- King Abdul-Aziz International Airport had an increase of 37%.
- King Khalid International Airport had a decrease of 31%.
- King Fahad International Airport had a decrease of 25%.
- Prince Mohammad Bin Abdul-Aziz International Airport had a decrease of 5 %.

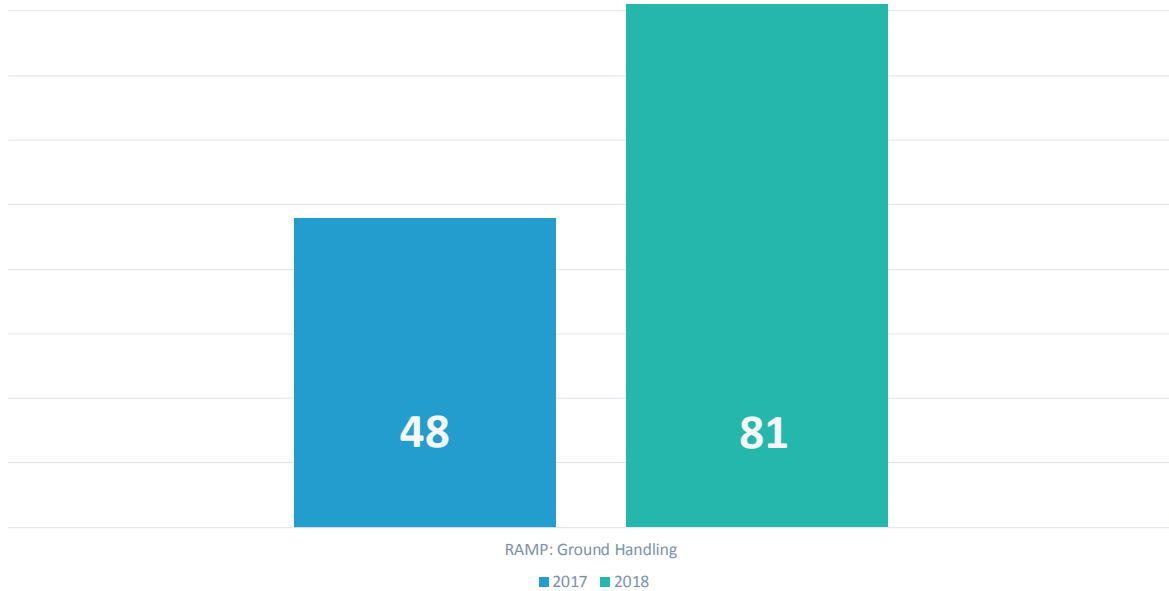


Notifications in KSA Airports



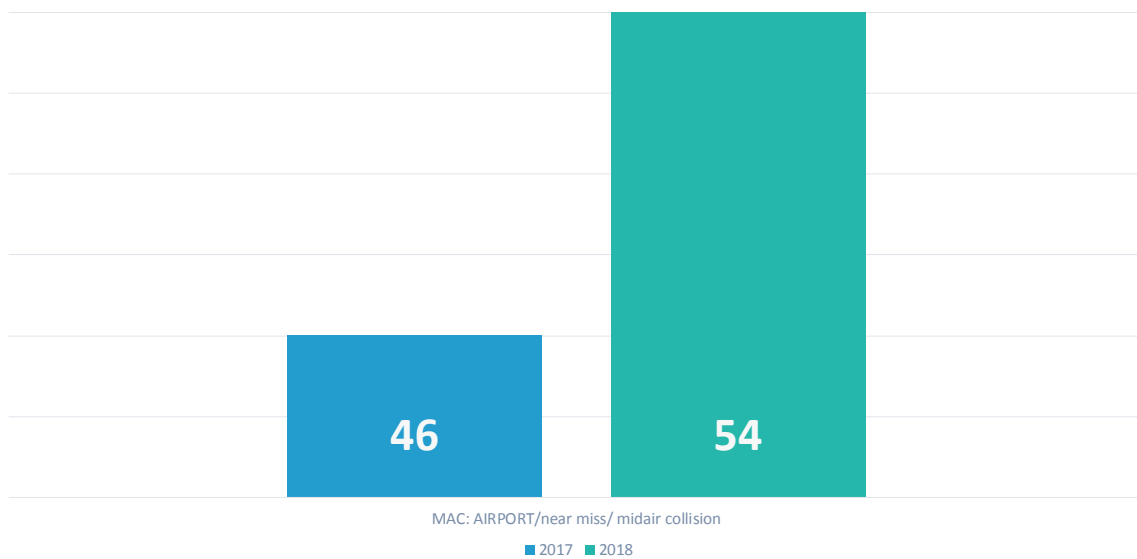
Significant Notifications

Ground Handling



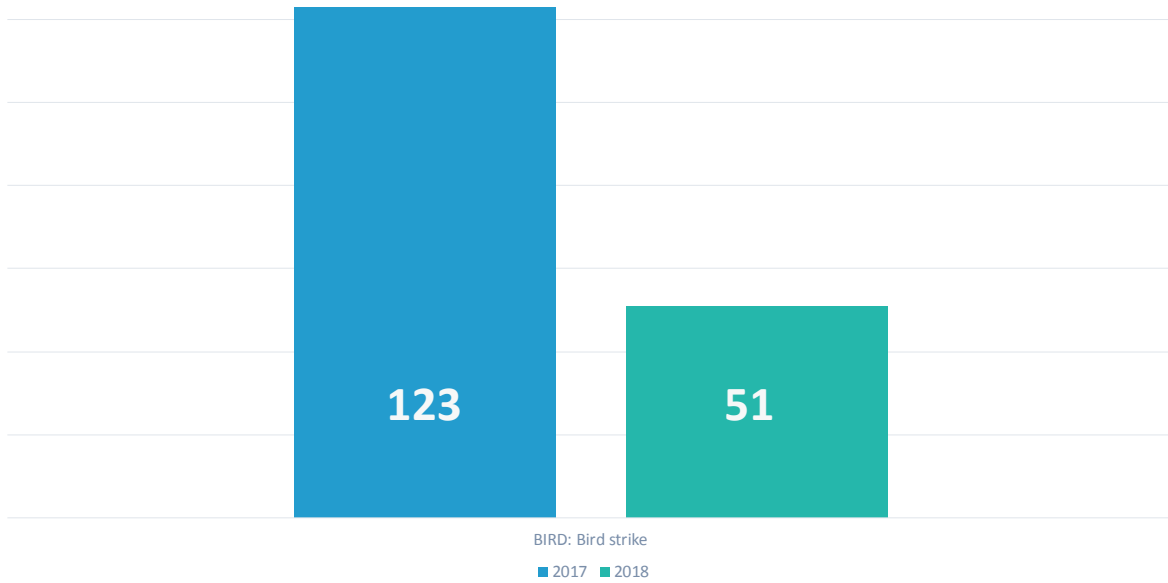
81 Ground handling incidents reported in 2018. They increased by 33 incidents compared to 2017 with an increase rate of 69%.

MAC: AIRPROX/near miss/midair collision



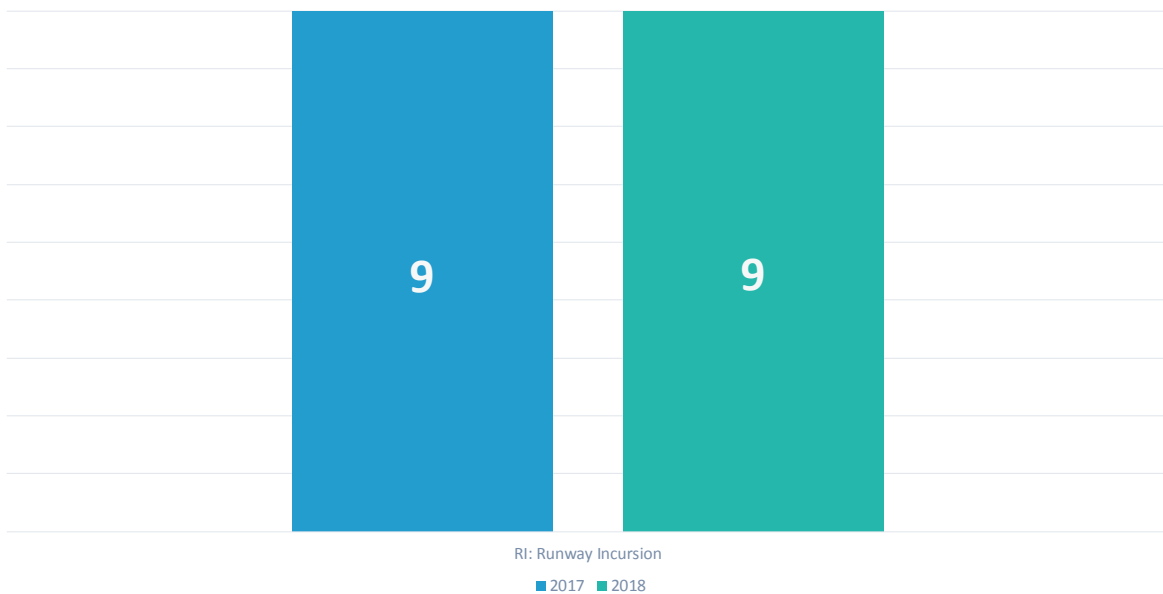
MAC: Airprox/near miss/Midair collisions represent a significant concern in the aviation industry. The total number of MAC reported incidents in Saudi Arabia has increased to 54 in 2018, which represents an increase of 17% as compared to 2017.

Bird Strike



Bird strike incidents represent a significant concern for the aviation industry. As shown in the graph above, the total number of bird strike reported incidents in Saudi Arabia had a decrease rate of more than 58% in 2018 compared to 2017.

Runway Incursion



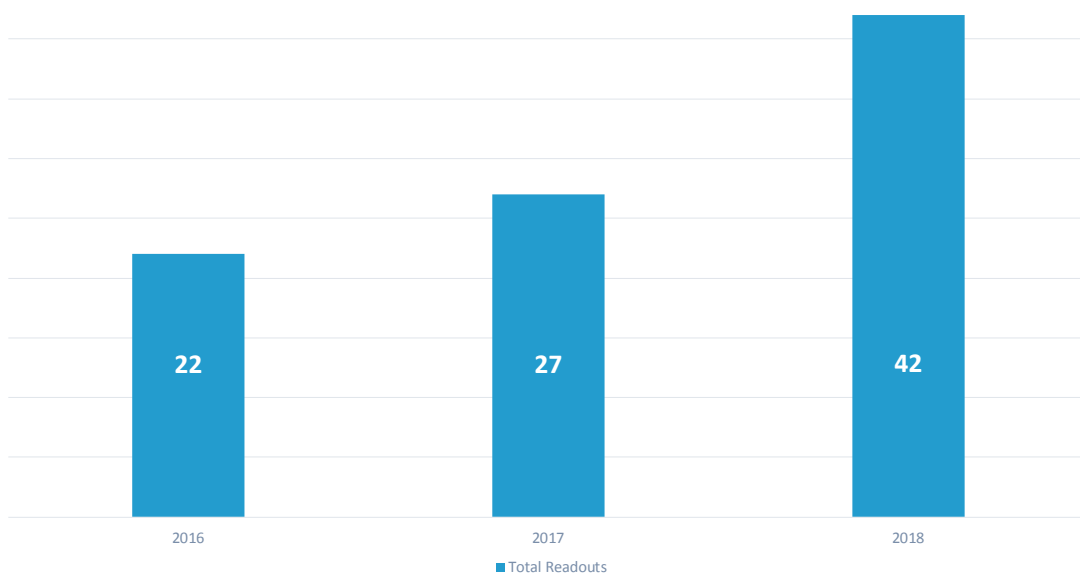
Runway Incursion events are one of the AIB’s safety concerns. The total number of reported incidents had no difference between 2017 and 2018. Their related safety investigations are still in progress.

AIB is continuously monitoring aviation occurrences and is planning to start three safety studies in 2019 in coordination with other stakeholders in order to analyze root causes and define needs for necessary actions to help reducing aviation occurrences.

Flight Recorders Downloads and Analysis

The records readouts significantly increased over the past three years from 22 to 42, with an increasing rate of 91% as shown in the chart below. This reflects the evolving capabilities of AIB Flight Recorder Lab (FRL) in the Engineering Laboratories Department (ELD) of the AIB. The table below shows FRL's participation in 2018 investigations (25) and Recorders download and analysis of Technical Assistance (17) which involved technical support for royal fleet, local operators and MENA regional operators and entities assisting them with various issues.

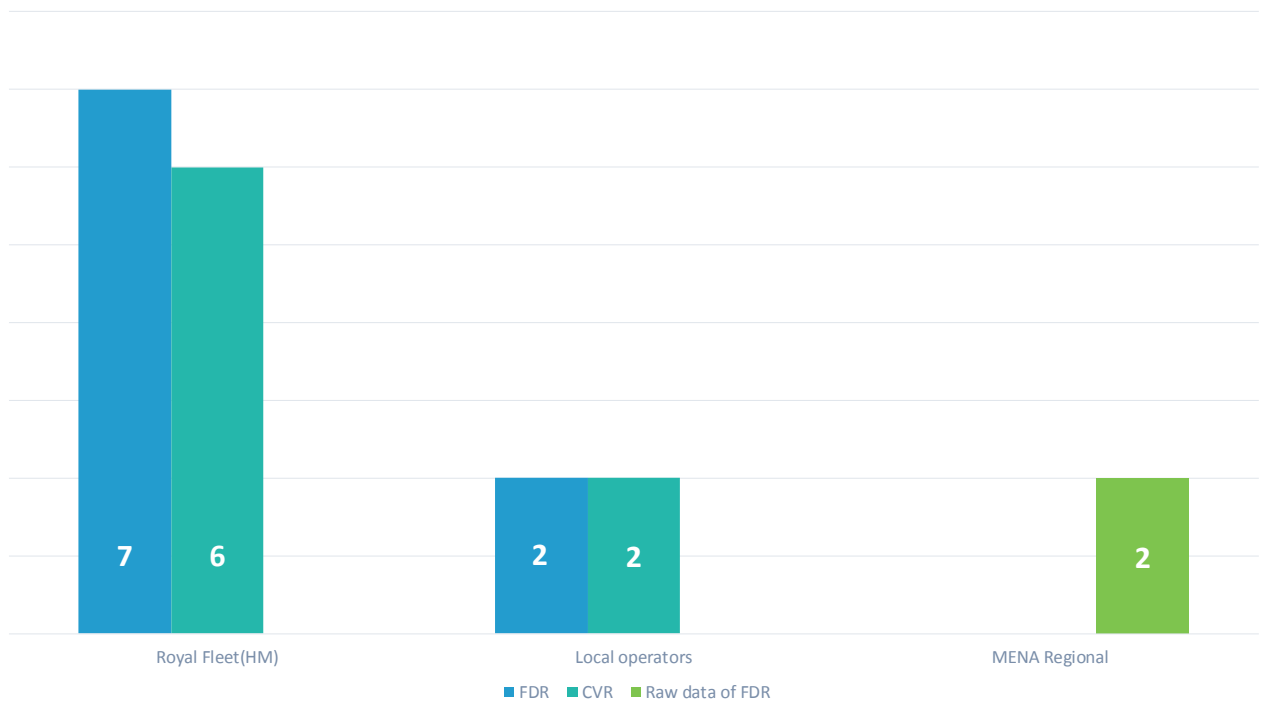
Period	Aircraft		Occurrence Location		Recorders Downloaded and Analyzed
	Saudi Registered	Foreign Registered	in KSA	Abroad	
Recorders download and analysis for Occurrences					
1st Quarter	4	0	3	0	7
2nd Quarter	3	3	6	0	12
3rd Quarter	1	1	2	0	4
4th Quarter	2	0	1	1	2
				Subtotal	25
Recorders download and analysis of Technical Assistance					
1st Quarter	0	3	1	1	5
2nd Quarter	2	0	2	0	3
3rd Quarter	5	0	5	0	9
4th Quarter	0	0	0	0	0
				Subtotal	17
				Total	42



Readouts comparison by Year

Recorders download and analysis of Technical Assistance

Operator	Recorder Type	Quantity
Royal Fleet(HM)	FDR	7
	CVR	6
Local Operators	FDR	2
	CVR	2
MENA Region	Raw data of FDR	2
	Total	19



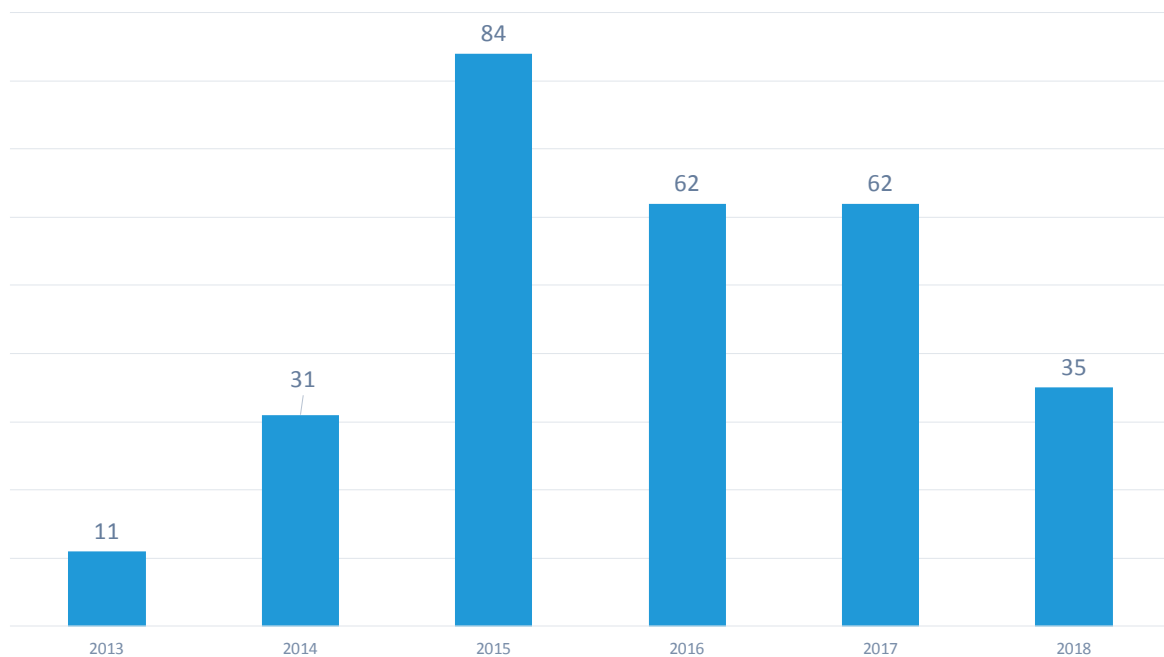
INVESTIGATIONS

AIB Investigations

A total number of 35 investigations were initiated in 2018 and 17 of these investigations were completed.

The AIB managed to reduce the number of open investigations (backlog) by adopting new methodology for initial assessment and classification of reported occurrences.

YEAR	Numbers of Investigations
2013	11
2014	31
2015	84
2016	62
2017	62
2018	35



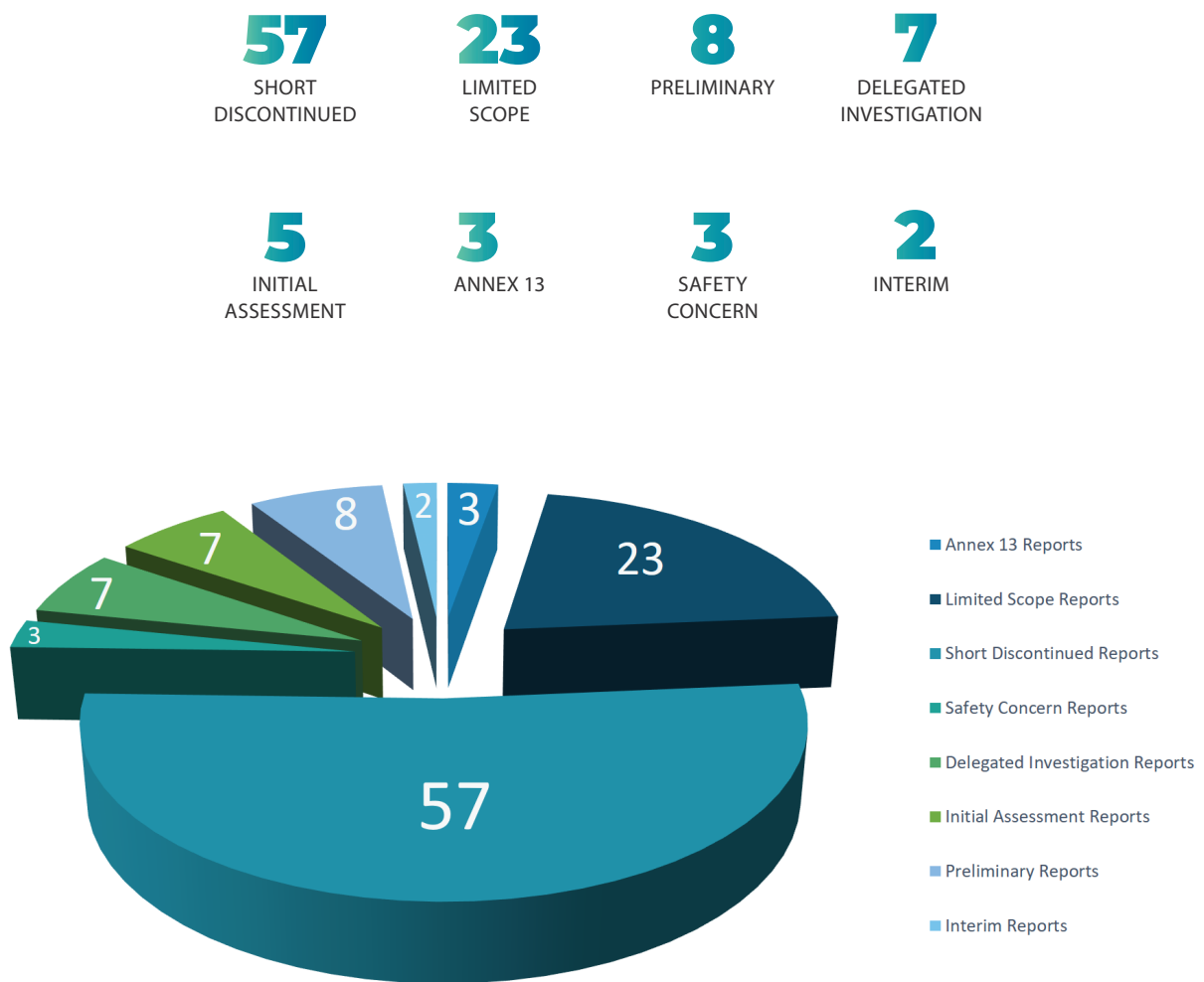
Investigations comparison by Year

Safety Reports

The initial analysis of a reported occurrence will reveal its seriousness and the expected outcome. Thus enabling the AIB to take the appropriate decision of commencing an investigation or not. Notwithstanding that approach, the AIB has taken the appropriate measures so not to impact its obligations to conduct core business activities in accordance with Annex 13 SARPs.

Additionally, the classification of the level of response and the investigation levels have greatly contributed to the success of the AIB to conduct effective and efficient investigations within a reasonable timeframe and resources. Short/limited scope investigations have been conducted through office-based investigations for occurrences that are common and the underlying factors are well known.

Discontinued investigation and short closing reports for occurrences sharing similar factors with previously investigated occurrences has also served the AIB objectives. This is a common practice in most investigation authorities. During 2018, the AIB has completed a total of 110 Various reports.



Significant Ongoing Investigations

1. AIB-2018-0267 ACCIDENT

System/Component Failure or Malfunction (Non-Power-Plant) (SCF-NP) & ARC

On May 21, 2018, Onur Air Airbus A330-243, registered as TC-OCH, was performing a commercial wet-lease flight for Saudi Arabian Airlines as SVA 3818. At 14:24, SVA 3818 departed from Prince Mohammed Bin Abdul-Aziz International Airport (OEMA), Al-Madinah, Kingdom of Saudi Arabia, to Shah-Jalal International Airport (VGHS), Dhaka, Bangladesh. There were one hundred and forty-two (142) passengers, two (2) Flight Deck Crewmembers (FDC) and eight (8) Cabin Crewmembers (CCM) on board the aircraft.

The flight was uneventful until reaching flight level 370. At 14:46, the FDC reported to ATC that they encountered a malfunction of the green hydraulic system followed by a “green hydraulic system reservoir low level” warning, and requested to hold for coordination and decision. The FDC decided to return back, but due to weather conditions at OEMA and operational considerations, they decided to divert to OEJN, which is the main base for their operations.

At 14:59, the flight crew advised Air Traffic Control (ATC) of their intention to divert to OEJN and the need to perform fuel-burn holdings, to be within Maximum Landing Weight (MLW) limitation.

Initial approach to OEJN was initiated at 17:03, the FDC applied manual (free fall) landing gear extension procedures. However, the Electronic Centralized Aircraft Monitor (ECAM) did not display a green triangle for the nose wheel on the wheel page. The flight crew coordinated with the control tower to conduct a low pass to confirm the nose gear extension. At 17:19, the first low pass was conducted above runway 16 C with no confirmation from the controller. A second low pass was conducted at 18:22 on the same runway. However, neither the control tower nor ground staff were able to confirm the nose gear extension. Figure 1 shows SVA 3818 flight route and circling path retrieved from the Flight radar 24.

At 18:32, the flight crew declared an emergency to land with a retracted nose landing gear.

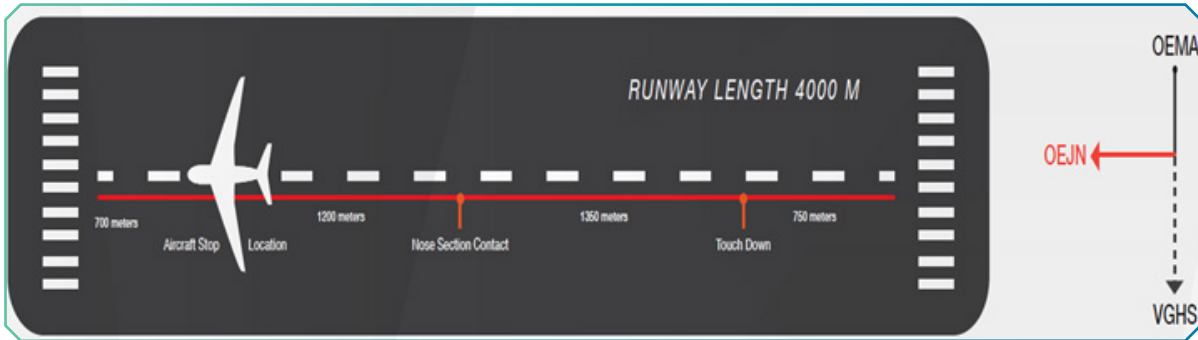
ATC cleared SVA 3818 to land on runway 34R, declared alert 2. Accordingly, Fire & Rescue Services (FRS), medical units, and other responders repositioned at emergency points of runway 34R.

At 18:50, SVA3818 touched down with the main landing gears at approximately 700 meters from the threshold of runway 34R and continued to roll for approximately 1350 meters before the bottom part of both engine cowlings and the nose section belly contacted the runway surface. The friction with the runway surface as the aircraft rolled caused extensive sparks and smoke until the aircraft came to a complete stop at approximately 700 meters from the end of the runway, 5 meters to the right of the runway centerline. (See Figures 2 for runway mapping and Figure 3 for the aircraft stop position).

FRS vehicles immediately attended to the aircraft on the runway as the aircraft came to rest. FRS reported that there was no indication of sustained fire, however they discharged the fire suppression agent to cool the affected parts of the aircraft (See Figure 4). Simultaneously, the FDC reacted to an engine fire indication on engine number two (2) by discharging one engine fire bottle.

FRS confirmed to the Captain that there was no fire and advised to evacuate from the left side. The Captain ordered an evacuation and the Cabin Crew Members (CCM) acted accordingly by opening the aircraft Left Hand (LH) doors L1, L2, and L4 deploying the slides. Right Hand (RH) door R1 slide was also deployed but not used for evacuation.

Passengers and crew evacuated the aircraft and were transported to the terminal by buses. Upon arrival to the terminal, 52 passengers were treated for minor injuries. One passenger received a serious injury during the evacuation and was transported to the hospital.



Infographic Image showing TC-OCH touchdown on R34R with NLG retracted



Image showing TC-OCH being attended by airport FRS

The AIB dispatched an investigation team to the incident site to conduct onsite investigation. The CVR and FDR were removed and delivered to AIB’s flight recorder lab for processing.

The investigation is conducted in accordance with the AIB regulation and SARP of annex 13 of ICAO. All Interested Parties were notified and Accredited Representative (AR) are nominated.

On 13 September 2018, the AIB has released a preliminary report on the occurrence.

On 10 September 2018, the AIB along with other participants have attended the detailed inspection and examination of the Hydraulic Manifold and the Free Fall Rotary Actuator (FFA) at the manufacturer’s facility in the United Kingdom. The detailed examination of the CT scan images for the affected aircraft components revealed the FFA motors (A and B) had deteriorated magnets coating and bonding that led to the failure of operating the FFA.



CT scan image showing motor A and B magnet disbonding

The AIB issued a safety concern report addressing type aircraft operator to verify the type series of FFA and perform Free Fall System operational check.

Consequently, aircraft manufacturer released AIRBUS-AOT in line and in compliance with the AIB safety concern and recommendation to mitigate possible repeated risk. EASA has also taken very supporting action by intending to issue an Airworthiness Directive (AD) to mitigate the identified risk and mandate the required action and mitigation plan.

2. AIB-2018-0377 SERIOUS INCIDENT

Navigation Errors (NAV) erroneous attempt to takeoff from taxiway

On 03 August 2018, a Jet Airways Boeing 737-8AL, registration VT-JFS, was performing flight No JAI-523 from King Khalid International Airport (OERK), Riyadh, Saudi Arabia, to Mumbai Airport (VABB), India with 144 passengers and 7 crewmembers onboard.

JAI-523 was cleared to taxi through taxiway (TWY-G) and for take-off from runway (RWY-33R). JAI-523 lined up on the TWY-K that is parallel to RWY-33R and commenced its take-off roll.

Approaching the end of TWY-K, the Flight Deck Crew (FDC) realized the situation and aborted the take-off. The aircraft uneventfully came to a complete stop on an unpaved ground along the path of TWY-K past TWY-G4 at approximately 2485 meters (m) from the beginning of take-off roll on TWY-K.

The OERK Fire and Rescue Services (FRS) responded to the incident emergency call, arrived at the scene, controlled the situation and secured the aircraft and its occupants. All passengers and crewmembers safely evacuated the aircraft through the emergency escape slides and were transported to the airport terminal with no reported injuries.

The incident was reported and the AIB initiated an investigation onto the reported serious incident.



Image showing the position of the aircraft final stop

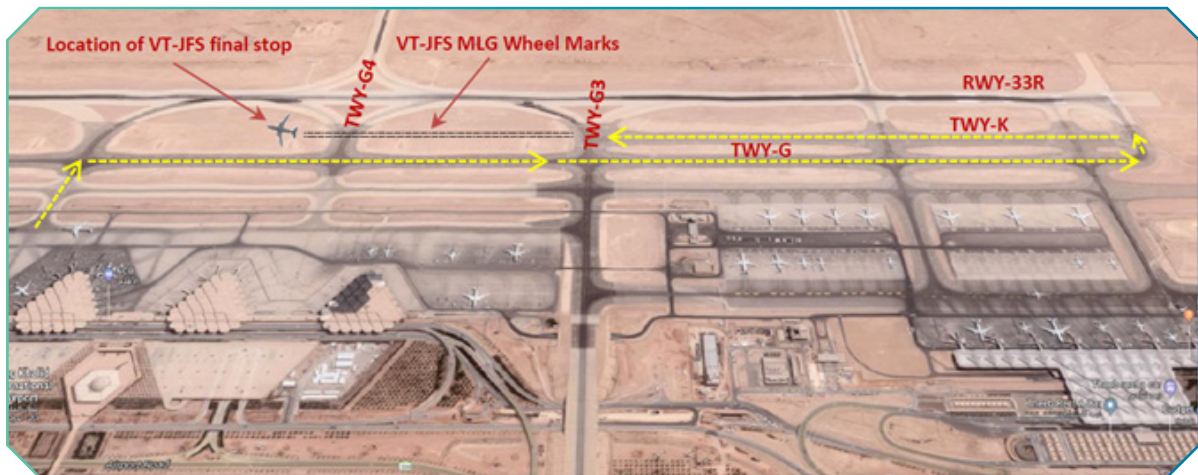


Image showing Layout of OERK aerodrome showing VT-JFS taxi and take-off path

The AIB dispatched an investigation team to the incident site to conduct onsite investigation. The CVR and FDR were removed and delivered to AIB's flight recorder lab for processing.

The investigation is conducted in accordance with the AIB regulation and SARP of annex 13 of ICAO. All Interested Parties were notified and Accredited Representative (AR) are nominated.

On 13 September 2018, the AIB has released a preliminary report on the occurrence and in the process of finalizing the final report.

3. AIB-2018-0338 SERIOUS INCIDENT

Runway Excursion (RE) veer-off

On 10 July 2018, a Honda Aircraft HA-420 owned and operated by Saif-Aviation Co. LTD, registration number VP-CEF was on a flight from King Khalid International Airport (OERK) in Riyadh, Saudi Arabia to King Abdul-Aziz International Airport (OEJN) in Jeddah, Saudi Arabia. The departure time was 09:30, and the captain was the Pilot Flying (PF), while the first officer was the Pilot Monitoring (PM), there was one passenger only onboard

At 10:22:48, the aircraft was established on ILS Approach runway 34L, weather visibility was CAVOK with headwind of 340/15 knots, the tower was controlling two aircraft for takeoff in the same runway. At 10:26:36, the tower controller cleared Honda HA-420 to land when it was at 3.3 NM to the runway threshold, the aircrew reported the aircraft was on a stabilized Approach, during touchdown the aircraft drifted off to the left almost 35 degrees from centerline, and before reaching the left edge of the runway it turned back to the right side crossing the centerline with almost 45 degrees until it exited from the runway.

The aircraft skidded on the airport soil crossing the high speed taxiway number B2 and came to a stop heading west with the nose wheel on taxiway number B2 edge and main wheel in the airport soil north of the taxiway number B2.

The AIB dispatched an investigation team to the incident site to conduct onsite investigation. The CVR and FDR were removed and delivered to AIB’s flight recorder lab for processing.

The investigation is conducted in accordance with the AIB regulation and SARP of annex 13 of ICAO. All Interested Parties were notified and Accredited Representative (AR) are nominated.

On 12 August 2018, the AIB released a preliminary report on the occurrence and in the process of finalizing the final report.



Image showing the position of the aircraft final stop



Image showing Layout of OEJN aerodrome showing HA-420 touchdown and veer-off path

4. AIB-2018-0503 SERIOUS INCIDENT

System/Component Failure or Malfunction (Non-Power-Plant) (SCF-NP),

On 23 November 2018, a Saudi Arabian Airlines Airbus A320 -214, registration HZ-AS23 was performing a scheduled passenger flight SVA-1053 from King Khalid International Airport (OERK), Riyadh, to King Abdulaziz International Airport (OEJN), Jeddah, Kingdom of Saudi Arabia.

At approximately 22:14 UTC, SVA1053 landed at OEJN RWY-34R, aircraft exited the RWY to TWY-R. The Flight Deck Crew (FDC) was instructed by the air traffic controller (ATC) to hold short prior to crossing RWY-34C. Later, the FDC received the clearance from the tower to cross RWY34C. As the aircraft just started to move toward RWY-34C, the FDC heard a loud bang. The FDC interpreted the loud bang as a flat tire and opted to continue taxiing the aircraft to the assigned parking stand (3-6) with maximum speed of 7 knots. The FDC requested maintenance personnel to meet the aircraft upon arrival at the assigned apron stand. After parking, maintenance personnel informed the FDC that tire Number Two (2) was missing. The FDC immediately contacted the ground controller and reported the incident and requested TWY-R inspection for possible Foreign Object Debris (FOD). The passengers were deplaned normally and no injuries were reported as a result of this incident.

The AIB dispatched an investigation team to the incident site to conduct onsite investigation. The CVR and FDR were removed and delivered to AIB's flight recorder lab for processing.

The investigation is conducted in accordance with the AIB regulation and SARP of annex 13 of ICAO. All Interested Parties were notified and Accredited Representative (AR) are nominated.

On 23 December 2018, the AIB released a preliminary report on the occurrence. The AIB is still examining analyzing the recovered parts in coordination with the BEA and the manufacturer.

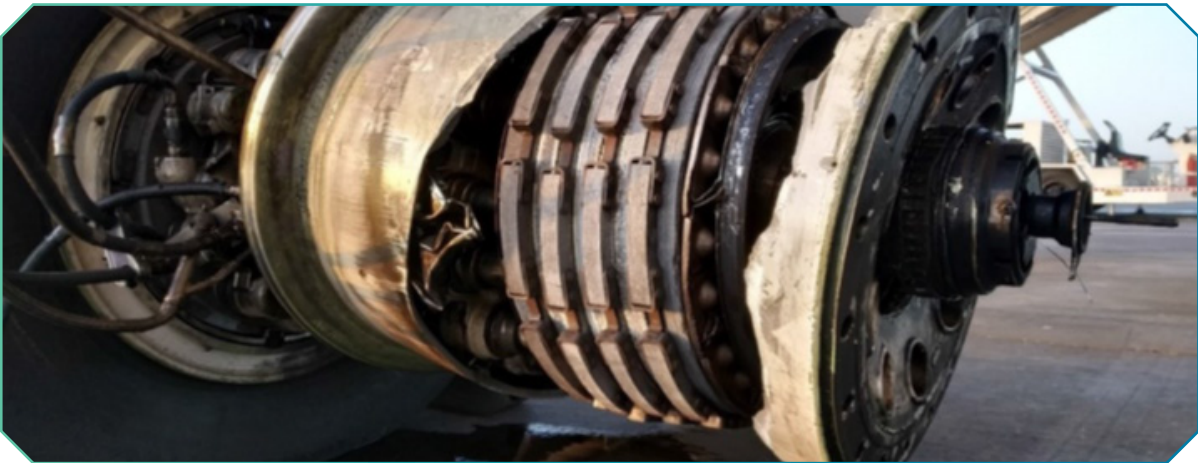


Image showing the damage incurred in wheel assembly number 2



Image showing Layout of OEJN aerodrome showing HZ-AS23 position at the time wheel number 2 tire flew off

5. AIB-2018-0291 SERIOUS INCIDENT

System/Component Failure or Malfunction (Non-Power-Plant) (SCF-NP) Pressurization

On 7 June 2018, Flydubai Boeing 737-800 aircraft, registration number A6-FEE performing flight FDB813 from Dubai (United Arab Emirates) to Abha (Saudi Arabia), was enroute at about 270 NM east of Jeddah (Saudi Arabia) with the left hand side Environmental Control System (ECS) PACK failure that could not be reset since after departure.

During descent to Abha, at FL255, crew reported pressurization problem, cabin altitude warning horn sounded and Passengers' Oxygen Masks were deployed.

The crew requested diversion to Taif, which was denied. The flight was diverted to Jeddah, where the aircraft landed safely. No Injury to persons or damage to aircraft resulted from this occurrence.

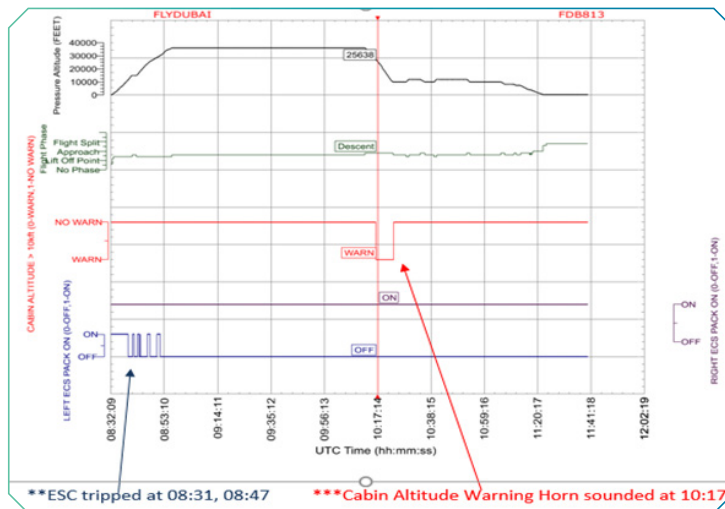


Image showing FDR plot of the loss of pressurization



Passengers Oxygen Masks



Lavatory Oxygen Masks



Portable Oxygen Cylinder

Significant Completed Safety Investigations

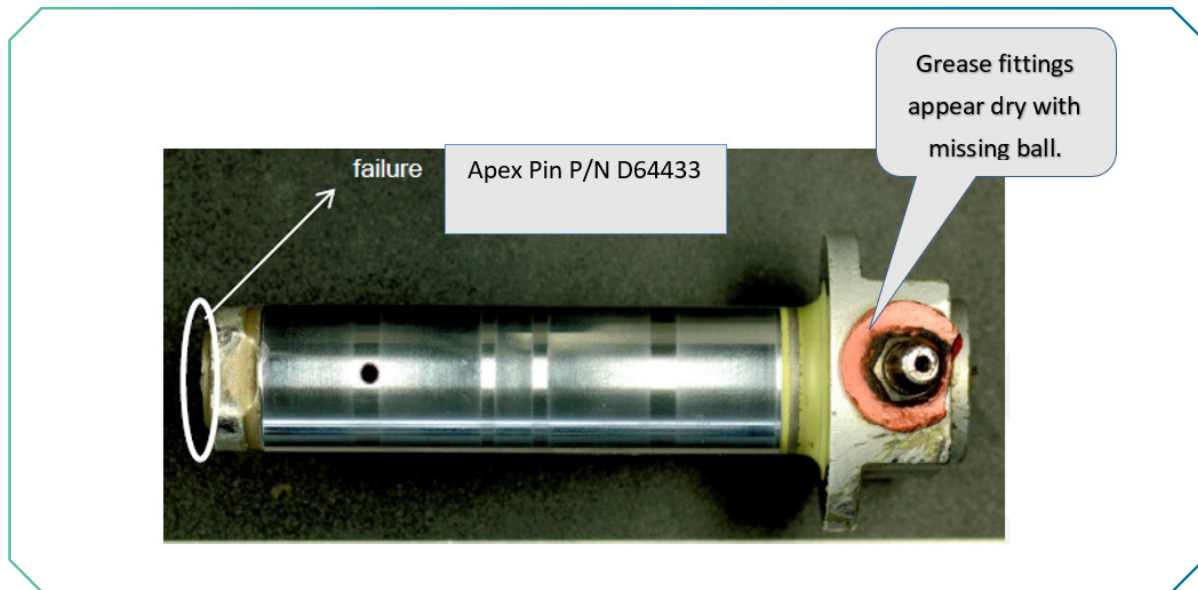
The following significant investigations were completed and their reports were released in year 2018:

1. AIB-2017-0136

20/03/2017 Serious Incident System/Component Failure or Malfunction

Narrative	Conclusion
<p>A Saudi Arabian Airlines Airbus A-321, Registration HZ-ASI, was operating a commercial scheduled flight (SV 1733) from King Khalid International Airport (OERK) Riyadh, Kingdom of Saudi Arabia to Bisha Domestic Airport (OEBH) Bisha, Kingdom of Saudi Arabia.</p> <p>After landing at OEBH, as the aircraft decelerated to approximately (~) 70 knots, excessive vibration was felt with a drift to the right of the runway. The flight crew managed to stop the aircraft on the runway. The excessive vibration and drift was due to the separation of the nose landing gear torsion links during the landing roll.</p> <p>The aircraft's Nose Landing Gear (NLG) and wheel assemblies were damaged and the aircraft was disabled on the runway. All aircraft occupants were deplaned normally on the runway and there were no injuries reported to persons as a result of this occurrence.</p>	<p>The investigation concluded that the occurrence was attributed to the Apex pin rupture caused by fatigue due to high torsion load resulting from absence of functional play and lack of greasing in the assembly.</p> <p>The investigation identified some other contributing factors related to compliance of the aircraft inspection and maintenance program and the continuous analysis and surveillance system by the Maintenance Repair Organization.</p> <p>The AIB issued three safety recommendations addressing the identified safety issues associated with the compliance to manufacturer safety bulletins and technical alerts.</p>

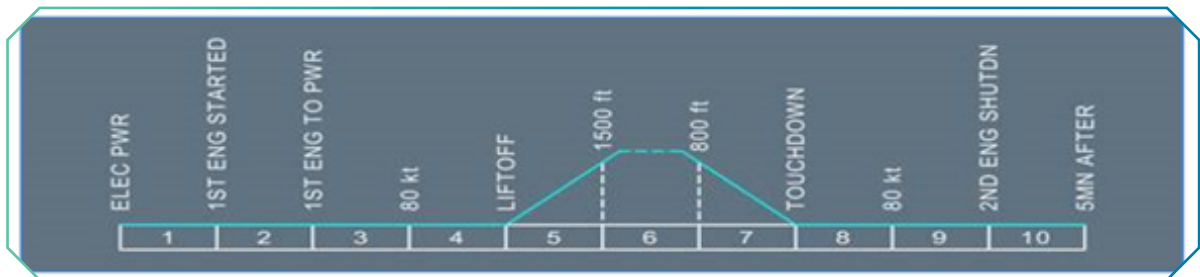
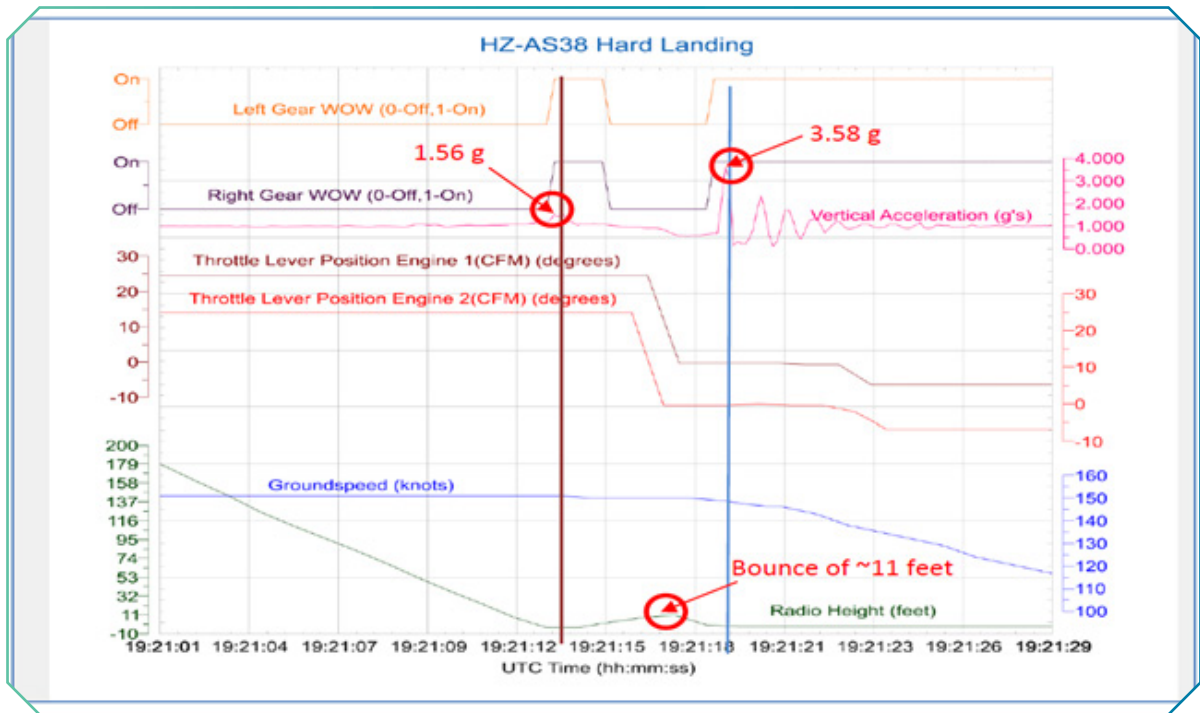




2. AIB-2016-0225

21/05/2016 Serious Incident Abnormal Runway Contact Hard Landing

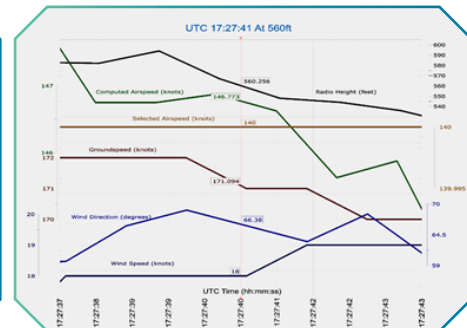
Narrative	Conclusion
<p>An Airbus A320, registration HZ-AS38, was operated by Saudi Arabian Airlines on Flight Number SVA 1913. The flight was operating from King Fahd International Airport (OEDF) Dammam, Saudi Arabia to Taif Regional Airport (OETF) Taif, Saudi Arabia. The First Officer was the pilot flying (PF). SVA1913 had 145 Souls on Board, 138 passengers and 7 crewmembers. The aircraft actual gross weight was 70400 kilograms (kg) with take-off fuel of 14500 kg.</p> <p>The take-off from OEDF and cruise phases were normal. The last published Meteorological Terminal Actual Report (METAR) prior to landing at OETF indicated good visibility, clear skies and surface temperature of 29° Centigrade. No significant change of weather forecast reported.</p> <p>The aircraft started to descend in preparation for landing at OETF. The final approach was well established through the Instrument Landing System (ILS) for runway 25 until the Flare point.</p> <p>The aircraft landed with a ~1.56 g vertical acceleration load factor, bounced 11 feet into the air with the ground spoilers retracted. The Captain (PM) immediately assumed control of the aircraft during the bounce and moved the throttles to the "IDLE" detent resulting in the immediate extension of the spoilers resulting in the aircraft losing lift and contacting the runway at ~3.58 g vertical acceleration load factor.</p> <p>The air carrier detected the severe hard landing for HZ-AS38 on Monday, 23 May 2016 (two days after the occurrence) during a review of events identified by the air carrier Flight Data Monitoring program (FDM).</p> <p>The aircraft had flown an additional nine (9) flights post the hard landing occurrence. After becoming aware of the hard landing occurrence, the aircraft was immediately grounded for the required inspection. After the completion of an initial severe hard landing inspection, the aircraft was ferried to Jeddah on 12 June 2016 for repairs.</p>	<p>The investigation concluded that the causal factors of this serious incident were:</p> <ol style="list-style-type: none"> (1) The initiation of landing flare was late in regards to the cumulative effect of the airport high elevation and runway up slope. (2) The engines thrust levers were left in the "CLIMB" detent below 20 feet altitude during the flare and during initial touchdown. (3) The induced full backside stick movement by the Pilot Flying resulted in an increase of the pitch angle to 9 degrees. <p>The investigation also identified some other contributing factors:</p> <ol style="list-style-type: none"> (1) After the initial bounce, the ground spoilers were deployed as the thrust levers were moved to "IDLE" position. This resulted in in the immediate loss of the aircraft lift and contributed to the hard landing. (2) The flight crew did not initiate a "Go-Around" procedure when the aircraft bounced to ~ eleven (11) feet after the initial touchdown. (3) The lack of effective coordination among the flight crewmembers during the approach and landing phase of the flight. <p>Previously, the AIB had addressed Hard Landing incidents occurred on the same operator aircraft with some safety recommendations. Additionally, the AIB issued three safety recommendations addressing safety issues identified during the investigation.</p>



3. AIB-2017-0225

28/04/2017 Serious Incident Runway Excursion (RE) Over Run

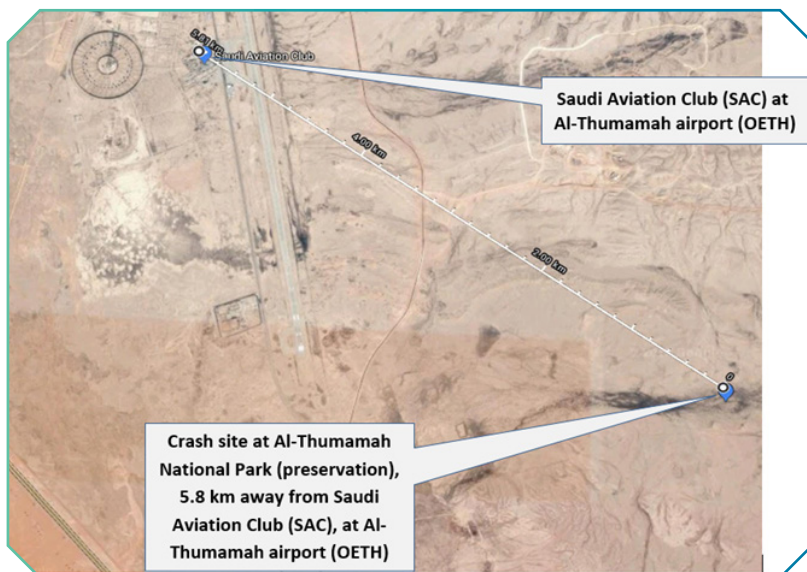
Narrative	Conclusion
<p>An Airbus A320-232, Registration SU-NMC, was being operated by NESMA Airlines, Flight No NMA154 from Cairo International Airport (HECA), Egypt to Abha Regional Airport (OEAB), Saudi Arabia. NMA154 was cleared to land on runway (RWY-31) at OEAB. The aircraft touched down at approximately 1446 meters (m) after the runway threshold. The aircraft overran (RWY-31), and came to a stop on a compacted ground at approximately 186 m beyond the end of (RWY-31). The Flight Crew communicated the incident with the Tower Controller and requested assistance. Upon evaluation of the aircraft position and condition, the flight crew decided not to disembark the passengers and to push back the aircraft onto the runway. The aircraft was pushed back onto the paved area of the runway and then was towed to the designated parking stand at the gate. All passengers disembarked the aircraft normally through the passenger stairs and no injuries were reported as a result of this occurrence. The aircraft sustained damage.</p>	<p>The investigation concluded that the causal factors of this serious incident were:</p> <ol style="list-style-type: none"> (1) The flight crew executed unstable approach. (2) The flight crew did not attain the proper touchdown point (3) The flight crew did not select the proper auto-braking mode. (4) The flight crew did not execute a go-around. <p>The investigation also identified some other contributing factors related to Crew Resource Management and pilot techniques for control and manual braking application.</p> <p>The investigation identified a number of safety issues associated with crew compliance to operator standard operating procedures, control tower equipment and aerodrome.</p> <p>The AIB issued seven Safety Recommendations addressing safety deficiencies identified in the investigation</p>



4. AIB-2018-0077

07/02/2018 Accident Loss of Control-Inflight (LOCI) Structural Failure

Narrative	Conclusion
<p>A privately owned QUIK GTR Explorer weight shift aircraft carrying two persons was last seen by eyewitnesses at approximately 17:25 flying in Al-Thumamah area. The aircraft was later reported missing as it did not return to the camp area at Al-Malham town (located approximately 35km west of Al-Thumamah) where it originally took-off. A search was conducted by a group of volunteers and the aircraft was found after midnight around 01:39 on 08 February 2018. The aircraft had crashed in Al-Thumamah National Park (wildlife preservation) Near Al-Thumamah Airport (OETH). Both aircraft occupants (a pilot and a passenger) were fatally injured in the accident and were found in the wreckage of the aircraft with no sign of life. They were strapped with the seat belts in their respective seats and were wearing helmets. Rescuers cut the seat belts to extract their bodies from the wreckage and notified the local authorities. Then arrangements were made to transport the two bodies to the hospital. The wreckage was left at the accident site until the arrival of the AIB investigation team on the morning of 08 Feb 2018.</p>	<p>The investigation concluded that the causal factors of this serious incident were:</p> <ol style="list-style-type: none"> (1) An inflight structural failure of the wing assembly that was most probably caused by high stresses exerted on the wing that exceeds the aircraft design limitations. (2) The High stresses on the wing is most probably attributed to performing extreme maneuvers (aerobatics). (3) The forward wing cable snapped causing the wing to drop back to the propeller which led to the detachment of the windshield strut and contacting the rotating propeller. (4) Lift, control and the capability to glide was lost, and the aircraft entered into a stall plunging in a steep trajectory to the ground. <p>The investigation also identified some other contributing factors related to Saudi Aviation Club oversight and promotion for safety culture. The AIB issued five Safety Recommendations addressed to the Saudi Aviation Club and GACA.</p>



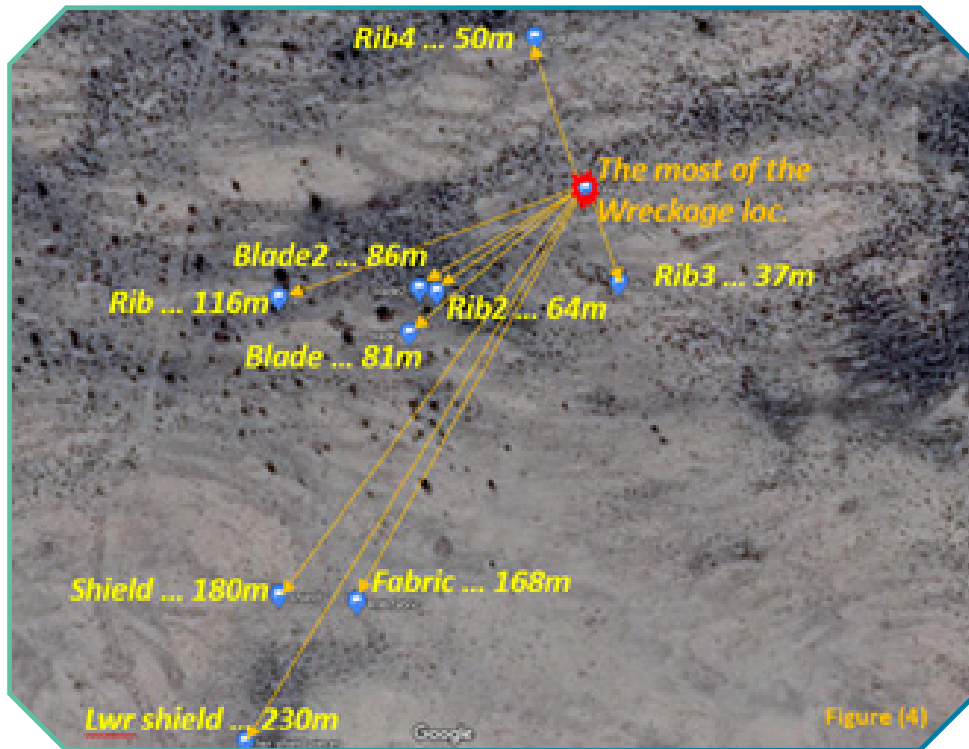
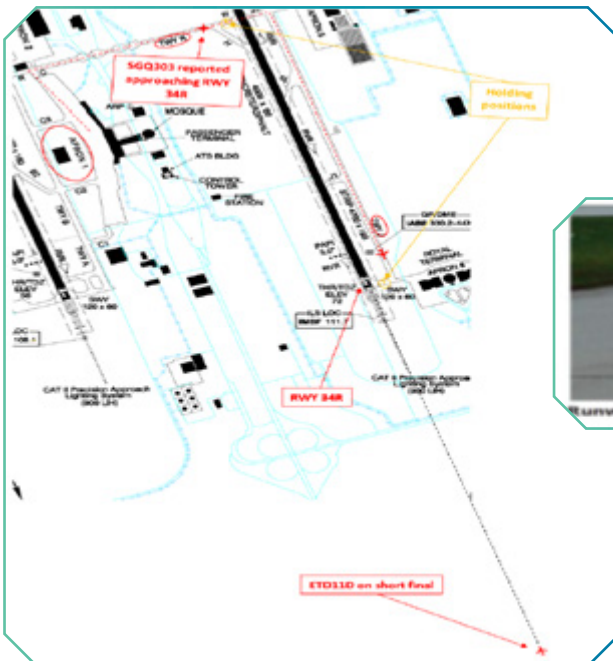
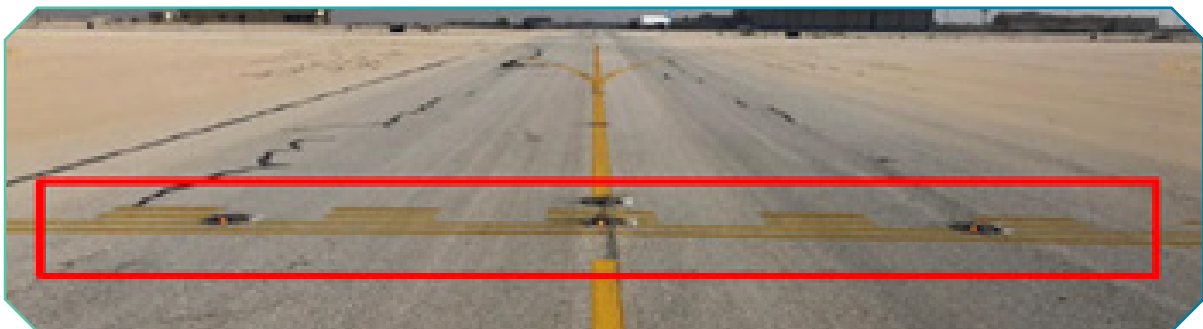


Image showing aircraft wreckage and its plotted positions

5. AIB-2018-0477

12/10/2018 Serious Incident Runway Incursion (RI)

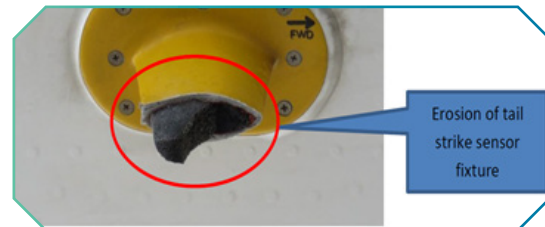
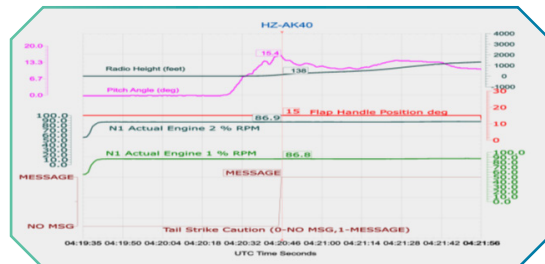
Narrative	Conclusion
<p>An Airbus A320, registration A6-EIC, operated by Etihad Airways (ETD11D) from Abu Dhabi International Airport (OMAA) to King Fahd International Airport (OEDF) in Dammam was approaching runway (RWY) 34R. At about 3 NM to the runway, an Airbus A320, registration VP-CGW, operated by Saudi Gulf Airlines (SGQ303) from King Fahd International Airport (OEDF) to King Abdul-Aziz International Airport (OEJN) in Jeddah crossed the runway (RWY 34R) without clearance. The Tower control (TWR) noticed the runway crossing. At 14:271, the controller received a confirmation that SGQ303 had cleared the runway. ETD11D continued the approach and landed safely.</p>	<p>The investigation concluded that the causal factor to this incident is attributed to SGQ303 FDC misinterpretation of taxi and hold instruction. The investigation also identified some other contributing factors related to non-standard phraseology and runway stop bar lightings intensity and misalignment. The AIB issued four Safety Recommendations addressed to the operator, air navigation service provider and the airport authority.</p>



6. AIB-2017-0601

09/12/2017 Serious Incident Abnormal Runway Contact (ARC) Tail Strike

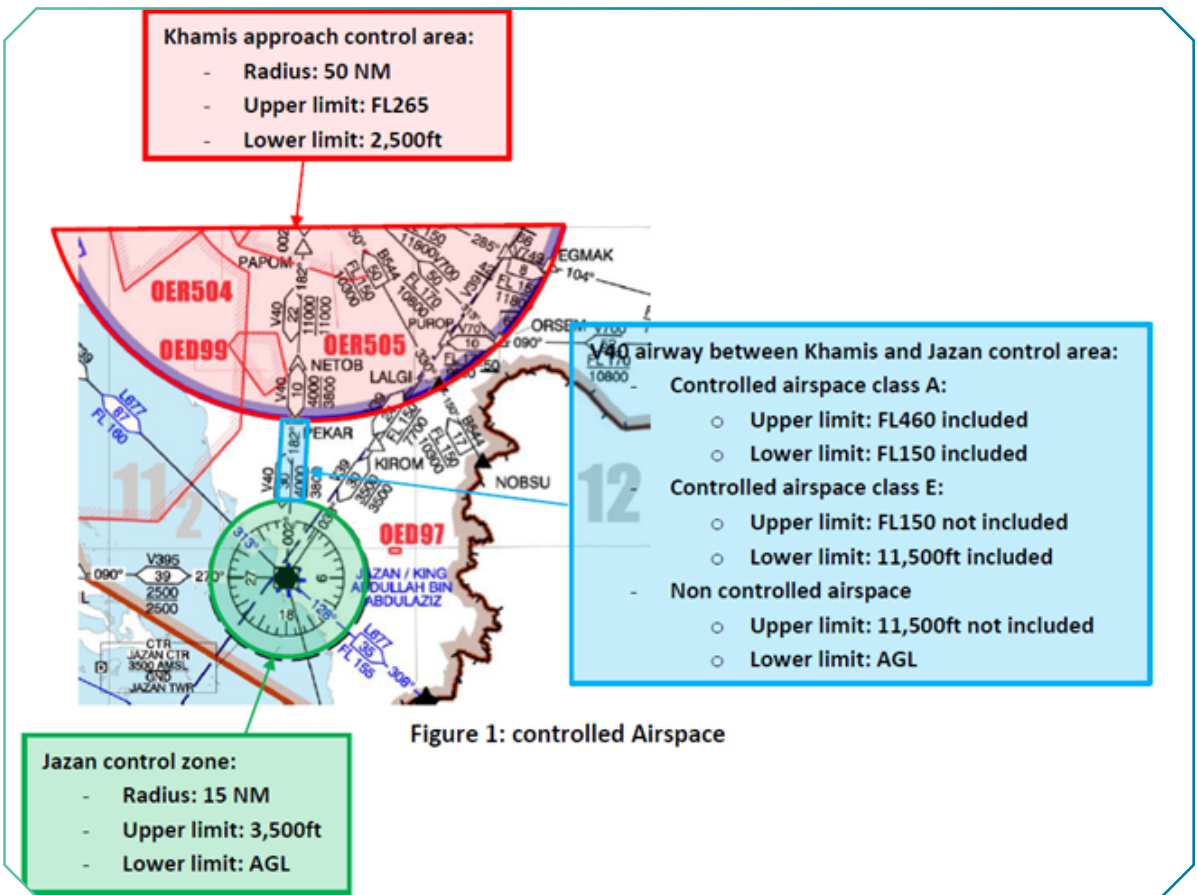
Narrative	Conclusion
<p>A Boeing 777-300ER, Registration HZ-AK40, was operating a scheduled Saudi Arabian Airlines Flight Number SV021 from King Abdulaziz International Airport (OEJN), Jeddah, Kingdom of Saudi Arabia to John F. Kennedy International Airport (KJFK), New York City, United States of America.</p> <p>During the initial lift-off, the aircraft tail contacted runway 34C surface and the flight crew was alerted of a tail strike by the aircraft cockpit instrumentation. The flight crew complied with tail strike checklist and decided to return to OEJN. The Air Traffic Control (ATC) was notified and fuel dump had been executed. The aircraft landed uneventfully on runway 34R with no reported injuries. The aircraft sustained damage to the tail strike sensor, which had been eroded/chipped off as a result of the runway surface contact and no further empennage structural damage was noted.</p>	<p>The investigation concluded that the causal factor to this incident was the incorrect performance calculation made by the FDC and the absence of effective crosscheck in addition to non-compliance with the requirement of the FCOM/SOP to reject takeoff.</p> <p>The investigation also identified some other factors related to situational awareness and hurry-up syndrome.</p> <p>The AIB endorsed two of the Safety Recommendations initiated by the operator in its safety investigation and other safety action taken.</p>



7. AIB-2018-0011

04/01/2018 Serious Incident Airprox, TCAS Resolution Advisory (RA)

Narrative	Conclusion
<p>An Airbus A320, Saudi Registration HZ-FAB, operated by Flyadeal on a scheduled Flight Number FAD264 from King Khalid International Airport in Riyadh (OERK) to King Abdullah Bin Abdulaziz airport in Jazan (OEGN). The HZ-FAB reported to Jazan control tower while turning to the final runway 33 having an opposite traffic climbing through its level. The opposite traffic was an Airbus A320, Cayman Registration VP-CYD, operated by Flynas on a scheduled Flight Number KNE115 departed from King Khalid International Airport (OERK) to King Abdullah Bin Abdulaziz airport in Jazan (OEGN) climbing from 2,500ft to 4,000ft. This incident was generated around 23:531 at around 07 NM south of OEGN while both traffic were under TIBA2 procedure. The conflict was cleared uneventfully and both traffic landed safely. awareness.</p>	<p>The investigation concluded that the causal factors to this incident were attributed to the absence of KNE115 coordination with FAD264 on TIBA frequency and the degardeness of KNE115 FDC situational awareness.</p> <p>The investigation identified some other contributing factors relted to the charted altitude on the IAP charts assumed by KNE115. The investigation identified a safety issues associated with the Air Navigation Service provider recording system.</p> <p>The AIB issued three safety recommendations addressing the findings and the action addressee was the operator of KNE115 and the Air Navigation Service provider.</p>



SAFETY STUDIES

In 2018, the AIB conducted a safety study addressing multiple concerns regarding the safety risks associated with the continuation of performing TIBA procedures on a regional busy airport, King Abdullah Bin Abdulaziz Airport (GIZ-OEGN).

The airport supports commercial, military and other general aviation traffic operated domestically and internationally. The current average number of civilian flights GIZ airport are more than 60 flights per day. Also, it has been received multiple safety reports regarding communication conflicts, TCAS alerts and extended delays.

During the safety study, SANS issued recommendations regarding above concerns and The AIB agrees with recommended below actions:

Immediate (within 30 Days)

1. Implement strategic Ari Traffic Flow Management (ATFM measures to JAZAN Airport.
 - a) Coordinate with GACA-Air transportation and VP-Airports regarding arrangement of slot program.
 - b) Coordinate with Airlines to brief on ATFM measures to be taken.
2. Implement Tactical ATFM measures to JAZAN Airport.
 - a) Apply special arrangements to enhance safety and efficiency that would ensure sufficient in-trail spacing between aircraft without effecting airport capacity.
 - b) Khamis Approach will manage the spacing between the aircraft inbound to JAZAN from over Abha VORTAC(ABH).

Mid-term (within 90 Days)

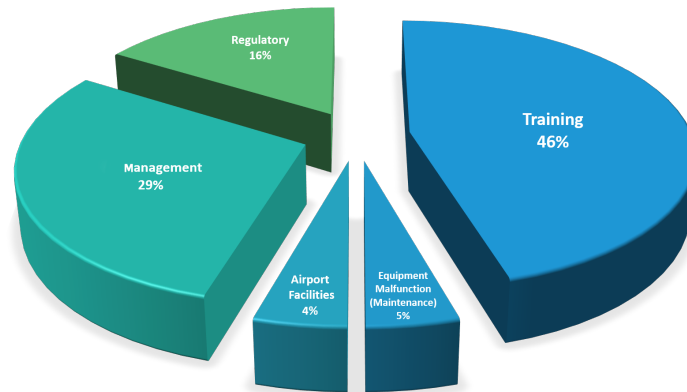
1. Implement non-radar approach procedures from JAZAN Tower:
 - a) Qualified ATCOs (procedural) to establish procedure approach services will be identified to work at JAZAN.
 - b) Qualify JAZAN ATCOs in procedural control to provide continuous service.
2. De-conflict ATS Routes:
 - a) V40 Inbound to JAZAN
 - b) V39/B544 Outbound from JAZAN (establish new waypoint).
 - c) Reopen V395
3. Coordination with military:
 - a) Coordination with military to approve usage of ATS routes in 2(b) & (c).
 - b) Coordination with military regarding drone operations in JAZAN area.

Long-term (April 2019)

1. Establish new Approach Control Surveillance Services for JAZAN airport.
2. Establish JAZAN TMA to include new IFPs.

SAFETY RECOMMENDATIONS

One of the main AIB roles is following up the implementation of the safety recommendations with the concerned parties to improve aviation safety standards and to prevent accidents/incidents re-occurrences.



Closed recommendations category in 2018

46%
TRAINING

29%
MANAGEMENT

16%
REGULATORY

5%
EQUIPMENT
MALFUNCTION
(MAINTENANCE)

4%
AIRPORT
FACILITIES

AIB Closing Recommendations achievement

AIB has achieved a safety recommendation closure rate of 86% in 2018. As shown in the chart above, the overwhelming majority relates to training issues with a percentage of 46%. The next highest closure rate, with a percentage of 29%, pertains to management, that includes lack of management, lack of direct supervision and not abiding with the regulations. The remaining closure issues relates to regulatory (15%), equipment deficiencies (5%) and airport facilities (4%).

AIB COOPERATION

2018 Memorandums Of Cooperation (MOC's)

REGIONAL

Public Authority for Civil Aviation of Oman

Date: 1/10/2018

Under the patronage of HE MOT and in the 4th Mid-Region Safety Summit, AIB & PACA signed this agreement to ensure the cooperation related to aviation safety and investigation between both countries in general. The focus was to share the Saudi experience as a regional reference and learn about the fundamentals and milestones needed in order to establish an independent investigation office.



INTERNATIONAL

The National Transportation Safety Committee of the Republic of Indonesia (NTSC)

Date: 29/11/2018

Within the framework of cooperation between both countries, and their desire to share expertise and experience relating to aviation accident/incident investigations, AIB & NTSC signed this agreement to ensure the facilitation of cooperation in aviation investigation in general, investigation training and sharing of information and expertise, consistent with the Standards and Recommendation Practices of Annex 13 to the Chicago Convention.



National Bureau of Air Accidents and Incidents Investigation with Civil Aircraft of Ukraine (NBAAI)

Date: 23/11/2018

Since the Kingdom of Saudi Arabia and Ukraine are partners in the design and manufacturing of the Antonov ANT-132 light transport Aircraft, and while they are parties to the Chicago Convention 1944, AIB & NBAAI signed an MOC to coordinate the representation of state of design and state of manufacturer and share expertise and experience relating to aviation accident/incident investigations.



The Bureau of Enquiry and Analysis (BEA), France

Date: 30/05/2018

The AIB signs an executive program for technical cooperation with the French Bureau of Enquiry and Analysis for Civil Aviation Safety (BEA). Mr. Abdulelah Felemban, Director General of the AIB signed for the Saudi side, and Mr. Rémi Jouty, Director of BEA signed for the French side

The program includes the participation of the two sides in the joint efforts at various levels for the development of techniques and methodology of safety investigations conducted for civil aviation occurrences for prevention and improvement of civil aviation safety



AIB PARTICIPATIONS

International Recorder Investigator Group (IRIG)

Accident Investigator Recorder (AIR) meeting is an annual meeting held under the International Recorder Investigator Group (IRIG) activities. The meeting is attended by experts representing leading global accident investigation agencies where they share and discuss latest techniques in accident investigation and lessons learned from exceptional investigation experiences. AIB participated in the meeting by sharing a case that utilized the FDM data, as well as sharing the progress and applications of the Memory Access Retrieval System (MARS).



AIB participation in AIR meeting 2018

Observer’s Participation

On 30th October of 2018, AIB sent 2 members to observe the investigation process of the catastrophic accident of Lion Air’s PK-LQP. The process included the participation of Singapore’s TSIB, Australia’s ASC, US’s NTSB lead by Indonesia’s NTSC. The experience was valuable to assess the knowledge of the members by noting important information alongside seeing how the theory is applied. The visit lasted for 10 days and covered all search and analysis aspects starting with the administrative roles followed by wreckage handling and three days on a vessel for underwater wreckage and recorder search, and finally handling the media and press.



AIB members during the inspection of PK-LQP’s engine

Commercial Air Transport Safety Investigation Training (BEA)

Date: 19/11/2018

AIB participated in a 3-week Commercial Air Transport Safety Investigation Training training offered by BEA experts.



4th MID REGION SAFETY SUMMIT

Date: 01/10/2018

The AIB was one of the participants on this summit at Riyadh city. The objective of the Summit was to raise awareness on the aviation safety developments including the Global Aviation Safety Plan (GASP), Regional Safety Priorities and Targets and RASG-MID activities and deliverables. The Summit provided a forum for sharing expertise and experience for States, International and Regional Organizations, Aviation Safety Partners, Service Providers and Industry Stakeholders. It also provided valuable panel sessions and opportunities for collaboration.



MEBAA Middle East & North Africa Business Aviation Association

Date: 03/09/2018

MEBAA Conferences in 2018 gathered experts from across the Middle East and North Africa to address issues related to specific areas of business aviation and communicate the effect they impose on the industry.

MEBAA Conference Jeddah held on 4th of September with over 300 attendees and 10 speakers, including the likes of GACA, (AIB) Saudi Arabian Investigation Bureau, Saudi Aramco, Clifford Chance, and many more.



ISASI: International Society of Air Safety Investigators

Date: 04/11/2018

AIB participated in ISASI 2018 with a Tutorial presented on the pre-seminar training day, the tutorial was about “Recorded Data Challenges”, also in the first day of the seminar AIB presented “MARS Journey - Climb Phase” the presentation briefed the industry about the progress of Memory Access Retrieval System (MARS) developed by KSA AIB and Plane Sciences Inc., and how it is a game changer in the recovery of crash damaged recorders.



DEVELOPMENT

Administrative

Recruitment and Selection

A) Saudization/Nationalization:

100% of all new recruits are Saudi Nationals.

B) Turnover and Retention Rate:

(2.5% T)(97.5% R)

C) Gender Equality:

Equal opportunity for both genders, the first 2 Saudi females recruited in the history of the AIB.

D) Transparency and Fairness:

Vacancies are advertised at the AIB's Website and all Résumés are screened then selected based on their credentials. Suitable candidates are then examined in the English Proficiency, Leadership Skills, and Competencies. Afterwards, candidates who pass all tests are interviewed in a random panel using a Competency Based Interview (CBI).

Succession Planning Program

The program was launched to retain knowledge and invest in new graduates. In fact, around ten young employees were drafted into the AIB OJT (On Job Training) and other training programs to improve their skills and abilities at work.

Staff Cross Utilization

All AIB staff are trained to handle deployment using the investigation kits and tools to assist the investigation team.

Training

A) Invested in training junior staff to build and develop competencies and prepare them for succession.

B) Aligning the Succession Program with training.

C) On the Job Training (OJT):

- Familiarization Program for new recruits.
- Part of Succession Planning and Knowledge Retention Efforts.
- New skills' development.
- Job Rotation.

Visits

DATE	ORGANIZATION	DETAILS
15/02/2018	Saudi Academy of Civil Aviation	15 Students
22/02/2018	Saudi Academy of Civil Aviation	16 Students
13/11/2018	Public Authority for Civil Aviation-Sultanate of Oman	4 Members

LAB Engineering Laboratories Department

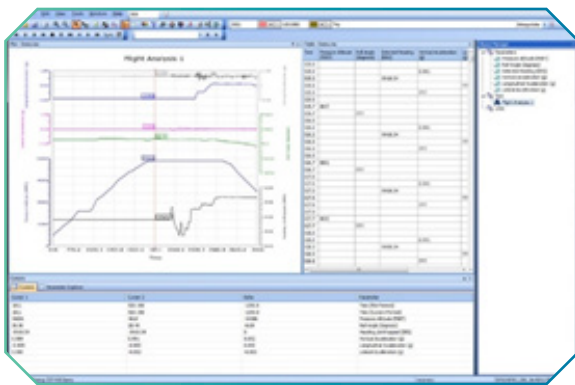
Analysis and Animation

Software

The main function of the FRL is configuring the retrieved data into readable files by using flight data analysis systems INSIGHT & FAS.

Insight analysis and animation

Insight is a software that take raw data from FDR to convert it into engineering data represented in tables, plots and animations. The current utilized version of insight is 4.8. Insight was developed by CAE then maintained and supported by Plane Sciences Inc.; the current version was released on 28th of August 2018 and installed on the 29th August 2018



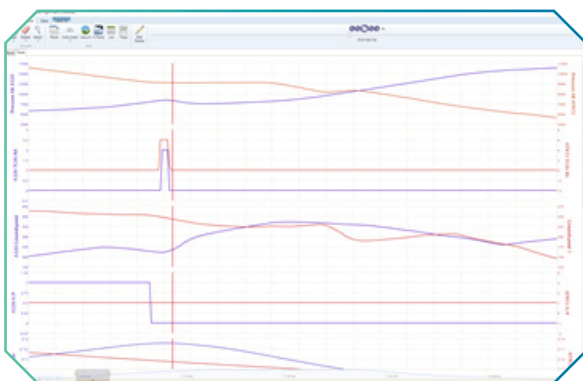
Insight Analysis



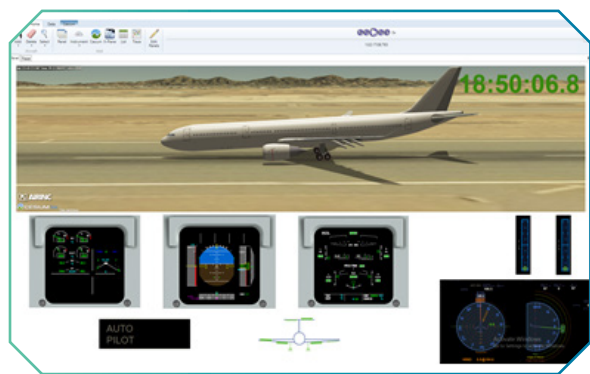
Insight Animation

FAS Flight Analysis System

FAS is an advanced software produced to analyze the FDR data with more functions to edit and correct illogical and corrupted data. The current utilized version by the AIB FRL is 1.8.0, which is developed by Plane Sciences and AIRINC Inc. and was released on 28th of August 2018 and installed the next day.



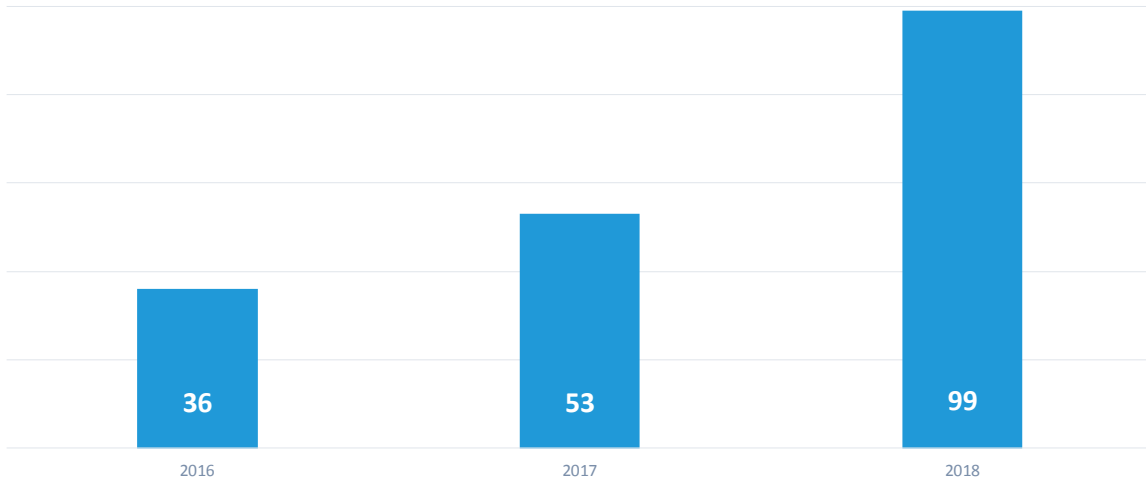
Flight Analysis System (FAS)



Flight Analysis System (FAS)

Frame Format Description Files (FFD)

Insight requires Frame Format Description (FFD) files to convert downloaded files to system readable files, the AIB FFD Files library increased in 2018 by 87% from 53 to 99 files covering most of the flown aircraft types in KSA.



FFD library growth along the past three years

Layout Files

The previous FAS version required specific files, layout files (LF), rather than FFD files. However, the updated version includes an add-on feature that can convert FFD files to (LF) which helps in extending the range of aircraft supported by FAS instead of obtaining an unnecessary inventory of files.

Upgrades and New Equipment

Universal data retrieval software

A new software and cable were acquired to extend the supported recorders range; universal recorders are commonly found in small aircrafts.

PART NUMBER	Recorder Type
1607-XX-XX	FDR
1605-00-XX	CVFDR
1606-00-XX	CVR
1606-01-XX	CVR
1605-01-XX	CVFDR



Universal recorder in the download process

MARS current capability:

PART NUMBER		Recorder Type
1)	Honeywell 980-4700-XXX SSFDR	• L-3 Com S603-1000-XX
2)	Honeywell 980-6020-XXX SSCVR	• L-3 Com S703-1000-XX
3)	Honeywell 980-6022-XXX SSCVR	• L-3 Com S800-X000-XX
4)	Honeywell 980-4710-XXX AR-FDR SSFDR	• L-3 Com S903-X000-XX
5)	Honeywell 980-6023-XXX AR-CVR SSCVR	
6)	Honeywell 980-6021-XXX AR-Combi	

Data Analysis Tools

The AIB has established a new tool for data analysis in 2019 called "Power BI" to support and meet their vision and objectives:

- Visualize all data and bring it to life via dashboards and reports
- Create Data analysis Culture to share insights across the organization.
- Flexibility to share insights and distribute all data needed.

New Communication Strategy

Communication has grown into an integral part of AIB since the very beginning. And with the increase in all the information that we need to share with our different audiences, communication now has shifted from its previous position as a helpful tool, to an essential one. Therefore, it was increasingly important to develop a new dynamic strategy in order to make communication more effective as a tool to help achieving the organization's goals and deploying its values:

- Internally to foster a healthy communicative environment for employees.
- Externally to showcase the bureau's capabilities and functions, and therefore its role in aviation safety & Investigations.

The New Strategy Covers the Following Aspects

- The Corporate Identity & The brand voice.
- Internal communication.
- External National & International communication.
- Crisis Management.

Where do we want to be?

Internally

- New guidelines for our brand voice/corporate identity.
- An organizational excellence system for a healthy productive environment.

Externally

- Activate the external (national and international) new methods of communication & cooperation.
- Establish a new mechanism for crisis management.
- Set new creative tools to turn factual data into attractive outputs.

APPENDICES

Appendix A: Abbreviations

Acronym	Definition
ACAC	Arab Civil Aviation Commission
ADREP	Aviation Data Reporting Program – ICAO
AIB	Aviation Investigation Bureau
AIG	Accident Investigation Group – ICAO
ARC	Abnormal Runway Contact
CVR	Cockpit Voice Recorder
DGCA	Directors General of Civil Aviation
FAS	Flight Analysis System
FDC	Flight Deck Crewmember
FDR	Flight Data Recorder
FRL	Flight Recorder Laboratory
GACA	General Authority of Civil Aviation (Kingdom of Saudi Arabia)
ICAO	International Civil Aviation Organization
ISASI	International Society of Air Safety Investigators
MENASASI	Middle East & North Africa Society of Air Safety Investigators
MLG	Main Landing Gear
NLG	Nose Landing Gear
OCC	Operation Control Center (AIB)
RAIO	Regional Accident Investigation Organization
SANS	Saudi Air Navigation Services
SAR	Stand-Alone Recommendation
SARP	Standards And Recommended Practices
SCG	Saudi Coast Guard
SR	Safety Recommendation
TCAS – RA	Traffic Collision Avoidance System – Resolution Advisory

Appendix B:

Definitions of occurrences classifications

Occurrence	Definition
Accident	<p>An aircraft accident is an aviation 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:</p> <p>a) A person is fatally or seriously injured as a result of:</p> <ol style="list-style-type: none"> 1) Being in the aircraft; or 2) Being in 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 <p>b) The aircraft sustains substantial damage or structural failure; or</p> <p>c) The aircraft is missing or is completely inaccessible; or</p> <p>d) A forced landing off an airport, irrespective of injuries or damage.</p>
Serious incident	An incident involving circumstances indicating that there was a high probability of an accident.
Incident	An occurrence, other than an accident, associated with the operation of an aircraft which affects or could affect the safety of operation.
Other Occurrences	A reported event that does not classify as an accident or incident.

Appendix C: Definitions of the different types of investigations

Investigation Type	Definition
Annex 13	A full scope investigation of accidents and serious incidents including site investigation, post site investigation, laboratory inspection and examination of affected aircraft parts in participation of national and international interested parties.
Limited Scope	Usually for office based investigation of an occurrence other than accident and serious incident that is associated with the operation of an aircraft which affects or could affect the safety of operation. There may be local and international parties participating in the investigation.
Discontinued	An investigation that is initiated on a reported occurrence and based on the gathered information it is determined that; <ul style="list-style-type: none"> • Underlying factors and circumstances are well known and they have been addressed in previous investigations • Safety actions taken by the concerned entity are satisfactory and more likely would prevent reoccurrence of similar incidents • Insufficient information to draw any specific conclusions regarding the circumstances Limited safety benefit would be expected from continuing the investigation and directing additional resources.
Safety Concern	A focused investigation addressing critical safety issue revealed from a reported occurrence. Or, when used as a standalone recommendation to swiftly address critical safety issues revealed during an on-going investigation. observation

Appendix D: Recorders Download and Analysis

Qtr	Date	Occurrence Description	Flight Data Recorder	Cockpit Voice Recorder	FRL Report
1st	10 JAN	Saudi Arabian Airlines' Airbus A321 registered as HZ-ASQ right main landing gear caught fire.	Downloaded	Downloaded	FRL-2018-02-01
	14 FEB	Saudi Arabian Airlines' Airbus A330 registered as HZ-AQC had a detachment of the left nose wheel.	Downloaded	Downloaded	FRL-2018-02-01
	01 MAR	Saudi Arabian Airlines' Boeing 777 registered as HZ-AKN had an engine shutdown.	Downloaded	Downloaded	FRL-2018-03-01
	09 MAR	FlyAdeal's Airbus A320 registered as HZ-FAA had a ground incident.	N/A	Downloaded	N/A
2nd	23 APR	Saudi Arabian Airlines' Airbus A320 registered as HZ-ASV nose landing gear had been broken.	Downloaded	Downloaded	N/A
	17 MAY	Saudi Arabian Airlines' Airbus A320 registered as HZ-ASU had an engine shut down during flight.	Downloaded	Downloaded	FRL-2018-06-03
	23 MAY	OnurAir's Airbus A330 registered as	Downloaded	Downloaded	FRL-2018-10-02
	07 JUN	TC-OCH lost green hydraulic system pressure.	Downloaded	Downloaded	FRL-2018-06-01
	07 JUN	FlyNas's Airbus A320 registered as VP-CXF had a loss of cabin pressure.	Downloaded	Downloaded	FRL-2018-06-02
	22 JUN	Flydubai's Boeing 737 registered as A6-FEE had a loss of cabin pressure.	Downloaded	Downloaded	No Further Investigation
3rd	10 JUL	Saudi Arabian Airlines' Airbus A320 registered as HZ-AS59 had an engine shut down during flight.	Downloaded	Downloaded	N/A
	03 AUG	Jet Airways' Boeing 737 registered as VT-JFS veered right off the taxiway and came to a stop on soft ground.	Downloaded	Downloaded	FRL-2018-08-01
4th	22 OCT	Breach of Separation between Saudi Arabian Airlines' registered as HZ-AK14 and United Parcel Services aircraft Registered as N578UP.	N/A	N/A	FRL-2018-10-01
	23 NOV	Saudi Arabian Airlines' A320 Registered as HZ-AS23 had a detachment of a main landing gear wheel	Downloaded	Downloaded	FRL-2018-12-01

Appendix E: Training

Name of Training Course	Training Institute and Country	Date and Duration
Advanced Aircraft Accident Investigation	Embry-Riddle Aeronautical University - USA	May 2018 (5 days)
Aircraft Accident Investigation	National Transportation Safety Board - USA	Sep 2018 (12 days)
Aircraft Accident Investigation Techniques and Management Course	Singapore Aviation Academy - Singapore	March 2018 (12 days)
Aircraft Crash Survival Investigation and Analysis	Embry-Riddle Aeronautical University - USA	October 2018 (5 Days)
Career Development and Succession Planning	Meirc Training and Consulting- UAE	Feb 2018 (5 days)
Certified Administration and Office Management Professional	Meirc Training and Consulting- UAE	July 2018 (5 days)
Certified Cyber Security Specialist	Meirc Training and Consulting- UAE	March 2018 (5 Days)
Certified Public Relations Specialist	Meirc Training and Consulting- UAE	May 2018 (5Days)
Finance for Non-Finance Professionals	Meirc Training and Consulting - UAE	March 2018 (5 Days)
Financial Accounting and Reporting	Meirc Training and Consulting - Egypt	March 2018 (5 days)
Flight Operations Workshop - Common Aviation Risk Issues	Civil Aviation Authority of Singapore - Singapore	March 2018 (3 days)
Managing Communications Following an Aircraft Accident or Incident	National Transportation Safety Board - USA	October 2018 (2 days)
Mid-Air Collision Accident Investigation	General Civil Aviation Authority - UAE	Aug 2018 (12 days)
OSHA 30 Hour General Industry and Aviation Ground Safety for Managers	Embry-Riddle Aeronautical University - USA	October 2018 (5 Days)
People Strategy Workshop	Cranfield University - UK	October 2018 (3 days)
Preparing Financial Statements and the Annual Report	Meirc Training and Consulting - UAE	Nov 2018 (5 days)
Singapore Aviation Safety Seminar	Flight Safety Foundation - Singapore	March 2018 (4 days)
Structural Failure Identification in Aircraft Accident Investigation	Embry-Riddle Aeronautical University - USA	April 2018 (3 days)
Supervisory Skills	Meirc Training and Consulting - UAE	August 2018 (5 days)
The M.A.R.S Workshop	Plain Sciences	April 2018 (3 days)
Transportation Disaster Response - Family Assistance	National Transportation Safety Board - USA	October 2018 (3 days)
الإدارة الإستراتيجية	المركز الوطني لقياس أداء الأجهزة العامة	Aug 2018 (3 days)
Commercial Air Safety Transportation Investigation	BEA - France	December 2018 (14 days)



Kingdom of Saudi Arabia
Aviation Investigation Bureau

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