ANNUAL REPORT 2015

Contents

1. Preamble

Aviation Investigation Regulation

Chapter 3.1 Objective of the AIB

The objective of the Aviation Investigation Bureau (AIB) is to advance aviation safety of civil aviation activities within the Kingdom of Saudi Arabia (KSA). This objective is achieved by conducting independent investigations into aviation occurrences, by monitoring the implementation of safety recommendations and by identifying and correcting systemic errors through a continuous/ predictive data-based accident prevention program encompassing all elements of the civil aviation environment.

All investigations of aviation occurrences are conducted in a manner consistent with the highest international safety standards; such as, the Standards and Recommended Practices contained in International Civil Aviation Organization (ICAO) Annexes 13 and 19 and, the related ICAO publications are utilized.

Chapter 3.4 Annual Report

The AIB shall submit an Annual Report to the Chairman of the General Authority of Civil Aviation (GACA) Board of Directors by 01 March Gregorian (G) of each year, encompassing all its related activities during the previous calendar year. The Annual Report shall include, but is not limited to:

a) A resume of the general activities of the AIB;

b) A statistical and analytical summary of all aviation occurrences reported to the AIB;

c) A statistical and analytical summary of the aviation occurrence investigations and safety studies conducted by the AIB;

d) A survey and summary of all the recommendations made by the AIB with the response to each recommendation; and

e) A list of on-going investigations and safety studies and, an estimate for their completion date.

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2. Foreword by Director General

The AIB is pleased to introduce to His Excellency Chairman of the Board of the General Authority of Civil Aviation the 2015 Aviation Investigation Bureau Annual Report. This is the second annual report since the establishment of the AIB in November 2013.

The continuous support of HE the Chairman has enabled the AIB to pursue ambitious initiatives and to achieve major accomplishments during 2015, in various areas of AIB functions.

AIB continued the outreach strategy to strengthen ties with civil aviation stakeholders locally and globally. On the local front interactive presentations and workshops with Airports, Air Navigation Services, and Service providers continued throughout the year. On the other hand, AIB continued reaching out to international Investigative authorities and Safety Boards such as USA NTSB and German BFU. The AIB shared its establishment experience in a technical paper delivered in ISASI seminar at Augsburg, Germany and was awarded for best technical paper presented.

On building investigative capabilities, AIB acquired an Aerial Photography System designed and made by a KAUST spin off company with precise and unmatched aerial imagery output. On the same front, AIB acquired a 3 Dimensional scanning device for accident site 360 imagery with defining coordinates for objects in a site scale.

In preparing for accident site deployment, benchmarked with UK AAIB and acquired complete line of supplies and remote area essential equipment. Conducted periodic practice drills to perfect the deployment process.

The challenges continue as the turnover of AIB leadership started late 2015 and with continued support from HE the Chairman and faith in a professional team AIB 2016 strategic initiatives will complement the achievements of 2015.

Director General (A)

Abdulelah O. Felemban

3. GLOSSARY

AIB	Aviation Investigation Bureau
ADREP	Accident/Incident Data Reporting
ANS	Air Navigation Service
AOTS	Aviation Occurrence Tracking System
ATC	Air Traffic Control
CTS	Correspondence Tracking System
CVR	Cockpit Voice Recorder
EASA	European Aviation Safety Agency
DFDR	Digital Flight Data Recorder
GACA	General Authority of Civil Aviation
ICAO	International Civil Aviation Organization
IIC	Investigator-In-Charge
KAIA	King Abdulaziz International Airport
KKIA	King Khalid International Airport
KSA	Kingdom of Saudi Arabia
MED	Medina
NOTAM	Notice to Airmen
RA	Resolution Advisory
SAEI	Saudi Aerospace Engineering Industries
SAR	Stand-Alone Recommendation
SQA	Safety & Quality Assurance
SVA	Saudi Arabian Airlines
TCAS	Traffic Collision Avoidance System
STCA	Short Term Conflict Alert

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4. Notifications of Aviation Occurrences

The AIB maintains 24/7 notification service that receives telephone calls, emails, facsimiles and web forms that are utilized to notify the AIB of aviation occurrences. Single occurrence can generate multiple notifications from different sources; it is common that duplicate notifications occur. In 2015, the Aviation Investigation Bureau received 341 occurrence notifications.

Occurrences are entered into the Aviation Occurrence Tracking System (AOTS), a database that allows the AIB to track an occurrence from initiation to investigation closure. Additionally, AOTS serves as a tool that allows the AIB to analyse trends and identify areas of concern that serve as the basis for the emphasis to conduct safety studies. This process is consistent with the AIB Regulation and the International Civil Aviation Organization ICAO Annex 13.

Figure 1 shows the number of occurrences the AIB received on a monthly basis during 2014-15. Figure 2 shows airport flight operations in KSA.

The number of notifications does not commensurate with the number of flight operations due to the present indicative reporting culture of aviation stakeholders.

Occurrences Notifications Chart

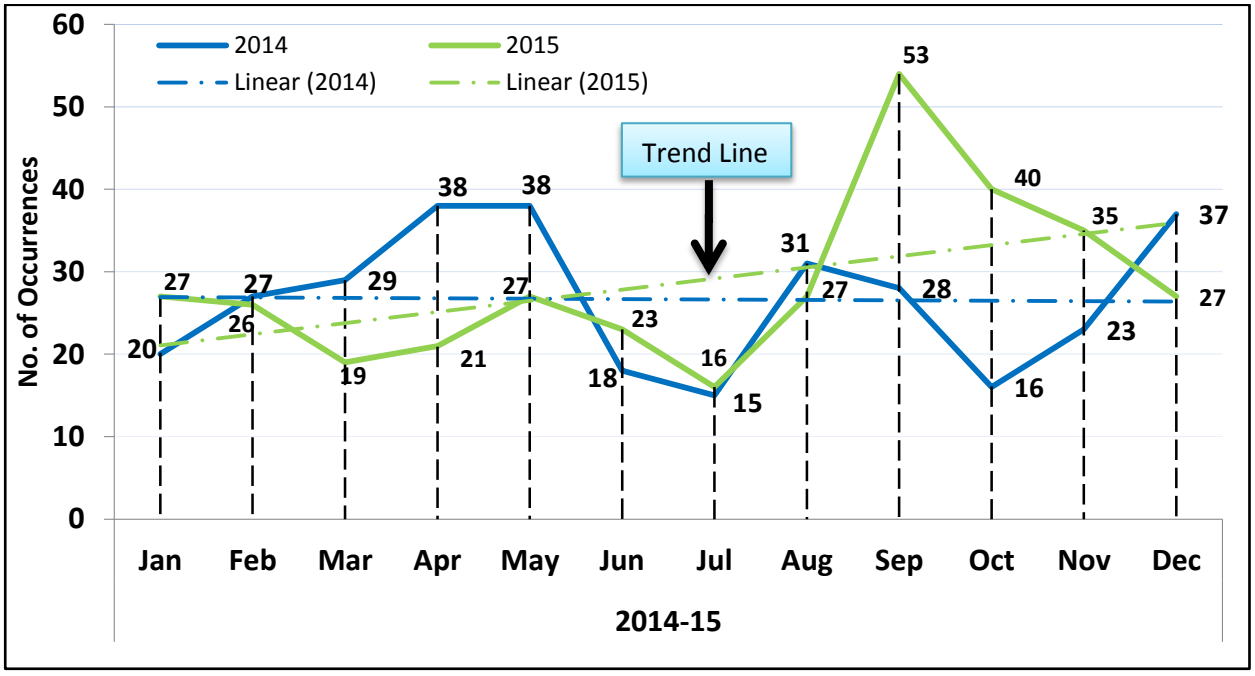

Figure 1: Occurrence notifications by month 2014-15 – Source: Safety Analysis & Prevention Division - Aviation Investigation Bureau (AIB).

5. Notification Rates and Reporting Culture

A statistical analysis of notifications indicates Jeddah experienced one occurrence notification for every 2356 flight movements in 2015. Riyadh experienced one occurrence notification for every 2468 flight movements. Dammam experienced one occurrence notification for every 3261 flight movements while Madinah had one occurrence notification for every 3885 flight movements.

Each airport has its own varying hazards and associated risks that may result in one airport having a higher number of occurrences annually as compared to other airports due to the reporting culture of operators and varying flight operations. One of the biggest challenges identified by the AIB is addressing the underreporting of occurrences.

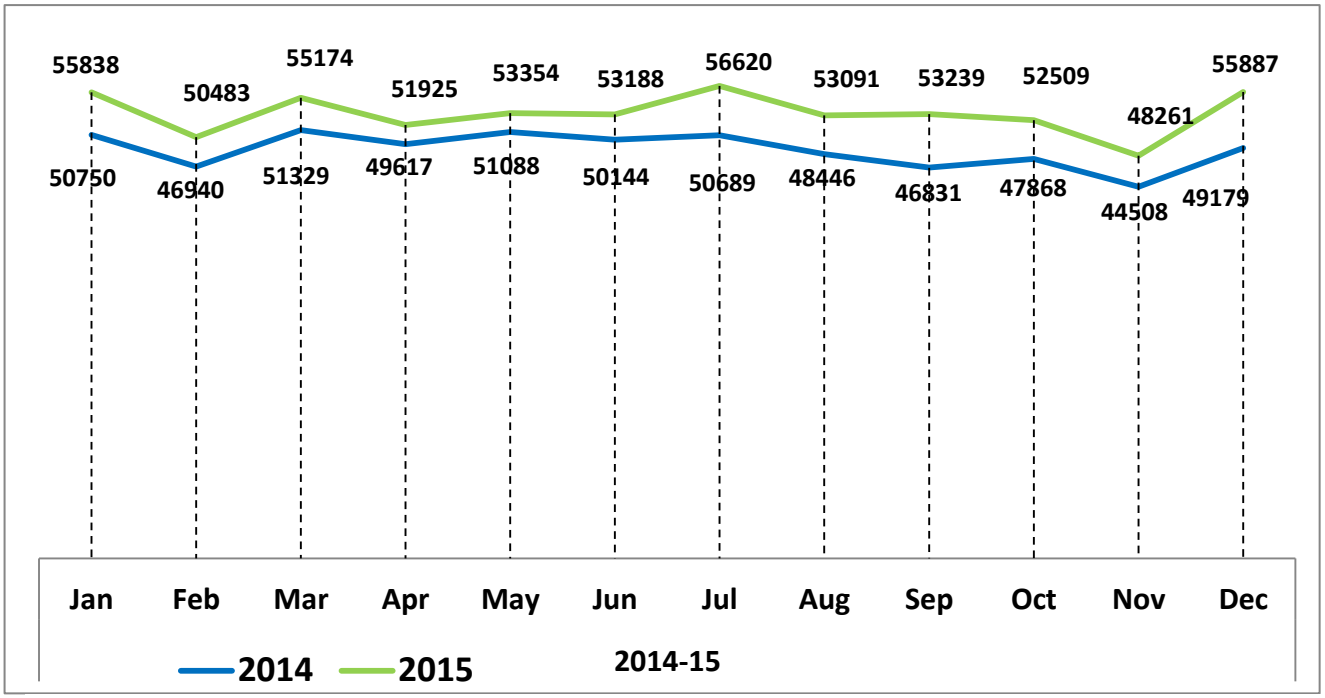

Figure 2: Kingdom of Saudi Arabia airport flight movements 2014-15 by month – Source: Information Centre and statistical studies – General Authority of Civil Aviation (GACA)

The table below shows the rate of notifications compared to flight movements at the four (4) main airports in the Kingdom.

Station	Flight Movements		Notifications		Rate of notification to movements %	
	2014	2015	2014	2015	2014	2015
JED	182879	207350	91	88	0.05	0.04
RUH	163383	172754	72	70	0.04	0.04
DMM	79284	84803	22	26	0.03	0.03
MED	48600	46621	20	12	0.04	0.03

The AIB is aware of certain factors that may discourage the reporting of occurrences as underreporting is not specific to aviation in Saudi Arabia, it is a challenge internationally. Other States have improved reporting culture through regulatory sponsored non-punitive reporting systems and creating incentives for reporting.

5.1 Occurrences Reported by Location

The number of notifications for occurrences by airport location corresponds to flight movement locations within the Kingdom, with the highest number of notifications being generated from the “in the Kingdom” international airports as noted in Figure 3.

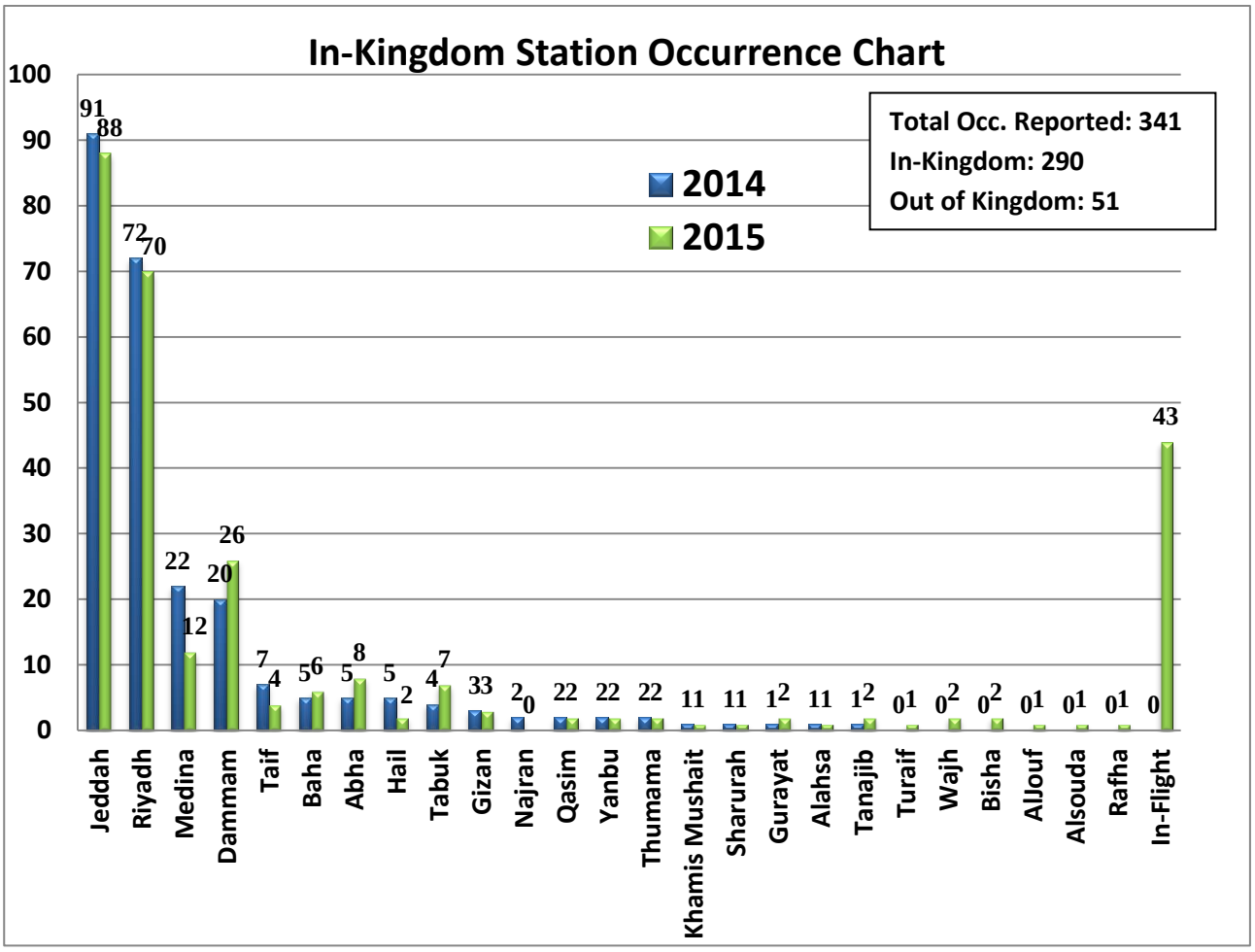

Figure 3: Occurrence notifications by location 2014-15 – Source: Safety Analysis Division - Aviation Investigation Bureau

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5.2 Occurrences Reported Out of Kingdom

Taking into account over-flight activities and the geographical location of KSA as well as the international route structures of KSA based operators; the AIB has a relatively high international exposure. With the projected growth of over-flights, airport capacities and international flight operations in the KSA, occurrences are expected to escalate.

By upholding confidentiality and protecting sensitive safety information, the AIB has succeeded in building trust and cooperation with our domestic and international aviation stakeholders in other States and aviation safety professionals worldwide. This type of cooperation has enabled the AIB to move forward and improve aviation transport safety in KSA.

The AIB fulfils obligations for the KSA not only by investigating occurrences within the Kingdom but also by assigning accredited representatives or following up with our counterparts when a KSA based Operator or registered aircraft or KSA citizens are involved in an occurrence outside of the KSA.

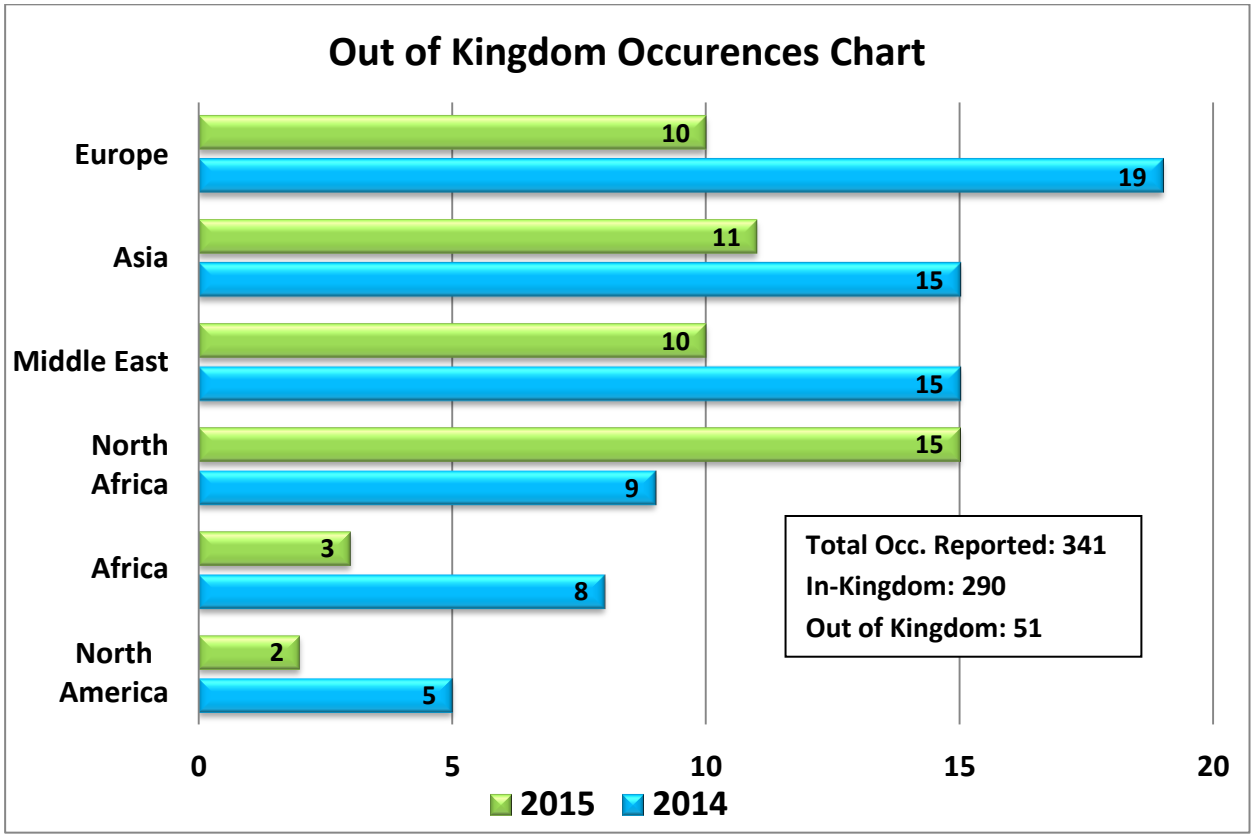

Figure 4: Occurrence notifications by International locations 2014-15 – Source: Safety Analysis Division - Aviation Investigation Bureau.

Figure 4 depicts the region and the number of occurrence notifications the AIB received involving KSA registered aircraft and operators. For occurrences where the State of occurrence has initiated an official investigation, the AIB has appointed a KSA AIB accredited representative in accordance with ICAO Annex 13.

6. Occurrences Categorization

All the occurrences reported to the AIB are categorized in accordance with the ICAO Categorization taxonomy as noted in Figure 5. The ICAO Accident/Incident Data Reporting (ADREP) system is based on the ADREP taxonomy to allow for international data sharing. The ADREP taxonomy is a set of definitions and descriptions used during the gathering and reporting of accident and incident data that is forwarded to ICAO. This taxonomy is maintained by the ICAO Accident Investigation Group. Some occurrences are categorized in more than one category.

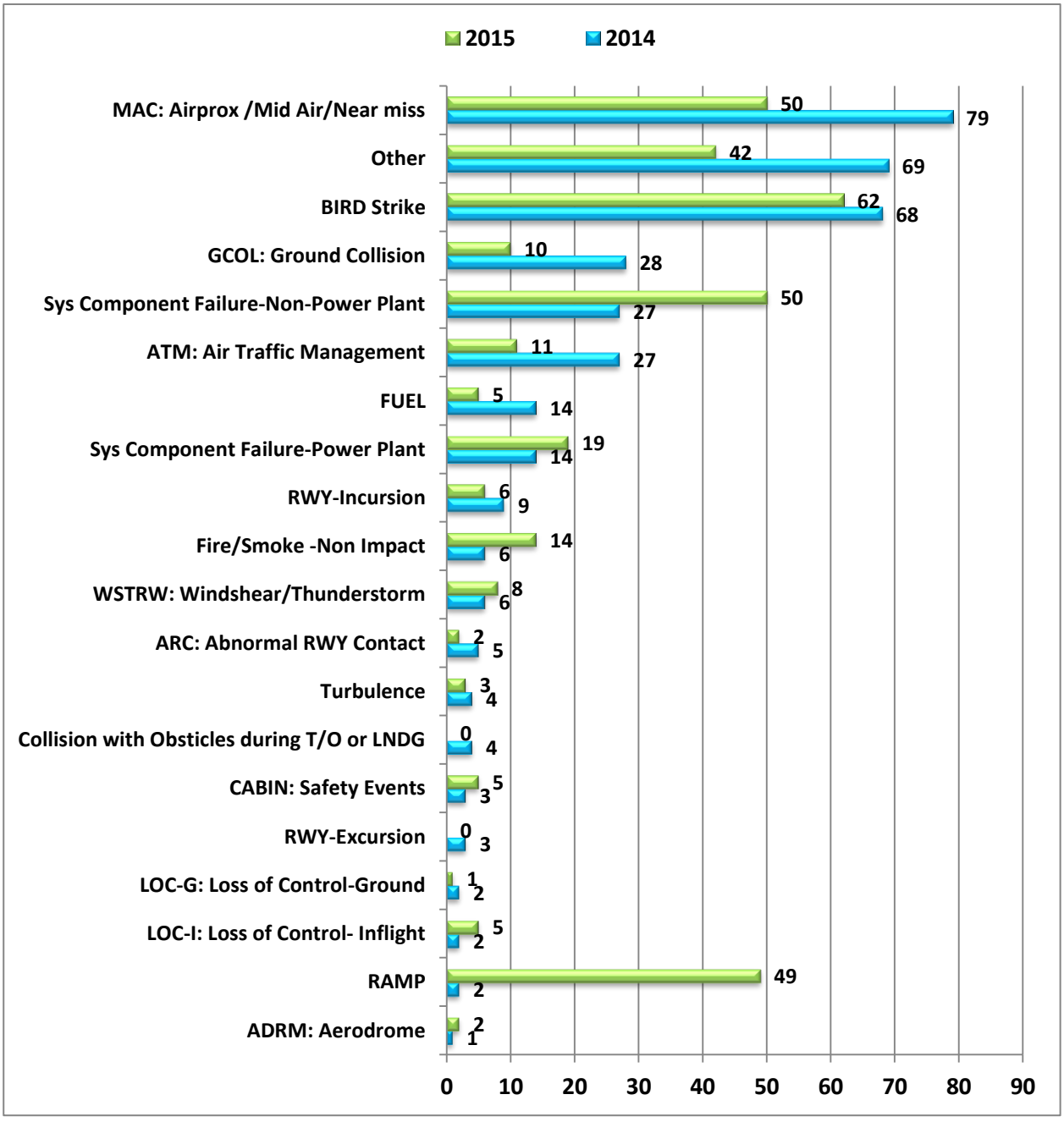

Figure 5: Occurrences Categorization 2014-15 – Source: Safety Analysis Division - Aviation Investigation Bureau (AIB).

7. Occurrences by Type

The two (2) basic types of occurrences are either an accident or an incident. The reported occurrences are identified based on severity and the impact the event had on passengers and flight operations as noted in Figure 6. Some minor events could be non-significant in nature but still recorded for data collection purposes.

"Occurrence" is defined as "accident or an incident." Generally, accidents and incidents differ only in the degree of injury sustained by persons involved or in damage sustained to the aircraft. Each category has a unique name and identifier to permit common coding in accident/incident systems. A serious incident is an "incident" involving circumstances indicating that there was a high probability of an accident. Some incidents could be relatively minor and considered as "Non-Significant."

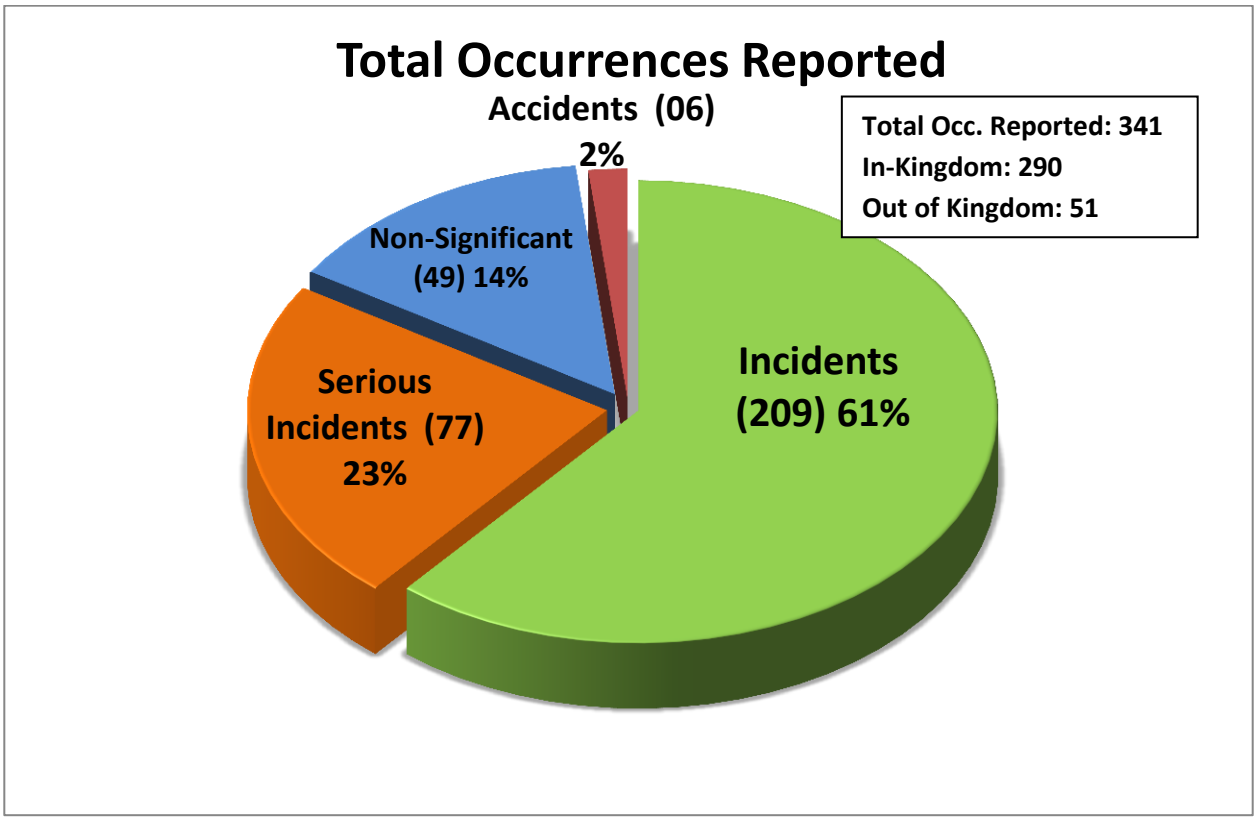

Figure 6: Chart showing the types of Occurrences– Source: Safety Analysis Division - Aviation Investigation Bureau

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7.1 Accidents

During 2015, six (6) aviation occurrences in-kingdom and out of KSA were categorized as accidents. Two (2) of the accidents involved commercial operators, while four (4) of the accidents are private owned aircrafts.

The two commercial operators accidents involved in ground accidents are by Saudi Arabian Airlines and Fly NAS in two separate occurrences. In both cases the technicians were severely injured while handling the aircraft on ground, as a result these occurrences are categorized as accidents.

One general aviation aircraft accident occurred near the Blackbushe Airport located in United Kingdom. The general aviation aircraft was conducting a private business trip from Milan to Blackbushe. The pilot lost the control while landing as a result crew and passengers were fatality injured.

One general aviation aircraft accident occurred near Abha airport, this aircraft was conducting exploration circuit around the aviation club. Both the pilot and the passenger survived the accident but the aircraft was declared total loss.

The other two aircrafts involved in accident were light weight aircrafts, one occurred in Jeddah and other in Ramsar, Iran. The accident in Ramsar had the pilot and passenger were fatal and the one in Jeddah had the pilot fatal and passenger survived with injuries.

AIB Ref.#	Date	Location
AIB-2015-0029	02-Feb-15	Iran
Private Light Aircraft involved in an accident near RAMSAR airport in the north of Iran, with two fatalities in which one was a Saudi national.		

AIB Ref.#	Date	Location
AIB-2015-0070	10-April-15	Al-Ahsa
Paragliding private microlight aircraft crash landed at Al-Ahsa region, with one fatality and one passenger seriously injured.		

AIB Ref.#	Date	Location
AIB-2015-0113	27-Mar-15	Jeddah
During the push back of NAS aircraft at JED airport, SGS operator seriously injured while disconnecting the Tow-bar.		

AIB Ref.#	Date	Location
AIB-2015-0156	31-Jul-15	UK

Embraer Phenom-505 aircraft registration HZ-IBN was on a flight from Milan Malpensa Airport to Blackbushe Airport with three passengers and one crew member. The aircraft went off end of the RWY into a car park and crashed, all on-board perished.

AIB Ref.#	Date	Location
AIB-2015-0157	20-AUG-15	ABHA

Cessna182M aircraft crash landed shortly after take-off from ABHA airport due to loss of engine power, the aircraft was total loss, both pilot and passenger survived the accident.

AIB Ref.#	Date	Location
AIB-2015-0217	20-Sep-15	Jeddah

B747-SP aircraft registration HZ-HM1B rolled over the technician's foot during nose gear tyres chocks removal.

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8. Investigations

The AIB investigators began the year 2015 with almost 18 On-Going investigations from the previous year. There are 341 Occurrences reported in year 2015, which has added a major workload on investigators. Figure 7 shows the number of investigated occurrences and the status of the investigations.

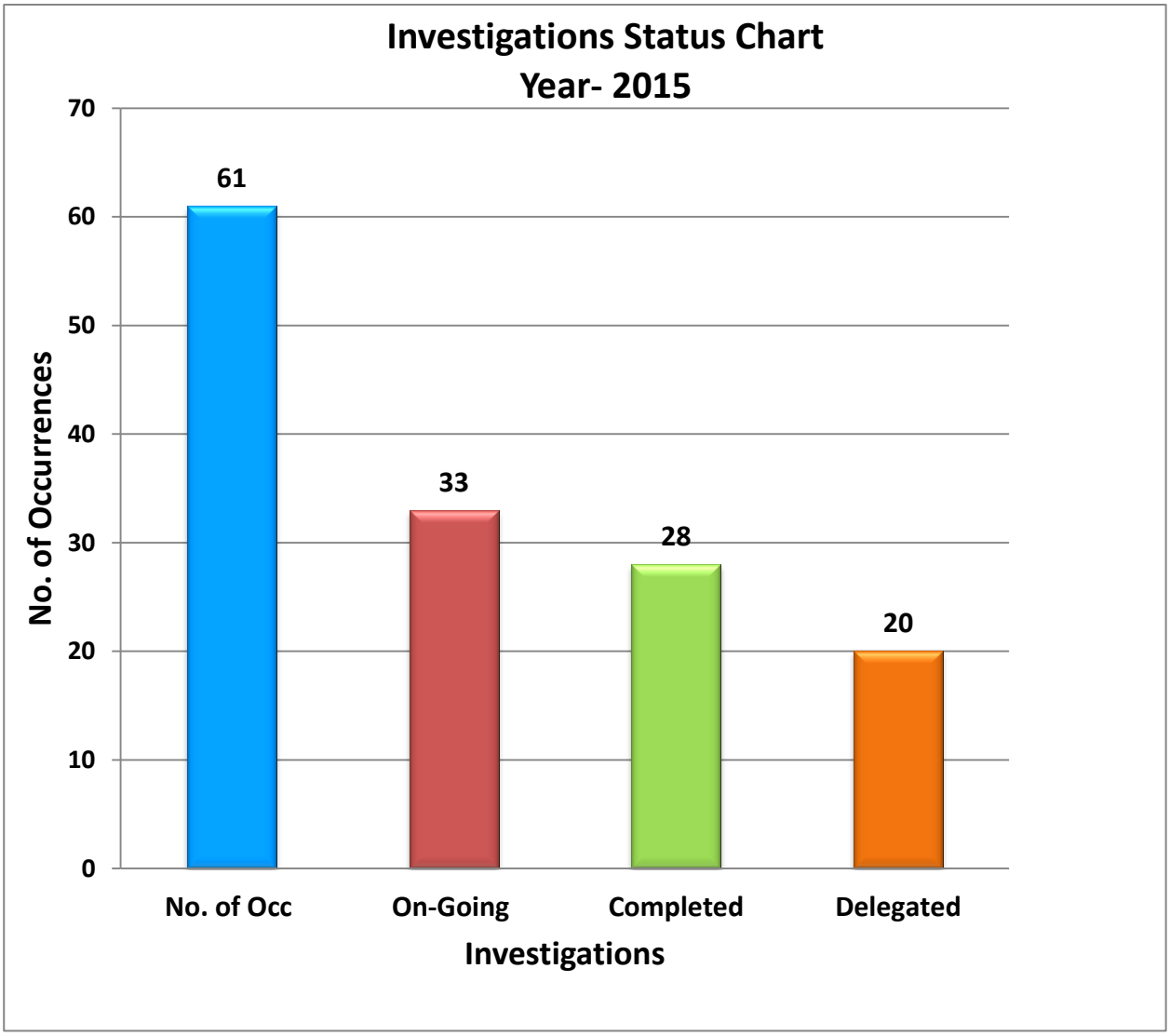

Figure 7: Investigations Status 2015 – Source: Safety Analysis Division - Aviation Investigation Bureau.

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8.1 Completed Investigations

AIB Ref.#	Occurrence Title	Comments
AIB-2013-0003	Unreliable Speed Indications	Investigation report completed, recommendations issued.
AIB-2013-0007	Turbulence-Injuries Inflight	Investigation report completed, recommendations issued.
AIB-2013-0013	TCAS -RA at MED	Draft final report submitted, under review by committee.
AIB-2014 0063	TCAS-RA at DMM airport	Investigation report completed, recommendations issued.
AIB-2014 0064	TCAS-RA at RUH ATCU	Investigation report completed, recommendations issued.
AIB-2014 0065	TCAS-RA at 23000 Ft at DMM ATCU	Investigation report completed, recommendations issued.
AIB-2014-0080	The aircraft at active RWY was given T/O clearance while another aircraft was at final.	Investigation report completed, recommendations issued.
AIB-2014-0103	NAS FLT 323 had TCAS-RA during take-off at TIF airport.	Investigation report completed, recommendations issued.
AIB-2014-0156	Landing Gear Damage SVA aircraft at MED airport	Investigation report completed, recommendations issued.
AIB-2014-0173	HZ-AS41 hard landing ABHA with PAX minor injury.	Draft final report under review
AIB-2014-0178	TCAS-RA OEJN to OKBK at FL350	Investigation report completed, recommendations issued.
AIB-2014-0184	Taxiway near collision	Investigation report completed, recommendations issued.
AIB-2014-0188	SVA aircraft had RWY excursion at manila airport.	Investigation report completed, recommendations issued.
AIB-2014-0191	TCAS-RA between SVA 1446 & SVA 1905 at RUH airport FIR	Investigation report completed, recommendations issued.
AIB-2014-0213	TCAS-RA between GFA172 and SVA 725 at JED FIR.	Investigation report completed, recommendations issued.

AIB Ref.#	Occurrence Title	Comments
AIB-2014-0218	TCAS-RA between SVA 1703 & KNE286 at RUH airport FIR	Investigation report completed, recommendations issued.
AIB-2014-0275	Qatari Private LSA aircraft made force landing on Road near to Al-Ahsa Airport	Investigation report completed.
AIB-2015-0006	Near Collision between SVA 1587 and aircraft call sign N5347	Executive summary submitted
AIB-2015-0026	TCAS –RA between GFA973 approaching position Sibli and ABQ471 east bound to JBL VOR.	Executive summary submitted
AIB-2015-0100	TCAS-RA between SVA 500 & AGY685 at RUH airport FIR	Investigation report completed, recommendations issued.
AIB-2015-0158	TCAS-RA between SVA 1864 & FD1817 at RUH airport FIR	Investigation report completed, Nuisance Occurrence
AIB-2015-0171	Loss of Separation between KNE463 & KNE7506 at MED airport FIR	Investigation report completed, recommendations issued.
AIB-2015-0202	TCAS-RA between SVA 1500 & KNE412 at JED airport FIR	Investigation report completed, Nuisance Occurrence
AIB-2015-0212	TCAS-RA between SVA 976 & RATOR (2F15) at DMM airport FIR	Military Investigation
AIB-2015-0217	B747-SP aircraft registration HZ-HM1B rolled over the technician's foot during nose gear tyres chocks removal.	SVA Royal Investigated Case
AIB-2015-0245	During push back damage the nose wheel	Delegated Investigation report completed.
AIB-2015-0297	TCAS-RA between SVA 1228 & BA236 at RUH airport FIR	Investigation report completed, recommendations issued
AIB-2015-0325	Flynas Aircraft returned From TAXI (VP-CXH) XY302 due to ENG#1 FIRE.	Draft report completed, under review

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9. Selected Investigation Synopsis

AIB-2015-0156

Embraer Phenom-505 aircraft (Fig.8) was on a private IFR flight from Milan, Italy, to Blackbushe, with the commander and three passengers on board. Following descent from its cruise level, it was handed over from controllers at London Control to Farnborough Approach. They provided a radar service to the aircraft, before instructing the pilot to contact Blackbushe Information, a few miles prior to its entry into the Blackbushe Aerodrome Traffic Zone. The weather at Blackbushe was fine with light and variable winds, visibility in excess of ten kilometres, and no low cloud.

Fig.8 Embraer Phenom-505 aircraft- Preliminary Report, AAIB-UK

HZ-IBM entered the left-hand circuit for Runway 25 via the crosswind leg. Toward the end of the downwind leg, it overtook a microlight aircraft, before climbing began, at approximately 1,000 ft above aerodrome level (aal), a TCAS ‘descend’ Resolution Advisory (RA) was presented to the pilot of HZ-IBN, to resolve a confliction with the microlight. The TCAS RA change to ‘maintain vertical speed’ and then ‘adjust vertical speed’, but these instructions may have been to resolve a second confliction with another aircraft which was above HZ—IBN, to the east of the aerodrome. Following this climb, HZ-IBN then descend at up to 3,000 feet per minute toward the threshold of Runway 25. The aircraft’s TCAS annunciate ‘clear of conflict’ when HZ-IBN was 1.1 nm from the runway threshold, at 1,200 ft aal at a speed of 146 KIAS, with the landing gear down and flap 3 selected.

The operator estimated that the landing weight was 6,522 kg. The aircraft manufacturer calculated that at this weight the target threshold speed was 108 KIAS.

The aircraft continued its approach at approximately 150 KAIS. Between 1,200 and 500 ft aal the rate of descend average approximately 3,000 fpm, and at 500 ft aal was 2,500 fpm. The aircraft's TAWS generated six 'pull up' warnings on final approach. The aircraft crossed the threshold of Runway 25 at approximately 50 ft aal at KIAS.

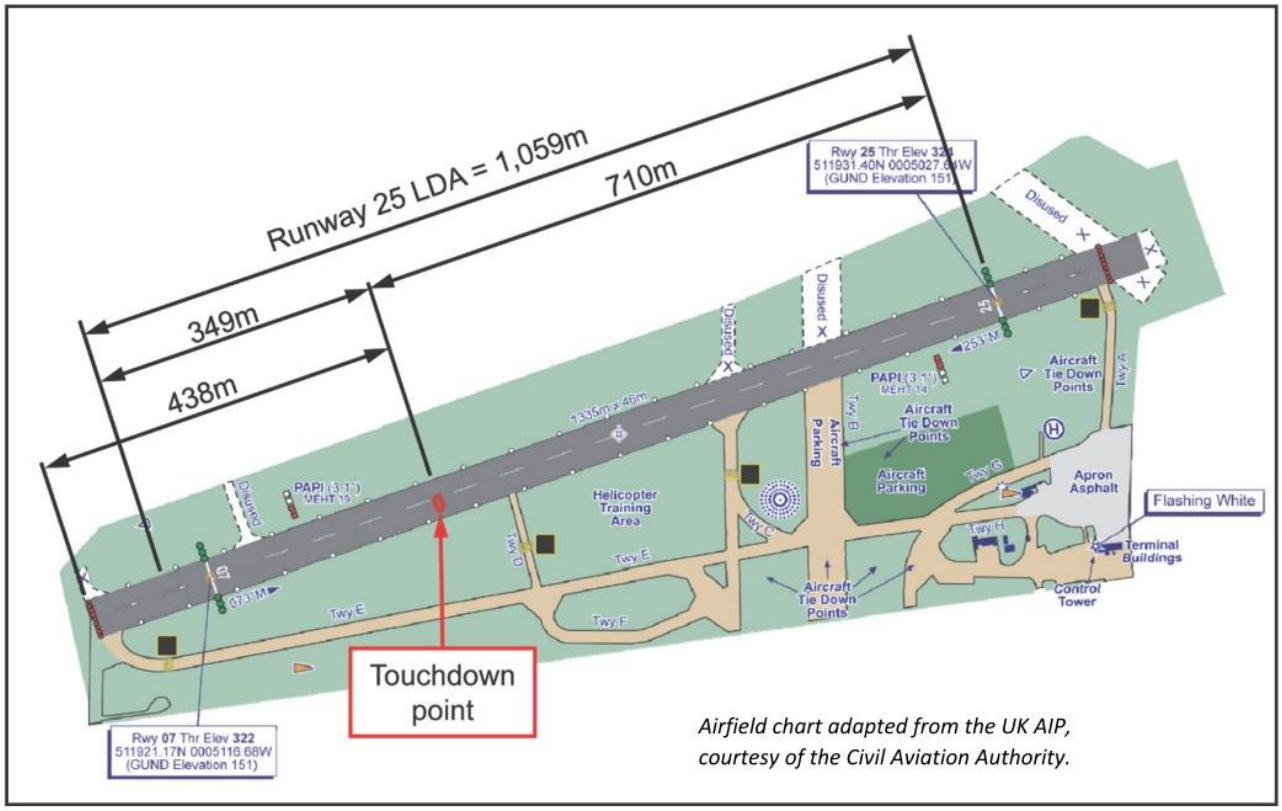

Fig. 9 Airfield chart Runway 25-Preliminary Report –AAIB-UK

Tyre marks made by the aircraft at touchdown indicated that it landed approximately 710 m beyond the Runway 25 threshold (Fig.9). Runway 25 has a declared Landing Distance Available (LDA) of 1,059 m; therefore the aircraft touched down approximately 349 m before the end of the declared LDA, 438 m before the end of the paved runway surface.

Data form the aircraft's CVFDR indicated that the groundspeed at the touchdown was 135 kt and the airspeed was 134 KIAS. The aircraft manufacture estimated that at this speed the landing ground roll required to stop the aircraft would be at least 616 m.

Accident site

The aircraft departed the paved surface at the end of Runway 25 approximately three meters to the left of the extended runway centreline. It then collided with a one meter high earth bank causing the lower section of the nose landing gear and the nose gear doors to detach. The aircraft became airborne again briefly, before colliding with several cars parked at an adjacent business and coming to rest approximately 70 meters beyond the parked at

an adjacent business and coming to rest approximately 70 meters beyond the earth bank. The aircraft's wing detached from the fuselage during the impact sequence and an intense fire developed shortly thereafter, consuming the majority of the aircraft. The aerodrome rescue and fire fighting service attended the scene, followed by local emergency services. The four occupants were fatally injured.

AIB-2015-0070

At approximately 14:30 hours on Thursday 09 April 2015 a microlight aircraft (fixed wings) weight-shift control s/n 122EB32056E08, took off from an unpaved dirt strip for a recreational flight at Jwatha area in Al-Ahsa city, eastern province carrying two persons on-board (Fig. 10).

Fig. 10 Microlight aircraft model –AIB Investigation Department

On the day of the accident the pilot prepared his microlight which was parked in a hanger located in Jwatha area in the city of Al- Ahsa in the eastern province. The area had two dirt strips used for take-off and landing depending on the wind direction.

Three seconds after aircraft was airborne, the landing gear struck 2.5 meter high sand dune and crashed. The aircraft was totally destroyed due to the impact. The pilot was fatally injured and the passenger received serious injuries. The Aviation Investigation Bureau was notified of the accident at approximately 17:50 Hours on 10 April 2016

The pilot positioned the aircraft at the Sothern part of the field, applied full throttle and started to perform take off. For an unknown reason he elected to take a diagonal path in the field to perform the take-off and not to use the correct airstrip (East to West) to be against wind direction (Fig. 11).

Fig. 11 Microlight aircraft take-off run-up in diagonal to runway-AIB Investigation Department

Due to the impact forces the cockpit and nose section of the aircraft were significantly disrupted and the damaging parts and the metal structure as shown in (Fig 12).

Fig. 12 Microlight aircraft after the accident-AIB Investigation Department

Findings:

- There was no evidence of technical failure of the aircraft that contributed to the accident.
- The aircraft take-off in the direction of cross winds.
- Takeoff roll did not utilize the full length of runway strip.

AIB-2015-0157

The Operator of the Cessna 182M, Registration G-AXNX (Fig. 13) as registered in the authorization issued by GACA was the Land & Space Aviation, Thumamah – Riyadh, Kingdom of Saudi Arabia.

Fig. 13 Cessna 182N at the ABHA airport before take-off – Source: picture collected by AIB investigators from operator during investigation

On 02August 2015, G-AXNX with two (2) occupants on board conducted a segment of a planned route from Thumamah Airport (OETH) to Abha Airport (OEAB). The flight plan was filed and flown using registration HZ- LS3 which is for a Maule Aircraft owned by Land & Space Aviation. At 1314hrs, G-AXNX departed from Abha Airport (OEAB) with four (4) occupants on board heading to Al-Habala Airstrip 24/06, the location of the Al-Habala Aviation Club.

Based on the pilot statement, G-AXNX landed on Runway 24at 1328hrs and taxied to the Aviation Club hangar. Two (2) passengers were off loaded. Shortly after off-loading the two passengers, G-AXNX departed Runway 24to conduct an exploration circuit around the Aviation Club.

Immediately after take-off and at approximately 70 feet AGL, the pilot experienced a loss of engine power and was unable to maintain altitude. The pilot manoeuvred the aircraft to avoid power lines and at a lower altitude decided to stall the aircraft and

force landed on a flat spot in the mountainous terrain at approximately 1270 feet beyond the end of the runway.

Fig. 14 Cessna 182N aircraft post-crash- Source : AIB Investigation Department

The aircraft impacted the rocky terrain before it settled on the planned designated hard spot. The two occupants survived the accident with no reported injuries. The aircraft sustained substantial damage. (Fig 14) The Saudi Civil Defence unit and the local police arrived at the site approximately 30 minutes after event.

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10. Safety Recommendations

In accordance with the AIB Regulations Chapter 8, paragraph 8.2, the AIB recommend corrective or remedial actions as a result of investigations or safety studies for the purpose of preventing further aviation occurrences. If during the course of an investigation any safety deficiency becomes known for which prompt preventative action is required, then it will be addressed through a Stand-Alone Recommendation (SAR) in accordance to AIB Regulation Chapter 6, paragraph 6.3.

The recommendations are usually broad in application to allow the addressees of the recommendations to have some discretion in implementing specific remedial actions.

All Safety recommendations are transmitted by the AIB to the concerned Organizations as a result of Chairman Board of Directors- General Authority of Civil Aviation (GACA) approval.

Responding to Safety Recommendations

This annual Report contains progress and status of all Safety Recommendations made by the AIB during 2015 including those Safety Recommendations issued during previous years in 2013 and 2014.

Status of the Safety Recommendations are categorised in to the following categories:

1. Accepted – CLOSED:

   Appropriate action is implemented or planned to be implemented.

2. Rejected – OPEN:

   Further action is required.

3. Rejected – CLOSED:

   Rejected for acceptable reasons not known at the time of publication (No further action by AIB).

4. Response awaited - OPEN

5. Superseded – CLOSED

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10.1 Safety Recommendations Status

Safety Recommendation		
Safety Recommendation AIB-2013-0001-SR-01	**Status Accepted – CLOSED**	**Assigned To: S.A.E.I.**
It is recommended that the Operator replaces all stands, platforms and ground equipment to meet industry standards; furthermore it is recommended that the Operator provide a corrective action plan to comply with the recommendation within a timeframe that is acceptable to the Regulator.		
Safety Recommendation AIB-2013-0001-SR-02	**Status Accepted – CLOSED**	**Assigned To: Saudi Airlines**
Corporate Safety & QA – It is recommended that Corporate Safety conducts an internal corporate investigation into why the role of S.A.E.I Plant and Equipment Maintenance was not fulfilled in regards to vehicle and equipment standards and determine whether the department was bypassed or whether it was a result of a systematic error.		
Safety Recommendation AIB-2013-0001-SR-03	**Status Accepted – CLOSED**	**Assigned To: Saudi Airlines**
Corporate Safety & QA - It is recommended that the Operator identifies and corrects the reasons the contract with the external service provider was not developed in accordance with its established procedures requiring it to specify the safety and quality standards and identifiable measurable specifications for the purpose of monitoring.		
Safety Recommendation AIB-2013-0001-SR-04	**Status Accepted – CLOSED**	**Assigned To: S.A.E.I.**
It is recommended that the Operator effectively implements its processes to monitor all external service providers.		
Safety Recommendation AIB-2013-0001-SR-05	**Status Accepted – CLOSED**	**Assigned To: S.A.E.I.**
It is recommended that the Operator ensures all External Service Providers employees conducting technical functions, receive adequate training before they are assigned to safety critical functions.		
Safety Recommendation AIB-2013-0001-SR-06	**Status Accepted – CLOSED**	**Assigned To: GACA**
It is recommended that GACA conduct an inquiry to determine the reasons why the maintenance provider did not comply with the Regulator's instructions to remove unsafe platform, stands and ground equipment with a corrective action plan as instructed by GACA S&ER Airworthiness on several occasions.		
Safety Recommendation AIB-2013-0001-SR-11	**Status Accepted – CLOSED**	**Assigned To: Saudi Airlines**
It is recommended that the recommendations made in the Final Report of the Operator be		

implemented by those concerned.		
Safety Recommendation AIB-2013-0002-SR-01	**Status Accepted -Closed**	**Assigned To: EASA**
The AIB recommends that Airbus evaluate methods to inspect the nose landing gear up-lock to verify the condition of springs, P/N GA71102.		
Safety Recommendation AIB-2013-0005-SR-01	**Status Response awaited - Open**	**Assigned To: GACA**
The General Authority of Civil Aviation should immediately comply with recommended practice in ICAO Doc 4444 (ATM/501 Fifteenth Edition – 2007 Procedures for Air Traffic Services, Air Traffic Management) paragraph 15.7.2.4 concerning retaining and analysing electronic records of STCA activations.		
Safety Recommendation AIB-2013-0005-SR-02	**Status Response awaited - Open**	**Assigned To: GACA**
The General Authority of Civil Aviation should take immediate corrective action by using data from recommendation AIB-2013-0005-SR-01 to analyse electronic records of STCA activations, identify specific causes for alerts and false alerts, and find opportunities to make changes to software and adaptation to minimize false and nuisance STCA activations.		
Safety Recommendation AIB-2013-0005-SR-03	**Status Response awaited - Open**	**Assigned To: GACA**
The General Authority of Civil Aviation should examine the aural and visual presentation of STCA, CLAM and RAM and consider a way to clearly distinguish high risk STCA warnings from CLAM, RAM and other warnings of less immediate threats.		
Safety Recommendation AIB-2013-0005-SR-05	**Status Response awaited - Open**	**Assigned To: GACA**
The General Authority of Civil Aviation should develop and implement an oversight program to support ATC supervisors in their management of daily shift duties. This may include managing sector opening/closing and relief breaks, and an internal monitoring system to ensure supervisors enforce fundamental rules of controller comportment.		
Safety Recommendation AIB-2013-0005-SR-06	**Status Response awaited - Open**	**Assigned To: GACA**
The General Authority of Civil Aviation should develop and implement a comprehensive Fatigue Management System for air traffic controllers. Such a system should incorporate training for managers and staff of personal fatigue management techniques, and gather data to identify optimum practices to manage fatigue. Such a system should immediately deliver basic fatigue management guidance to controllers.		
Safety Recommendation AIB-2013-0169-SR-01	**Status Response awaited - Open**	**Assigned To: GACA-ANS**
The responsible entity shall take action to rectify the STCA system in Air Traffic Control		

Centres in Riyadh and Jeddah and shall regularly ensure its effectiveness.		
Safety Recommendation AIB-2013-0169-SR-02	**Status Response awaited - Open**	**Assigned To: GACA-ANS**
The AIB shall conduct a workshop as part of the current Air Traffic Control Safety study to assess the effectiveness of the current KSA airspace structure and the relevant safety risks to propose restructuring. The workshop shall involve the relevant parties from GACA.		
Safety Recommendation AIB-2014-0277-SR-01	**Status Response awaited - Open**	**Assigned To: GACA-ANS**
Air traffic department to re-evaluate and train concerned traffic controller prior to rescheduling him to practice he duties and temporary suspend him during AIB investigation as per VP-ANS letter.		
Safety Recommendation AIB-2014-0277-SR-02	**Status Response awaited - Open**	**Assigned To: GACA-ANS**
KFIA traffic control unit to activate its supervisory role to carry out instructions related to distribution and scheduling of work load.		
Safety Recommendation AIB-2014-0277-SR-03	**Status Response awaited - Open**	**Assigned To: GACA-ANS**
Safety and Quality Assurance department within (ANS) should evaluate the technical defects on radar components and TCAS-RA warning system.		
Safety Recommendation AIB-2014-0277-SR-04	**Status Response awaited - Open**	**Assigned To: GACA-ANS**
Navigation Safety System department to activate frequent random inspections of traffic control unit.		
Safety Recommendation AIB-2014-0277-SR-05	**Status Response awaited - Open**	**Assigned To: GACA-ANS**
Licensing department within Safety and Aviation Transportation Division to issue required licenses to OJT aviation control trainers and to ensure their participation in supervising licensing examinations.		
Safety Recommendation AIB-2014-0277-SR-06	**Status Response awaited - Open**	**Assigned To: GACA-ANS**

Safety and Quality Assurance in ANS Division to revaluate the KAIA Air Control Unit on job training program and do necessary corrective action to direct aircraft at final approach stage to prevent frequent missed approaches.

Safety Recommendation AIB-2014-0277-SR-07	Status Response awaited - Open	Assigned To: GACA-SAT

VP Safety and Air Transport shall ensure that all personnel in his division provide support and information in compliance to the AIB Regulation.

Safety Recommendation AIB-2015-0026-SR-01	Status Response awaited - Open	Assigned To: GACA-ANS

The Safety and Quality Assurance in ANS Division should review the phraseology for imperative instructions to ensure that the desired actions are immediately understood by the flight crew for expeditious compliance.

Safety Recommendation AIB-2015-0026-SR-02	Status Response awaited - Open	Assigned To: GACA-ANS

The Safety and Quality Assurance in ANS Division should incorporate this part of Human Factors in Refresher Training so that controllers may be better prepared for these reactions.

Safety Recommendation AIB-2015-0026-SR-03	Status Response awaited - Open	Assigned To: GACA-ANS

The Safety and Quality Assurance in ANS Division, as a component of the Unit Preliminary Investigation, occurrences involving Loss of Separation or other significant event should be reviewed by a Training Manager and/or Supervisor to ensure that there are no knowledge or skills gaps. Should any be noted during this review then appropriate, non-punitive corrective action can be taken coincident with the ATCO's return to duty.

Safety Recommendation AIB-2015-0026-SR-03	Status Response awaited - Open	Assigned To: GACA-ANS

The Safety and Quality Assurance in ANS Division, as a component of the Unit Preliminary Investigation, occurrences involving Loss of Separation or other significant event should be reviewed by a Training Manager and/or Supervisor to ensure that there are no knowledge or skills gaps. Should any be noted during this review then appropriate, non-punitive corrective action can be taken coincident with the ATCO's return to duty.

Safety Recommendation AIB-2015-0026-SR-04	Status Response awaited - Open	Assigned To: GACA-ANS
The Safety and Quality Assurance in ANS Division, should review the practice of "penalizing" ATCOs who have experienced an Operating Irregularity, such as the "Black Mark" on personal record with the aim to ensure and maintain a climate of open reporting.		
Safety Recommendation AIB-2015-0100-SR-01	**Status Response awaited - Open**	**Assigned To: GACA-ANS**
The General Authority of Civil Aviation, ANS, should develop and deliver an educational training module on "Aircraft Flight Performance" and Flight Deck Operation to understand how flight crew react to normal and abnormal flight situations.		
Safety Recommendation AIB-2015-0100-SR-02	**Status Response awaited - Open**	**Assigned To: GACA-ANS**
The General Authority of Civil Aviation, ANS, should ensure the process of monitoring and alerting controllers, supervisors and Unit Management of validity dates of licence validation certifications (Licence, Medical and English Language Proficiency). This alerting would include notification to ensure that no controller is permitted to assume an operational position without the required validations.		
Safety Recommendation AIB-2015-0100-SR-03	**Status Response awaited - Open**	**Assigned To: GACA-ANS**
The General Authority of Civil Aviation, ANS, should undertake a Hazard Identification and Risk Assessment of the use of Bi-Directional Airways.		
Safety Recommendation AIB-2015-0100-SR-04	**Status Response awaited - Open**	**Assigned To: GACA-ANS**
The General Authority of Civil Aviation, ANS, should undertake a program of Random Audio/Radar Playback Review no less than yearly to assess controller Skill, Adherence to Approved Phraseology, Use of Approved Procedures, Operational Proficiency. This review would include (at minimum) a controller/assessor debrief as well as a corrective action plan for any noted deficiencies.		
Safety Recommendation AIB-2015-0171-SR-01	**Status Response awaited - Open**	**Assigned To: GACA-ANS**
The General Authority of Civil Aviation (GACA) , Air Navigation Services should provide the AIB with corrective actions (planned, initiated or completed) to address identified contributing and other factors (CF1- CF 6 and OF1). Details of actions to include Completion dates or planned and estimated completion dates.		
Safety Recommendation AIB-2015-0297-SR-01	**Status Response awaited - Open**	**Assigned To: GACA-ANS**
GACA-ANS should provide the AIB with corrective actions (planned, initiated or completed) to address identified contributing factors (CF1, CF2 and CF3) and other factors (OF1, OF2 and OF3). Details of actions to include Completion dates or planned and estimated completion dates.		

10.2 Stand-Alone Recommendation

Stand-Alone Recommendation AIB-2014-0039-SAR-04	Status ACCEPTED - CLOSED	Assigned To: Saudi Airlines
Review the fact that the avionics compartment door accessible from forward cargo bay and conduct a hazard analysis and determine whether mitigation is required through operational or security procedures (within 10 working days).		
Stand-Alone Recommendation AIB-2014-0039-SAR-05	**Status Response awaited - Open**	**Assigned To: Saudi Airlines**
Required any Operator conducting flights for the Operator through lease to comply with AIB-2014-0039-02, AIB-2014-0039-03, AIB-2014-0039-04.		
Stand-Alone Recommendation AIB-2014-0039-SAR-06	**Status ACCEPTED - CLOSED**	**Assigned To: GACA**
GACA notifies all Operators engaged in commercial air transport, holding an Air Operator Certificate (AOC) issued by the General Authority of Civil Aviation or who have aircraft registered in the Kingdom of Saudi Arabia that operate B-777 or B-767 or any aircraft in which the avionics compartment or aircraft which have avionics compartment which are accessible from the cargo bays of the security hazard associated and to comply with AIB recommendations AIB-2014-0039-02, AIB-2014-0039-03, AIB-2014-0039-04, AIB-2014-0039-05.		
Stand-Alone Recommendation AIB-2014-0056-SAR-02	**Status ACCEPTED - CLOSED**	**Assigned To: GACA**
Employee shall attend KAIA remedial drivers training.		
Stand-Alone Recommendation AIB-2014-0154-SAR-01	**Status ACCEPTED - CLOSED**	**Assigned To: GACA-ANS**
Provide necessary training to enhance the skills of the trainers in the ATC units.		
Stand-Alone Recommendation AIB-2014-0154-SAR-02	**Status Response awaited - Open**	**Assigned To: GACA-ANS**
Certify all trainers in accordance to the requirements in ICAO Annex 1		
Stand-Alone Recommendation AIB-2014-0156-SAR-01	**Status Response awaited - Open**	**Assigned To: Saudi Airlines**
Review the procedures for issuance and implementation of engineering orders for relevant to rectification or precautionary measures to ensure expeditious and timely responses that would avoid re-occurrence and enhance safety.		

Stand-Alone Recommendation AIB-2014-0168-SAR-01	Status Response awaited - Open	Assigned To: GACA
Prohibit flight crewmembers from using a portable electronic device for non-operational use while at their duty station on the flight deck while the aircraft is being operated.		
Stand-Alone Recommendation AIB-2014-0168-SAR-02	**Status Response awaited - Open**	**Assigned To: GACA**
Require all operators to incorporate into their initial and recurrent pilot training programs information on the detrimental effects that distraction due to the non-operational use of portable electronic devices can have on performance of safety-critical ground and flight operations.		
Stand-Alone Recommendation AIB-2014-0168-SAR-03	**Status Response awaited - Open**	**Assigned To: GACA**
Require all operators to review their respective general operations manuals to ensure that procedures are in place that prohibit the non-operational use of portable electronic devices by operational personnel while in flight and during safety-critical preparatory and planning activities on the ground.		

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11. Flight Recorders Lab (FRL) Activities

During the year 2015 Flight Recorders LAB has downloaded and analysed data for twenty (20) recorders. The product of these analysed factual data are plots, excel sheet text data tables, audible sessions conducted in CVR LAB are formulated in report format to be injected in investigations final report.

Period	KSA Registered Aircraft	Foreign Registered Aircraft	Occurrences in KSA	Occurrences Abroad	Recorders Downloaded and Analyzed
1st Quarter	6	0	6	0	10
2nd Quarter	0	0	0	0	0
3rd Quarter	0	2	2	0	4
4th Quarter	4	0	4	0	6

Date	Occurrence Title	Flight Data Recorder	Cockpit Voice Recorder
15-Jan	APU fire indication in NAS aircraft XY413-VP-CXC at JED	Downloaded	NO
18-Jan	NAS Aircraft TCAS-RA	Downloaded	NO
26-Jan	Loss of Engine #01 cowling of NAS aircraft at JED airport	Downloaded	Downloaded
19-Feb	During taxing HZ-ASO by maintenance personnel one the Royal Air Morocco service car crashed into the engine cowling.	Downloaded	Downloaded
25-Feb	Loss cowling on Take-Off SVA HZ-AIX at JED airport	Downloaded	Downloaded
22 Mar	Loss of Directional Control- Aileron Control Cable Broken SVA HZ-AEK	Downloaded	Downloaded
03-Sep	Korean Aircraft, return from Flt due to Engine No. 1 was In-Flt-Engine-Shutdown, Flt No. KE962 Reg. HL8211	Downloaded	Downloaded
03-Sep	Egypt Air aircraft diverted to PMIA due to Hyd system Failure	Downloaded	Downloaded
01-Oct	Aircraft Reg. HZ-WBT Returned from flight due to Eng2 over heat	Not Equipped	Downloaded
07-Oct	VIP Flt, returned from flight due to engine shut down	X	Downloaded
10-Nov	HZ-S34 Hard landing	Downloaded	Downloaded
15-Dec	VP-CXH Engine smoke during flight	Downloaded	Downloaded

The AIB FRL not only supports occurrences investigations in Kingdom of Saudi Arabia but also supports the accidents/incidents investigations in Middle East and South Asia region. Further enhancement to the capabilities of the FRL will recognise the AIB FRL to be one of the best LAB in the world

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12. Safety Study

Safety Study	Description	Status
RAMP	Ground Damage Safety Study	On-Going

Scope of work:

Ground Occurrences that took place in KSA airports through all types of operations including but not limited to commercial/ noncommercial, scheduled/ none scheduled and general aviation during 2014/ 2015, shall be analyzed, identify the contributing factors, risk mitigation and reduce the occurrences to acceptable level.

Progress:

Meeting was conducted which involved GACA-Safety and Transport, Safety Department Domestic and International, Safety Operations Department from KAIA, KKIA, PMIA and KFIA. There were discussion about current issues with service providers in terms of personnel qualifications and training, equipment periodic inspections and the cost analysis during damage to the aircraft.

In Accordance With (IAW) initiative 5.9 Ground Incidents Reporting, the AIB will be heading a working group (Quantify Ground Incident and Financial Impact) to:

- Establish a central database platform to collect all the Ground Damage Occurrences.
- Gather information from different available sources on Ground Occurrences that occurred in KSA airports during 2014 and 2015 and retain it in centralized database.
- Review and analyze Ground Occurrences data to identify root causes and contributing factors in order to support developing mitigation measures.
- Establish and agree on calculation standards and methods to estimate direct and indirect cost of Ground Occurrences.
- Assess the existing standards and regulations that regulate all aspects of ground support services such as personal and equipment certifications, personnel training and qualification, quality audits and oversight.
- Establish a mechanism to ensure a continuous provision of Ground Occurrences information to update the centralized database for developing related annual reports .
- Provide stakeholders with the Working Group final report containing all aspects related to the Ground Occurrences meetings such as contributing factors, mitigation measures and recommendations.

13. Safety Issues & Concerns

The AIB will be monitoring certain occurrences categories which are mostly quantitative but more initiatives are planned to mitigate the current escalating trends. The three (3) most notable areas of concern are identified in Fig 15.

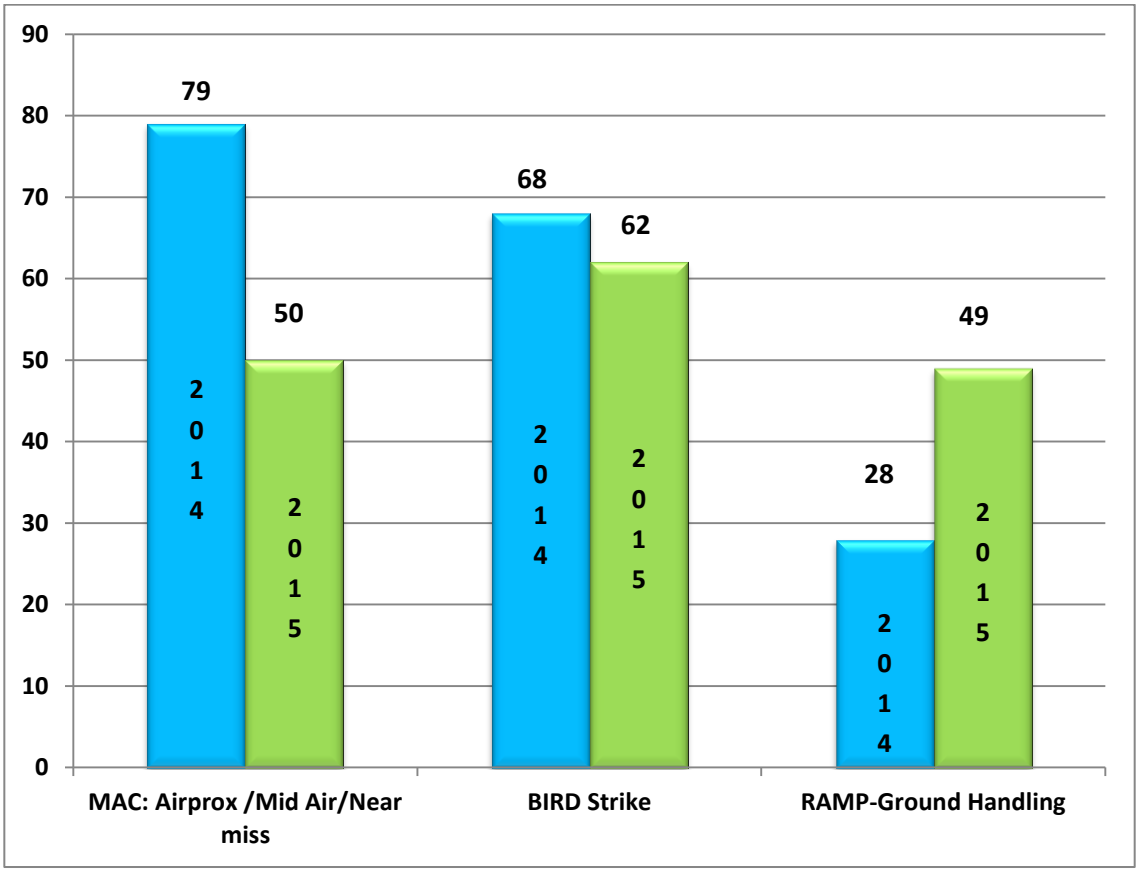

Fig 15: Top three occurrences categories year 2014-15– Source: Safety Analysis Division - Aviation Investigation Bureau

13.1 RAMP- Ground Handling

During 2014-15, there was a noticeable increase in incidents involving ground handling services. This includes catering trucks, airplane tugs and baggage vehicles colliding with serviced aircraft. In some cases, it resulted in serious injuries and/or significant damage to aircraft. Analysis of the occurrences show that the main causes were:

1. Equipment operators were not following proper operating procedures due to lack of knowledge or cutting corners.
2. Equipment failure due to poor maintenance.
3. Lack of supervision

The chart (Fig16) for ground occurrences in-kingdom international airports (data provided by the ground handling services company) shows frequency of occurrences by airport.

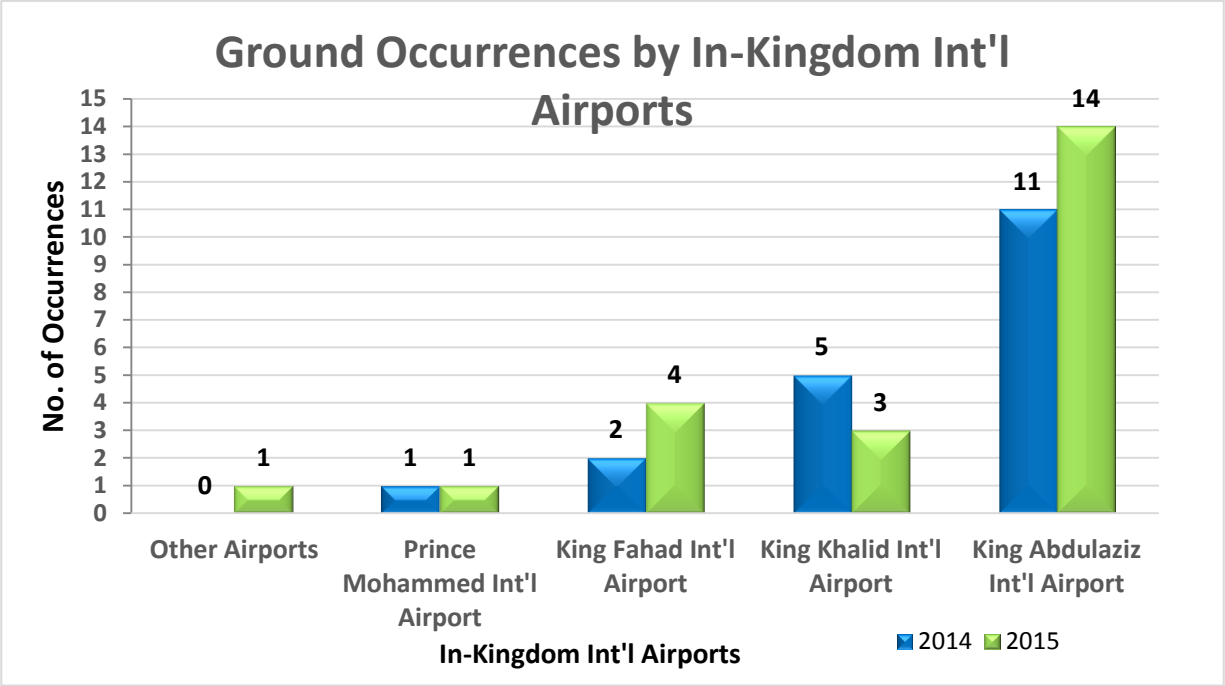

Fig.16. Ground Occurrences by Int'l Airports –Source: Ground Handling Service Provider

The main contributing factors in ground occurrences are shown in (Fig. 17).

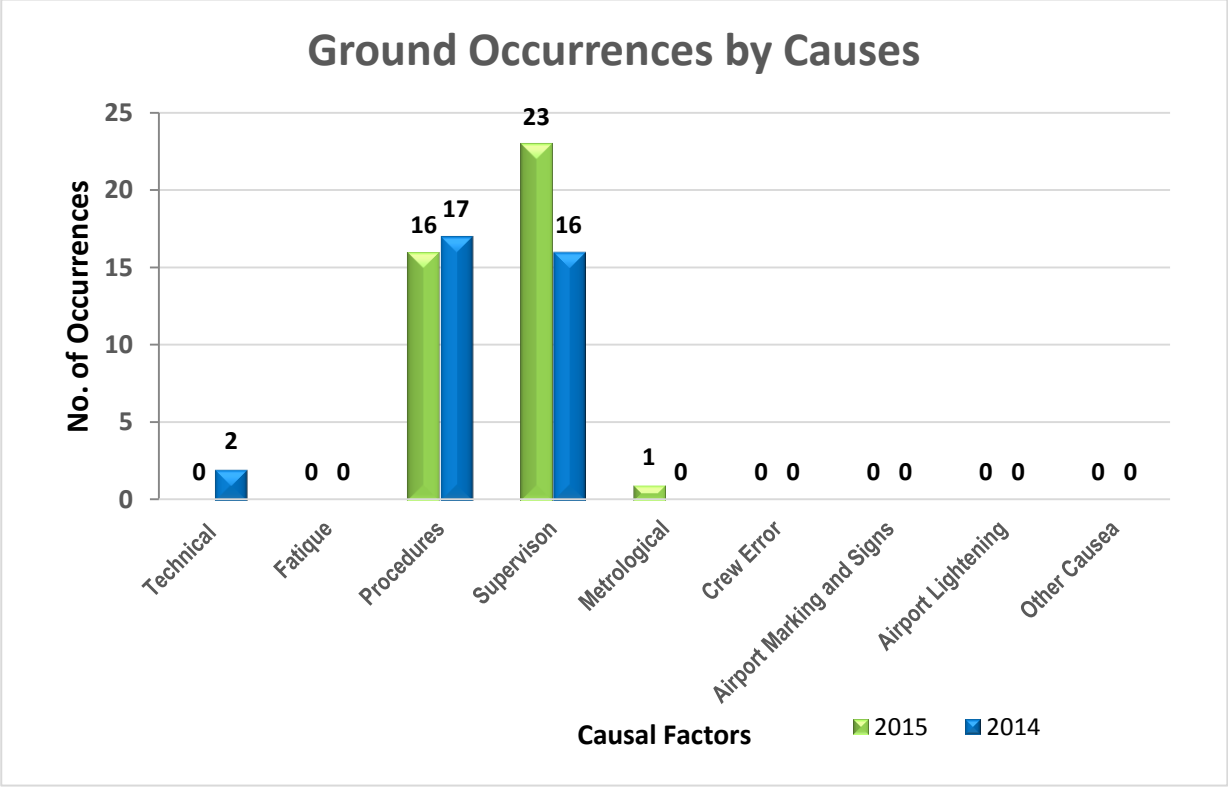

Fig.17. Ground Occurrences by Int'l Airports –Source: Ground Handling Service Provider

Minimizing the ground handling related occurrences requires a number of mitigation measures. Some of the identified measures are:

1. Airport operators need to review their respective airside driver's licensing programs;
2. The ground handling provider has to ensure the competence of operators for their assigned tasks;
3. The ground handling provider has to ensure proper supervision for their operation;
4. Airport operators should implement effective inspection programs to ensure ground handling equipment are safe for their operations

13.2 Bird Strike

During the year 2014 sixty eight (68) and in the year 2015 sixty two (62) occurrences of bird strike to the aircrafts has been reported. The damage to the aircraft was reportedly minor and all the occurrences were consequently not serious in nature.

Most bird strikes occurred during the months of September, October and November which coincides with the seasonal birds migration period.

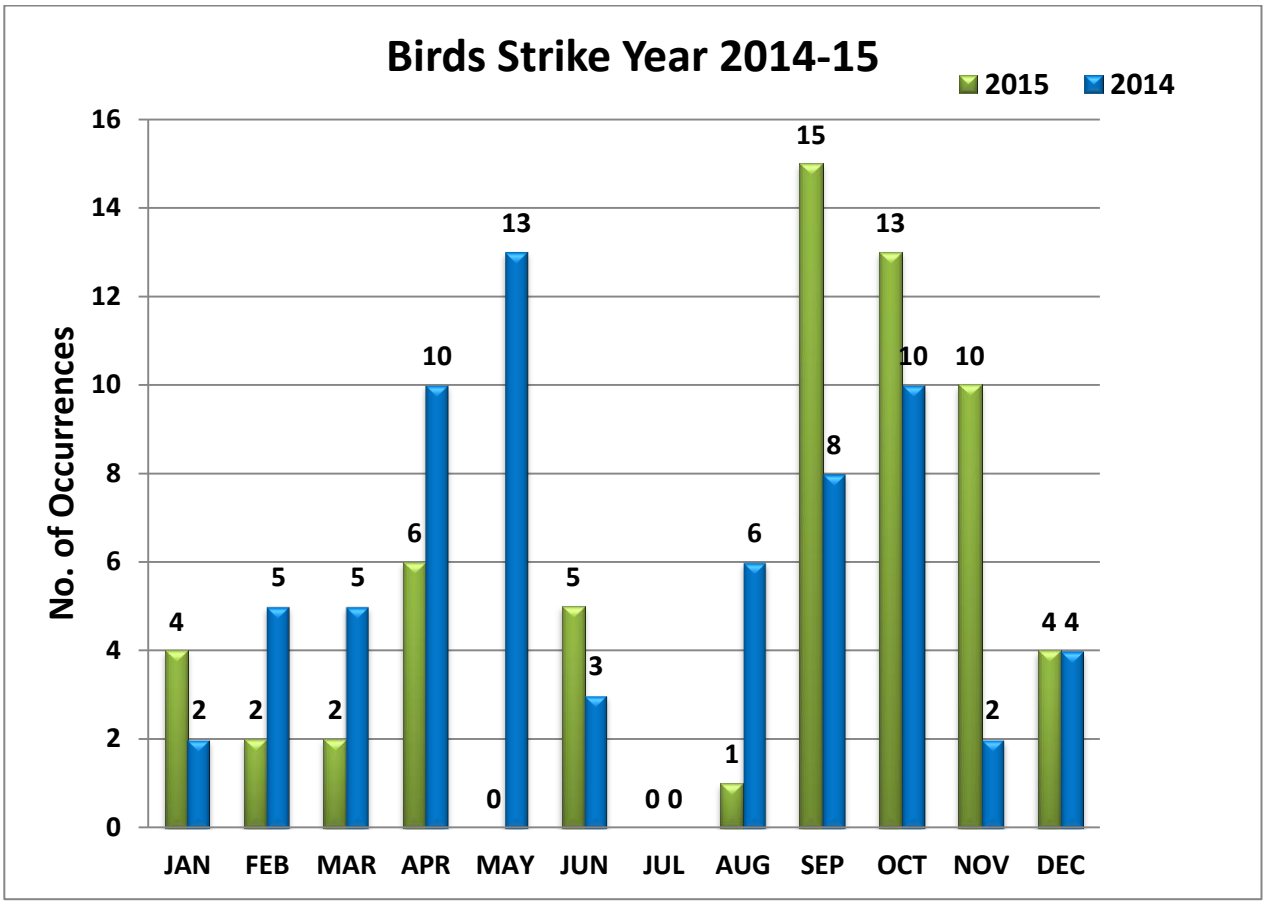

Fig.18. Birds Strike Monthly Occurrences Chart for Year 2014-15-Source : AIB Safety and Analysis Dept.

The Bird Strike Safety Study will be continuing utilizing research and outreach programs with airports having the greatest number of bird strikes as the AIB wishes to stay ahead of the issue.

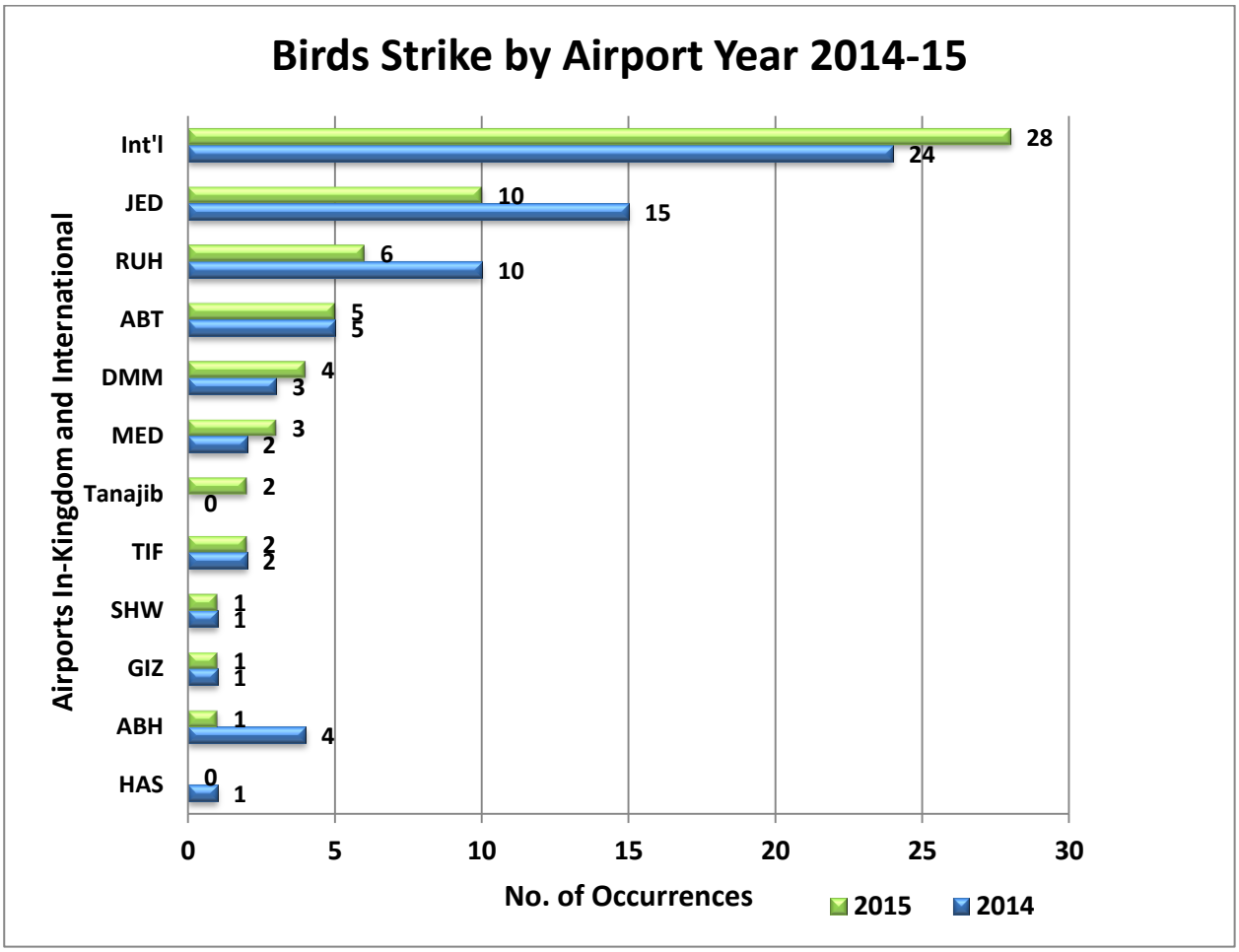

Fig.19. Birds Strike Occurrences Chart by Stations for Year 2014-15-Source : AIB Safety and Analysis Dept.

13.3 MAC: Airprox/Mid Air/Near Miss

The AIB had issued numerous safety recommendations on this subject matter. In addition, two days workshop was organized on 11th and 12th May 2015 involving all the relevant stakeholders, Air Traffic Control Units, aircraft operators, GACA-ANS and GACA-SSAT.

The purpose of the workshop was to address and highlight the noticeable rise in the number of TCAS RA incidents in KSA airspace and to discuss and promote safety and efficiency enhancement to the current KSA airspace structure, participants were given opportunity to share and present their experiences, challenges or issues related to Saudi Airspace.

The outcome of the workshop was a list of recommendations addressing organisational, procedural, technical and work environment issues, aiming to achieve the safety and efficiency enhancement in the KSA airspace.

14. Development

14.1 Underwater Wreckage Recovery

The Kingdom of Saudi Arabia has a coastline on the Red Sea and the Arabian Gulf area. The kingdom may face the responsibility of having to conduct an investigation into the loss of an aircraft in its territorial waters or on the high seas. As per the ICAO requirement and guidance material to acquire the capability for Underwater Wreckage Recovery are as stated below:

“ICAO Doc 9756 Part I- *Organization and Planning*, urges the investigation authorities to acquire capabilities in locating underwater aircraft wreckage and flight recorders. This capability is shared among various bodies within a State, and sometimes with other States. As advised by Doc 9756, the investigation authority shall utilise the expertise of naval authorities, marine salvage services and the accident investigation authorities of other experienced States.”

Fig 20. ALAZIZI Scientific Sea Research and Recovery Ship. Source: King Abdulaziz University

The AIB being the sole entity to perform the investigation takes the responsibility of wreckage plotting and recovery Flight Data Recorders.

Several underwater search methods can be used depending on the depth of water in which the wreckage is lying. Divers can search to a depth of 60 meters or less, but the following equipment should be considered for deeper water, or for more difficult situations:

- underwater equipment used to locate the wreckage;
- locating devices mounted on the flight recorders;
- underwater videos and cameras;
- side-scan sonar equipment; and
- manned or unmanned submersibles

Investigation authorities will not generally be able to conduct as investigation having an underwater dimension without external assistance of expertise. AIB identified the potential partners and sources of assistance within the kingdom of Saudi Arabia.

The decision as to whether to recover the wreckage or not depends on many factors. Among these factors are: the need for the wreckage as evidence, and the financial feasibility of recovery. As a minimum, the State shall always endeavor to recover the flight recorders.

To develop relationship with potential partners AIB has established communication and signed memorandum of understanding (MoUs) with King Abdulaziz University (KAU) and King Abdullah University of Science and Technology (KAUST).

These partners have procured equipment and sea vessels specific to research and recovery. There is continues coordination to implement the roles and responsibility by conducting drills to ensure the best outcome.

The MoU with KAU enabled the AIB to request the research ship AlAzizi (Fig. 14) and the state of art advance technology equipped on this ship. The experts trained on ship will facilitate the mapping and underwater scanning to plot the dimensions of the wreckage in case of aviation sea disaster, in addition to the collaboration in sea search and drills to ensure the readiness and availability.

14.2 Investigative Equipment Acquisition & Management

In the year 2015 AIB manage to procure sophisticated equipment to support the aerial photography, photogrammetry and scanning of the accident/incident site. The equipment which are purchased are Unmanned Aircraft Systems (UAS) or Drones and Faro scanners.

Aerial Photography

Aerial photos in Accident Reconstruction provide a highly accurate basis for evidence documentation, scene analysis, and reconstruction calculations. Aerial photographs are a viable alternative to standard accident scene practice.

Broad spectrum aerial photography is a useful and practical tool in aircraft accident investigations. Soil disruption patterns, wreckage distribution, burn areas and fuel dispersion patterns often appear in greater contrast and detail in infrared photographs. Analysis of false color infrared photographs may reveal missing aircraft parts and subtle evidence of tree strikes. Special infrared properties allow early detection of foliage changes due to hydrocarbon toxicity and heat damage.

The AIB has procured drone to capture the aerial photography of an accident/incident site in kingdom of Saudi Arabia. The staff is qualified and training to conduct this operations with registered license provided by GACA –SSAT.

The AIB sustain the equipment reliability and retention process and the qualified staff consistently practices their skills to keep current and ready for any operations.

Fig. 21 Unmanned Aircraft System (UAS) or Drone

Laser Scanners:

Laser scanners are fragment of investigative tools utilized by the investigators during any aviation accident/serious incidents. The products of these scanners not only help investigators in capturing visual three dimensional image but also provide them with precise measurement of size of the objects and aircraft parts, geographic location (via Global Position System (GPS) at which located or found and the distance between each part they were located at the accident site.

The amount of time investigators used to spend to capture the site on their photo cameras will reduced drastically as these scanners capture complete site within two to three hours. The processing time for the capture images and video needs one day to produce three dimensional imagery products.

There are plenty of different products available in the market which can be utilized as investigative tools, the AIB investigators team analyzed the specifications of laser scanners available and selected two types:

1. FARO Laser Scanner Focus -3D-X
2. FARO Laser Scanner Freestyle 3D-X

Fig.22 FARO Laser Scanner Focus -3D-X

When creating accident reconstructions, the sooner and faster the scene can be recorded, the better. With a 3D laser scanner from FARO, crash investigators can quickly record vast amounts of data and bring the virtual scene back to the office. Lines of sight, for example, be analysed from various vantage points or the scan data compared with OEM CAD files for aircraft deformation analysis. An accident animation may be possible in order to simulate the actual event.

3D laser scanning technology from FARO supports investigator by saving time and generating superior deliverables. All these minute detailed information from the accident site provide investigators information, which makes them produce reports more comprehensive.

Fig. 23 FARO Laser Scanner Freestyle 3D-X

15. Projects

15.1 AIB Engineering Laboratory Project

AIB has identified the specific tasks that require lab areas with special equipment and training requirements. The lab areas are teardown, avionics, photography, material analysis, and microscopy. The existing lab housing for FDR / CVR downloading and analysis equipment needs to be upgraded with the latest equipment due to the increasing technology on the latest modern aircraft. In order to meet the challenges for *maintaining the highest standards, up-to-date technology* and *development of the national skills and expertise*, AIB is working on a number of initiatives to develop these engineering and investigative capabilities.

1. Transfer of Flight Recorders Lab to AIB Facility
2. Completion of design study of Universal Crash Damaged Recorders Tester
3. Conclusion of INTERTEK Operational Agreement terms and moving forward plans.
4. Adding 3 Saudi Specialist to Engineering Lab team
5. Recorders Lab participation in (12) Investigations

Flight Recorders Lab transfer from GACA Safety and Air Transport Building to AIB Facility at KAIA was achieved through the following successful processes: (Fig 24 and Fig. 25)
1. Agreement between GACA Safety and AIB
2. Selecting a local contractor to execute the transfer
3. File for KAIA permit for site preparation, which included replacement of electrical wiring, adding laboratory standard sink with liquid storage cabinet, safety eye wash, closing off four windows completely, carpeting Cockpit Voice Recorder room, and adding a half height partition to the Flight Recorders room.
4. Packaging and transfer of all equipment
5. Installation and testing at new location.

Fig.24 Flight Recorders LAB at GACA SSAT Building before transfer -Source: AIB Engineering LABs Dept.

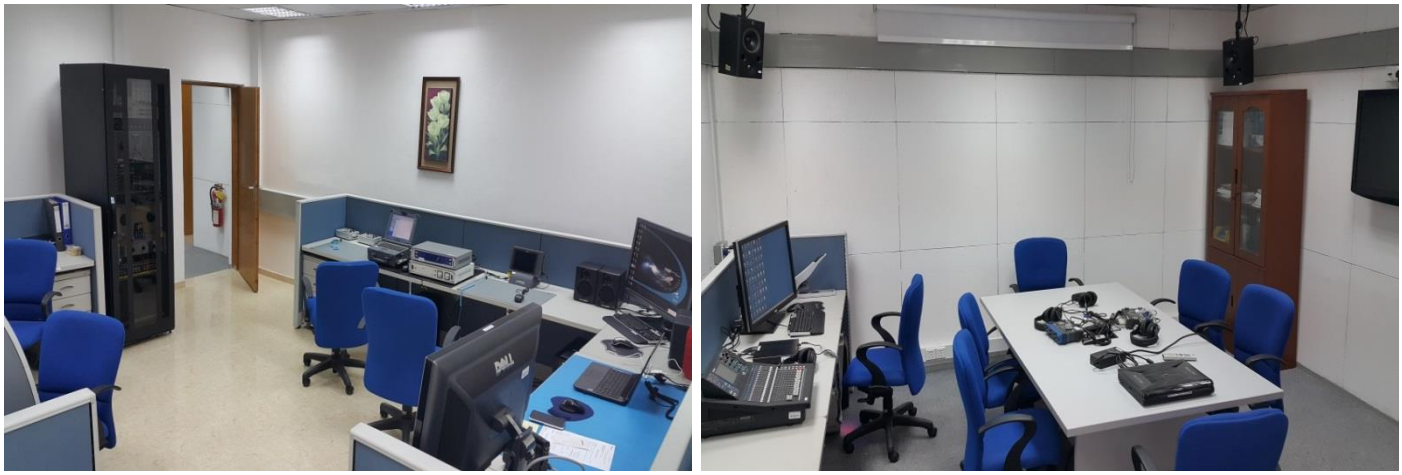

Fig.25 Flight Recorders LAB at AIB Building after transfer- Source: AIB Engineering LABs Dept.

15.2 Crash-damaged FDR/CVR Chip Readout Research Project

The AIB has initiated a research project to develop an innovative universal test bench with computer analysis integrated software to substitute the dependence on manufacturers costly multiple bench units.

AIB is sponsoring the initiative of a Canadian Subject Matter Expert consulting company. The AIB is reaching out to KAUST, to participate with technology experts under AIB umbrella. AIB received a commercial proposal from the Subject Matter Expert Consulting group.

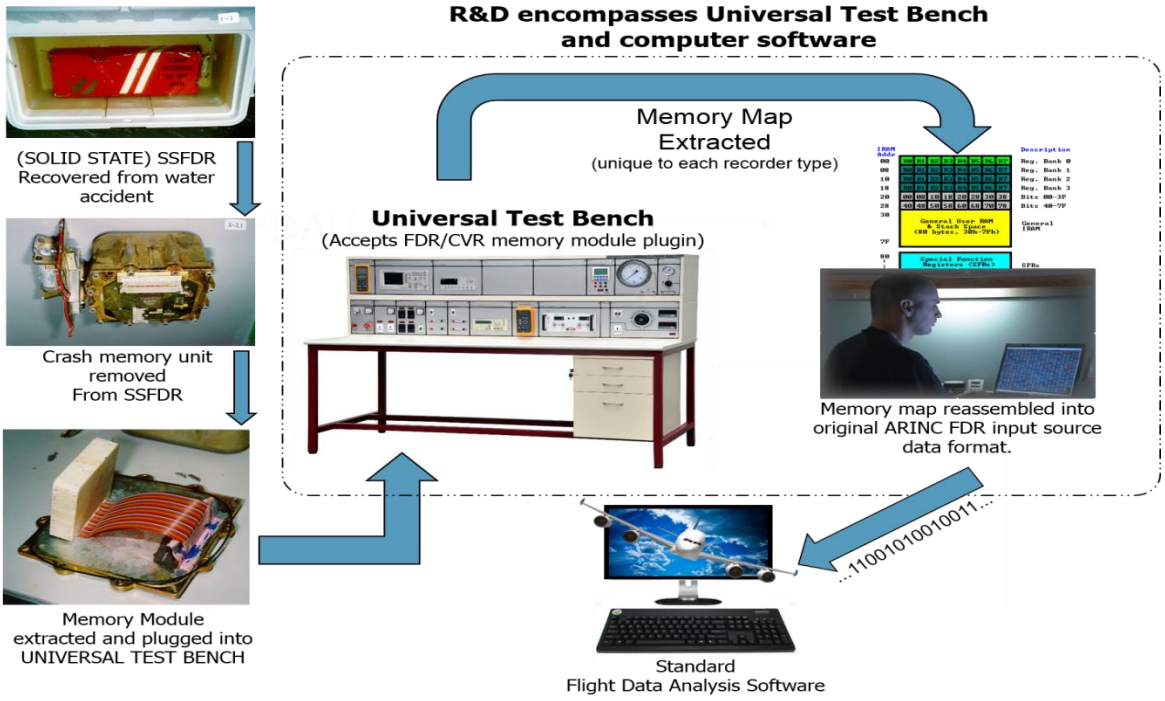

Figure 26: Damaged FDR/CVR units process– Source: Plane Sciences Company

Aircraft Flight Recorders are used as a bench test unit when the installed flight recorders are damaged in an accident. Recorders are similar in category, numerous in types, and costly to buy and shelf. AIB initiative to be a launch customer for a Universal Test Bench that provides Investigative Authorities with capability to download data from damaged Flight Recorders was blessed and authorized by HE the Chairman, the project was divided into two parts to minimize the risk, the first part is to study the design concept and evaluate the risk if manufacturers do not cooperate and provide further documentations and proprietary data beyond what is available for all operators. This was successfully completed in October 2015.

The second part of the project is to build the Test Bench and commission it in KSA AIB Facility in 2016.

Worthwhile to mention, that Canadian Transport Safety Board (TSB), and Canadian National Research Center is in the technical steering committee of this project.

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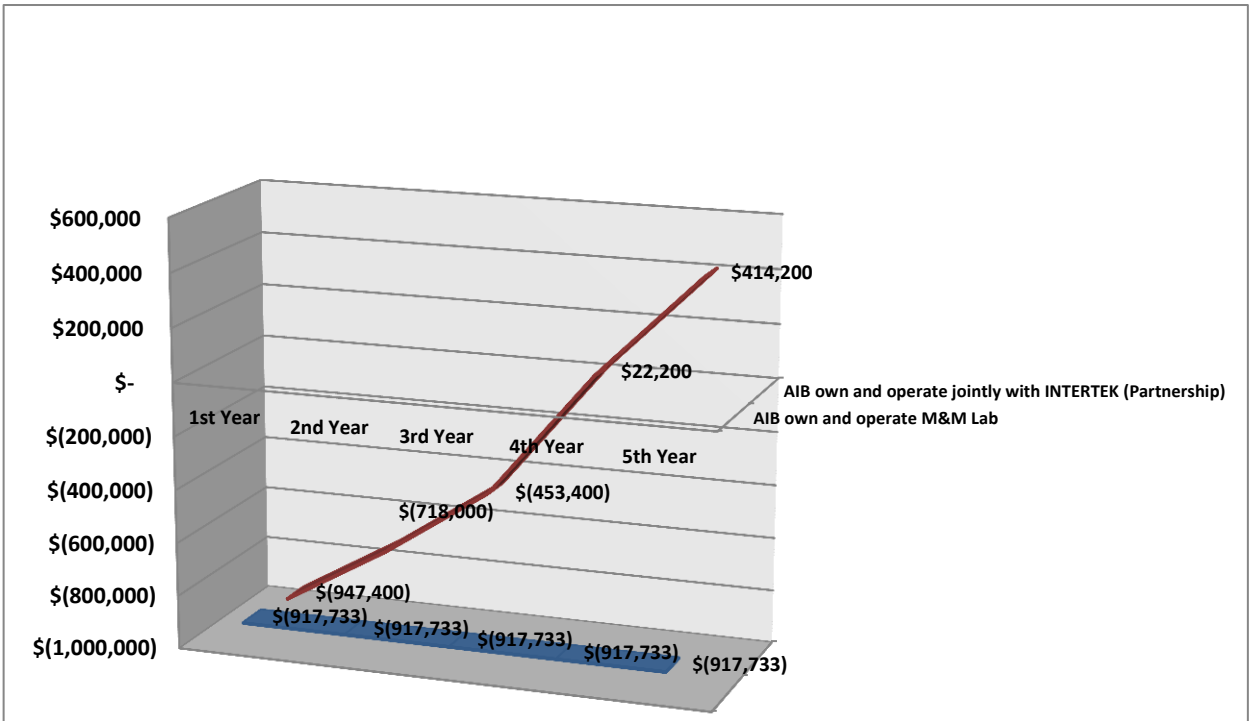
15.2 Intertek AIB metal and material LAB Project

In March 2015 with the support of HE Chairman, exchanges continued and main terms were agreed on to engage in an initial five year operational agreement whereby INTERTEK staffs the metal and material laboratory with an experienced lab manager, currently managing Rolls Royce lab at Derby, UK, a UK experienced assistant, and two engineers, the staffing will increase based on commercial volume. INTERTEK will operate the lab commercially with a priority to AIB investigations.



	1st Year	2nd Year	3rd Year	4th Year	5th Year
AIB own and operate M&M Lab	$(917,733)	$(917,733)	$(917,733)	$(917,733)	$(917,733)
AIB own and operate jointly with INTERTEK (Partnership)	$(947,400)	$(718,000)	$(453,400)	$22,200	$414,200

Fig. 27 INTERTEK Operational Agreement- Source: AIB Engineering LABs Department

Critical path for this project to proceed is:

1. The delivery of equipment included in tender A-00-255-SI-0.

2. Operational Contract approval.

Purpose of Safety Investigations

The objective of a safety investigation is to identify and reduce safety-related risk. The AIB investigations determine and communicate the safety factors related to the aviation safety matter being investigated.

It is not a function of the AIB to apportion blame or determine liability. At the same time, an investigation report must include factual material of sufficient weight to support the analysis and findings. At all times the AIB endeavours to balance the use of material that could imply adverse comment with the need to properly explain what happened, and why, in a fair and unbiased manner.

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AIB
AVIATION INVESTIGATION BUREAU
مكتب تحقيقات الطيران