

Foreword



My 46 years in aviation has seen a lot of changes and improvement on the landscape of aviation. The improvement in aviation safety has played a major role in Malaysia economic activity and development. One of the key elements to maintain a good performance on civil aviation is to ensure safe, secure, efficient and sustainable operations at the national levels.

Improving safety is the responsibility of Civil Aviation Authority of Malaysia (CAAM) as regulatory body and BSKU as investigation body. Both agencies have the responsibility to address and enhanced national aviation safety through co-ordinated activities programme under the State Safety Programme (SSP).

Since the introduction of Safety Management System (SMS), effort taken by stakeholders to identify hazards and managing risk has increased tremendously. These activities obviously will enhance awareness by all aviators on aviation safety and subsequently managing risk efficiently to reduce accident.

2019 is another safe year for our aviation industry with the focus on the use of unlicensed aerodrome by General Aviation. Regulatory body need to get feedback from the industry in order to ensure the regulation is being understood, applicable and user friendly. BSKU must continually develop its capabilities and relationship with stake holders and other related agencies to ensure it is ready for current and future challenges.

“Mistakes are inevitable in Aviation, especially when one is still learning new things. The trick is to not make the mistake that will kill you.

Safety is something that happens between your ears, not something you hold in your hands. “

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This year marks my 5th and final year to write this column as the Chief Inspector (CI) of Air Accident Investigation Bureau (AAIB) or Biro Siasatan Kemalangan Udara (BSKU), Malaysia. My contract as CI will expire on the 22nd May 2020. Previously, I served as pilot with Royal Malaysian Air Force for 12 years, a Pilot Examiner with the Department of Civil Aviation Malaysia, and finally as the Director of Flight Operations for 30 years. Despite having spent more than 46 years in the aviation industry, I know very well that I will, in whatever my future undertakings may be, remain in aviation circle and keep contributing to promoting aviation safety.

As years passed by, I observed that there has been a lot of changes and developments done on the landscape of aviation in terms of facilities, airlines, maintenance organisation, general aviation, safety culture and the number of accidents. However, there will always be a room for further improvement - especially on the safety reporting culture.

Officially established in 2013 and gradually manned with adequate technical personals, BSKU became fully functional in early 2016. Our record shows that since 2015, the air accident rate in Malaysia has reduced significantly. Most occurrences involved were non-scheduled operators and general aviation -mainly light aeroplanes and light helicopters.

Besides conducting accident investigation to all aircraft occurrences in the country, BSKU is also involved with hazards identification and safety promotions. Subsequently, all systematically acquired information can be used by the stake holders for managing risk in their various operations. On the safety promotion aspect every year BSKU will host an auspicious seminar attended by almost all stakeholders. During this seminar BSKU would present and share the most recent updates on the current risk identified and briefing on the status of the risk area for the overall aviation industry.

One of the outputs of the safety investigation process is a set of safety recommendations, which may be addressed to states, stake holders or to International Civil Aviation Organization (ICAO). Since BSKU has no enforcement power to ensure implementation on safety recommendations, the onus is left with the regulators or the industry itself to ensure corrective action is taken immediately.

BSKU has undergone a Universal Safety Oversight Audit Programme - Continuous Monitoring Approach (USOAP-CMA) conducted by ICAO from 2nd to 12th May 2016. There were 27 unsatisfactory findings raised with Effective Implementation (EI) of 75.93%. (ICAO average 55% EI). BSKU has addressed most of those findings and the outstanding findings are on legal matters. All those legal matters are being addressed together with our legal adviser.

For the whole of 2019, it has been a safe year for our aviation industry. There were four accidents investigation carried out involving 3 light aircrafts and one ground incident at Sultan Abdul Aziz Shah Airport, Subang with one fatality. There were four serious incidents investigated by BSKU. 3 SI Investigations as Accredited Representatives involving Malaysian registered Boeing 737-800 aircrafts; unfortunately all 3 SI occurred in Indonesia. Another SI involving D40 propeller struck the ground upon landing at Melaka airport.

The primary focus for 2019 investigation is the use of unlicensed aerodrome by General Aviation or private owners. Both accidents involving the light aeroplanes that occurred earlier in 2019 were due to landing and take-off into and out of unlicensed aerodrome. The preliminary investigation findings revealed that there was ambiguity and lack of understanding on the interpretation of the Regulation by the General Aviation community. Regulatory body needs to get feedbacks from the industry in order to ensure that the regulation are not only understood but also applicable and user friendly. Since they both have similar root cause, it needs to be addressed before another similar occurrence that may take lives.

Lastly, BSKU must continuously develop its capabilities and positive relationship with stake holders and other related agencies to ensure it is ready for current and future challenges. During my term as CI there have been several achievements that are worth mentioning here, like MOUs with other investigation agencies in preparation for any major accident, establishment of recorder laboratory, basic training for Investigators in cooperation with MIAT, successful USOAP-CMA audit, hosting seminars/workshop including APAC AIG/7 meeting and workshop, safety promotions by giving presentations, promoting voluntary special investigators, establishing safety data and etc.

Other ongoing measures include further development of technique for investigation under water environment, competency-based training, Aviation Risk Management Solution (ARMS) and development of technique for investigation of accident involving unmanned aircraft system.

I wish BSKU will continue to be successful and prominent in the exercise of transition from to statutory body, Malaysian Transport Safety Board.

Thank you.

CI BSKU

Accidents (A) and Serious Incident (SI) 2019

No	File	Date	Reg.	Type	Place	Category	Nature
1.	SI 01/19	25/02/19	9M-MXH	B737-800	En-route from CGK to KUL	CSF-NP	A/C fuel indicator showed false reading
2.	A 02/19	18/03/19	9M-TST	CL30	Subang Airport	RI	A/C hits ground vehicle on runway during landing
3.	SI 03/19	20/06/19	9M-LCK	B737-800	Bandung Int. Airport	RE	A/C veered-off runway during take-off roll
4.	A 04/19	29/06/19	9M-MZC	TECNAM P2002	Jelebu, Negeri Sembilan	LOC-I	A/C crashed just after take-off
5.	SI 05/19	06/07/19	9M-ITG	D40	Melaka Airport	ARC	A/C propeller struck ground
6.	A 06/19	17/08/19	9M-ETC	SUPER PETREL	Lumut, Perak	ARC	A/C landed hard on the landing surface
7.	A 07/19	09/11/19	9M-EBZ	Gyrocopter	Seberang Perak, Perak	LOC-I	A/C crashed during pesticide spraying
8.	SI 08/19	02/12/19	9M-LNH	B737-800	En-route from CGK to KUL	SCF-NP	A/C decompression during flight

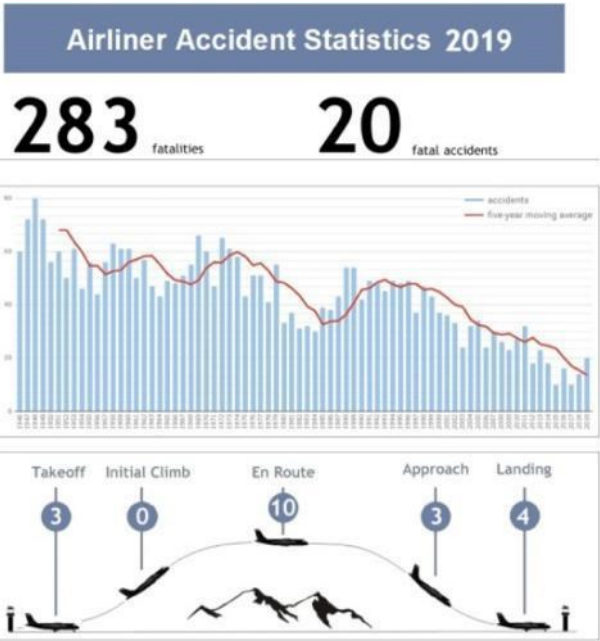
2019 ACCIDENT AND SERIOUS INCIDENT

		Accident	Serious Incident	Total	Fatality
	AFTO and GA	3	1	4	0
	Non Scheduled Operator	1	0	1	1
	Scheduled Operator	0	3	3	0
	Total	4	4	8	0

Categories	
ARC	2
SCF-NP	2
TURB	0
RI	1
RE	1
GCOL	0
LOC-I	2
OTHR	0
TOTAL	8

Note:
 SCF-NP - System/Component Failure or Malfunction (Non-powerplant)
 TURB - Turbulence Encounter
 ARC - Abnormal Runway Contact
 RI - Runway Incursion
 RE - Runway Excursion
 GCOL - Ground Collision
 LOC-I - Lost of Control - Inflight

2019 GLOBAL AIRLINER ACCIDENT STATISTIC



8 February RUUSA 1	23 February RUUSA 3	24 February Bangladesh 1	9 March Colombia 14	10 March Ethiopia 157	5 May Russia 41	13 May RUUSA 1
27 June Russia 2	26 July Canada 4	6 August Canada 2	11 September RUUSA 2	18 September Indonesia 4	23 September Tanzania 2	2 October RUUSA 7
4 October Ukraine 5	17 October RUUSA 1	26 October Canada 3	24 November D.R. Congo 19	9 December RUUSA 1	24 December Mexico 2	27 December Kazakhstan 12

AviationSafetyNetwork Statistics are based on all worldwide commercial (cargo and passenger) fatal accidents involving civil aircraft with a maximum capacity of 14 passengers, from the ASG Safety Database <https://aviation-safety.net>

2019 HAZARDS IDENTIFIED FOR ACCIDENT AND SERIOUS INCIDENT

S/No.	File No.	Nature of Occurrence	Fatality	HAZARDS (see note 1)
1.	SI 01/19	A/C fuel indicator showed false reading	Nil	Not determine yet.
2.	A 02/19	A/C hits ground vehicle on runway during landing	One	1.Lacked communication between ATC, landing aircraft and ground vehicle. 2. Non Std. Radio eqpt .used by vehicle on runway
3.	SI 03/19	A/C veered-off runway during take-off roll	Nil	1. Improper back tracking technique before take off on sloping runway. 2. Miscommunication between cockpit and cabin crew during postrejected take off.
4.	A 04/19	A/C crashed just after take-off	Nil	1.Take off on unapproved grass strip
5.	SI 05/19	A/C propeller struck ground	Nil	1. Wrong Bounced landing recovery technique
6.	A 06/19	A/C landed hard on the landing surface	Nil	1.Landing at unapproved water site
7.	A 07/19	A/C crashed during pesticide spraying	Nil	1.Aerial spray without approval and supervision 2.No flight plan for SAR alert
8.	SI 08/19	A/C decompression during flight	Nil	1. Failed outflow valve

Note 1

It is not the aim of this report to be used for assign fault or blame but it is for avoidance of similar occurrence in the future.

WET AND CONTAMINATED RUNWAY

Runway surface condition at airports is a critical safety concern. The presence of water or snow on runways can have a significant impact on aircraft performance. Runway contamination from rubber deposits can lead to a serious reduction in runway surface friction coefficients, especially if the runway is wet. Runway contamination could cause power loss due to water or slush spray ingestion, jammed or damaged landing gear doors, wing flaps and slats due to frozen slush or snow.

Each year there are a number of landing excursions where slippery runways or crew procedural deviations are contributing factors. These occurrences are due to a combination of issues such as weather, runway conditions, the airplane's weight, braking systems to be used, improper flight crew technique, or lower-than expected runway friction. Accurate reporting of contaminated runways is also an important factor.

DEFINITION

Wet runway: A runway that is neither dry nor contaminated.

Contaminated runway: A runway is contaminated when more than 25% of the runway surface area (whether in isolated areas or not) within the required length and width being used is covered by: Water or slush more than 3 mm (0.125 in) deep ; Loose snow more than 20 mm (0.75 in) deep; or Compacted snow or ice, including wet ice.

Damp Runway: The surface shows a change of colour due to moisture

Wet Runway: The surface is soaked but there is no standing water

Water patches: Significant patches of standing water are visible

Flooded: Extensive standing water is visible

RUNWAY CONDITION

Impact of Heavy Rain

Heavy rain may cause hydroplaning. A layer of water between the tires and the runway surface reduces the friction level to NIL braking action. The effect of the rain on rubber deposits disperse the water at varying depths. During a landing in heavy rain, these patches can play a major part in whether the aircraft manages to stay on the runway surface.

Impact of Rubber Deposits

The build-up of rubber affects the level of friction of the runway (i.e., reduction in braking and ground handling performance). The rubber deposits on the runway make it a potentially slippery surface in wet conditions. The accumulation of rubber deposits can vary, depending on the number of landings and the period between runway surfaces cleaning.

According to ICAO Airport Services Manual, Part 2, the surface of a paved runway shall be maintained in a condition so as to provide good friction characteristics and low rolling resistance. Snow, slush, ice, standing water, mud, dust, sand, oil, rubber deposits and other contaminants shall be removed as rapidly and completely as possible to minimise accumulation. Rubber removal also helps improve safe landing by improving friction of the runway surface, reducing braking distances.

Grooved Runways

Most of the runways, worldwide, are not grooved. Grooved runways allow water to flow off of the runway quicker, resulting significant reductions in wet landing stopping distance, reducing hydroplaning during wet weather. Benefits of grooves surfaces when wet:

Minimised skids: Overall good ground handling is sustained.

Minimised hydroplaning: Positive nose-wheel steering is maintained during landing roll-out.

Minimised drift: Provides high cornering forces.

Improved braking: Reduced stopping distances.

Safer landings: Pilots can maintain control in bad weather landings.

AIRPORTS AND ATC/ATM ROLE IN RUNWAY CONDITION REPORTING

Airports: Accurate and timely reports on runway condition are essential.

ATC/ATM: The importance of passing on accurate information on weather & runway conditions.

PILOT OPERATIONAL ASPECT

- Runway conditions significantly affect aircraft performance. The pilot needs:
 - To take into consideration the runway conditions.
 - To have information about the exact runway conditions at the moment of the take-off or landing.
For instance, to know the extent and nature of the runway contamination and also its depth.
 - With this information the crew can then calculate the required runway length, reduction in V1 and/or maximum take-off weight before taking off.
- When assessing landing performance, runway braking action must be taken into account.
- Braking action is an area where there is little standardization between pilots, industry and regulators. It is common practice in pilot reports to refer to braking action as ‘good’, ‘medium’ or ‘poor’ when describing water affected or contaminated runways.
- There has not been a relationship established between the wheel braking and friction assumptions used in the aircraft performance and the minimum friction standards stated in ICAO Annex 14.
- There are many different definitions of these terms, and their use may lead flight crews into:
 - believing that a runway is safe to use for their aircraft when it may not actually be safe;
 - miscalculating the landing rollout length; or
 - configuring the aircraft incorrectly for the landing.
- Operational data are provided by manufacturers based on common assumptions. It is the responsibility of the individual airline to adjust the performance data to reflect their Standard Operating Procedures (SOPs) and to include or provide a suitable operational margin.
- Pilot must have training to operate in crosswinds in conjunction with a wet or contaminated runway.
 - One of the worst control situations occurs when there is a crosswind in conjunction with a wet or contaminated runway.

- Pilots should be aware that whenever a touchdown far down the wet or contaminated runway is likely, a go-around should be considered.
- Increased risk due to a combination of wet or contaminated runways with significant crosswinds, should be conveyed to all operators and airport authorities.

REVERSE THRUST “CREDIT”

Should an airline take “credit” for reverse thrust during wet and contaminated runway operations?

- Pilots are sometimes slow to actuate reverse.
- Reverser failures are generally discovered during landing.
- Some aircraft do not allow the use of asymmetric reverse on contaminated runways.
- Not taking the credit provides an additional safety margin for long landings and other unexpected conditions (i.e., lower than expected braking action, higher than reported tailwinds, etc).

AIRPORT OPERATIONAL ASPECT

- Airport operators must ensure the safety of aircraft operations at their facilities.
- Airport Operators are responsible for monitoring, reporting and improving the runway surface conditions of their facility.
- In the Aeronautical Information Publications (AIP), an overview is presented of available runway friction testers, and possible contaminate removal equipment for each international airport in the state.
- The equipment necessary for contaminate removal depends on many factors like airport location, climate and density of take-offs and landings which are but a few to consider.

RECOMMENDATIONS FOR WET / CONTAMINATED RUNWAYS

- Delay landing of 15- to 20-minute after a downpour, this waiting period is usually sufficient to drain the water.
- Do not exceed VTH (Runway Threshold Speed) plus wind additives at the runway threshold.
- Select maximum allowable auto brake setting.
- Use runways with headwinds instead of tailwinds.
- Establish and maintain a stabilized approach.
- Use maximum flaps to provide minimum approach speeds.
- Be prepared to go around from the threshold.
- Do not perform a long flare.
- Do not allow the aircraft to drift during the flare.
- Touch down firmly and do not allow the aircraft to bounce.
- Be ready for required crosswind control inputs.
- Keep the aircraft centerline aligned with the runway centreline.

- Anti -skid braking should be applied steadily to full pedal deflection when automatic ground spoilers deploy and main wheel spin -up occurs. Do not modulate brake pressure. The anti -skid system will not operate until the main wheels of the aircraft spin... don't lock your brakes before touchdown.
- Be prepared to deploy ground spoilers manually if automatic deployment does not occur. Spoiler deployment greatly assists wheel spin -up during wet runway operations by materially reducing the wing lift and increasing the weight on the wheels, thus shortening your stopping distance.
- Apply maximum reverse thrust as soon as possible after main gear touchdown; this is when it is most effective.
- Continue maximum braking until at slow speed; do not delay braking to reduce time on the runway.
- Get the nose of the aircraft down quickly. Do not attempt to hold the nose off for aerodynamic braking.

ATC/ATM ROLE:

- Prompt collection of meteorology and notification to aircraft.
- Notification to aircraft when any portion of the runway is contaminated.
- Prompt notification to aircraft on the latest weather.
- ATC to comply with any notification notices established by the regulatory.
- Runway condition reports – to inform flight operations of the latest condition of the runways. Conditions to include:
 - Information on slippery runway
 - * Depth of ice, snow, and/or slush on runway surface
 - * Depth of water on runway
 - Information on runway surface
 - * Braking action
 - * Compacted snow on runway, etc.
 - * Wet, or water on runway
 - Information on significant wind
 - * Velocity of wind when reaching crosswind limitation associated with runway conditions.
 - * Turbulence on approach

AIRPORT OPERATORS ROLE:

- To monitor, report and improve the runway surface conditions of their facility
 - Prompt removal of snow and ice operations
 - To ensure to have appropriate equipment to be available for removal of snow, and should be fully aware of the changing nature of the runway condition especially when continuous snow or heavy rain occurs
- A Runway friction test to be carried out to quantifies runway conditions, especially on approach to a wet / contaminated runway (An index scale runs from 0.6 (good) to 0.18 (poor).
- To establish prompt notices (NOTAMs) containing information concerning the condition, or change in any component of the runway when wet or contaminated.

BY: KHAIRULNIZAM BIN JAMALUDIN (AIR ACCIDENT INSPECTOR, AAIB)



18 March 2019

CL30 hits ground vehicle on runway during landing in Subang, Selangor.



29 June 2019

A Tecnam P2002 aircraft crashed during take off from a private runway in Jelevu, Negeri Sembilan.





19 April 2018

Super Petrel doing a hard landing in Lumut, Perak.



9 November 2019

Gyrocopter belonging to Felcra Sdn Bhd crashed during pesticide spraying in Seberang Perak, Perak.



**AIRCRAFT ACCIDENT INVESTIGATION COURSE 1/2019
UniKL MIAT - SUBANG
11 TO 22 FEBRUARY 2019**



Second AAI course conducted in collaboration with UniKL MIAT.



SAREX LIMA 2019 in Langkawi. Three AAIB inspectors, Col Shamsudin, Lt Col Marzuki and Mr Khairul Nizam were involved as observers.



Mr Khairulnizam during the Table Top and Partial Exercise in Kucing



Col Shamsudin, and Lt Col Marzuki at the Emirates Table Top Ex in KLIA.



BSKU Aviation Safety Seminar 3/2019 - The Seminar was conducted on 16 April 2019 at Putrajaya and officiated by YB Minister of Transport. It was attended by most aviation related agencies. 6 topics of presentation were delivered. 146 participants attended the seminar.



BSKU had the honour of hosting the 7th meeting of the APAC-AIG was held in Putrajaya. It was attended by 45 participants from states in the Asia Pacific region. The meeting was followed with the ICAO RAIW workshop.





Langkawi International Maritime and Aerospace Exhibition 2019 (LIMA '19) was held in Langkawi from 26 to 30th March 2019.

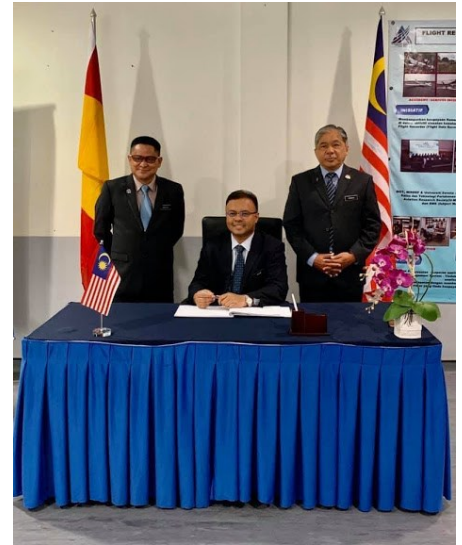




Visit by the Chief Secretary to the Government of Malaysia to BSKU



Visit by the former Secretary General, Ministry of Transport Malaysia to BSKU



Visit by the Secretary General, Ministry of Transport Malaysia to BSKU



Visit to CAE Malaysia in Sepang, Selangor.



Visit to PWN Excellence Simulator in Subang, Selangor.





Presentation of 9M-TST accident at the Ministry of Home Affairs.



Organisational Anti Corruption Plan Workshop in Melaka



Purification of Malaysian State Safety Programme and Roadmap meeting in Kuching



Technical Working Group Meeting on People Mobility in Nilai



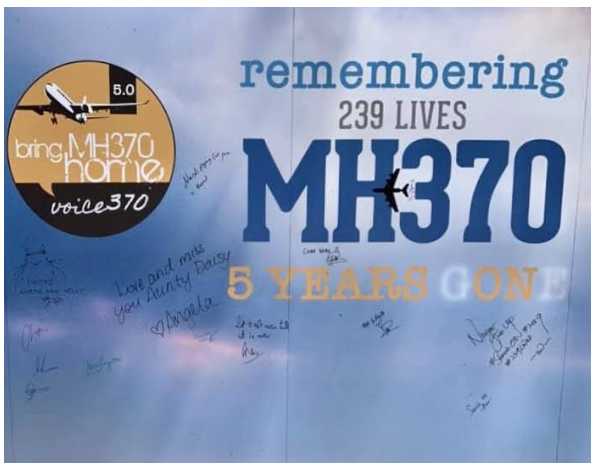
BSKU at the APAC_AIG 7 Meeting



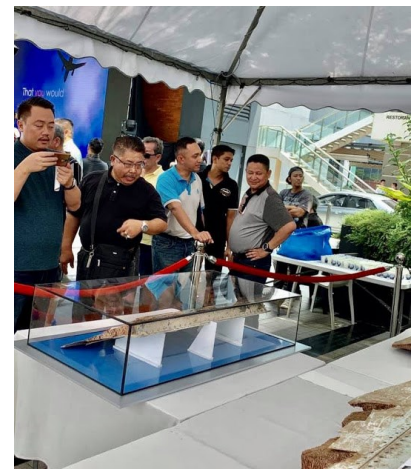
LIMA'19 with former Chief of Defence Force



BSKU Diver in Underwater Skill Refresher



MH370 5th Year Remembrance Event at Publika



BSKU Ladies behind the scene

DATE	PROGRAM FOR 2020
11 Feb	VISIT TO AIR ASIA
24 Feb - 6 Mar	AAI COURSE - SINGAPORE
Week 1 - April	AAIB SAFETY SEMINAR
12 - 14 May	AIRBUS MANUFACTURER'S TRG - TOULOUSE
May	DATA FRAME DEVELOPMENT COURSE, TAIWAN
June	AAI Course, UniKL MIAT
June	HUMAN FACTOR IN AVIATION COURSE, SINGAPORE
3 - 6 Nov	SAFRAN HELI ENGINE COURSE - SINGAPORE
25 - 27 Nov	IFALPA MEET - BUENOS AIRES

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