
AAIB SAFETY BULLETIN



News Update from AAIB Malaysia

Foreword By CI AAIB

In the previous issue of this bulletin, the then outgoing Chief Inspector covered multiple initiatives carried out by the AAIB during his tenure. I would like to briefly expand on the last initiative that he touched upon and give everyone concerned an update on where we stand at the moment.

The initiative I am talking about is the inevitable transformation of the AAIB from a single mode (aviation only) accident investigation authority in the MOT into that of an even more independent statutory body outside of the MOT covering an additional three modes of transport (i.e. maritime, rail and road). If the AAIB, Malaysia was modelled in the image of the the AAIB, UK ... then this new multi-modal entity named the Malaysia Transport Safety Board (MTSB) would be modelled after multi-modal investigative authorities such as the NTSB (US) and the ATSB (Australia).



Efforts to make the MTSB a reality got under way in earnest as early as 2017 though the idea was mooted much earlier as far back as 2013 when the tragic bus accident in Genting Highlands occurred. First on the agenda was to come up with a draft legal act on which to legally base the MTSB. The first draft was completed at the end of 2019 but its presentation to the Parliament was delayed by the COVID-19 pandemic. Another attempt to present it to the Parliament this year was deferred once more as MOT's legal advisors sought to revisit the whole act again to make it more resilient.

Other challenges to the formation of the MTSB also persisted whilst the act was being drafted. These included manpower and finance. In order to obtain the required manpower for the MTSB other agencies under the MOT needed to be streamlined. Targeted were agencies from the land sector which included SPAD (APAD), JKJR and MIROS. This was by no means an easy task as this streamlining exercise did not just mean the rationalisation of manpower but also the rationalisation of overlapping functions. As for the finances of the future MTSB it is planned for the MTSB to be financially independent from the MOT after its second year of operations. How this is to be achieved nonetheless remains a question mark.

Notwithstanding all these challenges, the MOT's Secretary General continues to press on. His latest initiative was the formation of an MTSB Nucleus Team which would act as a catalyst for the formation of the MTSB proper. Team members were recruited from the Marine Department of Malaysia (JLM) and MIROS. Together with the AAIB, the Nucleus Team has come up with a workable draft SOP for handling marine casualties (JLM), road accidents (MIROS) and an brief outline for a research function (MIROS) for the MTSB.

As has been demonstrated above it has not been an easy nor a smooth road in the formation of a workable solution for the formation of the MTSB. Nonetheless with the proper support from the powers that be, the realisation of the MTSB will not be a question of IF but more rather a question of WHEN.



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AIR ACCIDENTS (A) AND SERIOUS INCIDENTS (SI) FOR 2021

No.	File No.	Date of Occ.	Aircraft Reg.	Aircraft Type	Cat.	Nature of Occ.	Fatality
1.	A 01/21	01/01/2021	9M-SAW	Robinson R66	LOC-I	A/C crashed during hover	0
2.	SI 02/21	01/03/2021	NIL REG.	Trike GTE 582	LOC-G	A/C hits tree during landing roll	0
3.	A 03/21	24/04/2021	9M-LEO	H125	LOC-I	A/C spun and crashed on the tarmac	0
4.	I 04/21	07/11/2021	9M-AJN	A320-216	RAMP	Aerobridge contacted with a/c door 1L during pax disembarkation	0
5.	SI 05/20	23/11/2021	9M-AWD	BELL 206 B3	OTHR.	A/C hits electric cable during unplanned landing	0

	Accident	Serious Incident	Incident	Total	Fatality
FTO and GA	2	1	0	3	0
Non-Scheduled Operator	0	1	0	1	0
Scheduled Operator	0	0	1	1	0
Total	2	2	1	5	0

Categories	
LOC-G	1
LOC-I	2
OTHR.	1
RAMP	1
TOTAL	5

Investigation on Serious Incident Involving Microlight Trike 582 in Perlis on the 01 March 2021



The AAIB has investigated a 2-seater Microlight Trike 582 that crashed in Kangar, Perlis, on 01 March 2021. The Microlight was on a demonstration flight at Kangar Main Stadium area and landed on a field in the vicinity of Kangar Customs Complex. The aircraft crashed after touch-down during the roll and hit a small tree at the end of the landing area. No fatalities were reported, and the injured pilot was taken to the hospital for treatment.



Serious Incident involving rotary aircraft
Helicopter Bell 206B-3, Registration 9M-AWD on
the 23 November 2021 at Kota Marudi, Sabah



On 23 November 2021, a Bell helicopter had to make a precautionary landing while enroute back to BKI after completion of Flying Doctor Service (FDS) from KG. Sonsogon Makatol. The pilot initiated the decision after realising the door on the aft port passenger side was partially open. While approaching the landing area, the pilot noticed a wire in front of the aircraft, but due to momentum and close to the ground, the pilot could not take evasive action, and the aircraft struck the wire. There was no injury, and the aircraft landed safely in the landing area. AAIB despatched 2 of its investigators to investigate the occurrence.



Serious Incident Event: Aircraft Skidding Incident at STOLPORT, Sarawak - Dynamic Hydroplaning

It was the second sector flight for the day. The aircraft landed at the STOLPORT and had skidded to the left of the runway. It rotated clockwise before hitting the embankment tail first and ended up on the grass area to the left of the runway. Intermittent rain and drizzle were reported at the destination STOLPORT earlier before departure and temporary stopped during the aircraft approach to land. The pilot observed the runway was damp when assessing the runway surface condition. The pilot decided to land leading to this serious incident. The cause of this serious incident was attributed to Dynamic Hydroplaning.

What is Hydroplaning

When a tyre of an aircraft encounters a wet surface with water film forming on the runway, the surface in contact with the runway is actually applying pressure on the water film forming underneath it. At a specific critical speed, the tyre will be completely separated and will lift-off from entirely from the runway surface. This speed is called the hydroplaning speed.

Types of Hydroplaning

In general, there are two main types of hydroplaning:

a. **Viscous Hydroplaning** - Viscous hydroplaning is due to the viscous properties of water. A thin film of fluid no more than 0.025 mm in depth is all that is needed. The tyre cannot penetrate the fluid and the tyre rolls on top of the film. This can occur at a much lower speed than dynamic hydroplane, but requires a smooth or smooth-acting surface such as asphalt or a touchdown area coated with the accumulated rubber of past landings.

b. **Dynamic Hydroplaning** - Dynamic hydroplaning is a relatively high-speed phenomenon that occurs when there is a film of water on the runway that is at least 2.5mm deep. As the speed of the aircraft and the depth of the water increase, the water layer builds up an increasing resistance to displacement, resulting in the formation of a wedge of water beneath the tyre.

Factors affecting Hydroplaning

Control of the aircraft on the ground depends on the contact between the tyres and the surface and on the friction provided by that surface. Various factors that will determine whether hydroplaning had occurred and how significant its influence is on the braking capabilities of a tyre are as follows:

a. Runway Condition and Wetness

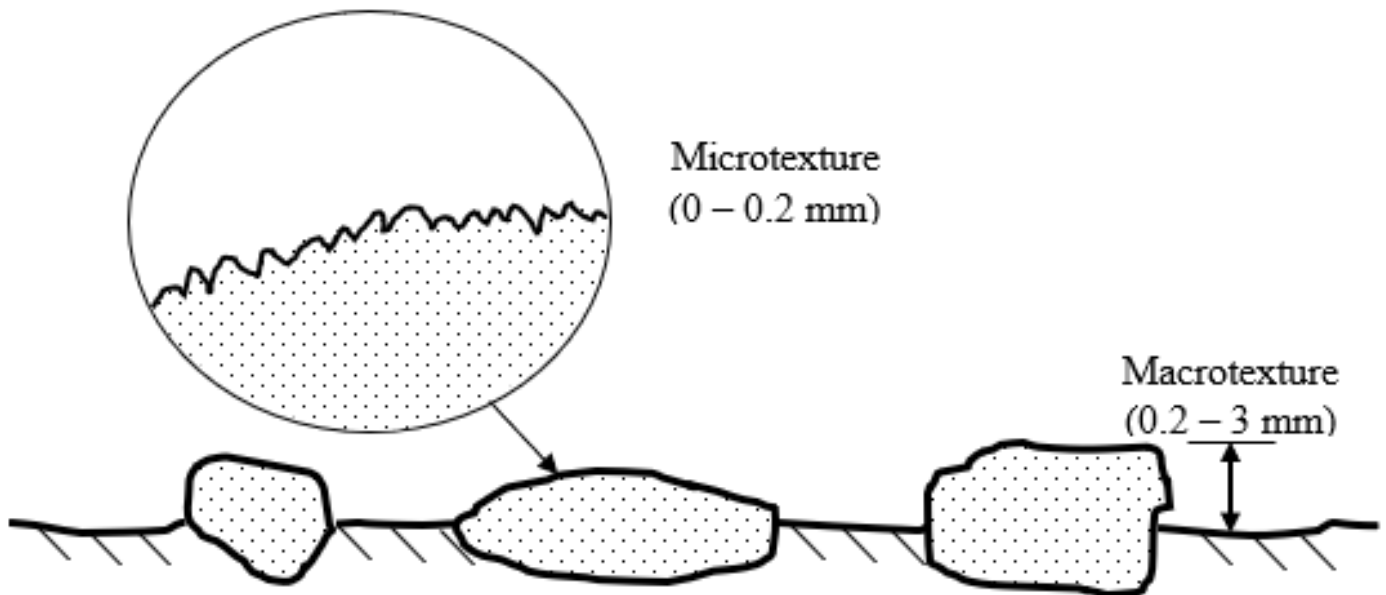


Figure 1: Illustration of pavement surface texture

i. Runway Macrottexture – Macrottexture refers to the large-scale texture of the pavement as a whole due to the aggregate particle arrangement which controls the escape of water from under the tyre and hence the loss of skid resistance with increased speed.

ii. Runway Microtexture – Microtexture refers to the small-scale texture of the pavement aggregate component which controls contact between the aircraft tyre rubber and the runway pavement surface. The smoother the surface, the less the skid resistance.

ii. Transverse Runway Slope – Transverse slopes are an important element in the cross-section design and a reasonably steep lateral slope is desirable to minimize water ponding on flat sections of uncurbed pavements due to pavement imperfections or unequal settlements and to control the flow of water adjacent to the curb on curbed pavements. Inadequate transverse slope, which retain water on the pavement for a longer time, reduces friction, and increases the thickness of the water layer and the potential for hydroplaning. The range of transverse slopes for various runway pavement types should varies from 1.5% to 2% to ensure rapid drainage (ICAO, 2018).

1. International Civil Aviation Organization (ICAO), 2018. Annex 14 Aerodromes, Volume 1 Aerodrome Design and Operations, 8th Ed.

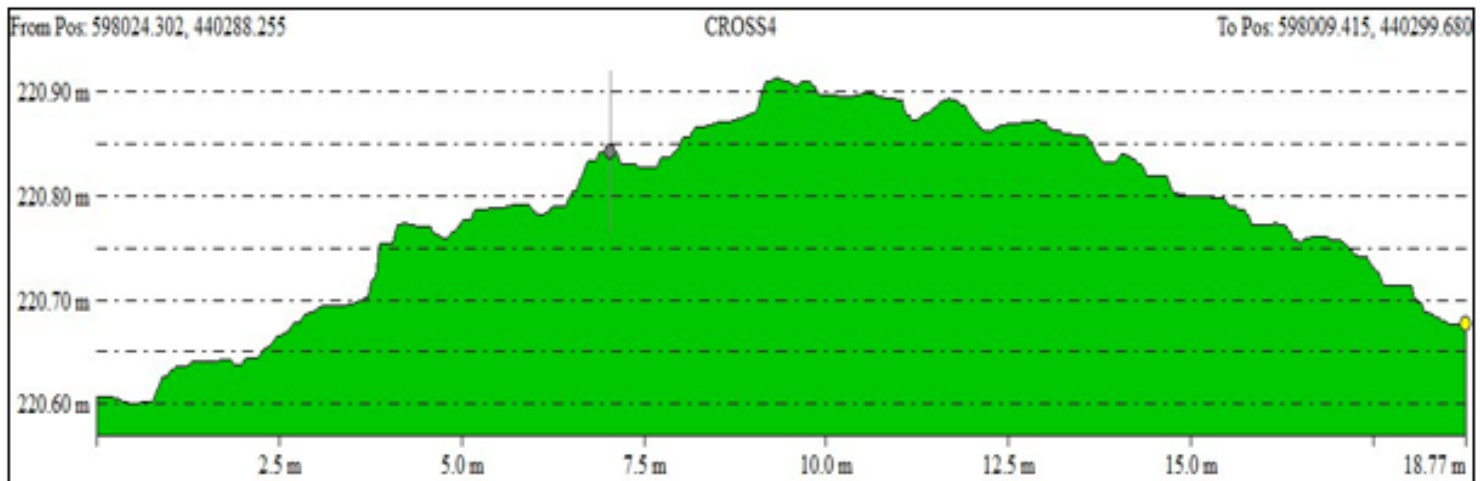


Figure 2: Transverse Runway Slope – Cross-section profile using Global Mapper

b. Water Depth & Tyre Tread

For dynamic hydroplaning to occur, the conditions below must be met:

- i. **Condition 1** – Thickness of water film equals (or larger) than the tyre tread depth or
- ii. **Condition 2** – Thickness of water film of 2.5 mm and above.

c. Aircraft Speed and Tyre Inflation Pressure

Dynamic aquaplaning is generally related to tyre inflation pressure. Tests have shown that for tyres with significant loads and enough water depth for the amount of tread so that the dynamic head pressure from the speed is applied to the whole contact patch, the minimum speed for dynamic hydroplaning V_p in knots is about 9 times the square root of the tyre pressure in pounds per square inch (PSI) based on the well-known Horne's empirical equation as shown in Equation 1.

$$V_p = 9\sqrt{p} \quad [1]$$

where V_p is the hydroplaning speed and p is the tyre inflation pressure.

The tyre inflation pressure of the main wheel and the groundspeed of the aircraft needs to be gathered to check if it falls within the hydroplaning speed range.

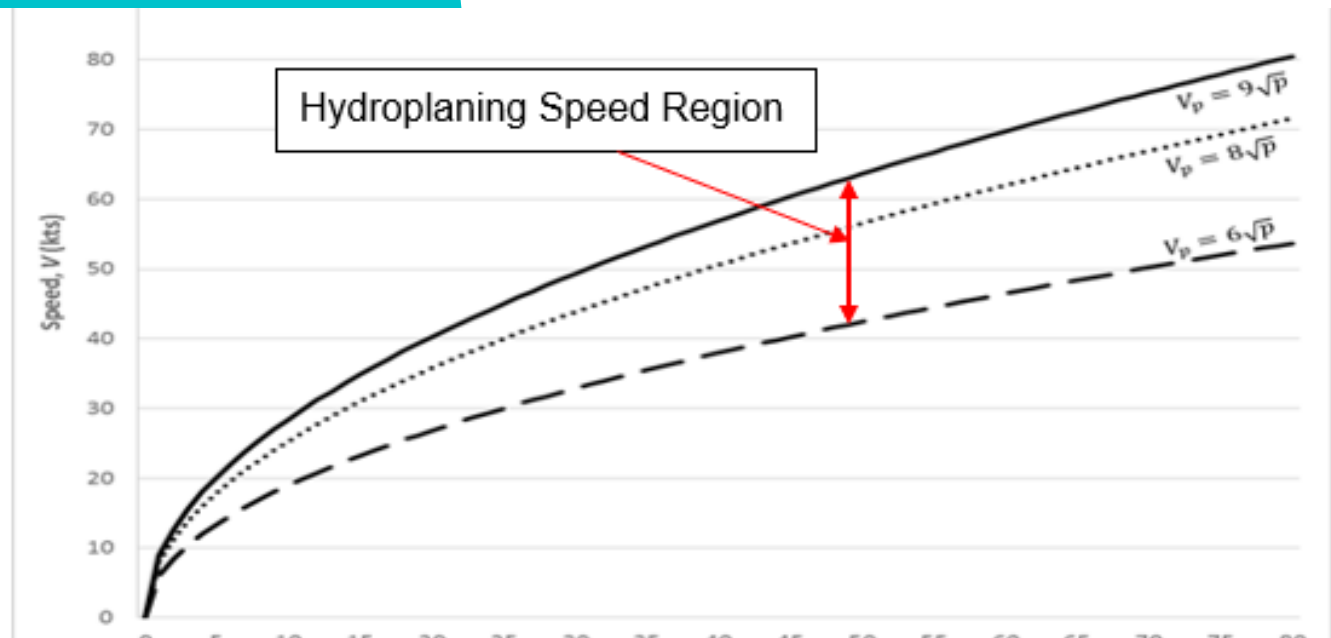


Figure 3: Relation between aircraft tyre pressure, p (psi) with aircraft touchdown speed, V (kts)

d. Human Factors

Knowledge and competency is essential to prevent the aircraft from encountering hydroplaning when landing on a wet surface. Proper training and continuous practice is paramount to ensure the correct execution of the following for a safe landing:

- i. Correct directional control technique on landing.
- ii. Correct braking technique on landing.

Safety Lessons Learnt

The above serious incident has brought forth the following safety lessons:

- a. Be conversant with wet runway landing safety procedures and landing limitations of each particular STOLPORT.
- b. Be competent on aircraft directional control and braking technique when landing on a wet runway.
- c. Hydroplaning will occur when conditions are met although runway surface is assessed as damp.
- d. Knowledge and experienced on weather trends are crucial for STOLPORT flying operations.
- e. Accurate weather information communication is essential at STOLPORTS.

f. Accurate visual assessment of wet surface condition comes with experience.

“Learn from the mistakes of others. You can’t live long enough to make them all yourself”

Eleanor Roosevelt.

Data Collection on Skid Resistance at the STOLPORT





The Air Accident Investigation Course was held twice in 2021. The Malaysia Aviation Academy (MAVA) the course and AAIB, where Air Accident Inspectors from AAIB were invited as speakers. It was held from 26 April to 7 May 2021 (Series 1) and 18 to 29 October 2021 (Series 2). For the year 2022, course 01/22 was held from 21 March to 1 April 2022.





The course below was carried out for two weeks between 21 March - 1 April 2022 and introduces the course participants to the basics of aircraft accident investigation techniques and management.

Course participants once more consisted primarily of ATC Officers from CAAM. However this time there were additional participants from the newly formed MTSB Nucleus Team sourced from the Marine Department (JLM) and MIROS. Instructors were once again sourced mainly from the AAIB aided by SMEs from UniKL MIAT, UKM, AFRS (MAHB), Ministry of Communications and Multimedia and even a private aviation medical facility AFly AeroHealth.





AAIB was invited to present a module during the course on the 20 July 2022. Kol Muhammad TUDM presented the module dealing with the intricacies of ICAO's Annex 13 – Air Accident and Incident Investigation.





Drone handling and Pix4D Mapping training were carried out on 28 Jun 22 at STRIDE. The training is to provide exposure to AAIB Inspectors to fly a drone and how to do the aerial mapping and surveying using Pix4D Mapping Software for investigation purposes.



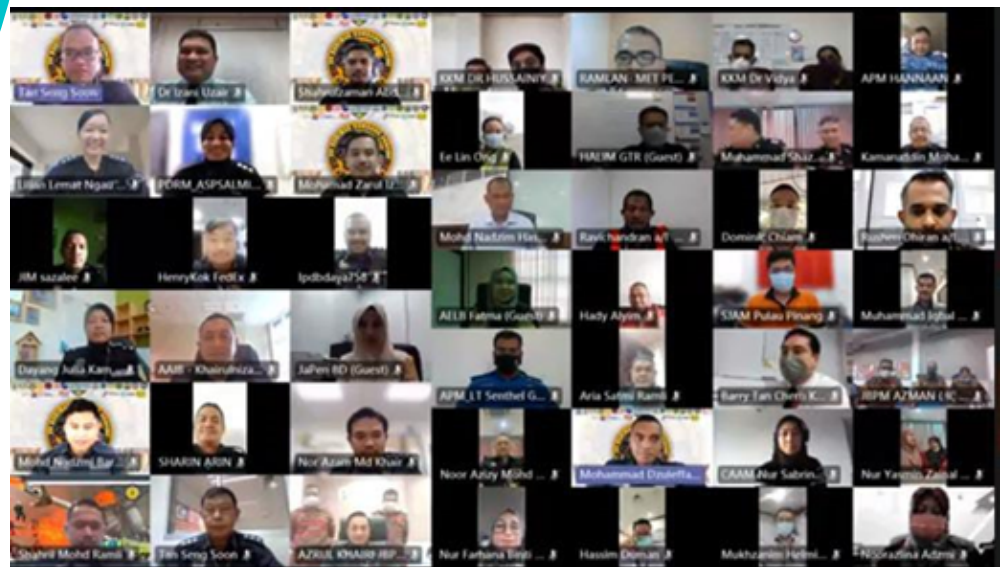


Aerial mapping and surveying using Drone and Pix4D Mapping Software for investigation purposes.

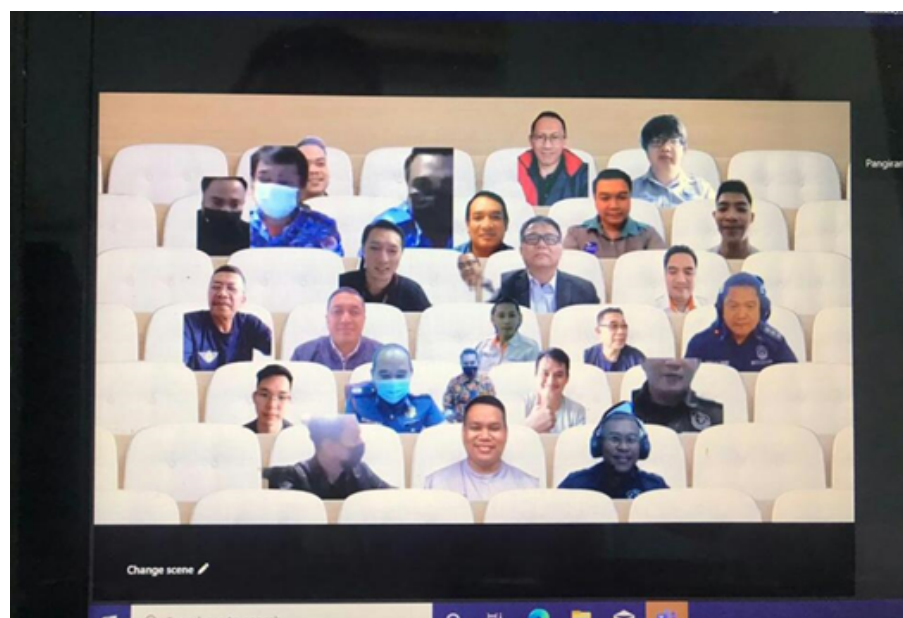


On 28 June 2022 - Continuation Training to AAIB inspectors was carried out on the process of downloading the raw data from Flight Recorder (Black Box) and analyzed using Flight Animation Software (FAS).





Many activities were outstanding after the country was under the government's Movement Control Order (MCO) for about two years due to the covid-19 pandemic. Among them was the Aerodrome Emergency Tabletop Exercise, which had to be held annually by Airport Fire Rescue Service (AFRS), Malaysia Airport Holding Berhad (MAHB). Once the government lifted the MCO, although not completely, the AFRS and its initiative have virtually organised several tabletop exercises and invited AAIB to participate either as an observer, player, or evaluator. The initiative indirectly allows AAIB to be closer to industry players and, at the same time, be able to share knowledge and provide an introduction to the duties and functions of AAIB. The airports that have organised this exercise are KLIA, Kuching International Airport, Labuan Airport, Miri Airport, Sandakan Airport, and Sultan Abdul Halim Airport, Kedah.





Singapore's Transport Safety Investigation Board (TSIB) hosted the Fifth International Accident Investigation Forum (IAI Forum) with Singapore Aviation Academy on 18 – 20 May 2022. The event was held at the Singapore Aviation Academy. The forum aims to bring together the world's top investigation officials and experts to discuss organisational, infrastructural, and management issues government investigation officials face. It is supported by international organisations such as the International Civil Aviation Organisation (ICAO), the European Civil Aviation Conference (ECAC), the International Society of Air Safety Investigators (ISASI), and the Flight Safety Foundation (FSF). The topics covered during the forum such as New Developments in AIG Matters by ICAO, Maintaining Safety in a Pandemic, Case Studies of Investigations during the Pandemic, Investigation Management Systems & Tools, Training and Capacity Building for Accident Investigation, Investigation into Safety Management Related Aspects and Future Challenges in Investigation. AAIB sent 2 of its investigators to attend the forum.



BANDAR BARU BANGI, 19 July 2022 – A Transport Safety Seminar 2022 organised by the Ministry of Transport, Malaysia (MOT) was held at Tenera Hotel, Bandar Baru Bangi with the presence of participants from various Ministries, Departments and Government and Private Agencies including representatives of several institutes of higher learning. The seminar was aimed at raising awareness and understanding on the safety of transportation which covers all three modes of land, marine and air transportation.





Among the topics discussed were the role of MOT from the standpoint of transportation safety, regulations on the use of drones, the implications of the International Convention for the Safety of Life at Sea (SOLAS) on the safety of transport at sea and also rescue and emergency operations in the transport sector. These were presented by speakers from the Ministry of Transport, Civil Aviation Authority of Malaysia (CAAM), Marine Department Malaysia (JLM) and Malaysian Fire and Rescue Department (JBPM).

Also held was a forum to discuss safety issues in the transport sector. A representative from the Malaysian Institute of Road Safety Research (MIROS) moderated the session. The panel consisted of Prasarana Malaysia Berhad (Prasarana), Road Transport Department (JPJ), Land Public Transport Agency (APAD), Kuala Lumpur City Hall (DBKL) and Royal Malaysian Police (PDRM).





On 26 October 2021, the Members of the Supreme Council National PUSPANITA visited the Flight Recorder Laboratory, Air Accident Investigation Bureau (AAIB), Ministry of Transport (MOT) at STRIDE Kajang.

The objective of this visit is to give awareness of women's role in science, technology and innovation to the PUSPANITA members. They have been exposed on the Flight Recorder 'Black Box' installed on commercial aircraft.



YBhg. Puan Sri To' Puan Seri Norizam binti Che Mohd Nor, President of PUSPANITA (wife of the Chief Secretary to the Government), and the Supreme Council National PUSPANITA members were briefed by Colonel Marzuki RMAF (AAIB Inspector) on the Flight Recorder downloading processes at Flight Recorder Laboratory STRIDE

Director General MIROS visited Flight Recorder Laboratory (MKH) on 23 February 2022.



This visit is to strengthen the working relationship between BSKU and MIROS in the field of investigation and accident-related research.





Briefing to Malaysia Aviation Academy (MaVA) Air Accident Investigations (AAI) course participants on how investigations were carried out involving FDR and CVR Analysis during their visit to MKH on 24 March 2022.



JKTPA



Mesyuarat Jawatankuasa Tetap Pegurusan Aduan (JKTPA) MOT Bil. 2/2002 organised by Unit Komunikasi Korporat MOT was held on the 28 July 2022, which involved one of the investigators from the AAIB. It was held at Institut Latihan Pengangkutan Laut (MATRAIN) hosted by Jabatan Laut Malaysia (JLM). The meeting chaired by MOT TKSU Dato Razali was held in the morning followed by a visit to MATRAIN simulator and MV POLARIS Ship operating tour session in the afternoon.



The AAIB Team & Contacts



FROM LEFT

Sitting: BG Datuk Yee Yit Hong, BG Izani bin Ismail (CI), Col Marzuki bin Ramli

Standing: Rosazwani binti Zukefli, Norhaslysa binti Mohd Johari, Akmalia binti Shabadin, Ts Kak D-Wing, Khairulnizam bin Jamaludin, Col Hasnan Bin Kassim, Col Muhammad bin Hj Abdullah, Jim Kalle Primus, Aidanurfirhan binti Badaruddin, Norliza binti Md Nor, Rozita binti Abdullah

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