KOMITE NASIONAL KESELAMATAN TRANSPORTASI
REPUBLIC OF INDONESIA

FINAL

KNKT.24.01.02.04

Aircraft Serious Incident Investigation Report

Batik Air Indonesia

Airbus A320; PK-LUV

En route from Kendari to Jakarta

Republic of Indonesia

25 January 2024

2025

This Final Report was published by the *Komite Nasional Keselamatan Transportasi* (KNKT), Transportation Building, 3rd Floor, Jalan Medan Merdeka Timur No. 5 Jakarta 10110, Indonesia.

The report is based upon the investigation carried out by the KNKT in accordance with Annex 13 to the Convention on International Civil Aviation, the Indonesian Aviation Act (UU No. 1/2009) and Government Regulation (PP No. 62/2013).

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Jakarta, 8 January 2025
KOMITE NASIONAL
KESELAMATAN TRANSPORTASI
CHAIRMAN

SOERJANTO TJAHJONO

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ABBREVIATIONS AND DEFINITIONS

A/P	:	Autopilot
AC	:	Advisory Circular
ACC	:	Area Control Center
ATC	:	Air Traffic Controller
ATPL	:	Airline Transport Pilot License
C of A	:	Certificate of Airworthiness
C of R	:	Certificate of Registration
CASR	:	Civil Aviation Safety Regulation
CPL	:	Commercial Pilot License
CVR	:	Cockpit Voice Recorder
DGCA	:	Directorate General of Civil Aviation
DME	:	Distance Measuring Equipment
FA	:	Flight Attendant
FAC	:	Flight Attendant Certificate
FDP	:	Flight Duty Periods
FDR	:	Flight Data Recorder
FRMS	:	Fatigue Risk Management System
ICAO	:	International Civil Aviation Organization
IFR	:	Instrument Flight Rules
KNKT	:	*Komite Nasional Keselamatan Transportasi*
LT	:	Local Time
NM	:	Nautical Mile
OM	:	Operation Manual
OM-A	:	Operation Manual Volume A
PF	:	Pilot Flying
PIC	:	Pilot in Command
PM	:	Pilot Monitoring
QAR	:	Quick Access Recorder
RDO	:	Rostered Day Off
SEP	:	Safety Emergency Procedures
SIC	:	Second in Command
STAR	:	Standard Instrument Arrival
UTC	:	Universal Time Coordinated
VOR	:	Very-High-Frequency Omnidirectional Radio
WOCL	:	Window of Circadian Low

SYNOPSIS

On 25 January 2024, an Airbus A320 aircraft registered PK-LUV was being operated as scheduled passenger flight from Soekarno-Hatta International Airport (WIII), Jakarta to Halu Oleo Airport (WAWW), Kendari and return. The aircraft was operated by two pilots and four flight attendants.

The first flight from Jakarta departed at 0314 LT (2014 UTC). The Pilot in Command (PIC) acted as pilot flying (PF) and the Second in Command (SIC) acted as pilot monitoring (PM).

At 0711 LT (2311 UTC), the aircraft landed Kendari using Runway 26 and parked at the apron. During this transit, both pilots eat instant noodle cups in the cockpit.

At 0805 (0005) UTC, the aircraft departed from Kendari to Jakarta. In this flight, the PIC acted as PM and the SIC acted as PF. The total number of passengers on board was 153.

At 0037 UTC, the aircraft reached the cruising altitude of 36,000 feet. After maintaining the cruising altitude, both pilots took their headsets off and the cockpit loudspeaker volume was increased. The PIC then asked permission to rest from the SIC and was granted. A few seconds later, the PIC slept and the SIC then took over the PIC duty as PM.

The PIC woke up and at 0122 UTC, asked whether the SIC wanted to rest. The SIC responded that he did not want to rest. Both pilots then had a non-related-duty conversation for about 30 seconds and then the PIC continued to sleep. The SIC was aware that the PIC was sleeping and continued the duty both as PF and PM.

At 01:43:32 UTC, the SIC made initial contact with the air traffic controller of Jakarta Area Control Center (ACC). BTK6723 was instructed to follow KURUS 2G Standard Instrument Arrival (STAR) and report when the aircraft was clear from bad weather conditions. At that time, the aircraft was flying on a heading of 250° to avoid bad weather condition, and position was about 125 Nm from Waypoint KURUS. A few moments later, the SIC inadvertently fell asleep.

Jakarta ACC called BTK6723 several times and there was no response from the pilots.

At 0211 UTC or 28 minutes after the last recorded transmission from the SIC, the PIC woke up and was aware that the aircraft was not in the correct flight path. The PIC then saw the SIC was sleeping and woke him up. About the same time, the PIC responded to the call from another pilot and Jakarta ACC. The PIC advised the Jakarta ACC that BTK6723 experienced radio communication problem and currently the problem has been resolved. The flight then continued and landed at Jakarta uneventfully.

The investigation concluded several contributing factors based on the safety issues identified following the serious incident.

The KNKT acknowledges the safety actions taken by the aircraft operator and considered that the safety actions were relevant to improve safety, however there still safety issues remain to be considered. Therefore, the KNKT issued safety recommendations to address safety issues identified in this report.

1 FACTUAL INFORMATION

1.1 History of the Flight

On 25 January 2024, an Airbus A320 aircraft registered PK-LUV was being operated as scheduled passenger flight from Soekarno-Hatta International Airport (WIII), Jakarta[1] to Halu Oleo Airport (WAWW), Kendari[2] and return. The aircraft was operated by two pilots and four flight attendants.

The first flight from Jakarta was scheduled for departure at 0255 LT (1955 UTC on 24 January 2024) and the crew required to sign in for duty at 0125 LT. During the flight preparation, the Second in Command (SIC) advised the Pilot in Command (PIC) that he did not have adequate rest.

The aircraft departed from Jakarta at 0314 LT (2014 UTC on 24 January 2024) in night condition. According to the filed flight plan, the flight would follow the Instrument Flight Rules (IFR). The PIC acted as pilot flying (PF) and the SIC acted as pilot monitoring (PM). The aircraft cruised at an altitude of 35,000 feet. During cruising, the PIC offered the SIC to take a rest. The SIC rested in the cockpit and slept for about 30 minutes. The PIC took over the SIC duty as the PM while the SIC was sleeping. The SIC woke up before the aircraft started to descend.

When the aircraft approached Kendari, the Kendari air traffic control (ATC) advised that the weather was below the IFR minimum for landing and the airport was still closed. The aircraft then made holding about 30 minutes.

At 0711 LT (2311 UTC on 24 January 2024)[3] the aircraft landed Kendari using Runway 26 and parked at the apron on parking stand number 4. During this transit, both pilots consumed instant noodle cups in the cockpit. After the passenger disembarkation had been completed, the passenger boarding process for the return flight to Jakarta initiated.

At 0748 LT (2348 UTC on 24 January 2024), after the boarding process had been completed, the aircraft started to move for the return flight with flight number BTK6723. Both pilots utilized their headsets to monitor the radio communication. The cockpit loudspeakers were on with minimal volume.

At 0800 LT (0005 UTC on 25 January 2024), in daylight condition, the aircraft departed from Kendari to Jakarta. In this flight, the PIC acted as PM and the SIC as PF. The total number of passengers on board was 153. After the fastened seatbelt sign was turned off, the Flight Attendants (FAs) performed cabin check and started the passenger light meal service. The FA1 came to the cockpit and provided snacks to the pilots.

About 55 Nm from KDI VOR/DME, when the aircraft was at altitude of 22,000 feet, the Kendari ATC transferred the control of BTK6723 to the ATC of Makassar Area Control Center (ACC). The aircraft continued to climb to the cruising altitude of 36,000 feet.

[1] Soekarno-Hatta International Airport (WIII), Jakarta will be named as Jakarta for the purpose of this report.
[2] Halu Oleo Airport (WAWW), Kendari will be named as Kendari for the purpose of this report.
[3] The local time at Kendari is UTC+8 hours or 1 hour ahead of Jakarta LT (UTC+7).

At 0037 UTC, the aircraft reached the cruising altitude of 36,000 feet. After maintaining the cruising altitude, both pilots took their headsets off, and the cockpit loudspeaker volume was increased.

The PIC then asked permission to rest from the SIC and was granted. The PIC slept and the SIC then took over the PIC duty as PM while the PIC was sleeping.

At 0104 UTC, the FA called the pilot via interphone and asked whether the pilots needed something. The SIC responded that the PIC was sleeping, and they did not need anything. The Cockpit Voice Recorder (CVR) data did not indicate any further discussion between SIC and FA regarding the sleep of the PIC.

The PIC woke up and at 0122 UTC, asked whether the SIC wanted to rest. The SIC responded that he did not want to rest. Both pilots then had a non-related-duty conversation for about 30 seconds and then the PIC continued to sleep. The SIC was aware that the PIC was sleeping and continued the duty both as PF and PM.

At 0124 UTC, the SIC requested to fly on heading 275° to avoid bad weather conditions to the Makassar ACC and it was approved.

At 0129 UTC, the SIC communicated with FA using interphone asking the passenger condition as he felt that the aircraft encountered light turbulence. FA1 responded to the SIC that the passengers were fine.

At 0134 UTC, the SIC reported to the Makassar ACC that the aircraft was flying on heading 250°. The Makassar ACC acknowledged the pilot report and instructed BTK6723 to report when the aircraft was clear from the bad weather conditions. The SIC then readback the Makassar ACC instruction.

At 0142 UTC, the Makassar ACC instructed the BTK6723 to contact ATC of Jakarta ACC, and it was readback by the SIC.

At 01:43:22 UTC, the SIC made initial contact with Jakarta ACC. BTK6723 was instructed to follow KURUS 2G Standard Instrument Arrival (STAR) and to report when the aircraft was clear from bad weather conditions.

At 01:43:43 UTC, the SIC readback the Jakarta ACC instruction. At that time, the aircraft was flying on heading 250° and the position was about 125 Nm east of Waypoint KURUS. A few moments later, the SIC inadvertently fell asleep.

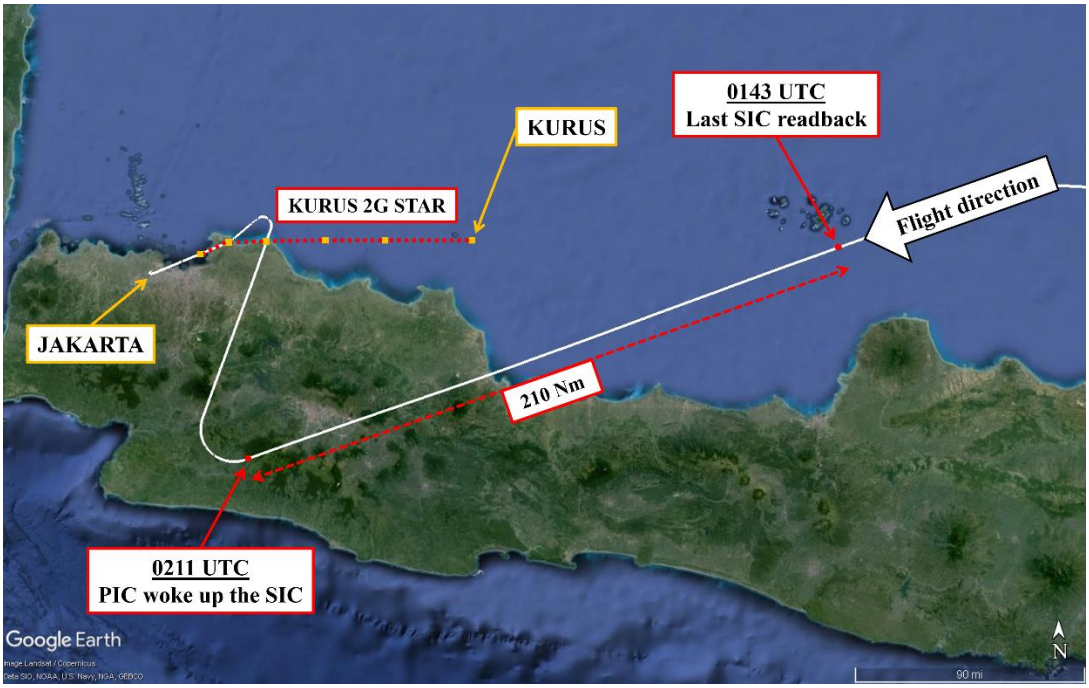


Figure 1: BTK763 flight profile

Makassar ACC and Jakarta ACC provided the air traffic control services by utilizing surveillance system (radar service).

At 0156 UTC or 12 minutes after the last recorded transmission from the SIC, the Jakarta ACC asked BTK6723 for how long the aircraft need to fly on the current heading (250°). There was no reply from the pilots.

At 0157 UTC, the Jakarta ACC called BTK6723 and there was no response from the pilots. Several attempts to contact BTK6723 had been made by the Jakarta ACC including asking other pilots to call the BTK6723. None of the calls were responded to by the BTK6723 pilots.

The PIC woke up and was aware that the aircraft was not on the correct flight path. The PIC saw the SIC was sleeping, and at 0211 UTC, the PIC woke him up. About the same time, the PIC responded to the call from another pilot and Jakarta ACC. The PIC advised the Jakarta ACC that BTK6723 experienced radio communication problem and currently the problem has been resolved. The flight then continued and landed at Jakarta uneventfully.

No one was injured in this occurrence and there was no damage to the aircraft.

1.2 Personnel Information

1.2.1 Pilot in Command

The PIC was 32 years old, Indonesia nationality who held valid Airline Transport Pilot License (ATPL) and qualified as Airbus A320 pilot. The pilot also held valid Class 1 medical certificate with medical limitation to wear corrective lenses.

The last proficiency check was conducted on 12 November 2023, and the result was satisfactory.

The PIC had total flying time of 6,304 hours 11 minutes. The details flight time of the PIC as provided by the aircraft operator was as follows:

Last 90 days	:	200 hours 19 minutes
Last 30 days	:	77 hours 37 minutes
Last 7 days	:	16 hours 31 minutes
Last 24 hours	:	6 hours 26 minutes
This flight	:	3 hours 2 minutes

On 13 January 2024, the PIC had a day off and took sick leave from 14 until 15 January 2024. Thereafter, the PIC had five consecutive duty days followed by a day off on 21 January 2024.

On 23 January 2024, the PIC had a scheduled flight with a total flight time of 1 hour 35 minutes. The flight duty terminated at 1235 LT (0535 UTC) and the PIC returned home using a car with a driver. The PIC slept about 2200 LT.

On 24 January 2024, the PIC was scheduled for standby which required the PIC to stay reachable and ready for the early morning duty schedule. The PIC woke up about 0530 LT and did a morning run for about 40 minutes. After the morning run, PIC took a bath and had his breakfast. About 1100 LT, the PIC visited a family and had lunch. The PIC arrived home about 1830 LT. The PIC continued his routine daily activities and slept about 2000 LT. The PIC woke up about 2200 LT and prepared to go to the airport.

On 25 January 2024, about 0045 LT, the PIC left to the airport by driving a car. At 0139 LT, the PIC signed on at the flight operation office and underwent a medical examination performed by a nurse provided by the company. The blood pressure and the heart rate of the PIC was normal, and the alcohol test was negative, which then considered fit for the flight duty. The PIC then prepared the flight with the other crew members.

The rest period of the PIC prior conducting the flight duty on 25 January 2024 was 35 hours.

The investigation did not find any fatigue report submitted by the PIC related to this occurrence.

1.2.2 Second in Command

The SIC was 28 years old, Indonesia nationality who held valid Commercial Pilot License (CPL) and qualified as Airbus A320 pilot. The SIC also held a valid Class 1 medical certificate without limitation.

The last proficiency check was conducted on 1 November 2023, and the result was satisfactory.

The SIC had a total flight time of 1,664 hours 45 minutes. The details flight time of the SIC as provided by the aircraft operator was as follows:

Last 90 days	:	212 hours 36 minutes
Last 30 days	:	79 hours 57 minutes

Last 7 days	:	17 hours 8 minutes
Last 24 hours	:	6 hours 26 minutes
This flight	:	3 hours 2 minutes

On 19 January 2024, the SIC had a day off and followed by three consecutive duty days.

On 22 January 2023, the SIC had one flight schedule with a total flight time of 1 hour 2 minutes. The flight duty terminated on 1842 LT (1142 UTC), and the SIC returned home using a car with a driver. The SIC slept about 2200 LT. The SIC had one-month-old twin babies. His wife took care of the babies and the SIC assisted while at home.

On 23 January 2024, the SIC was scheduled for a day off. The SIC woke up about 0800 LT and did a house move. After the packing was completed in the afternoon, the SIC drove to the new house in about one and half hours.

On 24 January 2024, the SIC was scheduled for standby which required the SIC to stay reachable and ready for the early morning duty schedule. The SIC woke up at about 0800 LT and had breakfast. About 0900 LT, the SIC drove to the old house to continue moving the remaining stuff to the new house. The SIC had lunch and returned to the new house about 1400 LT then continued to tidy up the house stuff. About 1900 LT, the SIC attempted to sleep, however the sleep was interrupted several times to help his wife take care of the babies. The SIC felt that the sleep quality was poor caused by the several wakes up.

On 25 January 2024, about 0000 LT, the SIC woke up and prepared to go to the airport. The SIC drove a car to the airport and signed on at the flight operation office at 0126 LT. The SIC underwent a medical examination performed by a nurse provided by the company. The blood pressure and the heart rate of the PIC was normal, and the alcohol test was negative which then considered fit for the flight duty. The SIC then prepared the flight with the other crew members.

The rest period of the SIC prior to conducting the flight duty on 25 January 2024 was 53 hours.

Prior to the flight, the SIC did not notify the Chief Pilot or Deputy about his fatigue condition nor complete the personal checklist and lacked the knowledge necessary to do the assessment according to the personal checklist (IM SAFE). The SIC also did not submit any fatigue report related to this occurrence.

1.2.3 Flight Attendants

The flight attendants are Indonesian nationality who held valid Flight Attendant Certificate (FAC) and qualified as Airbus A320 FA.

1.3 Aircraft Information

The Airbus A320 with serial number of 7673, was manufactured in 2017 by Airbus, France. The aircraft was registered PK-LUV and had valid Certificate of Airworthiness (C of A) and Certificate of Registration (C of R).

Prior to the flight there were no records or reports of aircraft system malfunction. After the occurrence flight, the aircraft radio communication system was found in normal condition.

1.4 Flight Recorders

1.4.1 Flight Data Recorder

The aircraft was fitted with a Flight Data Recorder (FDR) manufactured by L3 Technologies Inc. with part number of 2100-4245-00 and serial number of 001209509. KNKT received the downloaded Quick Access Recorder (QAR) data from aircraft operator. The data contained 1,025 parameters and approximately 49 hours of aircraft operation, which consisted of 24 flights including the occurrence flight.

The relevant information based on the FDR were as follows:

Time (UTC)	Event
00:37:41	Aircraft started to cruise at altitude of 36,000 feet
01:23:49	Autopilot (A/P) mode directional control was changed from NAV to HDG[4]
01:23:50	Heading selector was set to 270°
01:24:49	VHF1 emitting
01:24:59	VHF1 emitting
01:33:49	Heading selector was set to 250°
01:34:51	VHF1 emitting
01:35:02	VHF1 emitting
01:39:18	Heading selector was set to 255°
01:41:17	Heading selector was set to 250°
01:42:35	VHF1 emitting
01:42:48	VHF1 emitting
01:43:22	VHF1 emitting
01:43:43	VHF1 emitting
02:11:58	Heading selector was set to 304°
02:12:03	VHF1 emitting

1.4.2 Cockpit Voice Recorder

The aircraft was fitted with a Cockpit Voice Recorder (CVR) manufactured by L3 Technologies Inc. with part number 2100-1226-02 and serial number 001210711. The CVR recorded 2 hours 4 minutes of good quality recording data.

The CVR recorded conversation in the cockpit and the communication between pilot and air traffic controllers. The events and the excerpt of the CVR data were as follows:

Time (UTC)	Event
01:24:49	SIC contacted Makassar ACC to request right heading 275 to avoid weather and was approved.
01:24:59	SIC readback the Makassar ACC approval instruction.

[4] HDG is the mode of autopilot to fly the aircraft on a heading selected by the pilot.

Time (UTC)	Event
01:29:02	SIC asked FA about the turbulence and the passengers. The FA responded that the turbulence felt moderate, but passengers were okay.
01:34:51	SIC reported to the Makassar ACC that BTK6723 was on heading 250°. Makassar ACC acknowledged the report and instructed BTK3723 to report when clear of weather.
01:35:02	SIC readback the Makassar ACC instruction to report when clear of weather.
01:42:29	Makassar ACC instructed the BTK6723 to contact Jakarta ACC.
01:42:35	SIC readback Makassar ACC instruction to contact Jakarta ACC.
01:42:39	Makassar ACC reinstructed the BTK6723 to contact Jakarta ACC.
01:42:48	SIC readback Makassar ACC instruction to contact Jakarta ACC.
01:43:22	SIC contacted Jakarta ACC and advised that BTK6723 was on level 360 heading 250 due to weather.
01:43:32	Jakarta ACC acknowledged and instructed BTK6723 to Jakarta KURUS 2G arrival and to report when clear for weather.
01:43:43	SIC readback the Jakarta ACC instruction.
01:56:32	Jakarta ACC asked BTK6723 about how long maintaining the heading but there was no response.
01:57:50 – 02:00:50	Jakarta ACC called BTK6723 seven times.
02:01:00	Another aircraft called BTK6723.
02:01:21 – 02:0143	Jakarta ACC called BTK6723 two times.
02:04:27	Jakarta ACC asked another aircraft (LNI693) to call BTK6723.
02:05:02	Jakarta ACC called BTK6723.
02:05:35	LNI693 advised Jakarta ACC that they were unable to contact BTK6723.
02:07:32 – 02:08:50	Jakarta ACC called BTK6723 three times.
02:09:08	Another aircraft (BTK6292) also tried to contact BTK6723.
02:09:22	Jakarta ACC called BTK6723.
02:09:54 – 02:10:59	Another aircraft called BTK6723 four times.
02:11:52	PIC asked SIC of the flight direction, and was responded “what?”
02:12:03	PIC called Jakarta ACC
02:12:05	Another aircraft called BTK6723 and was responded to by the PIC. The other aircraft pilot instructed BTK6723 to contact Jakarta ACC.
02:13:13	Jakarta ACC asked whether BTK6723 had problems onboard and responded by the PIC that there were no problems onboard.

1.5 Organizational and Management Information

1.5.1 Aircraft Operator

The aircraft was operated by Batik Air Indonesia which had a valid Air Operator Certificate. The aircraft operator is authorized to conduct air transportation carrying passenger and cargo in schedules and non-scheduled operation within and outside Indonesia.

The aircraft operator developed Operation Manuals (OM)s which contained policies and procedures approved by the Directorate General of Civil Aviation (DGCA).

1.5.1.1 Flight Duty Time and Rest Policy

Aircraft operator Operation Manual Volume A (OM-A) subchapter 7.1.2.2 described one of the crew member responsibilities and duties was:

> *Not operate the flight if he is fatigued, or if in his opinion his physical, emotional or mental wellbeing would render him unfit or unsafe during any part of his flight duty period. In this case, the pilot must advise Fleet Chief Pilot or his deputy, and for Flight Attendants, must advise Chief FA Assistant for Daily Operations at first possible opportunity;*

The flight duty time limitation described in the OM-A subchapter 7.2 as follows:

BASIC LIMITATIONS WITHIN 24 CONSECUTIVE HOURS

MAX. FLIGHT DUTY TIME (ALL CREWMEMBERS)	*MAX. FLIGHT TIME (FLIGHT CREW)*	*MAX. FLIGHT TIME (CABIN CREW)*
14 Hrs.	*9 Hrs.*	*12 Hrs.*

SCHEDULING CUMULATIVE FLIGHT TIME LIMITATIONS FOR FLIGHT CREWS

	MAX. FLIGHT TIME (FT) (FLIGHT CREW ONLY)	*MAX. FLIGHT DUTY TIME (FDT)*
In any 7 consecutive days	*30 Hrs.*	*NIL*
In any calendar month	*110 Hrs.*	*NIL*
In any 12 Calendar month	*1,050 Hrs*	*NIL*

The flight crew rest requirements were described in the OM-A as follows:

7.4.1 ROSTERED DAY OFF (RDO)

All crewmembers (flight crews and flight attendants) must be relieved from all further duty for at least 24 consecutive hours within any 7 consecutive days. This period of 24 consecutive hours will commence after a FDP[5]*.*

7.4.2 MINIMUM REST PERIODS BETWEEN TWO FLIGHT DUTY PERIODS

The minimum rest period must be given to each crew who has performed an assignment involving flying duty and before the next flight duty period. During rest period, the crewmember must not be given any assignment by the Company.

	MINIMUM REST PRIOR TO THE NEXT FLIGHT DUTY PERIODS			
PREVIOUS FDT[6]	*FLIGHT CREWS*	*FLIGHT ATTENDANTD*		
		NORMAL	*REDUCED*	*SUBSEQUENT*
FOLLOWING STANDARD FDP				
< 14 Hrs.	*9 Hrs.*	*9 Hrs.*	*8 Hrs.*	*10 Hrs.*
FOLLOWING SCHEDULED EXTENDED FDP (AUGMENTED CREW)				
Up to 16 Hrs.	*11 Hrs.*	*12 Hrs.*	*10 Hrs.*	*14 Hrs.*
FOLLOWING SCHEDULED EXTENDED FDP (SPLIT FLIGHT DUTY TIME)				
>14 Hrs.	*= 9 Hrs. + FDT extension*			
EXTENDED FTD (UNFORESEEN OPERATIONAL CIRCUMSTANCES)				
>14 Hrs.	*17 Hrs.*			

7.4.3.1 ENTIRE DURATION OF THE FLIGHT

Flight Time Duty is considered to begin:

- *Home base (Jakarta / CGK): 90 minutes before Block Off time (reporting time)*
- *Home base (Jakarta / HLP): 120 minutes before Block Off time (reporting time)*
- *Wide Body: 120 minutes before Block Off time (reporting time).*
- *Others stations: 60 minutes before Block Off time (reporting time).*
- *International Flight from Home base/other station: 120 minutes before Block Off time (reporting time).*

Flight Time Duty is considered to end:

- *Home base (Jakarta / CGK): 30 minutes after Block On Time (check-out time)*

[5] FDP is Flight Duty Periods.

[6] FDT is Flight Duty Times. The FDT is the total elapsed time from the time a crewmember is required to report for duty to the time that crewmember has completed all official duties with respect to a flight or series of flights and is released for an official crew rest.

- *Other stations: 30 minutes after Block On Time (check-out time)*

Therefore, in order to ensure that crewmembers benefit from the minimum required rest period, purpose, the minimum BLOCK ON – BLOCK OFF time could not less than:

- *Home base (Jakarta, CGK):*

  0.5 Hrs. (sign off) + 1.5 Hrs. (transportation to home + Physiological needs) + Minimum Rest + 1.5 Hrs. (traveling to airport) + 1.5 Hrs. (reporting time)
- *Other stations:*

  0.5 Hrs. (sign off) + 1.5 Hrs. (transportation to the hotel + Physiological needs) + Minimum Rest + 1 Hrs. (traveling to airport) + 1Hrs. (reporting time)

1.5.1.2 Pilot Health and Medical Fitness Policy

OM-A subchapter 6.1 described as follows:

…

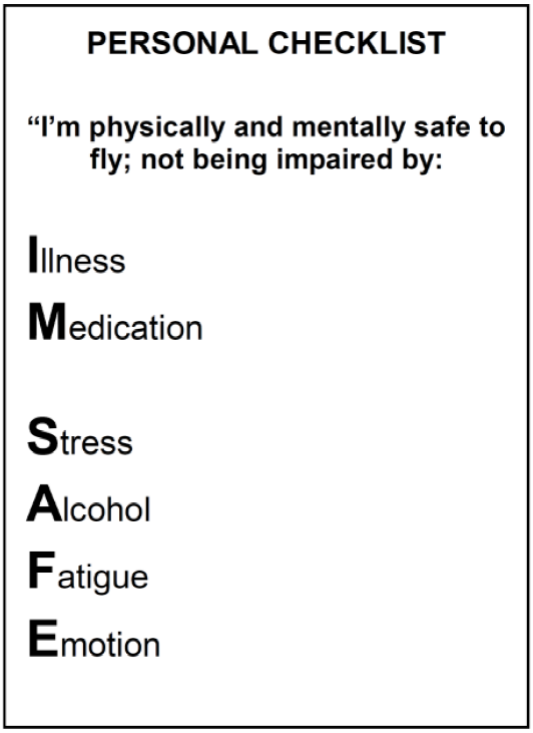
BATIK AIR and all crewmembers are required to consider aero medical factors that may affect or be related to flying activities. Crewmembers have an obligation to remain fit for duty and to use every endeavor to maintain a level of fitness that supports safe operations.

All crewmembers have an obligation to inform their respective Chief or Manager of any medical condition that may interfere with flight safety, and take responsibility prior to being assigned to duty, will not be affected by factors that could impair human performance, to include, as a minimum:

- *Pregnancy*
- *Illness, surgery or use of medication(s);*
- *Blood donation.*
- *Deep underwater diving.*
- *Fatigue whether occurring in one flight, successive flights or accumulated over a period of time*

…

BATIK AIR pilots must develop a personal checklist, which includes all of the categories of pilot impairment as discussed in this section that can be easily committed to memory as a reminder before performing any flight duty.



The investigation did not find any detailed guidance nor procedure for pilots when using the personal checklist (IM SAFE), such as the assessment guidance for each impairment category. The aircraft operator stated that the personal checklist was a means to help pilot conducting a self-assessment.

OM-A subchapter 6.2.3.3 described as follow:

> *6.2.3.3 BLOOD PRESSURE AND ALCOHOL CONTAMINATION*
>
> *Batik Air examines medical condition of the crew on their first flight of the day, by conducting blood pressure and alcohol contamination check.*

OM-A subchapter 6.5.1.1 described fatigue as follows:

> *Fatigue continues to be one of the most treacherous hazards to flight safety, as it may not be apparent to a pilot until serious errors are made. Fatigue is best described as either acute (short-term) or chronic (long-term).*
>
> *A normal occurrence of everyday living, acute fatigue is the tiredness felt after long periods of physical and mental strain, including strenuous muscular effort, immobility, heavy mental workload, strong emotional pressure, monotony, and lack of sleep. Consequently, coordination and alertness, so vital to safe pilot performance, can be reduced. Acute fatigue is prevented by adequate rest and sleep, as well as by regular exercise and proper nutrition.*
>
> *Chronic fatigue occurs when there is not enough time for full recovery between episodes of acute fatigue. Performance continues to fall off, and judgment becomes impaired so that unwarranted risks may be taken. Recovery from chronic fatigue requires.*
>
> *The safest rule is not to fly as a crewmember if signs/symptoms of fatigues occur in daily activities. Crewmembers should take adequate rest and sleep as well as regular exercise and proper nutrition.*

1.5.1.3 Use of Headsets or Cockpit Speakers

OM-A subchapter 6.2.3.3 described company procedures to use headsets or cockpit speakers as follows:

Headset must be worn by both pilots from the time the aircraft starts to move until top of climb and from the top of descent throughout descent, approach and landing until the aircraft fully stops at parking gate;

- *Both pilots must wear headsets when either pilot is off the active ATC frequency (to obtain weather, etc.);*
- *In flight, when only one pilot is present on the flight deck, a headset must be worn (also refer to paragraph §8.3.14.1 of this chapter).*

Other than that, flight deck speakers may be used. Speaker volume should be kept at the minimum usable level adequate to avoid interference with normal flight crew deck conversation, but still ensure reception relevant ATC communications.

1.5.1.4 Cockpit Check Policy

Aircraft operator Safety Emergency Procedures (SEP) subchapter 1.1.24.1 (i) described procedures to perform cabin checks which also contain policy for the FA to check the cockpit as follows:

…

i. ***Perform cabin checks****. Cabin checks must be made every 15 minutes during the day and every 20 minutes on night flights. The cockpit should be checked every 30 minutes. Monitors the cabin temperature and inform the PURSER/FA -1 if any adjustments need to be made. During night flights and/or when the cabin is darkened for film viewing, watch for: Call lights i. ii. Reading lights left on iii. Tray tables left down iv. Signs of passenger illness or discomfort v. Passengers who may desire food or beverages*

…

The investigation did not find detailed procedures to conduct the cockpit check as mentioned in the SEP, such as the methods and the responsible person of cockpit check.

1.5.1.5 Fatigue Risk Management

OM-A subchapter 7.6 describes the fatigue risk management for the operation. The approaches to fatigue management in aviation were explained as follows:

...

These approaches share two important basic features. First, they are based on scientific principles and knowledge as well as operational experience. Both should take into account:

- *the need for adequate sleep (not just resting while awake) to restore and maintain all aspects of waking function (including alertness, physical and mental performance, and mood); and*

- *daily rhythms in the ability to perform mental and physical work, and in sleep propensity (the ability to fall asleep and stay asleep), that are driven by the circadian clock in the brain; and*
- *the contribution of workload to fatigue and physical and mental performance degradation; and*
- *the operational context and the safety risk that a fatigue-impaired crew member represents in that context.*

Second, because fatigue is affected by all waking activities (not only work demands), fatigue management has to be a shared responsibility between regulators, operators and crew members.

- *The regulator is responsible for providing a regulatory framework and ensuring that operators manage their fatigue-related risks to achieve an acceptable level of safety.*
- *Operators are responsible for providing fatigue management education, creating pairings and rosters that enable crew members to perform their duties safely, and implementing processes for monitoring and managing fatigue hazards.*
- *Crew members are responsible for arriving fit for duty, including making appropriate use of rest breaks to obtain sleep, and for reporting fatigue hazards.*

Subchapter 7.6.4 outlined fatigue reporting as follows:

…

Crew members should be encouraged to report fatigue hazards such as the following.

- *Fatigue contributes to a duty period not being started or completed. Batik Air have a process for reporting 'not fit for duty' due to fatigue, and a clear procedure around the consequences.*
- *A crew member completes a duty period in which they believe their own fatigue or that of others reduced the safety margin to an unacceptable level or required some unplanned mitigation.*
- *A crew member identifies something in their operating environment that could significantly increase their fatigue, or that of others.*

An effective fatigue reporting system should include information on recent sleep history (minimum last 3 days), time of day of the event, and measures of different aspects of fatigue-related impairment (for example, validated alertness or sleepiness scales.

…

The investigation did not find fatigue reporting submitted by the PIC and SIC prior and after the occurrence flight.

1.5.2 Regulation and Guidance on Fatigue Management

Directorate General of Civil Aviation (DGCA) had established prescriptive regulations for fatigue management in the Civil Aviation Safety Regulation (CASR) Part 91.

The CASR Part 91 Subchapter 91.515 also described fatigue management program as follows:

> *Each operator shall establish and implement a fatigue management programme that:*
>
> *(a) Ensures operations and maintenance staff are not fatigued when carrying out their duties,*
>
> *(b) Addresses flight and duty time limitations, and*
>
> *(c) Is included in the Operations Manual.*

The DGCA had also established prescriptive regulations for flight time, flight duty period, duty period limitations and rest period requirements with purpose to manage fatigue. These regulations were described in the CASR Part 121 as follows:

> *121.471 Flight Time Limitations and Rest Requirements: All Crewmembers*
>
> *(a) Each air carrier shall relieve each flight crewmember engaged in scheduled air transportation from all further duty for at least 24 consecutive hours during any 7 consecutive days.*
>
> *(b) An air carrier may not assign a flight crewmember and a flight crewmember may not accept assignment to any duty with the air carrier during any required rest period.*
>
> *(c) Time spent in transportation that an air carrier requires of a flight crewmember and provides to transport the crewmember to an airport at which he is to serve on a flight as a crewmember, or from an airport at which he was relieved from duty to return to his home station, is not considered part of a rest period.*
>
> *121.472 Duty Time Limitations: All Crewmembers*
>
> *(a) Except as provided in paragraphs (c), (d) and (e) of this section an air carrier may not assign a flight crewmember and a flight crew member may not accept an assignment where the flight crewmember's flight duty time in any 24 consecutive hours will exceed 14 hours. For any aircraft that requires a flight engineer as part of the crew, a crewmember's flight duty time may be extended to 15 hours.*
>
> *(b) Flight duty time is defined as the time between the time the crewmember reports for duty until the termination of the flight-*
>
> *(c) Where a flight crew is augmented by the addition of one pilot, flight duty time may be extended beyond 14 hours up to 16 hours if:*
>
> *(1) A passenger seat for the off-duty pilot is available in the passenger compartment;*
>
> *(2) The additional pilot occupies a flight deck observer seat during take-off and landing;*
>
> *(3) The maximum flight deck duty time for any pilot is 12 hours; and*

(4) Two hours are added to the required rest period prior to the next flight duty period

(d) Where rest is taken during a flight duty period, flight duty time may be extended beyond the 14 hours in Paragraph (a) of this section if:

(1) The air carrier provides the flight crewmember with advance notice of the split flight duty time;

(2) One-third of the flight duty time precedes the rest period;

(3) A rest period of at least four hours in suitable accommodation is provided;

(4) The flight crew member's rest is not interrupted by the air carrier during the rest period;

(5) The flight duty time is extended by one-half the length of the rest period referred to in (d)(3)), to a maximum of three hours; and

(6) The required rest period following the split flight duty time and prior to the next flight duty period is increased by an amount equal to the extension to the flight duty time.

The DGCA provided information and guidance for the operator to develop and implement Fatigue Management Programme in Advisory Circular (AC) 120-08. The subchapter 5.d of the AC 120-08 defined three main responsibilities of pilot as follows:

a) Get Enough Sleep.

The only remedy for sleep deprivation is sleep and it is the crewmember's responsibility to use the facilities and sleep opportunities to obtain rest, sleep, and meals. Each person has a unique requirement for sleep and only the individual can decide how much sleep is adequate to maintain alertness and performance. As a general guide, the average person is thought to require about 8 hours of sleep per day.

b) Plan Sleep Ahead of Time.

Getting adequate sleep requires planning with future duty times in mind. For example, if duty will require an early morning awakening, then the crewmember should plan to go to bed early the night before so as to be fully rested for the next duty. If the next duty will commence in the evening, the crewmember is responsible for taking an afternoon or evening nap so that her or she does not start work with eight or more hours of continuous wakefulness before the start of duty.

c) Report Fatigue.

If circumstances preclude sufficient sleep for the crewmember to be adequately alert and rested and to perform duty, whether they are the result of the schedule, delays, illness, life events, or personal actions, it is the crewmember's responsibility to report his or her state of fatigue to the certificate holder. The crewmember should not accept the responsibilities of duty when fatigued or feeling unfit to perform assigned duties to the extent that the safety of the flight may be jeopardized. ...

1.5.3 Standard and Recommended Practice of Fatigue Management

ICAO Annex 6: Operation of Aircraft, Part I – International Commercial Air Transport — Aeroplanes described fatigue management as follows:

4.10.1 The State of the Operator shall establish regulations for the purpose of managing fatigue. These regulations shall be based upon scientific principles, knowledge and operational experience with the aim of ensuring that flight and cabin crew members are performing at an adequate level of alertness. Accordingly, the State of the Operator shall establish:

a) prescriptive regulations for flight time, flight duty period, duty period limitations and rest period requirements; and

b) where authorizing the operator to use a Fatigue Risk Management System (FRMS) to manage fatigue, FRMS regulations.

4.10.2 The State of the Operator shall require that the operator, in compliance with 4.10.1 and for the purposes of managing its fatigue-related safety risks, establish either:

a) flight time, flight duty period, duty period limitations and rest period requirements that are within the prescriptive fatigue management regulations established by the State of the Operator; or

b) a Fatigue Risk Management System (FRMS) in compliance with 4.10.6 for all operations; or

c) an FRMS in compliance with 4.10.6 for part of its operations and the requirements of 4.10.2 a) for the remainder of its operations.

ICAO Document 9966: Manual for the Oversight of Fatigue Risk Management Approaches, subchapter 2.3.2 described that humans are programmed for daytime wakefulness and nighttime sleepiness by the circadian body clock. The circadian body clock also affects every aspect of human functioning, which causes cycles of high and poor performance. The period of the circadian body clock cycle when people generally feel most sleepy and are least able to accomplish mental and physical work is the time around the daily minimum in core body temperature. This is sometimes referred to as the Window of Circadian Low (WOCL). The influences of the circadian body clock on sleep at night can be seen at the picture below:

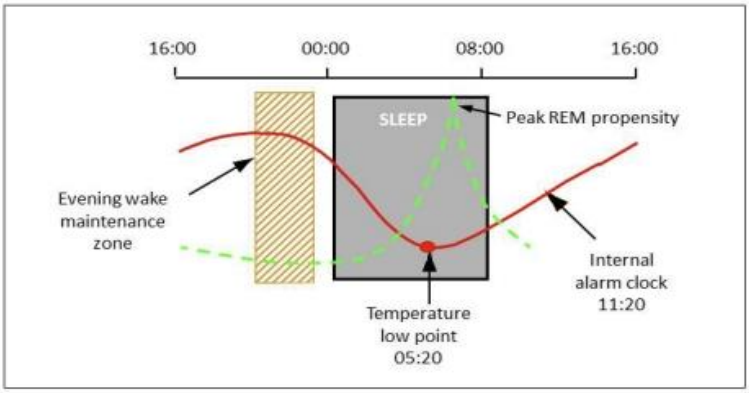


Figure 2: Relationship between normal sleep at night and the circadian body clock cycle

The ICAO Document 9966 subchapter 2.3.4 described during shift work, sleep is disrupted from the optimal phase of the circadian body clock cycle. The shift work and night work schedules cause a change in work that the circadian body clock cannot quickly adjust to. Shift work requires adaptation of the circadian clock by sleeping in a different part of the circadian body clock cycle before and after night duty. Crew members frequently operated the flight in the WOCL, when they would be anticipated to be drowsy, and had to exert more effort to maintain their performance as result of the circadian body clock's poor adaptation to night duty. For example, on off duty days, when pilot is sleeping at night, the average time of the temperature minimum is at 0520 in the morning (see figure 2). When pilot is flying at night this shift and will begin around 0808 in the morning and pilot will feel sleepy close to that time (see figure 3).

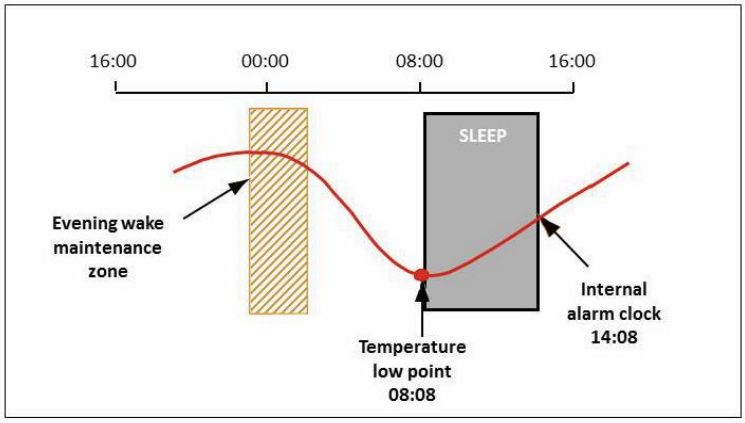


Figure 3: Relationships between sleep after night duty and the circadian body clock cycle

1.6 Useful or Effective Investigation Techniques

The investigation was conducted in accordance with the KNKT approved policies and procedures, and in accordance with the standards and recommended practices of Annex 13 to the Chicago Convention.

2 ANALYSIS

The investigation did not find any issue related to aircraft system malfunction, including the aircraft radio communication system, therefore the analysis will discuss about flight crew member activities during flight, the utilization of rest period prior to flight, and the implementation of the fatigue management.

2.1 The Utilization of Rest Period Prior to Flight

According to the aircraft operator Operation Manual Volume A (OM-A), pilots must be relieved from all duty for at least 24 consecutive hours within any seven consecutive days. The OM-A also described that the minimum rest period between two flight duty periods for a standard pilot flight duty period was nine hours. All those requirements were in accordance with the Civil Aviation Safety Regulation (CASR) part 121.

The PIC had a day off on 13 January 2024 and took sick leave from 14 until 15 January 2024. Thereafter, the PIC had five consecutive duty days followed by a day off on 21 January 2024. The occurrence flight was the fourth consecutive duty days of the PIC after having a day off.

The SIC had a day off on 19 January 2024 then had three consecutive duty days followed by a day off on 23 January 2024. The occurrence flight was the second duty days of the SIC after having a day off.

The rest period for the PIC prior conducting the flight duty at the day of the occurrence was 35 hours or more than one day, while for the SIC was 53 hours or more than two days. Therefore, the scheduled day off and the minimum rest period for both pilots were in accordance with the rest requirement described in the OM-A.

The PIC was scheduled for a standby one day before the occurrence, and a fight schedule in the early morning on the day of the occurrence. During the standby time, the PIC did the daily routine activities and slept for two hours before driving himself to the airport at 0045 LT.

Two days before the occurrence, the SIC was scheduled for a day off and one day before the occurrence was scheduled for a standby. During the scheduled day off and standby, the SIC did not obtain proper rest as the SIC was doing a house move. A night before the occurrence flight, the SIC attempted to get some sleep and was sleeping for approximately five hours. However, the SIC’s sleep quality was not good caused by several wakes up as he helped his wife to take care of their one-month twin babies at home.

Directorate General of Civil Aviation Advisory Circular (AC) 120-08 provided information and guidance for aircraft operators to develop and implement a fatigue management program. The AC 120-08 highlighted that pilot was responsible to manage their fatigue by having enough sleep, planning to sleep ahead of time and making a report when fatigued. The quantity of sleep in the AC 120-08 was described would differ between individual, however it was stated that an average person requires about eight hours of sleep per day. If the duty would commence in the evening, a pilot should plan sleep ahead of time to ensure that the pilot would not have eight or more hours of continuous wakefulness before the start of duty. However, if any circumstances preclude sufficient sleep which leads to fatigue, for example as result of life events or personal actions, the pilot should not accept the flight duty and should make a fatigue report to the company.

The OM-A had described that fatigue was the most treacherous hazard to flight safety as it may not be apparent to pilot until serious errors were made. Lack of sleep was mentioned as one of the causes of fatigue, and the pilot has the responsibility to use their scheduled rest period appropriately for obtaining enough sleep. However, the investigation was unable to find any detailed guidance in the aircraft operator document that described the recommended quantity of sleep nor requirement for pilot to plan sleep ahead of time as mentioned in the AC 120-08.

Based on the fatigue management guidance described in the AC 120-08, it could be concluded that neither pilot utilized their scheduled rest period properly which had made the pilots did not have enough sleep prior to their duty. The condition of the SIC worsened as he had physical activities from a house move and his limited duration of sleep was disrupted.

The OM-A described pilot must not accept the flight duty when sign or symptoms of fatigue have been identified and notify Chief Pilot at first possible opportunity. The SIC advised that he did not have adequate rest, and the PIC slept only two hours indicated that both pilots were in fatigue prior to the flight and should not accept the flight duty.

2.2 Flight Crew Member Activities during Flight

During the flight return to Jakarta, the Pilot in Command (PIC) acted as Pilot Monitoring (PM) and the Second in Command (SIC) acted as Pilot Flying (PF). After reaching the cruising altitude of 36,000 feet, both pilots took their headsets off, and the cockpit loudspeaker volume was increased.

According to the aircraft operator Operation Manual Volume A (OM-A), pilot was allowed to take their headsets off and use flightdeck speaker with volume at the minimum useable level adequate to avoid interference with normal flight crew deck conversation, but still ensure reception relevant ATC communications. The CVR record indicated that the speaker volume allowed the pilot to hear the Air Traffic Controller transmission.

At 0037 UTC after the aircraft reached the cruising altitude, the PIC asked permission to rest from the SIC and was granted. At 0122 UTC, the PIC woke up and asked whether the SIC wanted to rest. The SIC responded that he did not want to rest, and the PIC continued to sleep. While the PIC was sleeping, the SIC took over the PIC duty as PM while also maintaining his role as PF.

The aircraft flew on assigned airways with autopilot system was engaged with directional control selected on NAV. When the SIC attempted to avoid bad weather conditions, the autopilot directional control was changed to HDG, which means the directional control of the aircraft would follow the selected heading set by the pilot.

At 0143 UTC, the SIC made initial contact with the Jakarta ACC and was instructed to follow KURUS 2G Standard Instrument Arrival (STAR) with additional instruction to report when the aircraft was clear from bad weather conditions. At that time, the aircraft position was about 125 NM east of Waypoint KURUS, which was the initial waypoint of the KURUS 2G STAR.

The flight could not be directed to follow the STAR as the SIC was still avoiding the bad weather conditions by setting the heading selector on 250°.

After readback the Jakarta ACC instruction, the SIC inadvertently fell asleep when the PIC was sleeping. About 12 minutes after the SIC readback, the Jakarta ACC asked BTK6723 of how long the aircraft needed to fly on the current heading but was no reply. In the next 13 minutes, after the call was not replied, the Jakarta ACC called BTK6723 fourteen times and asked two other aircraft pilots to call BTK6723. None of the calls were replied to by the BTK6723 pilots as both pilots were sleeping.

The occurrence flight was the second flight of the day, and the first flight duty was started at night and the flight was performed on early morning. According to the ICAO Document 9966, those conditions altered the circadian rhythm of the body as the pilots must awake and work during the time in the circadian body clock cycle when they would normally be asleep. Therefore, the altered circadian rhythm would shift the temperature low point to around 0808 in the morning, and pilot would feel sleepy close to that time. The SIC fell asleep sometime after communicating with Jakarta ACC at 0843 in the morning (0143 UTC).

The fatigue as result of the improper utilization of the scheduled rest period and altered circadian rhythm have reduced the pilots' capability to maintain their wakefulness. This condition has made the PIC need to sleep during the occurrence flight and the SIC inadvertently falling asleep even though the SIC had 30 minutes sleep on the previous flight.

The inadvertently falling asleep of the SIC while the PIC was sleeping and the autopilot system was engaged, resulted in the aircraft flying on heading 250° following last directional control input by the SIC to avoid bad weather.

The aircraft operator Safety Emergency Procedures (SEP) described procedures to perform cabin checks which also requires the FA to check the cockpit every 30 minutes. However, the investigation did not find a detailed description of how to conduct the procedure, such as the method and the responsible person to conduct the cockpit check.

After the PIC was sleeping, the Flight Attendant (FA) called the pilot via interphone and asked whether the pilots needed something. The SIC responded that the PIC was sleeping, and they did not need anything. About 25 minutes later, the SIC called the FA using an interphone and asked the passengers' condition as he felt a light turbulence. The FA responded that the passengers were fine. The FA considered this communication as a cockpit check. That last cockpit check was recorded 42 minutes prior to the PIC waking up and realized that the SIC fell asleep. The absence of detailed procedures resulted in the improper implementation of the cockpit check, preventing the detection of the inadvertently falling asleep of the SIC.

2.3 The Implementation of the Fatigue Management

ICAO Annex 6 Part I described the State of the Operator shall establish regulations for the purpose of managing fatigue. Accordingly, the State of the Operator shall establish prescriptive regulations for flight time, flight duty period, duty period limitations and rest period requirements; and Fatigue Risk Management System (FRMS) regulation when authorizing the operator to use a FRMS to manage fatigue.

Directorate General of Civil Aviation had established prescriptive regulations to manage fatigue as the FRMS was not authorized to the Indonesian operator. The prescriptive regulations were described in the CASR Part 121, and in the CASR Part 91 required a fatigue management program to be established and implemented by Indonesian operator. All the regulations to manage fatigue in the CASR Part 121 and Part 91 had been transposed into OM-A.

The scheduled day off and the minimum rest period for both pilots were in accordance with the rest requirement described in the OM-A. The OM-A described pilot must not accept the flight duty when fatigued and notify Chief Pilot at first possible opportunity. However, as mentioned in the previous analysis (subchapter 2.1), both pilots were fatigued prior to the flight duties as result of the improper utilization of the scheduled rest period. The investigation did not find any fatigue reporting submitted by the pilots prior to the flight duty and both pilots elected to perform their flight duty while in fatigue condition.

The OM-A had described that fatigue was the most treacherous hazard to flight safety as it may not be apparent to pilot until serious errors were made. Lack of sleep was mentioned as one of the causes of fatigue, and the pilot has the responsibility to use their scheduled rest period appropriately for obtaining enough sleep. However, the investigation was unable to find any detailed guidance in the aircraft operator document that described the recommended quantity of sleep nor requirement for pilot to plan sleep ahead of time as mentioned in the AC 120-08.

On the first flight, the PIC offered the SIC to rest which then the SIC slept during the first flight and on the occurrence flight, the PIC asked permission to rest from the SIC and after it was granted, the PIC slept. In addition, when the FA asked whether the pilots needed something via interphone the SIC advised that the PIC was sleeping. The Cockpit Voice Recorder (CVR) data did not indicate any further discussion between SIC and FA regarding the sleep of the PIC. Based on those mentioned events, pilot sleep during flight was most likely considered as common practice to deal with insufficient sleep time prior to the duty. This common practice was not in accordance with the pilot guidance to manage fatigue as described in the AC 120-08.

The lack of detailed guidance from aircraft operator for pilot to manage fatigue most likely has made the pilot did not utilize their scheduled rest period appropriately and might be managed by improper common practice by sleeping during flight.

Pilots are required to use a self-assessment checklist (IM SAFE) to identify the pilot impairment including fatigue. However, there was no detailed guidance on how to conduct the assessment. This condition resulted in insufficient sleep time was not considered leading to fatigue that could impair pilot performance as the pilots believed that the sleepy condition can be managed by sleeping during flight. The aircraft operator also developed means to check the pilot's medical condition on the first flight of the day by conducting the blood pressure and alcohol contamination check. Both pilots had underwent medical examinations conducted by a nurse who was assigned by the company prior to the first flight. This examination was unable to identify fatigue condition of both pilots as it limited to blood pressure and alcohol contamination check. The self-assessment checklist and medical examinations on the first flight of the day were considered ineffective to identify the fatigue condition of the pilots.

The lack of detailed guidance of the aircraft operator to manage fatigue, the ineffective means to identify fatigue condition and inappropriate common practice to manage fatigue during flight indicated that the fatigue management has not been implemented properly.

3 CONCLUSIONS

3.1 Findings

The findings are statements of all significant conditions, events or circumstances in the accident sequence. The findings are significant steps in the accident sequence, but they are not always causal or indicate deficiencies. Some findings point out the conditions that pre-existed the accident sequence, but they are usually essential to the understanding of the occurrence, usually in chronological order.

In this occurrence, the KNKT identified several findings as follows:

1. The aircraft had a valid Certificate of Airworthiness (C of A) and Certificate of Registration (C of R).
2. Prior to the flight there were no records or reports of aircraft system malfunction. After the occurrence flight, the aircraft radio communication system was found in normal condition.
3. Both pilots and all the flight attendants held valid licenses and medical certificates.
4. During the occurrence flight, the PIC acted as Pilot Monitoring (PM) and the SIC acted as Pilot Flying (PF).
5. On the occurrence flight, the PIC asked permission to rest from the SIC and after it was granted, the PIC slept. While the PIC was sleeping, the SIC took over the PIC duty as PM while also maintaining his role as PF.
6. The SIC attempted to avoid bad weather conditions and changed the autopilot directional control from NAV to HDG, which means the directional control of the aircraft would follow the selected heading set by the pilot.
7. At 01:43:22 UTC, the SIC made initial contact with the Jakarta ACC and was instructed to follow a Standard Instrument Arrival (STAR) with additional instruction to report when the aircraft was clear from bad weather conditions. At that time, the flight could not be directed to follow the STAR as the SIC was still avoiding the bad weather conditions by setting the heading selector on 250°.
8. At 01:43:42, the SIC readback the Jakarta ACC instruction and then inadvertently fell asleep a few moments later.
9. The inadvertently falling asleep of the SIC while the PIC was sleeping and the autopilot system was engaged, resulted in the aircraft flying on heading 250° following last directional control input by the SIC to avoid bad weather.
10. About 12 minutes after the last SIC readback, the Jakarta ACC asked BTK6723 of how long the aircraft needed to fly on the current heading but was no reply.
11. In the next 13 minutes, after the call was not replied, the Jakarta ACC called BTK6723 fourteen times and asked two other aircraft pilots to call BTK6723. None of the calls were replied to by the BTK6723 pilots as both pilots were sleeping.

12. The aircraft operator Safety Emergency Procedures (SEP) described procedures to perform cabin checks which also requires the FA to check the cockpit every 30 minutes.
13. The absence of detailed procedures resulted in the improper implementation of the cockpit check, preventing the detection of the inadvertently falling asleep of the SIC.
14. The PIC woke up and was aware that the aircraft was not in the correct flight path. The PIC saw the SIC was sleeping, and at 0211 UTC, the PIC then woke the SIC up.
15. The occurrence flight was the fourth consecutive duty days of the Pilot in Command (PIC) after having a day off, and for the Second in Command (SIC) it was the was the second duty days after having a day off.
16. The scheduled day off and the minimum rest period for both pilots were in accordance with the rest requirement described in the Civil Aviation Safety Regulations Part 121.
17. Directorate General of Civil Aviation Advisory Circular (AC) 120-08 provided information and detailed guidance for aircraft operators to develop and implement a fatigue management program.
18. The AC 120-08 highlighted that pilot was responsible to manage their fatigue by having enough sleep, planning to sleep ahead of time and making a report when fatigued.
19. The quantity of sleep in the AC 120-08 was described would differ between individual, however it was stated that an average person requires about eight hours of sleep per day.
20. If the duty would commence in the evening, the AC 120-08 required pilot to plan sleep ahead of time to ensure that the pilot would not have eight or more hours of continuous wakefulness before the start of duty.
21. The AC 120-08 described that if any circumstances preclude sufficient sleep which leads to fatigue, for example as result of life events or personal actions, the pilot should not accept the flight duty and should make a fatigue report to the company.
22. The aircraft Operator Manual Volume A (OM-A) described that fatigue was the most treacherous hazard to flight safety as it may not be apparent to pilot until serious errors were made.
23. The OM-A described that pilot must not accept the flight duty when sign or symptoms of fatigue have been identified and notify Chief Pilot at first possible opportunity.
24. The OM-A stated that lack of sleep was mentioned as one of the causes of fatigue, and the pilot has the responsibility to use their scheduled rest period appropriately for obtaining enough sleep. However, the investigation was unable to find any detailed guidance in the aircraft operator document that described the recommended quantity of sleep nor requirement for pilot to plan sleep ahead of time as mentioned in the AC 120-08.

25. The SIC advised that he did not have adequate rest, and the PIC slept only two hours indicated that both pilots were in fatigue prior to the flight and should not accept the flight duty.

26. Neither pilot utilized their scheduled rest period properly which had made the pilots did not have enough sleep prior to their duty. The condition of the SIC worsened as he had physical activities from a house move and his limited duration of sleep was disrupted.

27. Both pilots must awake and work during the time in the circadian body clock cycle when they would normally be asleep, according to the ICAO Document 9966, those conditions altered the circadian rhythm of the body. Therefore, the altered circadian rhythm would shift the temperature low point to around 0808 in the morning, and pilot would feel sleepy close to that time.

28. The elected to fly in fatigued condition and altered circadian rhythm have reduced the pilots' capability to maintain their wakefulness.

29. Pilot sleep during flight was most likely considered as common practice to deal with insufficient sleep time prior to the duty.

30. The lack of detailed guidance from aircraft operator for pilot to manage fatigue most likely has made the pilot did not utilize their scheduled rest period appropriately which led to fatigue and might be managed by improper common practice by sleeping during flight.

31. The self-assessment checklist and medical examinations on the first flight of the day were considered ineffective to identify the fatigue condition of the pilots.

32. The lack of detailed guidance of the aircraft operator to manage fatigue, the ineffective means to identify fatigue condition and inappropriate common practice to manage fatigue during flight indicated that the fatigue management has not been implemented properly.

3.2 Contributing Factors

Contributing factors is defined as actions, omissions, events, conditions, or a combination thereof, which, if eliminated, avoided or absent, would have reduced the probability of the accident or incident occurring, or mitigated the severity of the consequences of the accident or incident.

The identification of contributing factors does not imply the assignment of fault or the determination of administrative, civil or criminal liability. The presentation of the contributing factors is based on chronological order and does not show the degree of contribution.

The KNKT concluded the contributing factors as follows:

- The lack of detailed guidance from aircraft operator for pilot to manage fatigue most likely has made the pilot did not utilize their scheduled rest period appropriately which led to fatigue and might be managed by improper common practice by sleeping during flight.
- The elected to fly in fatigued condition and altered circadian rhythm have reduced the pilots' capability to maintain their wakefulness.
- The absence of detailed cockpit check procedures resulted in the improper implementation of the cockpit check, preventing the detection of the inadvertently falling asleep of the pilot.

4 SAFETY ACTION

At the time of issuing this draft Final Report, the KNKT had been informed of safety actions resulting from this occurrence taken by the aircraft operator as follows:

On 7 February 2024, issued Safety Notice to all pilots and flight attendants (FAs) with subject to enhancing vigilance and communication during flight operations. The notice included reminder as follows:

- to perform cabin and cockpit checks in accordance with the Safety Emergency Procedures (SEP) subchapter 1.1.24.1.
- to manage adequate rest periods before reporting time for flight duty, especially for early morning flights.

On 12 February 2024, issued Notice to Pilot for ensuring personal fitness prior to the flight duty, which including reminder for pilot to:

- implement sufficient, adequate, and good quality rest. For a red eye/midnight flight, flight crew must utilize the available rest given prior and understand the circadian rhythm effect on the body.
- review the IM SAFE personal checklist during the pre-flight briefing as described in the OM-A subchapter 6.1

On 27 February 2024, KNKT issued the following safety recommendations to Batik Air Indonesia in the preliminary report as follows:

- ***04.O-2024-02.01***

  Batik Air Indonesia Operation Manual Volume A (OM-A) described that pilots must develop a personal checklist, which includes the categories of pilot impairment – Illness, Medication, Stress, Alcohol, Fatigue and Emotion (IM SAFE) that can be easily committed to memory as a reminder before performing any flight duty.

  The investigation did not find any detailed guidance nor procedure of the IM SAFE personal checklist, such as the assessment guidance for each impairment category. The absence of detailed guidance and procedure might have made pilots unable to assess their physical and mental condition properly.

  Therefore, KNKT recommends Batik Air Indonesia to develop detailed guidance and procedure for ensuring that the IM SAFE personal checklist can be used to assess pilot physical and mental condition properly.

Responding to the safety recommendation number 04.O-2024-02.01, the Batik Air Indonesia revised the OM-A by adding detailed guidance for pilot and flight attendant (all crew members) to apply the IMSAFE personal checklist. The revision also described detailed procedures to use the checklist, which requires all crew members to use the IMSAFE personal checklist before performing a flight duty. After completing the self-assessment using the checklist, if the crew feels that they are not fit to fly, they can immediately report to the respective chief so they can be relieved from the flight duty. Batik Air conducted several efforts to ensure that the revised guidance and procedure are implemented properly, such as:

- issued safety notice to pilots and flight attendants, and recorded the recipient of the safety notice;

- conducted safety campaign within the company which highlighted the IMSAFE personal checklist not only to all crew members but also to all ground support personnel.

- ***04.O-2024-02-02***

  Batik Air Indonesia Safety Emergency Procedures (SEP) describes procedures to perform cabin checks which also contain policy that cockpit should be checked every 30 minutes. However, the investigation did not find detailed procedures to conduct the cockpit check as mentioned in the SEP such as who is responsible and how to do it. The absence of detailed procedures might have made the cockpit check policy unable to be implemented properly.

  Therefore, KNKT recommends Batik Air Indonesia to develop detailed procedures to conduct cockpit check for ensuring that the cockpit check can be implemented properly.

Responding to the KNKT safety recommendation number 04.O-2024-02-02, Batik Air Indonesia revised the Safety Emergency Procedures by adding detailed procedures to conduct periodic cockpit checks. The periodic cockpit check must be conducted no more than every 30 minutes. In addition, Batik Air also conducted several efforts to ensure that the periodic cockpit check procedure is implemented properly, such as:

- issued safety notice to pilots and flight attendants which highlighted the revised periodic cockpit check procedure;
- conducted safety campaign within the company which highlighted the revised periodic cockpit check procedure;
- presented the revised periodic cockpit check procedure during monthly pilot and flight attendant sharing session.

5 SAFETY RECOMMENDATIONS

The KNKT acknowledges the safety actions taken by aircraft operator and considered that the safety actions were relevant to improve safety, however there still safety issues remain to be considered. Therefore, the KNKT issued safety recommendations to the Batik Air Indonesia to address safety issues identified in this report.

5.1 Batik Air Indonesia

- **04.O-2024-02.03**

  Directorate General of Civil Aviation Advisory Circular (AC) 120-08 provided information and guidance for aircraft operators to develop and implement a fatigue management program. The investigation was unable to find any detailed guidance in the aircraft operator document that described the recommended quantity of sleep nor requirement for pilot to plan sleep ahead of time as mentioned in the AC 120-08. In addition, the investigation found that the pilot sleep during flight was most likely considered as common practice to deal with insufficient sleep time prior to the duty.

  The lack of detailed guidance from aircraft operator for pilot to have adequate sleep most likely has made the pilot did not utilize their scheduled rest period appropriately and might be managed by improper common practice by sleeping during flight.

  Therefore, KNKT recommends Batik Air Indonesia to develop and implement fatigue management to include recommended quantity of sleep and requirement for pilot to plan sleep ahead of time.

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