



**KOMITE NASIONAL KESELAMATAN TRANSPORTASI  
REPUBLIC OF INDONESIA**

# **FINAL**

## **KNKT.17.04.10.04**

### **Aircraft Accident Investigation Report**

**PT. Spirit Avia Sentosa (FlyingSAS)**

**Cessna 208; PK-FSO**

**Anem Mountain, Oksibil**

**Republic of Indonesia**

**12 April 2017**

**2019**

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

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

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Jakarta, May 2019  
**KOMITE NASIONAL  
KESELAMATAN TRANSPORTASI  
CHAIRMAN**



**SOERJANTO TIAHJONO**

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## ABBREVIATIONS AND DEFINITIONS

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AIP	: Aeronautical Information Publication
ALA	: Aerodrome for Light Aircraft
ALT	: Altitude
AME	: Aviation Medical Examiner
AOC	: Aircraft Operator Certificate
APP	: Approach
BC	: Back Course
BMI	: Body Mass Index
BMKG	: <i>Badan Meteorologi Klimatologi dan Geofisika</i> (Bureau of Meteorology, Climatology and Geophysics)
C of A	: Certificate of Airworthiness
C of R	: Certificate of Registration
CAD	: Coronary Artery Disease
CASR	: Civil Aviation Safety Regulation
CPL	: Commercial Pilot License
CWS	: Control Wheel Steer
DGCA	: Directorate General of Civil Aviation
ECG	: Electrocardiographic
FCI	: Flight Command Indicator
FD	: Flight Director
FOO	: Flight Operation Officer
GA-EGPWS	: General Aviation Enhanced Ground Proximity Warning System
GERD	: Gastroesophageal Reflux Disease
GPS	: Global Positioning System
HDG	: Heading
HDL	: High Density Lipoprotein
ICAO	: International Civil Aviation Organization
kg	: Kilogram
KNKT	: <i>Komite Nasional Keselamatan Transportasi</i> (National Transportation Safety Committee)
lbs	: A pound by weight
LDL	: Low Density Lipoprotein
LT	: Local Time
m	: Meter
MHz	: Mega Hertz
NAV	: Navigation
NDB	: Non-Directional Beacon

Nm	:	Nautical Mile
OM	:	Operation Manual
ON	:	Operation Notice
OSA	:	Obstructive Sleep Apnoea
SOS	:	Save Our Soul
TAWS	:	Terrain Avoidance Warning System
UTC	:	Universal Time Coordinated



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## SYNOPSIS

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On 12 April 2017, a Cessna C208 aircraft registered PK-FSO was being operated by PT. Spirit Avia Sentosa (FlyingSAS) for unscheduled cargo flight from Tanah Merah to Oksibil.

At 1144 LT on daylight condition, the aircraft departed Tanah Merah with intended cruising altitude of 7,000 feet. Prior to departure, there was no report or record of aircraft system malfunction. On board the aircraft was one pilot, 1,225 kg of general cargo and 800 pounds of fuel which was sufficient for about 3 hours of flight time.

At about 29 Nm from Oksibil, the PK-FSO aircraft passed a Cessna 208B aircraft which was flying on opposite direction from Oksibil to Tanah Merah at altitude 6,000 feet. The Cessna 208B pilot advised to the pilot on radio frequency 122.7 MHz that the PK-FSO aircraft was in sight. The pilot responded that the aircraft was maintaining 7,000 feet on direct route to Oksibil.

At 1240 LT, the Oksibil tower controller received another phone call from the FlyingSAS officer at Jakarta which informed that the FlyingSAS flight following system received SOS signal (emergency signal) from PK-FSO aircraft which located approximately 6 Nm north of Oksibil. Afterwards, the Oksibil air traffic controller advised the occurrence to the Search and Rescue Agency.

On 13 April 2017, at 2211 UTC, the PK-FSO aircraft was found on ridge of Anem Mountain which located about 7 Nm north of Oksibil. The aircraft was destroyed by impact forces and the pilot was fatally injured.

The investigation determined that the aircraft serviceability was not issue in this occurrence. Therefore, the analysis discussed the aircraft flight profile; pilot medical condition and activities; organization oversight; and pilot medical examination. The investigation concluded the contributing factor of the accident was the possibility of the pilot being fatigue, physical and environment condition increased pilot sleepiness which might have made the pilot inadvertently falling asleep indicated by no pilot activity. The absence of GA-EGPWS aural alert and warning was unable to wake up the pilot.

The KNKT has been informed safety actions taken by the FlyingSAS and *Balai Kesehatan Penerbangan* (Aviation Medical Center) resulting from this occurrence, however, there still remain safety issues that need to be considered. Therefore, the KNKT issues safety recommendations addressed to the FlyingSAS, Aviation Medical Center and Directorate General of Civil Aviation.

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# 1 FACTUAL INFORMATION

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## 1.1 History of the Flight

On 12 April 2017, a Cessna C208 aircraft registered PK-FSO was being operated by PT. Spirit Avia Sentosa (FlyingSAS) for unscheduled cargo flight. The flights of the day scheduled for the aircraft were Mopah Airport (WAKK) – Tanah Merah Airport (WAKT)<sup>1</sup> – Oksibil Airport (WAJO)<sup>2</sup> – Tanah Merah – Oksibil – Tanah Merah. The estimated time departure of first flight from Mopah Airport to Tanah Merah was 0800 LT<sup>3</sup> and the flight departed at 0848 LT, on board the aircraft were two pilots and seven passengers. The aircraft arrived in Tanah Merah at about 0943 LT.

At 1012 LT, the flight departed from Tanah Merah to Oksibil. About 10 Nm from Oksibil the pilot contacted the Oksibil tower controller to get air traffic services and landed at 1044 LT. The flight then departed from Oksibil to Tanah Merah at 1058 LT and arrived about 1126 LT. These flights were single pilot operation.



**Figure 1: The archive photo of PK-FSO aircraft (copyright of FNQSkies.blogspot.com)**

At 1144 LT on daylight condition, the aircraft departed Tanah Merah with intended cruising altitude of 7,000 feet. Prior to departure, there was no report or record of aircraft system malfunction. On board the aircraft was one pilot, 1,225 kg of general cargo and 800 pounds of fuel which was sufficient for about 3 hours of flight time. After departure, the pilot advised Tanah Merah tower controller of the estimate time arrival at Oksibil would be 1224 LT.

At 1149 LT, the pilot advised Tanah Merah tower controller that the aircraft position was about 10 Nm from Tanah Merah and passing altitude of 3,500 feet. The Tanah Merah tower controller acknowledged the message and advised the pilot to monitor radio communication on frequency 122.7 MHz<sup>4</sup> for traffic monitoring.

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1 Tanah Merah Airport (WAKT), Papua will be named as Tanah Merah for the purpose of this report.

2 Oksibil Airport (WAJO), Papua will be named as Oksibil for the purpose of this report.

3 The local time (LT) in Papua is Universal Time Coordinated (UTC) +9 hours.

4 The radio frequency of 122.7 MHz is the frequency based on the pilot consensus to be used as traffic advisory between pilots.

At about 29 Nm from Oksibil, the PK-FSO aircraft passed a Cessna 208B aircraft which was flying on opposite direction from Oksibil to Tanah Merah at altitude 6,000 feet. At this time, the aircraft ground speed recorded on the flight following system was about 164 knots. The Cessna 208B pilot advised to the pilot on radio frequency 122.7 MHz that the PK-FSO aircraft was in sight. The pilot responded that the aircraft was maintaining 7,000 feet on direct route to Oksibil.

At 1230 LT, the Oksibil tower controller received phone call from the FlyingSAS officer at Jakarta which confirming whether the PK-FSO aircraft has landed on Oksibil. The Oksibil tower controller responded that there was no communication with the PK-FSO pilot. The Oksibil tower controller did not receive the flight plan for the second flight of the PK-FSO flight. Afterwards, the Oksibil tower controller called Tanah Merah tower controller confirming the PK-FSO flight and was informed that PK-FSO departed Tanah Merah to Oksibil at 1144 LT and the reported estimate time of arrival Oksibil was 1224 LT.

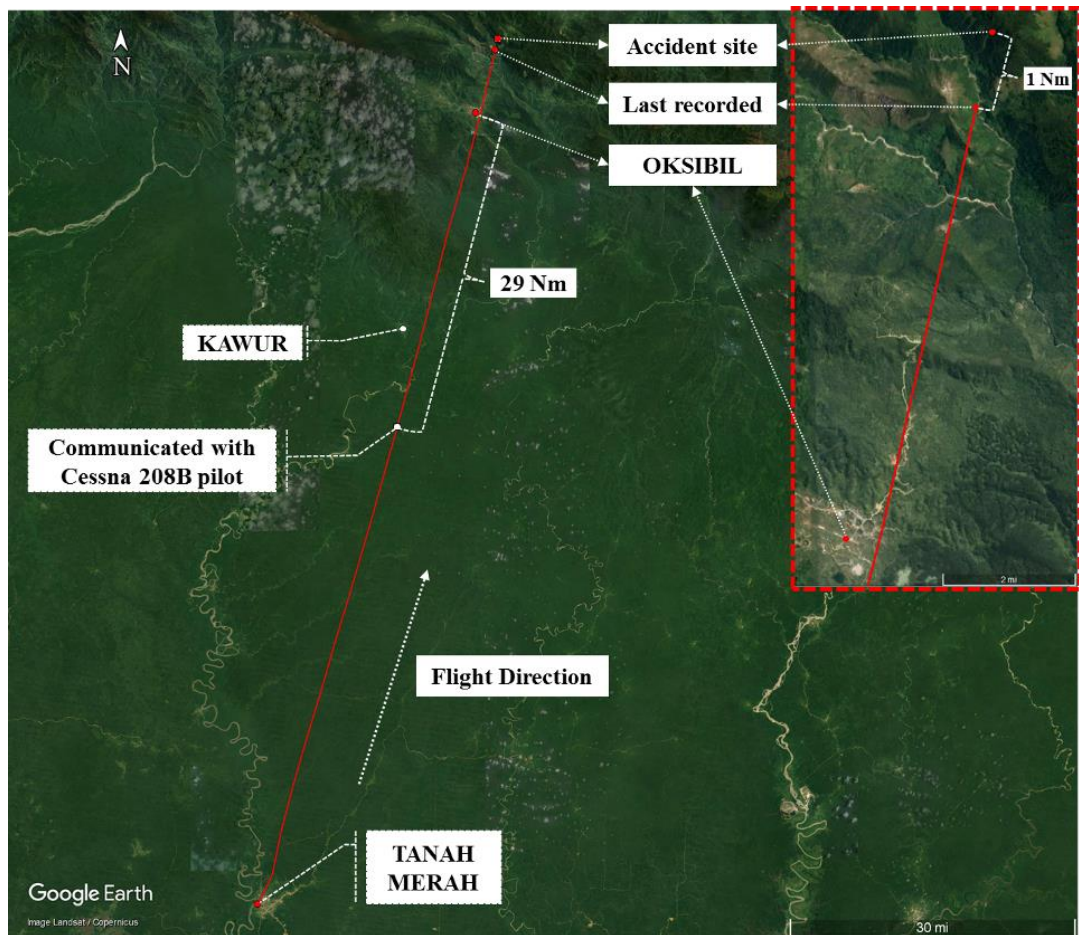
At 1240 LT, the Oksibil tower controller received another phone call from the FlyingSAS officer at Jakarta which informed that the FlyingSAS flight following system received SOS signal (emergency signal)<sup>5</sup> from PK-FSO aircraft and the last position recorded was on coordinate 04°48'47.7" S; 140°39'31.7" E which located approximately 6 Nm north of Oksibil. Afterwards, the Oksibil air traffic controller advised the occurrence to the Search and Rescue Agency.

On 13 April 2017, at 0711 LT, the PK-FSO aircraft was found on ridge of Anem Mountain which located about 7 Nm north of Oksibil.

The following figure showed the illustration of the aircraft track plotted on the Google earth refer to the known coordinates of Tanah Merah, Oksibil and the crash site.

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<sup>5</sup> The SOS signal (emergency signal) is a feature on the Spidertracks flight following system which automatically active if the aircraft is not transmitted data to the system for period of for a period of ten minutes or manual activation by pilot. The detail of Spidertracks information can be found at subchapter 1.17.1.



**Figure 2: The recorded accident flight track superimposed with Google Earth**

## 1.2 Injuries to Persons

The pilot fatally injured as a result of this occurrence.

## 1.3 Damage to Aircraft

The aircraft was destroyed by impact forces.

## 1.4 Other Damage

There was no other damage to property and/or the environment.

## 1.5 Pilot Information

Gender	:	Male
Age	:	42 years
Nationality	:	Indonesia
Marital status	:	Married
Date of joining company	:	1 May 2016
License	:	CPL
Date of issue	:	26 May 1998
Aircraft type rating	:	Cessna C208

Medical certificate : First Class  
Last of medical : 6 March 2017  
Validity : 30 September 2017  
Medical limitation : None  
Last line check : 21 February 2017  
Last proficiency check : 21 February 2017

**Flying experience**

Total hours : 4,236 hours 53 minutes  
Total on type : 2,552 hours 39 minutes  
Last 90 days : 138 hours 9 minutes  
Last 30 days : 45 hours 34 minutes  
Last 7 days : 2 hours 28 minutes  
Last 24 hours : 2 hours 28 minutes  
This flight : Approximately 33 minutes

The KNKT conducted interviews to the FlyingSAS personnel to get significant information related to the pilot activities and behavior prior to the occurrence.

**1.5.1 Pilot Activities Prior the Occurrence**

The occurrence flight was multiday duty schedule after off duty period for the pilot. The off-duty period was from 29 March until 9 April 2017. On 7 April 2017, the pilot conducted recurrent and type rating class as ground instructor.

On 10 April 2017, the pilot travelled from Jakarta to Merauke on board a night commercial flight. The flight departed at about 2245 LT<sup>6</sup> and arrived at Merauke on 11 April 2017 at about 0900 LT in the morning. Thereafter, the pilot had rest in hotel. The pilot had dinner outside the hotel at about 1900 LT and back to the hotel at about 2130 LT. No one witness the pilot activity while in the hotel room.

The pilot had appointment to leave the hotel at 0700 LT since the estimate time departure for the first flight was at 0800 LT. At about 0700 LT, the pilot had not shown up and another pilot of the company knocked the door of the pilot room. The pilot woke up and after a few minutes, the pilot ready to leave the hotel. The pilot arrived at the airport at about 0815 LT.

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<sup>6</sup> The local time (LT) in Jakarta is two hours earlier than LT in Papua.

### 1.5.2 Pilot Behavior

The pilot had behavior to engage the Terrain Inhibit switch of the General Aviation Enhanced Ground Proximity Warning System (GA-EGPWS) during flight in Papua area and often use autopilot. The consideration to inhibit the GA-EGPWS was due to several warning activations that considered distracting.

The pilot often smoked in the cockpit during flight and looked sleepy while flying. In addition, the pilot was snoring while sleeping. The pilot usually brings snack to the cockpit and prior to the departure from Tanah Merah to the Oksibil the snacks provided for the pilot.

### 1.5.3 Pilot Medical Records

The pilot medical condition as result of the medical examination was recorded in the *Balai Kesehatan Penerbangan* (Aviation Medical Center). The last five medical examinations were performed on 7 November 2012, 22 January 2015, 20 August 2015, 18 December 2015 and 6 March 2017.

The history of the pilot Body Mass Index (BMI) and Electrocardiographic (ECG) examination were as follows:

Date Examination	Body Mass Index (kg/m <sup>2</sup> )	ECG
7 November 2012	27	ECG resting met standard
22 January 2015	30	ECG exercise (treadmill) met standard
20 August 2015	31	ECG resting met standard
18 December 2015	31	ECG exercise (treadmill) met standard
6 March 2017	33	Did not performed

During the last medical examination on 6 March 2017, the pilot provided information to the Aviation Medical Examiner which included the total flying hour in the last 6 months was about 300 hours. The chest radiography result stated that the cor<sup>7</sup> looked big because of the inspiration phase was not deep enough.

The blood test result indicated that the cholesterol was 285 mg/dL, High Density Lipoprotein (HDL) 51.6 mg/dL, Low Density Lipoprotein (LDL) 202.3 mg/dL, triglyceride 132 mg/dL, urea 34.2 mg/dL, creatinine 0.97 mg/dL and the uric acid was 9.23 mg/dL. As the cholesterol and the uric acid values were above normal, the pilot did not pass the examination. The pilot had a retest and the result for the cholesterol was 230 mg/dL and the uric acid was 8.2 mg/dL, this met the standard.

The result of medical examination met the requirement standard thus the aeromedical disposition was fit. The pilot received a first-class medical certificate without any limitation which valid until 30 September 2017.

The medical summary of the increased BMI and laboratory blood test result were highlighted to the pilot and recommended for life style changed including dietary, but were not highlighted to the FlyingSAS due to medical confidentiality. Afterwards, the pilot reported to the management that the result of medical examination met the requirement standard by providing the copy of first-class medical certificate.

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<sup>7</sup> Cor is latin word for the heart.

Prior to departure from Tanah Merah, the pilot conducted blood pressure and alcohol test, the blood pressure was 138 (systolic) – 91 (diastolic) and the alcohol test result indicated the pilot was not under the influence of alcohol.

## **1.6 Aircraft Information**

### **1.6.1 General**

Registration Mark	: PK-FSO
Manufacturer	: Cessna Aircraft Company
Country of Manufacturer	: United States of America
Type/Model	: Cessna C208
Serial Number	: 20800313
Year of Manufacture	: 1991
Certificate of Airworthiness	
Issued	: 18 January 2017
Validity	: 17 January 2018
Category	: Normal
Limitations	: None
Certificate of Registration	
Number	: 3777
Issued	: 18 January 2017
Validity	: 17 January 2020
Time Since New	: 6,226 hours 57 minutes
Cycles Since New	: 9,371 cycles
Last Major Check	: 15 February 2017 (200/400 hours inspection)
Last Minor Check	: 12 April 2017 (daily inspection)

### **1.6.2 Weight and balance**

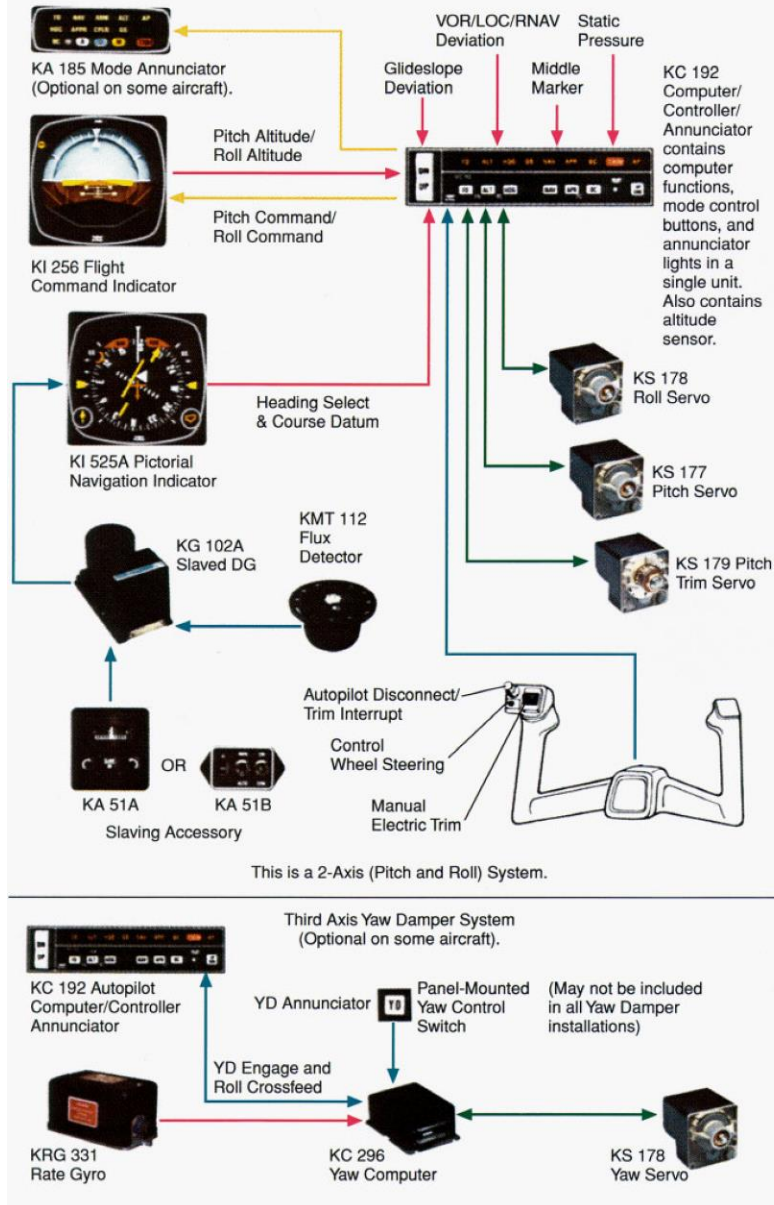
Fuel on board	: 800 pounds
Total cargo on board	: 2,700.6 pounds
Total take-off weight	: 8,181 pounds (maximum: 8,360 pounds)

The aircraft was operated within the approved weight and balance envelope.

### **1.6.3 Autopilot**

The aircraft was equipped with Bendix King KFC 150 autopilot. The KFC 150 autopilot system incorporates two-axis autopilot and flight director system. Typical system of the KFC 150 autopilot system is as follow:

## TYPICAL KFC 150 FLIGHT CONTROL SYSTEM



**Figure 3: The KFC 150 autopilot system**

The autopilot has basic capabilities of Flight Director (FD), Altitude (ALT), Heading (HDG), Navigation (NAV), Approach (APP) and Back Course (BC) mode.

The selection of ALT, HDG, NAV, APP and BC mode will display the desired altitude, heading, navigation, approach or back course in the flight command indicator (FCI). If the autopilot is engaged it will turn to satisfy the commands.

The flight director mode is activated by depressing the FD button on the mode controller or the control wheel steer (CWS) button on the control wheel. The V-bar will appear in the FCI and provide commands to maintain wings level and the pitch attitude existing at the time of engagement.



#### 1.6.4 Terrain Awareness and Warning System<sup>8</sup>

The aircraft was equipped with the Bendix/King KGP 560 General Aviation Enhanced Ground Proximity Warning System (GA-EGPWS) manufactured by Honeywell International incorporated. The GA-EGPWS provides aural and visual alerts/warnings based on aircraft position from Global Positioning System (GPS) relative to surrounding recorded terrain and known obstacles on terrain database.

Should the aircraft fly into condition where a conflict with terrain or a known obstacle is imminent, the system will provide both visual and aural alerts and /or warnings to the pilot. The level of the aural alert and/or warning is unable to be adjusted by pilot.

The GA-EGPWS had a Terrain Inhibit switch which will inhibit both visual and aural of the alerts and warnings. Once the Terrain Inhibit switch is engaged, an external annunciator lamp is illuminated and a message will be displayed indicating "Warnings Inhibited". The purpose of the "Terrain Inhibit" switch is to allow aircraft to operate without nuisance or unwanted warnings at airports that are not in the system database.

##### **"Look Ahead" Alerting and Warning**

The GA-EGPWS provides an envelope of protection for the aircraft which is independent from the Terrain Awareness Display called "Look Ahead" function. This function compares the aircraft flight path to terrain and obstacle database information, and distance to known runways.

If the "Look-Ahead" function detects a terrain or obstacle threat approximately one minute ahead of the aircraft, the aural alert "CAUTION TERRAIN, CAUTION TERRAIN" (or "CAUTION OBSTACLE, CAUTION OBSTACLE") is given, and a bright, solid yellow "threat area" is shown on the Terrain Display. If the aircraft flight path continues toward to the threat area, the alert message will repeat approximately every seven seconds.

If the aircraft flight path approaches to within approximately 30 seconds of a threat area, the aural message "TERRAIN AHEAD" (or "OBSTACLE AHEAD") or optionally "TERRAIN TERRAIN, PULL UP" (or "OBSTACLE-OBSTACLE, PULL UP") will be given continuously and the threat area on the Terrain Display will be shown in a bright, solid red color.

In either case, when the pilot reacts and changes the aircraft flight path to one that will safely avoid the detected threat area, the voice alerts will cease and the threat area(s) shown on the Terrain Display will be removed.

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<sup>8</sup> The information in this subchapter was taken from KGP-560 GA-EGPWS Pilot's Guide.

## **1.7 Meteorological Information**

There was no meteorological station or automatic meteorological aids at Oksibil. The weather information for air traffic at Oksibil was based on air traffic controller observation and pilot report.

The weather at Oksibil between 1130 until 1230 LT was reported clear while the west and north west area was cloudy, the wind was calm, the cloud was scattered <sup>9</sup> at altitude approximately 9,000 feet above mean sea level.

The pilot of Cessna 208B who passed the PK-FSO aircraft reported that the weather along the route from Oksibil to Tanah Merah was clear with areas of scattered clouds base at approximately 9,000 feet and visibility more than 10 kilometers.


## **1.8 Aids to Navigation**

According to the Aeronautical Information Publication (AIP) Volume IV (Aerodrome for Light Aircraft/ALA), Oksibil equipped with Non-Directional Beacon (NDB) identified as ZX and was serviceable during the occurrence. The AIP Volume IV did not include approach guidance for Oksibil.

The aircraft operator issued Oksibil Approach Guidance and Visual Approach chart of Oksibil. These charts were used for internal use.

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<sup>9</sup> Cloud amount is assessed in total which is the estimated total apparent area of the sky covered with cloud. The international unit for reporting cloud amount Scatter (SCT) is when the clouds cover 3/8 up to 4/8 area of the sky.

	OXSIBIL	OKL	WAJO
	<b>OXSIBIL APPROACH GUIDANCE</b>		
	Revision: Original	1-Oct-2016	FlyingSAS-OP-2016
<b>DESCEND</b>	<p>MAKE SURE TO GET AN ACTUAL WEATHER REPORT FROM OXSIBIL TOWER RADIO (123.00) BEFORE START DESCEND AND APPROACH. OXSIBIL RADIO COVERAGE IS AFTER IWUR AIRFIELD AREA. APPROACH FROM NOTH AREA VIA AMBISIBIL OR KIWIROK; IF CRUISE ALTITUDE 9500 FEET , START DESCEND VISUALLY 10 NM FROM AIRPORT. TARGET ALTITUDE IS CIRCUIT ALTITUDE 5000 FEET VIA OVERHEAD RUNWAY. TARGET APPROACH CHECK POINT ARE EITHER RIGHT DOWNWIND R/W 11, OR LEFT DOWNWIND R/W 11, OR LONG FINAL R/W 11. APPROACH FROM SOUTH AREA VIA KAWUR; IF CRUISE ALTITUDE 7000 FEET , START DESCEND VISUALLY 10 NM FROM OXSIBIL AIRPORT. TARGET ALTITUDE IS CIRCUIT ALTITUDE 5000 FEET. TARGET APPROACH CHECK POINT ARE EITHER LONG FINAL R/W 11, OR LEFT DOWNWIND R/W 27 VIA OVERHEAD R/W 11. APPROACH FROM SOUTHEAST AREA VIA IWUR; START DESCEND VISUALLY AT 10 NM FROM AIRPORT OXSIBIL. TARGET DESCEND IS RIGHT DOWNWIND R/W 11 AT CIRCUIT ALTITUDE 5000 FEET. FOR VISUAL CIRCLING AREA AVAILABLE FROM OVERHEAD RUNWAY TO LONG FINAL R/W 11. RADIO CALL; FIRST CONTACT OVER CHECK POINT AMBISIBIL, KIWIROK, KAWUR, DAN IWUR, GIVING DEPARTURE TIME, ALTITUDE, AND ETA, REQUEST QAM. REPORT TO JAYAPURA INFO ON HF FREQ. 8834 ESTABLISH WITH OXSIBIL TOWER RADIO. NEXT CALL POSITION RIGHT OR LEFT DOWNWIND R/W 11, BASE LEG OR FINAL R/W 11.</p>		
<b>APPROACH</b>	<p>FROM RIGHT DOWNWIND R/W 11: FOLLOW NORMAL CIRCUIT PATTERN AND DISTANCE, ADJUST APPROACH SPEED AS CORRECT AS POSSIBLE. BE AWARE OF RUNWAY INVERSION DUE TO HILLS AND RAISING TERRAIN BEFORE START OF RUNWAY 11. FROM LEFT DOWNWIND R/W 11 : DOWNWIND DISTANCE IS CLOSER SO YOU MUST ADJUST THE RATE OF DESCEND AND BANK DURING BASE LEG TURN, STEEP BANK IS NEEDED. RADIO CALL; POSITION CALL BASE LEG OR FINAL RUNWAY 11.</p>		
<b>LANDING</b>	<p>RUNWAY 11 SURFACE IS FLAT WITH SLIGHTLY UPCURVED AT THE TOUCHDOWN ZONE. THE RUNWAY LENGTH IS LONG ENOUGH FOR MAKE NORMAL LANDING WITH REVERSE POWER FOR DHC-6. APRON IS AVAILABLE AT THE LEFT SIDE OF RUNWAY 11 OLD APRON OR NEW APRON, APRON IS WIDE ENOUGH WITH HIGH RISE TERRAIN ON THE SIDE. MOVEMENT OF PEOPLE, CAR AND MOTORCYCLE IN THE VICINITY AREA.</p>		
<b>GO AROUND</b>	<p>FINAL POSITION AT 4500 FEET, IF LOST OF RUNWAY VISUAL CONTACT OR NOT STABILIZED MAKE GO AROUND HEADING TO OVERHEAD RUNWAY THEN SLIGHTLY TURN TO THE RIGHT HEADING FOR 10 NM CHECK POINT THEN TO IWUR AREA AND CONTINUE CLIMB TO 8000 INITIALY. VFR HOLDING FOR WEATHER IS AT OVERHEAD IWUR AIRFIELD.</p>		

**Figure 4: Oksibil approach guidance**

**OKSIBIL (WAJO)**  
**PEGUNUNGAN BINTANG**

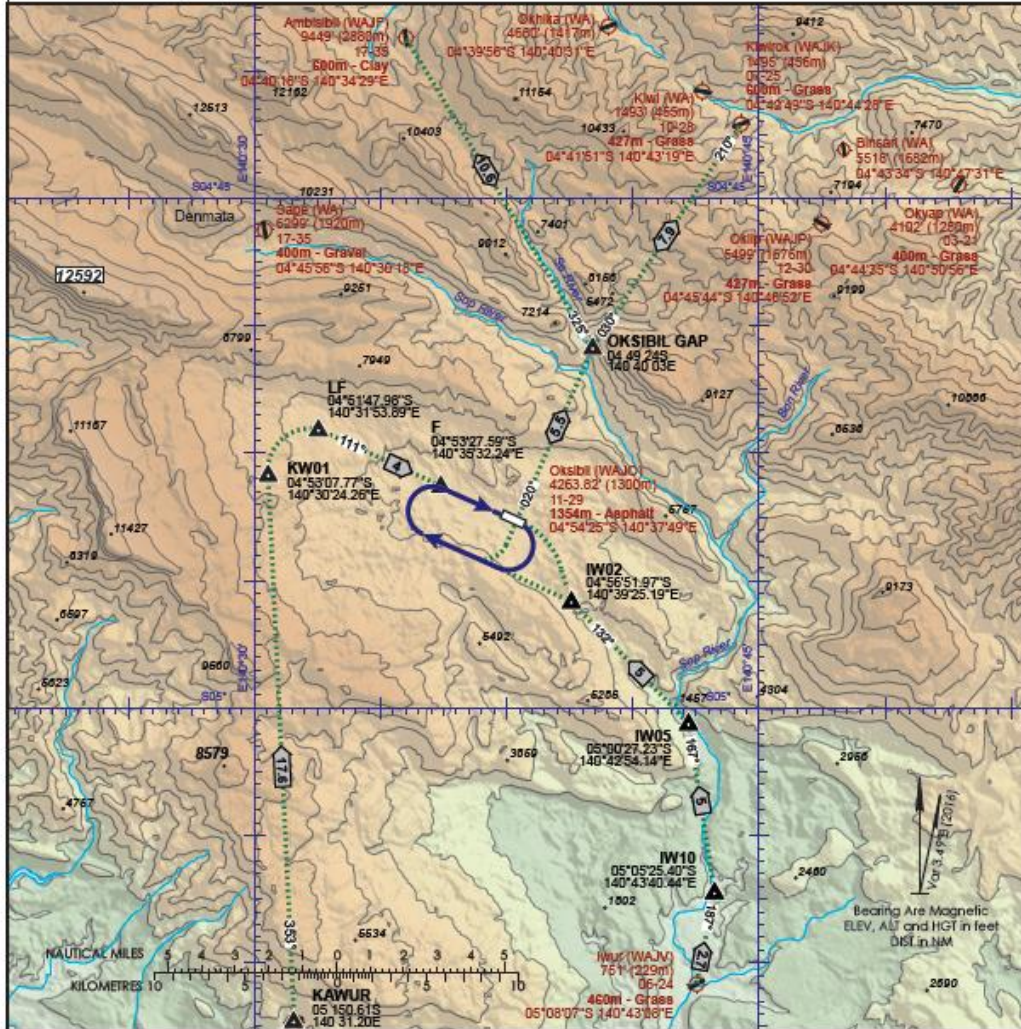


**PAPUA, INDONESIA**  
**VISUAL APPROACH Rwy 11 & 29**

<b>COMMUNICATIONS :</b>	<b>NAVAIDS :</b>	<b>ELEV :</b>	<b>AIRPORT INFO :</b>
AFIS : <b>123.00</b>	VOR : N / A	AD : 4263.82 ft	Coord ARP : 04°54'25"S 140°37'49"E
MERAUKE INFO : HF <b>5580</b>	NDB : ZX 342	THR 11 : 4283.82 ft	Asphalt
JAYAPURA INFO : HF <b>8834</b>		THR 29 : 4248.76 ft	NO LIGHTED

**Caution :**

- High approach profile for Rwy 11 due to upslope terrain.
- Strong Easterly wind expected after 11.00 local time.
- Heavy inbound/outbound traffic.
- One way landing Rwy 11 .
- Parking on new apron.
- All inbound / outbound aircraft must contact Oksibil radio on 123.00 over IWUR and over Ambisibil area.



**MISS APPROACH :**

- Rwy 29 : Rwy not available for landing.
- Rwy 11 : Climb overhead Rwy than return to IWUR entry point.

LANDING RWY 11 OR 29	
MDA (H) -	
FULL VISUAL	
VISIBILITY	-

CHANGES : Caution

Aviaterra, 2015.

**Figure 5: Oksibil visual approach chart for runway 11 and 29**

The Visual Approach chart showed that approach to Oksibil from the south can be performed from the west of Oksibil via visual checkpoint KAWUR or from east of Oksibil via visual checkpoint IWUR.

## **1.9 Communications**

The communication on Oksibil radio frequency (123.0 MHz) was recorded by ground based automatic voice recording equipment and the recorder was serviceable. The ground based automatic voice recording did not record the communication between PK-FSO pilot and Oksibil air traffic controller during the accident flight.

## **1.10 Aerodrome Information**

Airport Name	: Gunung Bintang Airport
Airport Identification	: WAJO
Airport Operator	: Directorate General of Civil Aviation (DGCA)
Coordinate	: 04°54'26" S; 140°37'49" E
Elevation	: 4,263 feet
Runway Direction	: 11 – 29 (114° – 294°)
Runway Length	: 1,354 meters
Runway Width	: 30 meters
Surface	: Asphalt

The airport situated on a valley surrounded by mountainous area with the highest terrain up to 11,000 feet at approximately on 9.5 Nm at northwest from the airport.

## **1.11 Flight Recorders**

The aircraft was not equipped with flight recorder and it was not required by current Indonesia regulation for this type of aircraft.

## **1.12 Wreckage and Impact Information**

The aircraft wreckage was found at altitude approximately 7,100 feet on ridge of Anem Mountain, which located at about 7 Nm north of Oksibil with coordinate 04°47.79' S; 140°39.77' E. The distance between the last recorded position in the Spydertracks to the accident site was about 1 Nm (see figure 2).

The aircraft destroyed by impact forces and the wreckage distribution was found toward 010° direction.



**Figure 6: The accident site**

### **1.13 Medical and Pathological Information**

The investigation unable to perform autopsy since it was not authorized by the family.

### **1.14 Fire**

There was no evidence of fire in-flight or after the aircraft impacted terrain.

### **1.15 Survival Aspects**

On 12 April 2017, at about 1027 LT<sup>10</sup> (1227 LT in Oksibil), the FlyingSAS officer in Jakarta received SOS/emergency signal of PK-FSO aircraft from Spidertracks flight following system. Afterwards, the officer informed the Oksibil air traffic controller that the last recorded position of the PK-FSO aircraft was on coordinate 04°48'47.7" S 140°39'31.7" E which located at approximately 6 Nm north of Oksibil.

The Oksibil air traffic controller relayed the information to the search and rescue agency and to pilots who were flying near the last reported position of PK-FSO aircraft. The search and rescue team were assembled and consisted of the Oksibil Airport personnel, local government, police, and army.

At 1243 LT, the Oksibil air traffic controller informed the pilot of landing aircraft who flew from Kawur Airstrip<sup>11</sup> to Oksibil related to the missing aircraft and asked whether the pilot had visual contact or communicated with PK-FSO pilot. The pilot of the landing aircraft did not communicate with the PK-FSO pilot nor have visual contact of the PK-FSO aircraft.

At 1302 LT, there was departing aircraft from Oksibil to Sentani Airport, Jayapura which flew near to the last reported position of the PK-FSO aircraft. The departing aircraft pilot reported that the weather near the location was cloudy and unable to get a clear view of the location.

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<sup>10</sup> The local time (LT) in Jakarta is Universal Time Coordinated (UTC) +7 hours.

<sup>11</sup> Kawur Airstrip is located approximately 21 Nm south west of Oksibil.

At 1340 LT, a PAC 750 aircraft departed from Oksibil to search the PK-FSO aircraft on south area of Oksibil. At 1627 LT, the PAC 750 aircraft departed to search on north area of Oksibil. Both search operations could not find the PK-FSO aircraft position.

On 13 April 2017, at 0704 LT, the PAC 750 aircraft departed from Oksibil to search the PK-FSO aircraft on north area of Oksibil. At 0711 LT, the PAC 750 pilot advised Oksibil air traffic controller that the PK-FSO aircraft found at ridge of Anem Mountain.

The rescue operation deployed and reached the site at 1650 LT. The rescue team found the pilot was fatally injured and was evacuated to Oksibil by helicopter on 14 April 2017.

## **1.16 Tests and Research**

No test and research have been conducted.

## **1.17 Organizational and Management Information**

### **1.17.1 Aircraft Operator**

Aircraft Owner and Operator : PT. Spirit Avia Sentosa (FlyingSAS)  
Address : Jalan Protokol Halim Perdanakusuma No. 8,  
Jakarta Timur, 13620, Republic of Indonesia

The PT. Spirit Avia Sentosa (FlyingSAS) had valid Aircraft Operator Certificate (AOC) number 135-058 which authorized to conduct air transportation carrying passengers and cargo in non-scheduled operation within and outside Indonesia for aircraft operations under Civil Aviation Safety Regulation (CASR) Part 135.

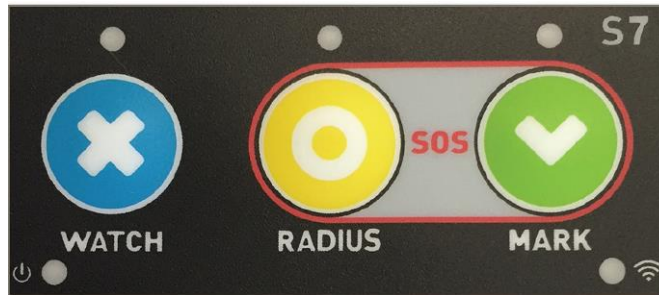
The FlyingSAS operated three DHC-6 Twin Otter aircraft and two Cessna C208 Caravan aircraft including the accident aircraft to serve on Papua area.

#### **1.17.1.1 Aircraft Flight Following System**

The aircraft operator utilizes flight following system provided by Spider Tracks Limited with type/model Spider 7 which manufactured in New Zealand. The tracking and flight data from the aircraft transmitted to the Spidertracks website and monitored by FlyingSAS officer in Jakarta.

The FlyingSAS subscribed the Spidertracks flight following system for 2 minutes interval data reporting for each fleet, including the PK-FSO aircraft. The reporting parameters in the tracking system contained several data including time, coordinate, aircraft altitude, speed and bearing. The tracking system begins to send position report when the device is powered in open area.

The Spider 7 installed in the aircraft utilizes keypad with three different functions (figure 7).



**Figure 7: Spider 7 keypad**

The Spidertracks provides two tracking capabilities, which are passive (NORMAL mode) and active (WATCH mode). Both modes will send positional information and flight data to the monitoring system in real time depends on the interval time subscription.

Under the NORMAL mode, the Spidertracks will report positional information and flight events in real time, however, if the aircraft encounters an emergency situation in flight, ground personnel will not be alerted unless there is a conscious SOS button press by pilot.

The WATCH mode could be activated either manually by pressing WATCH button or automatically triggers by aircraft speed. The WATCH button must be pressed to disable the WATCH mode. There is no auto-off system for the WATCH mode.

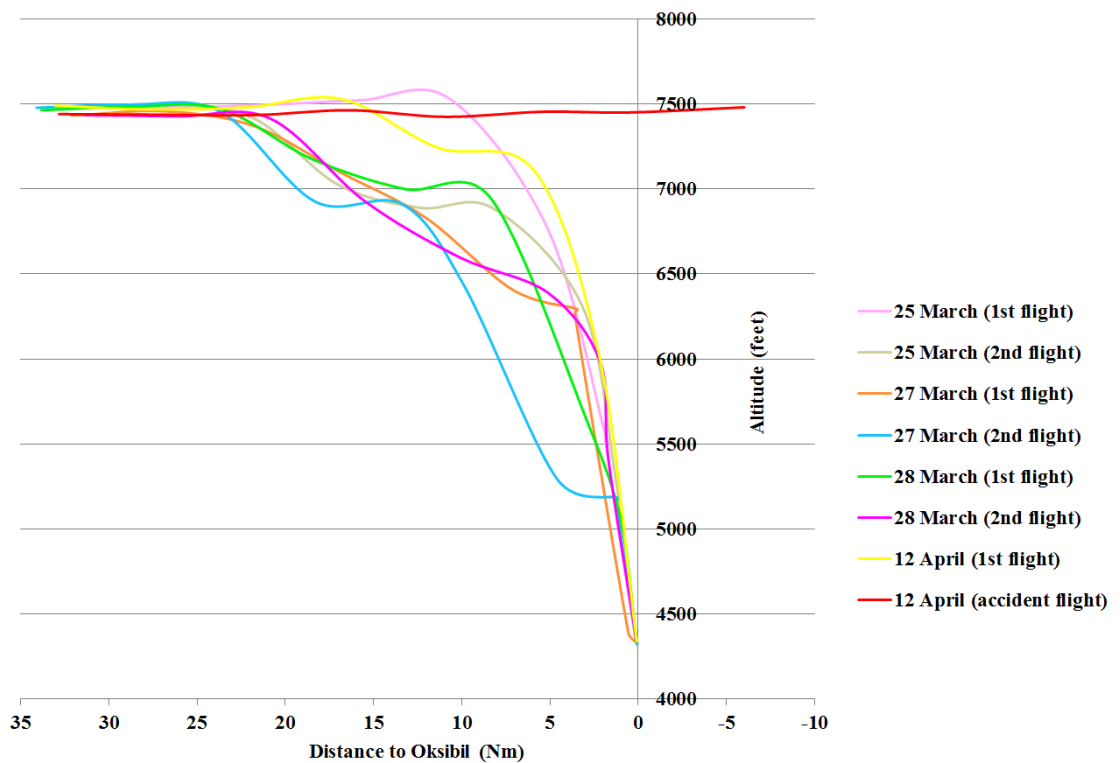
In both modes, pilot could send SOS signal by pressing the RADIUS and the MARK button together. While in WATCH mode, the SOS signal could be sent automatically to the system when the aircraft is unable to send flight data for a period of ten minutes.

In order to avoid unnecessary SOS signal when the aircraft engine is off after landing with WATCH mode still active, the aircraft operator developed pilot guidance to turn off WATCH mode approximately 2 minutes before touchdown to avoid SOS signal transmitted to the system after the aircraft landing.

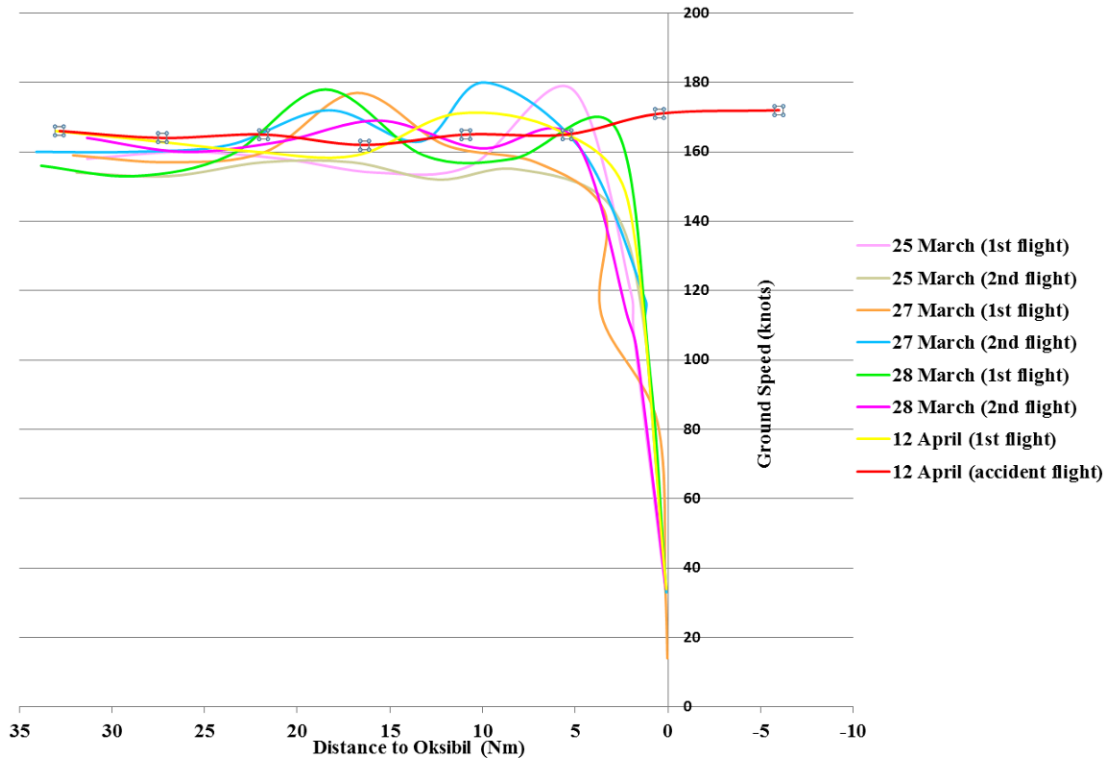
The investigation downloaded the reporting Spidertracks data of the seven flights from Tanah Merah to Oksibil by the pilot prior to the accident flight. The last recorded position of the aircraft on the accident flight was at 1217 LT.



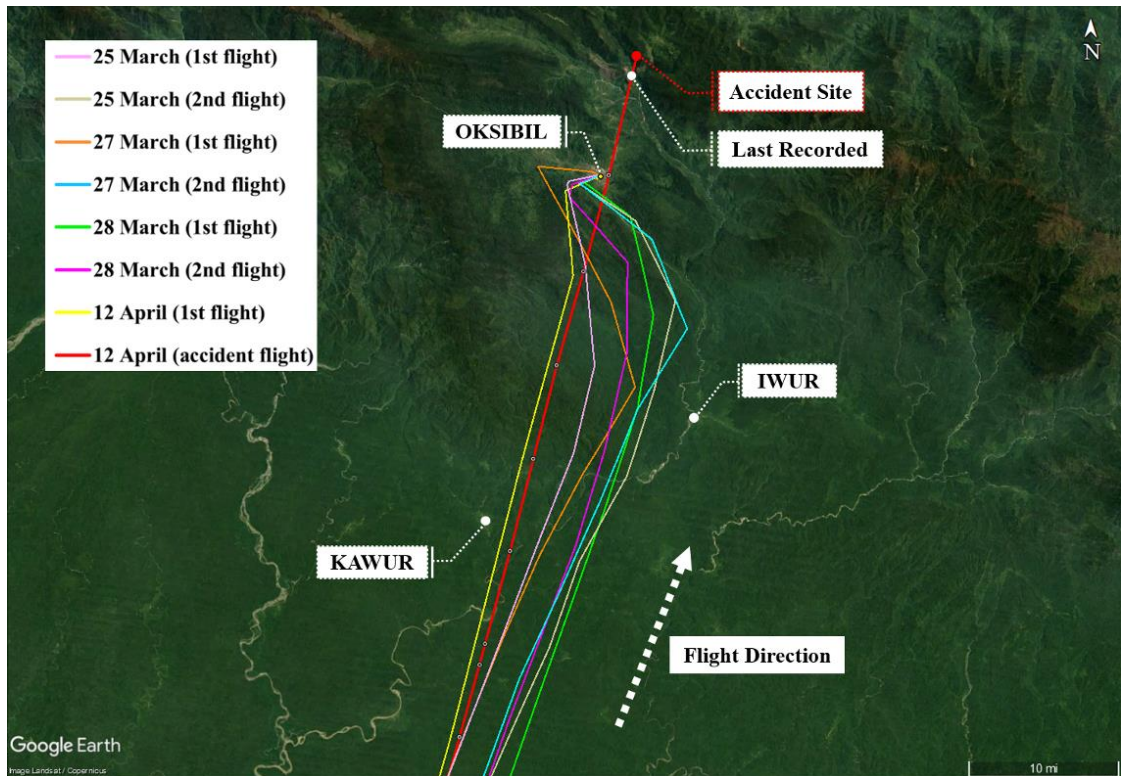
	25 March 2017 1 <sup>st</sup> flight	25 March 2017 2 <sup>nd</sup> flight	27 March 2017 1 <sup>st</sup> flight	27 March 2017 2 <sup>nd</sup> flight	28 March 2017 1 <sup>st</sup> flight	28 March 2017 2 <sup>nd</sup> flight	12 April 2017 1 <sup>st</sup> flight	12 April 2017 (accident flight)
Runway in use	11	11	11	11	11	11	11	11
Entry point	KAWUR	IWUR	KAWUR	IWUR	IWUR	IWUR	KAWUR	KAWUR
Cruising altitude (feet)	About 7,500	About 7,500	About 7,500	About 7,500	About 7,500	About 7,500	About 7,500	About 7,500
Initiated descend point (Nm from Oksibil)	11	22	22	24	24	26	17	–
Bearing changed to join circuit pattern (Nm from Oksibil)	11	8	12	10	8	5	6	–
Turn off the WATCH mode (Nm from Oksibil)	2	1	0	1	1	2	2	–



**Figure 8: The recorded altitude**



**Figure 9: The recorded ground speed**



**Figure 10: The recorded flight tracks superimposed with Google Earth**

### **1.17.1.2 Pilot Oversight**

The FlyingSAS pilot was directly supervised by Operation Manager. According to the Operation Manual (OM) – Part A chapter 2, the supervision area by the Operation department only covered operational issue such as pilot training, operation manuals, and represent the management with other parties for operational aspect. There was no requirement for the operation manager to monitor the health issue for pilots. Monitoring of pilot medical condition was conducted by Human and Resource Department and it was limited to the due date of the medical certificate.

According to the OM – Part A subchapter 16.4, the FlyingSAS developed occurrence report system to improve the level of flight safety and not to attribute blame. The occurrence report was managed by Safety Department including its hazard identification and risk assessment of each report. Prior to the occurrence, there was no report of the pilot engage the Terrain Inhibit switch of the General Aviation Enhanced Ground Proximity Warning System (GA-EGPWS), pilot smoking in the cockpit and pilot looked sleepy during flying.

### **1.17.2 Aviation Medical Center**

The medical examination for pilot in Indonesia was only conducted by *Balai Kesehatan Penerbangan* (Aviation Medical Center). The Aviation Medical Center also conducts medical examination to flight attendant and flight operation officer of several aircraft operators and air traffic controllers. The Aviation Medical Center is established facility by Directorate General of Civil Aviation (DGCA), for the proper conduct of aviation medical assessments and safe keeping of relevant documents and apparatus used for the purpose, which is functioning as a fully-fledged clinic.

The operating hour of the Aviation Medical Center was from 0600 up to 1700 LT. The Aviation Medical Center has 13 doctors consisted of 10 Aviation Medical Examiner (AME) and 3 Aviation Medical Assessor (AMA) which examined more than 100 applicants per day. The AMA also could act as medical examiner.

Prior the occurrence, the Aviation Medical Center did not have procedure to identify the risk factor of Obstructive Sleep Apnoea (OSA) while performing medical examination.

### **1.17.3 Medical Standard for Aviation Personnel**

According to the Civil Aviation Safety Regulation (CASR) part 67 on subchapter 67.203 described Electrocardiographic (ECG) examination must be performed on the first issue of medical certificate as part of heart examination. When medical certificate applicant is above 40 years old, a routine of renewal ECG examination must be performed. ECG resting must be performed at the first six months and ECG exercise/treadmill stress test at the next six months or vice versa.

The CASR part 67 on subchapter 67.15 described that every holder of medical certificate must not exercise the privileges of their license and related ratings at any time when they are aware of any decrease in their medical fitness which might render them unable to safely and properly exercise these privileges. Afterwards, the holder of medical certificate who acquaint or experienced any decrease in medical fitness which could cause incapacitation should report to the Director General of Civil Aviation.

#### 1.17.4 ICAO Standard and Recommended Practices for Medical Fitness

According to the ICAO Annex 1 – Personnel Licensing chapter 6, the evaluation of medical fitness of aviation personnel must be left to the judgment of the individual examiner which should in accordance with the highest standards of medical practice. This chapter also described that obesity and smoking threatened as predisposing factors for disease which may be important for determining further evaluation or investigation in an individual case.

### 1.18 Additional Information

#### 1.18.1 Body Mass Index and Obstructive Sleep Apnoea

Body Mass Index (BMI) is a number calculated from a person weight and height. BMI is a screening method that may indicate underlying health issues<sup>12</sup>.

BMI increases from 30 to 40 or above, the risk of developing health problems was extremely high<sup>13</sup>. According to National Heart, Lung, and Blood Institute (NHLBI) on the Bryman and Mills (2007), a BMI greater than 30 was classified as obesity which has some health risk as follows:

- cardiovascular – hypertension, stroke, Coronary Artery Disease (CAD), pulmonary embolism, varicose veins;
- gastrointestinal disorders – cholelithiasis, Gastroesophageal Reflux Disease (GERD), hernias, colon cancer, hepatic steatosis;
- neurological – meralgia parasthetica, idiopathic intracranial hypertension;
- psychological – depression, social and occupational discrimination;
- integument – venous stasis dermatitis, cellulites, poor hygiene, carbuncles;
- endocrine/reproductive – amenorrhea, breast cancer, cushing syndrome, diabetes, dyslipidemia, glucose intolerance, insulin and leptin resistance, infertility, hypothyroidism, uterine cancer, polycystic ovarian syndrome;
- musculoskeletal – chronic low back pain, osteoarthritis, immobility;
- respiratory – obstructive sleep apnea, pickwickian syndrome, chronic dyspnea, fatigue, obesity-hypoventilation syndrome; and genitourinary – prostate cancer, hypogonadism.

Obesity has very strong association with Obstructive Sleep Apnoea (OSA), approximately 70% of individuals who have OSA<sup>14</sup> are obese and conversely 50% of obese individuals have OSA<sup>15</sup>.

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12 FAA Body Mass Index (BMI) formula and table. The article can be found in

[https://www.faa.gov/about/office\\_org/headquarters\\_offices/avs/offices/aam/ame/guide/](https://www.faa.gov/about/office_org/headquarters_offices/avs/offices/aam/ame/guide/)

13 According to Robert et al (2005) on *Body Mass Index May Overestimate the Prevalence of Overweight and Obesity among the Inuit*.

The article can be found in <https://doi.org/10.3402/ijch.v64i2.17969>

14 Millman et al (1991). Daytime Hypertension in Obstructive Sleep Apnea: Prevalence and Contributing Risk Factors. The article can be

found in <https://www.sciencedirect.com/science/article/pii/S001236921648743X>

15 Resta et al (2001). *Sleep-related breathing disorders, loud snoring and excessive daytime sleepiness in obese subjects*. The article can be

found in <https://www.nature.com/articles/0801603>

The ICAO doc. 8984 described Obstructive Sleep Apnoea (OSA) as:

*A condition in which, during sleep, the upper airway is obstructed due to loss of tone in the pharyngeal musculature. The obstruction may be complete, leading to cessation of airflow (an apnoea) or partial, leading to a markedly reduced inspiratory flow (a hypopnoea).*

The OSA could lead to poor quality of sleep which caused daytime sleepiness. According to the subchapter 17.6.8 of ICAO doc. 8984 described that the diagnosis of OSA should be considered in pilot who is overweight, have Type 2 diabetes<sup>16</sup>, have history of snoring, and who complain of excess daytime sleepiness. Snoring while sleeping and had excessive daytime sleepiness were symptoms of OSA<sup>17</sup>. In addition, any pilot who has fallen asleep on the cockpit outside planned rest period should be investigated.

### 1.18.2 Human Performance

Human normally need 8 hours of sleep in a 24-hour period which losing as little as 2 hours of sleep will result in acute sleep loss, which will induce fatigue and degrade subsequent waking performance and alertness (Dinges et al, 1996)<sup>18</sup>. During sleep, usually human have 4 stages. Human need about 5 minutes to enter stage one of sleep and need 10 up to 30 minutes to enter the stage two<sup>19</sup>.

The Australia Civil Aviation Safety Authority (2005)<sup>20</sup> explained that during the stage two of sleep, the blood pressure, metabolism and cardiac activity decrease. A person will not see anything even if the eyes are opened. The Fatigue and Sleep Management of EUROCONTROL<sup>21</sup> mentioned that if waking up from stage two of sleep, a person usually has sleep inertia which would last 30 minutes. The sleep inertia is defined as transitional state of lowered arousal occurring immediately after awakening from sleep and producing a temporary decrement in subsequent performance.

Human brain has a clock which regulates 24-hour pattern of body function which controls the human sleep and wakefulness time<sup>22</sup>. According to FAA aeromedical safety brochure<sup>23</sup>, circadian rhythm is described as described as an internal biological clock that regulates our body functions, based on our wake/sleep. A circadian cycle disruption can lead to acute sleep deficits, cumulative sleep loss, decreases in performance and alertness, and various health problems.

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- 16 Type 2 diabetes is a long-term metabolic disorder that is characterized by high blood sugar, insulin resistance, and relative lack of insulin (National Institute of Diabetes and Digestive and Kidney Diseases, 2016). The detail explanation could be found in <http://www.niddk.nih.gov/health-information/health-topics/Diabetes/causes-diabetes/Pages/index.aspx>
- 17 Ferini-Strambi et al, (2003). Cognitive Dysfunction in Patients with Obstructive Sleep Apnea (OSA): Partial Reversibility After Continuous Positive Airway Pressure (CPAP). The full article could be found in <https://www.sciencedirect.com/science/article/abs/pii/S0361923003000686>
- 18 Dinges et al. (1996). *Principles and guidelines for duty and rest scheduling in commercial aviation*. The article can be found in <https://ntrs.nasa.gov/search.jsp?R=19990063635>
- 19 Sleep Phase and Cycle article taken from <https://www.webkesehatan.com/fase-siklus-tidur-tahapan-tidur/>. The article accessed on 1 April 2018.
- 20 Flight Safety Australia Volume 9 No 3 (May – June 2005). The article can be found in <http://pandora.nla.gov.au/tep/140978>
- 21 The Fatigue and Sleep Management of EUROCONTROL can be found in <https://www.eurocontrol.int/articles/fatigue-sleep-management>
- 22 National Sleep Foundation, (2018). The article can be found in <https://sleepfoundation.org/sleep-topics/what-circadian-rhythm>
- 23 FAA (2009). *Circadian Rhythm Disruption and Flying*. The article can be found in <https://www.faa.gov/pilots/safety/pilotsafetybrochures/>

Dinges et al (1996) explained that on 24-hour cycle, between 0200 and 0600 is estimation for window of circadian low, when human biological functions and performance efficiency are at their lowest level. Maintaining wakefulness or having sleep disturbance during the window of circadian low has a higher potential for fatigue and increased requirement for recovery.

In aviation, take-off and landing are the phases of flight with the highest workload and potential for accident, therefore, multiple take-offs and landings in a day might be expected to have cumulative effects on fatigue and human performance (Gander et al, 1998)<sup>24</sup>.

### **1.19 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.

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24 Gander et al (1998). Flight Crew Fatigue II: Short-Haul Fixed-Wing Air Transport Operations.

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## 2 ANALYSIS

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Referring to the gathered information, there was no record or report of aircraft system malfunction and was not an issue in the accident. Therefore, the analysis will discuss the relevant issues as follows:

- Aircraft flight profile;
- Pilot medical condition and activities;
- Organization Oversight;
- Pilot Medical Examination.

### 2.1 Aircraft Flight Profile

At 1157 LT which was at about 49 Nm from Oksibil, the Spidertracks recorded the aircraft altitude reached cruising altitude and maintained until the last recorded. At about 29 Nm from Oksibil, the pilot communicated with a Cessna 208B pilot which was flying on opposite direction from Oksibil to Tanah Merah.

Based on the previous flights, the next pilot activities should be descending the aircraft altitude, communicating with the Oksibil tower controller, turning the aircraft to join circuit pattern at Oksibil and turning off the WATCH mode on Spidertracks. On the previous flight to Oksibil, the pilot descended the aircraft at about 17 Nm from Oksibil, communicated with the Oksibil tower controller at about 10 Nm, turned the aircraft heading at about 6 Nm and turned off the WATCH mode at about 2 Nm.

At the accident flight, the Spidertracks recorded that the aircraft altitude and heading was maintained until the last recorded and there was no turning off of the WATCH mode on the Spidertracks.

Comparing the accident flight with the seven previous flights pattern to Oksibil conducted by the pilot indicated that the pilot did not perform pattern activities such as descend the aircraft altitude, turned aircraft heading to join the circuit pattern and turned off the WATCH mode on Spidertracks.

The ground based automatic voice recording did not record the communication between PK-FSO pilot and Oksibil air traffic controller during the accident flight. The Oksibil tower controller did not receive the flight plan for the second flight of the PK-FSO. Therefore, the Oksibil tower controller did not aware of the PK-FSO flight and did not attempt to contact the pilot when there was no communication. The communication with the Cessna 208B pilot was the last known pilot activity.

The pilot of Cessna 208B reported that the weather along the route from Oksibil to Tanah Merah was good, the sky conditions were clear with areas of scattered clouds with bases at approximately 9,000 feet and visibility was more than 10 kilometers.

The Spidertracks recorded the PK-FSO aircraft was over Oksibil at about 1215 LT and the weather over Oksibil at that time was reported in good condition while the west and north-west area was cloudy. Based on the weather condition, the pilot should able to identify the airport location. The Spidertracks recorded that the aircraft heading was maintained and flew passing the Oksibil airport.

The aircraft wreckage was found on a ridge at approximately 7,100 feet, which located at about 7 Nm north of Okisbil and the wreckage distribution was found toward 010° direction. Comparing to the last recorded aircraft bearing on the Spidertracks which was 011°, the aircraft was maintaining the altitude and heading until the impact. Based on the wreckage information, indicated that there was no pilot input to change the aircraft altitude or heading until the impact. The altitude and heading could be maintained indicated that the autopilot was engaged.

Based on the flight track, the absence of voice communication, the weather condition permitting the pilot to identify the airport location and the aircraft wreckage, consistently indicated that there were no pilot activities to fly the aircraft after the last known pilot activities at about 29 Nm from Oksibil until impact.

## **2.2 Pilot Medical Condition and Activities**

The investigation used available information to determine why no pilot activity since 1204 LT until the impact. The aircraft system was not an issue in this accident and the pilot had several health issues on the last medical examination, therefore the investigation considered the pilot health issue. The autopsy was not authorized by the family therefore the health condition of the pilot on that day could not be determined.

The last pilot medical record showed that the pilot had high cholesterol and increased Body Mass Index (BMI). This medical condition combined to the flight environment was unlikely that the pilot became unconscious/collapse during the flight. The other possibility was the pilot inadvertently falling asleep during the flight.

Two days prior the occurrence, the pilot travelled from Jakarta to Merauke as a passenger on night commercial flight. The flight departed at about 2245 LT and arrived at about 0900 LT in the morning and rest at the hotel. Night travel and arrived in the morning might resulted in the pilot had sleep disturbance during the window of circadian low which might increase the potential of fatigue and required adequate restorative sleep.

The pilot had dinner outside the hotel at about 1900 LT and returned to the hotel at about 2130 LT. No one witnessed the pilot activity while in the hotel room, therefore no information of the time when the pilot begun the night sleep. In the next morning, the pilot woke up late at about 0700 LT which was the time scheduled to leave the hotel to the airport. This might be an indication that the pilot did not have adequate restorative sleep to recover the sleep disturbance during the overnight flight.

Prior to the occurrence flight, the pilot had flown for 3 flight sectors, with total flight hour of 2 hours 55 minutes. The multiple take-offs and landings in a day increased the pilot fatigue.

The conditions of sleep disturbance during travelling to Merauke, no adequate restorative sleep and multiple takeoff and landings increased the possibility of the pilot being fatigue during the occurrence flight.

The pilot medical record showed that the BMI of the pilot increased and the last record indicated that the pilot was obesity. In addition, the interview with the FlyingSAS personnel indicated that the pilot often looked sleepy while flying. These might be an indication that the pilot might had problem with the sleep quality or quantity and/or physical fitness. The pilot was reported snoring while sleeping which leading to cessation of airflow and reduced the quality of sleep.



According to Resta et al., (2001), more than 50% of a group of obese people had Obstructive Sleep Apnoea (OSA). Snoring while sleeping and had excessive daytime sleepiness were symptoms of OSA (Ferini-Strambi et al, 2003). The interview with the FlyingSAS personnel indicated that the pilot snored while sleeping and often looked sleepy while flying, in addition the medical report indicated that the pilot was obese, these indicate that the pilot was possible had OSA.

The pilot had a habit of smoking while flying, if combined with the environment of flying when less air density could decrease the oxygen inhalation, resulted in increased of sleepiness.

During the occurrence flight, the pilot might had used the autopilot as reported that the pilot had the habit to use the autopilot while flying. The use of autopilot in a good weather condition could reduce the pilot workload and the less workload increased the sleepiness.

The last known activity of the pilot was about 29 Nm from Oksibil and at this phase the aircraft ground speed recorded on the Spidertracks was about 164 knots. Refer those particular data, if assumed that the pilot used the same pattern as previous flight, the flight should have started to descend at about 17 Nm from Oksibil or about 4 minutes (12 Nm) after the last known activity. The distance between the last known activities to Oksibil was about 29 Nm and would take about 11 minutes to pass the Oksibil in cruising speed while the distance to the accident site was about 36 Nm or about 13 minutes. According to the sleep phase, human need about 5 minutes to enter phase one of sleep and need 10 up to 30 minutes to enter the stage two. Therefore, refers to the time from the last pilot activity to the impact, the pilot might have entered the phase two of sleep.

Prior to the impact, the GA-EGPWS aural alert followed by aural warning should activate and triggers the pilot to take appropriate action. The level of the audio alert and/or warning is unable to be adjusted by the pilot. Should the GA-EGPWS aural alert and/or warning active, it should able to wake up the pilot if the pilot was inadvertently sleeping. The pilot had habit to engage the Terrain Inhibit switch which disables the GA-EGPWS function. The aural GA-EGPWS alert and warning might not active to trigger the pilot as the Terrain Inhibit switch was engaged.

The possibility of the pilot being fatigue, physical and environment condition increased pilot sleepiness which might have made the pilot inadvertently falling asleep indicated by no pilot activity. The absence of GA-EGPWS aural alert and warning was unable to wake up the pilot.

### **2.3 Organization Oversight**

The investigation identified several safety issues existed prior to the occurrence. Several pilots who had experience flying with the pilot advised the investigator that the pilot had behavior to inhibit the General Aviation Enhanced Ground Proximity Warning System (GA-EGPWS) during flight in Papua area. The consideration to inhibit the GA-EGPWS was due to several warning activation that was considered distracting. The other safety issue was the pilot often smoked in the cockpit during flight and looked sleepy while flying. These conditions were not reported to the FlyingSAS Operation or Safety department.

The Operation and Safety department were unable to identify the issue since there was no report from the operational personnel. This condition indicated that the hazard reporting system of the FlyingSAS was not well implemented.

The CASR part 67 on subchapter 67.15 described that every holder of medical certificate must not exercise the privileges of their license and related ratings at any time when they are aware of any decrease in their medical fitness which might render them unable to safely and properly exercise these privileges. Afterwards, the holder of medical certificate who acquaint or experienced any decrease in medical fitness which could cause incapacitation should report to the Director General of Civil Aviation.

The last pilot medical record showed that the pilot had high cholesterol and obesity which might affect to the pilot performance. These conditions were not identified by the FlyingSAS management. In addition, the FlyingSAS did not have means to monitor the possibility of the decreasing of pilot medical condition as the monitoring of pilot medical condition that was conducted by Human and Resource Department which limited to the due date of the medical certificate.

## **2.4 Pilot Medical Examination**

According to Resta et al., (2001), more than 50% of a group of obese people had Obstructive Sleep Apnoea (OSA). Snoring while sleeping and had excessive daytime sleepiness were symptoms of OSA (Ferini-Strambi et al, 2003). The interview with the pilot colleagues indicated that the pilot snored while sleeping and often looked sleepy while flying, in addition the medical report indicated that the pilot was obese, these indicate that the pilot was possible had OSA.

According to the ICAO doc. 8984 described that the diagnosis of OSA should be considered in pilot who is overweight, have Type 2 diabetes, have history of snoring, and who complain of excess daytime sleepiness.

Prior the occurrence, the Aviation Medical Center did not have procedure to identify the risk factor of OSA while performing medical examination, therefore the risk factor of OSA did not included in the last medical examination of the pilot.

The Civil Aviation Safety Regulation (CASR) part 67 described that when medical certificate applicant is above 40 years old, a routine of renewal ECG examination must be performed. ECG resting must be performed at the first six months and ECG exercise/treadmill stress test at the next six months or vice versa.

On the last pilot medical examination, the ECG examination was not performed by the Aviation Medical Center, the last ECG resting was performed on 20 August 2015 and the ECG exercise was performed on 18 December 2015. This was not in accordance with the CASR part 67 as the pilot was 42 years old.

When conducting the last medical examination on 6 March 2017, the pilot provided medical history to the Aviation Medical Examiner which included the total flying hour in the last 6 months was about 300 hours. The Aviation Medical Center did not record the pilot medical examination in 2016.

The result of medical examination on 6 March 2017 met the requirement standard thus the aeromedical disposition was fit. The pilot received a first-class medical certificate without any limitation which valid until 30 September 2017.

The medical examination for pilot in Indonesia was only performed by the Aviation Medical Center in Jakarta. In addition the Aviation Medical Center also conducts medical examination to flight attendant and flight operation officer of several aircraft operators and air traffic controllers.

The Aviation Medical Center had 13 personnel who examined for more than 100 applicants per day. In average, one applicant needs about two hours to complete all medical assessment process. Comparing the number examiner and the applicant with the operating hour of the Aviation Medical Center, it was very possible that the pilot medical condition was not examined thoroughly.

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## 3 CONCLUSIONS

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### 3.1 Findings<sup>25</sup>

1. The pilot held valid license and medical certificate.
2. The aircraft had valid Certificate of Airworthiness (C of A) and Certificate of Registration (C of R). The aircraft serviceability was considered not contributed to this accident.
3. The occurrence flight was multiday duty schedule after off duty period for the pilot.
4. Two days prior the occurrence, the pilot travelled from Jakarta to Merauke as a passenger on a night commercial flight. Night travel and arrived in the morning might resulted in the pilot had sleep disturbance during the window of circadian low which might increase the potential of fatigue and required adequate restorative sleep.
5. The pilot had rest in hotel and in the next morning, the pilot woke up late at about 0700 LT which was the time scheduled to leave the hotel to the airport. This might be an indication that the pilot did not have adequate restorative sleep to recover the sleep disturbance during the overnight flight.
6. Prior to the occurrence flight, the pilot had flown for 3 flight sectors, with total flight hour of 2 hours 55 minutes. The multiple take-offs and landings in a day increased the pilot fatigue.
7. The occurrence flight was the fourth flight of the day for the pilot and the aircraft, the previous routes were Mopah Airport – Tanah Merah – Oksibil – Tanah Merah and scheduled for Oksibil – Tanah Merah.
8. Prior to departure, there was no report or record of aircraft system malfunction. The aircraft was operated within the approved weight and balance envelope.
9. The aircraft departed Tanah Merah at 0244 UTC on daylight condition and cruised at altitude of 7,000 feet. The estimate time arrival in Oksibil would be 0324 UTC. The flight carried cargo and the pilot was the only person on board the flight.
10. At about 29 Nm north from Oksibil, the aircraft passed a Cessna 208B aircraft which was flying on opposite direction from Oksibil to Tanah Merah at altitude 6,000 feet. The pilot of Cessna 208B and the PK-FSO pilot communicated to inform their position. This was the last known activity from the pilot.
11. At 0340 UTC, the flight following officer of Flying SAS at Jakarta received emergency signal of PK-FSO aircraft. The aircraft last position recorded from the flight following system was approximately 6 Nm north of Oksibil.
12. The PK-FSO pilot did not contact the Oksibil air traffic controller during the accident flight.

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<sup>25</sup> 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.

13. On 13 April 2017, at 2211 UTC, the PK-FSO aircraft was found on ridge of Anem Mountain which located about 7 Nm north east of Oksibil. The aircraft destroyed by impact forces and the wreckage distribution was found toward 010° direction. There was no evidence of fire in-flight or after the aircraft impacted terrain.
14. The weather in Oksibil between 0230 until 0330 UTC was reported clear, the wind was calm, the clouds was scattered at approximately at altitude of 9,000 feet and south area of Oksibil was clear while the west and north west area was cloudy. Based on the weather condition, the pilot should able to identify the airport location.
15. Based on the flight track, the absence of voice communication, the weather condition permitting the pilot to identify the airport location and the aircraft wreckage, consistently indicated that there were no pilot activities to fly the aircraft after the last known pilot activities at about 29 Nm from Oksibil until impact.
16. The pilot medical record combined to the flight environment was unlikely to make the pilot became unconscious/collapse during the flight.
17. The possibility of the pilot being fatigue, physical and environment condition increased pilot sleepiness which might have made the pilot inadvertently falling asleep indicated by no pilot activity. The absence of GA-EGPWS aural alert and warning was unable to wake up the pilot.
18. Based on the FlyingSAS personnel interview, the pilot often smoked in the cockpit during flight, looked sleepy and engages the Terrain Inhibit switch which disables the GA-EGPWS function while flying.
19. The Operation and Safety department were unable to identify the issue of smoking in cockpit and engagement of the Terrain Inhibit switch while flying since there was no report from the operational personnel. This condition indicated that the hazard reporting system of the FlyingSAS was not well implemented.
20. The last pilot medical record showed that the pilot had high cholesterol and obesity. These conditions were highlighted to the applicant for life style modification including dietary, but were not highlighted to the FlyingSAS due to medical confidentiality.
21. The CASR part 67 subchapter 67.15 described that holder of medical certificate must not exercise the privileges of their license and related ratings at any time when they are aware of any decrease in their medical fitness which might render them unable to safely and properly exercise these privileges. Afterwards, the holder of medical certificate who acquaint or experienced any decrease in medical fitness which could cause incapacitation should report to the Director General of Civil Aviation.
22. The FlyingSAS did not have means to monitor the possibility of the decreasing of pilot medical condition as the monitoring of pilot medical condition that was conducted by Human and Resource Department which limited to the due date of the medical certificate.

23. The CASR part 67 on subchapter 67.203 described Electrocardiographic (ECG) examination must be performed on the first issue of medical certificate as part of heart examination. When medical certificate applicant is above 40 years old, a routine of renewal ECG examination must be performed. ECG resting must be performed at the first six months and ECG exercise/treadmill stress test at the next six months or vice versa.
24. On the last pilot medical examination, the ECG examination was not performed by the Aviation Medical Center, the last ECG resting was performed on 20 August 2015 and the ECG exercise was performed on 18 December 2015. This was not in accordance with the CASR part 67 as the pilot was 42 years old.
25. On the last medical examination (6 March 2017), the pilot provided medical history to the Aviation Medical Examiner which included the total flying hour in the last 6 months was about 300 hours. The Aviation Medical Center did not record the pilot medical examination in 2016.
26. Prior the occurrence, the Aviation Medical Center did not have procedure to identify the risk factor of OSA while performing medical examination, therefore the risk factor of OSA did not included in the last medical examination of the pilot.
27. The Aviation Medical Center had 13 personnel who examined for more than 100 applicants per day. In average, one applicant needs about two hours to complete all medical assessment process.
28. Comparing the number of examiner and the applicant with the operating hour of the Aviation Medical Center, it was very possible that the pilot medical condition was not examined thoroughly.

## **3.2 Contributing Factors<sup>26</sup>**

The possibility of the pilot being fatigue, physical and environment condition increased pilot sleepiness which might have made the pilot inadvertently falling asleep indicated by no pilot activity. The absence of GA-EGPWS aural alert and warning was unable to wake up the pilot.

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<sup>26</sup> Contributing factors is defined as events that might cause the occurrence. In the case that the event did not occur then the accident might not happen or result in a less severe occurrence.

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## 4 SAFETY ACTION

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The Komite Nasional Keselamatan Transportasi (KNKT) informed safety actions taken by the aircraft operator resulting from this occurrence.

### 4.1 FlyingSAS

The FlyingSAS issued 17 operation notices (the detail of the notices can be found in the appendices) that require pilot, engineer and Flight Operation Officer (FOO) to take particular action following these subjects:

- Daily blood pressure and alcohol test record;
- Medical examination procedure;
- Guidance material for single pilot resource management;
- Two persons on board policy for Cessna 208B flight operation;
- Crew rest time management;
- Mandatory training procedure;
- Cessna 208B checklist revision;
- Aircraft operational checklist usage;
- Aircraft position broadcast procedure;
- Aircraft on board weather radar test;
- Aircraft on board Terrain Avoidance Warning System (TAWS) test;
- Aircraft on board TAWS inhibition procedure;
- WATCH ON feature on Spidertracks;
- Smoking during flight prohibition;
- Oxygen supply usage on high altitude flight operation;
- Flight release form and load sheet conformity;
- Flight operational document management.

The KNKT also informed safety action that would be taken by FlyingSAS as follows:

- Install satellite phone and portable video camera on all aircraft.
- Appoint chief pilot for Cessna 208 aircraft operation.

### 4.2 *Balai Kesehatan Penerbangan (Aviation Medical Center)*

On 11 July 2018, the Aviation Medical Center issued circular number SE.15 of 2018, which required additional examination to all aviation personnel with BMI over 30 and reminded all aviation personnel to be more aware that medical condition is a dynamic condition which requires to be maintained actively.

On 11 July 2018, the Aviation Medical Center also issued circular number SE.16 of 2018 with described recommendation to perform additional task to be followed by Aviation Medical Examiner when examines aviation personnel who had obese with risk from metabolic and cardiorespiratory problem. The additional task included to identify the risk factor of OSA.

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## **5 SAFETY RECOMMENDATIONS**

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The KNKT acknowledged the safety actions taken by the related parties, however, there still remain safety issues that need to be considered. Therefore, the KNKT issues the following safety recommendations addressed to the Directorate General of Civil Aviation and the Aircraft Operator.

### **5.1 FlyingSAS**

- **04.O-2018-10.1**

On the last medical examination, the medical summary of the increased BMI and laboratory blood test result were highlighted to the pilot for life style modification including dietary, but were not highlighted to the FlyingSAS due to medical confidentiality. Afterwards, the pilot reported to the management that the result of medical examination met the requirement standard by providing the copy of first-class medical certificate without any limitation.

The pilot was obese, also reported snoring while sleeping and often looked sleepy while flying, these indicated that the pilot had medical fitness decrement. There was no report received by the DGCA and FlyingSAS management regarding the pilot condition.

The CASR part 67 subchapter 67.15 described that holder of medical certificate must not exercise the privileges of their license and related ratings at any time when they are aware of any decrease in their medical fitness which might render them unable to safely and properly exercise these privileges. Afterwards, the holder of medical certificate who acquaint or experienced any decrease in medical fitness which cause incapacitation should report to the Director General of Civil Aviation.

The KNKT recommend the FlyingSAS to increase pilot awareness of their medical condition and emphasize pilot who acquaint or experienced any decrease in medical fitness which could cause incapacitation to report to FlyingSAS management and the Director General of Civil Aviation.

- **04.O-2018-10.2**

The pilot often smoked in the cockpit during flight, looked sleepy and engages the Terrain Inhibit switch which disables the GA-EGPWS function while flying.

These operational safety issues were not identified by the Operation and Safety department since there was no report from the operational personnel. This condition indicated that the hazard reporting system of the FlyingSAS was not well implemented

The KNKT recommend the FlyingSAS to review and improve the hazard reporting system including identification of operational safety issue.



## 5.2 *Balai Kesehatan Penerbangan (Aviation Medical Center)*

- **04.R-2018-10.3**

The CASR part 67 on subchapter 67.203 described Electrocardiographic (ECG) examination must be performed on the first issue of medical certificate as part of heart examination. When medical certificate applicant is above 40 years old, a routine of renewal ECG examination must be performed. ECG resting must be performed at the first six months and ECG exercise/treadmill stress test at the next six months or vice versa.

On the last pilot medical examination, the ECG examination was not performed by the Aviation Medical Center, the last ECG resting was performed on 20 August 2015 and the ECG exercise was performed on 18 December 2015. This was not in accordance with the CASR part 67 as the pilot was 42 years old. The absence of the ECG examination made the heart condition of pilot was unable to be identified.

The KNKT recommend the Aviation Medical Center to conduct the required examination including ECG resting or ECG exercise in accordance with the CASR part 67.

- **04.R-2018-10.4**

The medical examination for pilot in Indonesia was only performed by the Aviation Medical Center in Jakarta. In addition the Aviation Medical Center also conducts medical examination to flight attendant and flight operation officer of several aircraft operators and air traffic controllers.

The Aviation Medical Center had 13 personnel who examined for more than 100 applicants per day. In average, one applicant needs about two hours to complete all medical assessment process. Comparing the number examiner and the applicant with the operating hour of the Aviation Medical Center, it was very possible that the pilot medical condition was not examined thoroughly.

The KNKT recommend the Aviation Medical Center to conduct examiner workload analysis to adjust the ration of examiner and applicant so that the examination can be performed thoroughly.

## 5.3 Directorate General of Civil Aviation

- **04.R-2018-10.5**

The CASR part 67 on subchapter 67.15 described that every holder of medical certificate must not exercise the privileges of their license and related ratings at any time when they are aware of any decrease in their medical fitness which might render them unable to safely and properly exercise these privileges. Afterwards, the holder of medical certificate who acquaint or experienced any decrease in medical fitness which could cause incapacitation should report to the Director General of Civil Aviation.

There was no detail description of the method and address of the report related to medical fitness decrement.

The KNKT recommend the DGCA providing method and address to report any decrease in medical fitness which causes incapacitation by holder of medical certificate.

- **04.R-2018-10.6**

The pilot often smoked in the cockpit during flight, looked sleepy and engages the Terrain Inhibit switch which disables the GA-EGPWS function while flying.

These operational safety issues were not identified by the Operation and Safety department of the FlyingSAS since there was no report from the operational personnel. This condition indicated that the hazard reporting system of the FlyingSAS was not well implemented.

The KNKT recommend the DGCA to review the implementation of Safety Management System including hazard reporting system by aircraft operator in regards to be able identifying operational safety issue.

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## 6 APPENDICES

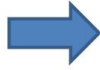
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### 6.1 FlyingSAS Spider 7 Pilot User Guide



#### SPIDERTRACK S7 PILOT USER GUIDE

**WATCH** - PRESS  
TO ACTIVATE  
INTENSIVE  
MONITORING +  
AUTO S O S  
ALLERT.  
PRESS AGAIN TO  
DEACTIVATE.




**MARK** - PRESS ONCE: HIJACKED.  
PRESS TWICE: TECHNICAL PROBLEM,  
NEED ATTENTION ON ARRIVAL.  
PRESS 3 TIMES: AIRCRAFT RTB DUE TO  
TECHNICAL REASON.  
PRESS 4 TIMES: AIRCRAFT RTB DUE TO  
WEATHER REASON.

**NOTE:** TO AVOID VALSE S.O.S SMS AUTOMATICALLY BEING SEND BY THE SPIDERTRACK SYSTEM, PILOTS ARE REQUESTED TO TURN OFF **WATCH ON MODE** APPROXIMATELY 2 (TWO) MINUTES BEFORE TOUCHDOWN TIME AFTER A LANDING DECISION IS ASSURED !

REVISION: NO. 1	FlyingSAS-OP-2016	April 1, 2016
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## 6.2 FlyingSAS Operation Notices

### 6.2.1 04/OD/ON/V/2017

	OPERATIONS DEPARTEMENT	04/OD/ON/V/2017
	OPERATION NOTICE	1/5/2017
		Page 1/1

DATE OF EFFECTIVENESS :	1 <sup>ST</sup> MAY 2017
DISTRIBUTION :	DX, DB,DD,DF, FX, FO, FS, OP
APPLICABILITY :	<b>ALL PILOTS, ENGINEERS, FOOS PT, SAS</b>
PREPARED BY :	
VERIFIED BY :	
APPROVED BY :	
SUBJECT :	<b>BLOOD PRESSURE AND ALCOHOL CONTENT TEST SOP</b>


1. THIS NOTICE TO PILOTS, ENGINEERS, FOOS WAS ISSUED BASED ON DATAS FACTUAL FROM PK-FSO ACCIDENT AT OKSIBIL AREA 12<sup>TH</sup> APRIL 2017.

2. TO ALL PT. SPIRIT AVIA SENTOSA FOO, FOR BLOOD PRESSURE TEST AND ALCOHOL CONTENT DAILY MONITORING FOR PILOTS, ENGINEERS AND FOOS. MANAGEMENT INSTRUCT YOU TO SEND THE DAILY RECORD TAKEN AFTER COMPLETE CONDUCTING A TEST BEFORE FIRST FLIGHT BY TAKE A PHOTO SHOOT OF THE DOCUMENT AND SEND IT TO THE PT. SPIRIT AVIA SENTOSA COMMAND CONTROL CENTER.

3. MANAGEMENT INSTRUCTS YOU TO COMPILE AND SEND ALL HARD COPY OF THE DAILY RECORD TAKEN BEFORE FIRST FLIGHT TOGETHER WITH COMPILEMENT OF FLIGHT OPERATIONAL DOCUMENTS AND SEND IT TO THE PT. SPIRIT AVIA SENTOSA PRINCIPAL BUSSINESS OFFICE JAKARTA.

4. PLEASE ACTKNOWLEDGE, FOLLOW SUIT AND DO ALL THIS INSTRUCTION WITH FULL RESPONSIBILITY AND PROFFESIONALISM. THANK YOU FOR YOUR COOPERATIONS.


6.2.2 05/OD/ON/V/2017

	OPERATIONS DEPARTEMENT	05/OD/ON/V/2017
		1/5/2017
	OPERATION NOTICE	Page 1/1

DATE OF EFFECTIVENESS :	1 <sup>ST</sup> MAY 2017
DISTRIBUTION :	DX, DB,DD,DF, FX, FO, FS, OP
APPLICABILITY :	<b>All PILOTS PT. SAS</b>
PREPARED BY :	
VERIFIED BY :	
APPROVED BY :	
SUBJECT :	<b>CRM FOR SINGLE PILOT OPERATION AIRCRAFT</b>

1. THIS NOTICE TO **PILOTS** WAS ISSUED BASED ON DATAS FACTUAL FROM PK-FSO ACCIDENT AT OKSIBIL AREA 12<sup>TH</sup> APRIL 2017.
2. TO ALL PT. SPIRIT AVIA SENTOSA CARAVAN PILOTS, MANAGEMENT INSTRUCTS YOU TO READ A **FAA GUIDANCE MATERIAL FOR SINGLE PILOT RESOURCE MANAGEMENT (CRM FOR SINGLE PILOT OPERATIONS)**.
3. ATTACHED HERE A COPY OF FAA MATERIAL FOR SINGLE PILOT RESOURCE MANAGEMENT (CRM FOR SINGLE PILOT OPERATIONS). **FOR COMPLETE FAA MATERIAL WILL BE SEND TO ALL CARAVAN PILOTS EMAIL ADDRESS.**
4. PLEASE ACTKNOWLEDGE, FOLLOW SUIT AND DO ALL THIS INSTRUCTION WITH FULL RESPONSIBILITY AND PROFFESIONALISM. THANK YOU FOR YOUR COOPERATIONS.

6.2.3 06/OD/ON/V/2017

	OPERATIONS DEPARTEMENT	06/OD/ON/V/2017
	OPERATION NOTICE	01/5/2017
		Page 1/2

DATE OF EFFECTIVENESS :	01 MAY 2017
DISTRIBUTION :	DX, DB, DD, DF, FX, FO, FS, OP
APPLICABILITY :	All Pilots PT. SAS /
PREPARED BY :	
VERIFIED BY :	
APPROVED BY :	
SUBJECT :	MANDATORY TRAINING PROCEDURES

1. THIS NOTICE TO PILOT WAS ISSUED BASED ON DATAS FACTUAL FROM PK-FSO ACCIDENT AT OKSIBIL AREA 12<sup>TH</sup> APRIL 2017.

2. TO ALL PT. SPIRIT AVIA SENTOSA PILOTS, MANAGEMENT PROCEDURES FOR MANDATORY TRAINING ARE:


A. PILOT MUST MONITOR HIS/HER LAST VALIDATION DATE OF THE LAST MANDATORY TRAINING.

B. MANAGEMENT INSTRUCTS PILOTS TO RECORD ALL TYPE HIS/HER MANDATORY TRAINING IN THE PILOT LOGBOOK.

C. CHIEF PILOT AND COMMAND CONTROL CENTER WILL SCHEDULE PILOT TO MANDATORY TRAINING BEFORE THE END OF THE MONTH OF VALIDATION DATE AND AT THE DATE THAT WILL NOT CONFLICT AGAINTS FLIGHT DUTY.

D. PILOT MUST INFORM COMMAND CONTROL CENTER FOR CANCELLING, DELAYING OR RESCHEDULING DATE OF MANDATORY TRAINING.

E. MANDATORY TRAINING INVOICE WILL BE SEND DIRECTLY TO COMPANY.

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		01/5/2017
	OPERATION NOTICE	Page 2/2


F. MANDATORY TRAINING CERTIFICATE AND ATTENDANT LIST WILL BE COLLECTED BY COMPANY REPRESENTATIVE.

G. MANDATORY TRAINING CERTIFICATE WITHOUT ATTENDANT LIST RECORD WITH THE SAME DATE VALIDATION WILL BE REJECTED BY COMPANY REPRESENTATIVE. MANDATORY TRAINING CERTIFICATE AND ATTENDANT LIST RECORD TRUECOPY WILL BE KEPT IN THE COMPANY DORSIER.

H. MANDATORY TRAINING CERTIFICATES ARE BELONGING TO THE COMPANY.

4. PLEASE ACTKNOWLEDGE, FOLLOW SUIT AND DO ALL THIS INSTRUCTION WITH FULL RESPONSIBILITY AND PROFFESIONALISM. THANK YOU FOR YOUR COOPERATIONS.

6.2.4 07/OD/ON/V/2017

	OPERATIONS DEPARTEMENT	07/OD/ON/V/2017
	OPERATION NOTICE	1/5/2017
		Page 1/2

DATE OF EFFECTIVENESS :	1 <sup>ST</sup> MAY 2017
DISTRIBUTION :	DX, DB,DD,DF, FX, FO, FS, OP
APPLICABILITY :	All FOO PT. SAS
PREPARED BY :	
VERIFIED BY :	
APPROVED BY :	
SUBJECT :	FLIGHT OPERATIONAL DOCUMENTS SHIPPING SOP

1. THIS NOTICE TO FOO WAS ISSUED BASED ON DATAS FACTUAL FROM PK-FSO ACCIDENT AT OKSIBIL AREA 12<sup>TH</sup> APRIL 2017.

2. TO ALL PT. SPIRIT AVIA SENTOSA FOO, MANAGEMENT PROCEDURES FOR FLIGHT OPERATIONAL DOCUMENTS SHIPPING ARE:


A. BASE ON DGCA STAFF INSTRUCTION 8400 AMANDEMENT 4. ALL FLIGHT OPERATIONAL DOCUMENTS MUST BE KEPT IN THE PT. SPIRIT AVIA SENTOSA PRINCIPAL BUSSINESS OFFICE AT JAKARTA.

B. KIND OF ALL FLIGHT OPERATIONAL DOCUMENTS, REFER TO PT. SPIRIT AVIA SENTOSA OPERATION MANUAL PART – A CHAPTER 8 – OPERATING PROCEDURES 8.14.4 - INFORMATION TO BE RETAINED ON GROUND.


C. EVERIDAY, FLIGHT OPERATIONAL DOCUMENTS MUST BE COMPILE ACCORDING TO EACH FLIGHT, THEN COMPILE ACCORDING TO ITS AIRCRAFT REGISTRATION, THEN COMPILE ACCORDING TO ITS DATE AND COMPILE ACCORDING TO ITS WEEK.

D. COMPILEMENT OF FLIGHT OPERATIONAL DOCUMENTS MUST BE SENT ON THE NEAREST WEEK TO PRINCIPAL OFFICE JAKARTA ALONG WITH THE CHANGE OF CREW ON DUTY (CAN USE ROTATION CHANGE OF PILOTS BECAUSE IT'S THE MOST FREQUENT).




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	OPERATION NOTICE	1/5/2017 Page 2/2

4. PLEASE ACTKNOWLEDGE, FOLLOW SUIT AND DO ALL THIS INSTRUCTION WITH FULL RESPONSIBILITY AND PROFFESIONALISM. THANK YOU FOR YOUR COOPERATIONS.

	OPERATIONS DEPARTEMENT	08/OD/ON/V/2017
		1/5/2017
	OPERATION NOTICE	Page 1/2

DATE OF EFFECTIVENESS :	1 <sup>ST</sup> MAY 2017
DISTRIBUTION :	DX, DB,DD,DF, FX, FO, FS, OP
APPLICABILITY :	All PILOTS PT. SAS /
PREPARED BY :	
VERIFIED BY :	
APPROVED BY :	
SUBJECT :	MEDICAL EXAMINATION S O P

1. THIS NOTICE TO **PILOTS** WAS ISSUED BASED ON DATAS FACTUAL FROM PK-FSO ACCIDENT AT OKSIBIL AREA 12<sup>TH</sup> APRIL 2017.
2. TO ALL PT. SPIRIT AVIA SENTOSA PILOTS, MANAGEMENT PROCEDURES FOR MEDICAL EXAMINATION ARE:
  - A. PILOT MUST MONITOR HIS/HER LAST VALIDATION DATE OF THE PREVIOUS / LAST MEDICAL EXAMINATION.
  - B. MANAGEMENT INSTRUCTS PILOTS TO RECORD HIS/HER MEDICAL EXAMINATION DATE IN THE PILOT LOGBOOK.
  - C. CHIEF PILOT AND COMMAND CONTROL CENTER WILL SCHEDULE PILOT TO MEDICAL EXAMINATION BEFORE THE END OF THE MONTH OF VALIDATION DATE AND AT THE DATE THAT WILL NOT CONFLICT AGAINTS FLIGHT DUTY.
  - D. PILOT MUST INFORM COMMAND CONTROL CENTER FOR CANCELLING, DELAYING OR RESCHEDULING DATE OF MEDICAL EXAMINATION OR DATE OF MEDICAL RE-EXAMINATION.
  - E. MEDICAL EXAMINATION INVOICE WILL BE SEND DIRECTLY TO COMPANY.

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	OPERATION NOTICE	1/5/2017 Page 2/2


F. PILOT MEDICAL EXAMINATION RECORD AND CERTIFICATE WILL BE COLLECTED BY COMPANY REPRESENTATIVE.

G. PILOT MEDICAL EXAMINATION CERTIFICATE WITHOUT MEDICAL EXAMINATION RECORD WITH THE SAME DATE VALIDATION WILL BE REJECTED BY COMPANY REPRESENTATIVE (EXCEPT FOR SCHEDULED RE-EXAMINATION).

H. PILOT MUST REPORT TO COMPANY AFTER FINISHING HIS/HER MEDICAL EXAMINATION AND BRING HIS/HER PILOT LICENCE AND LOGBOOK TO COMPANY REPRESENTATIVE TO MAKE TRUE COPY AND BE LEGALIZED. TRUECOPY WILL BE KEPT IN THE COMPANY DORSIER.

4. PLEASE ACTKNOWLEDGE, FOLLOW SUIT AND DO ALL THIS INSTRUCTION WITH FULL RESPONSIBILITY AND PROFFESIONALISM. THANK YOU FOR YOUR COOPERATIONS.

6.2.6 09/OD/ON/V/2017

	OPERATIONS DEPARTEMENT	09/OD/ON/V/2017
	OPERATION NOTICE	1/5/2017 Page 1/2


DATE OF EFFECTIVENESS :	1 <sup>ST</sup> MAY 2017
DISTRIBUTION :	DX, DB,DD,DF, FX, FO, FS, OP
APPLICABILITY :	<b>All CARAVAN PILOTS PT. SAS</b>
PREPARED BY :	
VERIFIED BY :	
APPROVED BY :	
SUBJECT :	<b>CARAVAN C208B CHECKLIST REVISION</b>

1. THIS NOTICE TO **CARAVAN PILOTS** WAS ISSUED BASED ON DATAS FACTUAL FROM PK-FSO ACCIDENT AT OKSIBIL AREA 12<sup>TH</sup> APRIL 2017.

2. TO ALL PT. SPIRIT AVIA SENTOSA **CARAVAN PILOTS**, ATTACHED HERE **CARAVAN DAILY OPERATIONAL CHECKLIST REVISION 2** (HARD COPY OF CHECKLIST WILL BE AVAILABLE IN THE BOTH COCKPIT POCKETS).


3. TO ALL PT. SPIRIT AVIA SENTOSA **CARAVAN PILOTS**, MANAGEMENT INSTRUCT YOU TO **READ THE AIRCRAFT OPERATIONAL CHECKLIST PROVIDED TO YOU FOR YOUR TYPE OF AIRCRAFT AND LOCATED IN THE BOTH SIDE COCKPIT POCKET**. THE AIRCRAFT OPERATIONAL CHECKLIST MUST BE READ ACCORDING TO A CERTAIN PHASE OF FLIGHT (DAILY NORMAL OR ABNORMAL AND EMERGENCY PHASE) AS A STANDARD OPERATIONAL PROCEDURES STATED IN THE PT. SPIRIT AVIA SENTOSA OPERATIONS MANUAL PART – B.

4. AS TO REMINDER THAT ITEMS IN THE AIRCRAFT OPERATIONAL CHECKLIST ARE NOT TO BE MEMORIZED BY PILOTS TO AVOID MISSING ITEMS DURING MAKING A SELECTION OR TAKING ACTION (EXCEPT FOR EMERGENCY CHECKLIST MEMORY ITEMS). SEE STANDARD OPERATIONAL PROCEDURES STATED IN THE PT. SPIRIT AVIA SENTOSA OPERATIONS MANUAL PART – B.

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		1/5/2017
	OPERATION NOTICE	Page 2/2

5. PLEASE ACTKNOWLEDGE, FOLLOW SUIT AND DO ALL THIS INSTRUCTION WITH FULL RESPONSIBILITY AND PROFFESIONALISM. THANK YOU FOR YOUR COOPERATIONS.

6.2.7 10/OD/ON/V/2017

	OPERATIONS DEPARTEMENT	10/OD/ON/V/2017
		1/5/2017
	OPERATION NOTICE	Page 1/3

DATE OF EFFECTIVENESS :	1 <sup>ST</sup> MAY 2017
DISTRIBUTION :	DX, DB,DD,DF, FX, FO, FS, OP
APPLICABILITY :	<b>ALL CARAVAN PILOTS PT. SAS /</b>
PREPARED BY :	
VERIFIED BY :	
APPROVED BY :	
SUBJECT :	<b>TWO PERSON ON COCKPIT SEATS FOR CESSNA CARAVAN</b>

1. THIS NOTICE TO **CARAVAN PILOTS** WAS ISSUED BASED ON DATAS FACTUAL FROM PK-FSO ACCIDENT AT OKSIBIL AREA 12<sup>TH</sup> APRIL 2017.

2. TO ALL PT. SPIRIT AVIA SENTOSA **CARAVAN PILOTS, ENGINEERS AND FOOS**, THIS IS MANAGEMENT ANOUNCEMENT FOR THE CARAVAN FLEET CREW COMPOSITION. FROM 1<sup>ST</sup> MAY 2017 ALL CARAVAN AIRCRAFT THAT OPERATED BY PT. SPIRIT AVIA SENTOSA USE POLICY OF " 2 (TWO) PERSON ONBOARD OCCUPYING PILOTS SEAT ".


3. BELOW ARE THE PROCEDURE OF 2 (TWO) PERSON ONBOARD OCCUPYING PILOTS SEAT;

A . 1<sup>ST</sup> PROCEDURE:

A CAPTAIN AS PILOT IN COMMAND (PIC) OCCUPYING THE LEFT SEAT AND ACCOMPANIED BY SECOND IN COMMAND (SIC) OCCUPYING THE RIGHT SEAT.

**SECOND IN COMMAND POSITION CAN BE OCCUPIED BY FIRST OFFICERS, OTHER FELLOW CAPTAINS, INSTRUCTORS, OR CCPS.**

**NORMAL STANDARD OPERATIONAL PROCEDURES APPLY FOR FIRST OFFICER AND SECOND IN COMMAND DUTY AND RESPONSIBILITY AS STATED IN THE OPERATION MANUAL PART – A CHAPTER 2 – ORGANIZATION, 2.5 DUTIES AND RESPONSIBILITY OF CREW MEMBERS.**

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**IN CASE OF CAPTAINCY LINE TRAINING FLIGHT, THE CANDIDATE CAPTAIN AS A SECOND IN COMMAND WILL OCCUPY THE LEFT SEAT AND THE INSTRUCTOR AS THE PILOT IN COMMAND WILL OCCUPY THE RIGHT SEAT. NORMAL STANDARD OPERATIONAL PROCEDURES APPLY FOR INSTRUCTOR DUTY AND RESPONSIBILITY AS STATED IN THE OPERATION MANUAL PART – A CHAPTER 2 – ORGANIZATION, 2.5 DUTIES AND RESPONSIBILITY OF CREW MEMBERS.**

**B. 2<sup>ND</sup> PROCEDURE:**


**A CAPTAIN AS PILOT IN COMMAND (PIC) OCCUPYING THE LEFT SEAT AND ACCOMPANIED BY PT. SPIRIT AVIA SENTOSA ON DUTY ON TYPE ENGINEER OR PT. SPIRIT AVIA SENTOSA ON DUTY FOO OCCUPYING THE RIGHT SEAT.**

**NOTE: THE 2<sup>ND</sup> PROCEDURE SHALL ALLOW TO BE ACCOMPLISHED ONLY IF THE FLIGHT TIME OF THE FLIGHT IS BELOW 1 HOUR FLIGHT TIME. NORMAL STANDARD OPERATIONAL PROCEDURES APPLY FOR ENGINEER DUTY AND RESPONSIBILITY AS STATED IN THE MAINTENANCE MANUAL CHAPTER 2.5.5 DUTY AND RESPONSIBILITY ENGINEER.**

**NORMAL STANDARD OPERATIONAL PROCEDURES APPLY FOR FOO DUTY AND RESPONSIBILITY AS STATED IN THE OPERATION MANUAL PART – A CHAPTER 2 – ORGANIZATION, 2.5 DUTIES AND RESPONSIBILITY OF CREW MEMBERS.**

**ADDITIONAL DUTY AND RESPONSIBILITY FOR 2<sup>ND</sup> PERSON OCCUPYING THE RIGHT SEAT DURING FLIGHT:**

- B.1. TO PREVENT AND REMIND THE PIC NOT TO FALL A SLEEP DURING ALL PHASE OF FLIGHT.
- B.2. TO REMIND THE PIC TO READ THE CHECKLIST DURING ALL PHASE OF FLIGHT.
- B.3. TO REMIND THE PIC TO FOLLOW VFR PROCEDURES.
- B.4. ASSIST THE PIC IN FILING THE AFML AND FDR AS DIRECTED BY PIC.

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**NOTE: A SPECIAL BRIEFING MUST BE GIVEN BY THE PIC TO THE 2<sup>ND</sup> PERSON OTHER THAN PILOT OCCUPYING THE RIGHT SEAT.**

SECOND PERSON OCCUPYING RIGHT SEAT SAFETY BRIEFING CARD ON BOARD IN THE AIRCRAFT DOORS POCKET.

4. PLEASE ACTKNOWLEDGE, FOLLOW SUIT AND DO ALL THIS INSTRUCTION WITH FULL RESPONSIBILITY AND PROFFESIONALISM. THANK YOU FOR YOUR COOPERATIONS.



6.2.8 11/OD/ON/V/2017

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DATE OF EFFECTIVENESS :	1 <sup>ST</sup> MAY 2017
DISTRIBUTION :	DX, DB,DD,DF, FX, FO, FS, OP
APPLICABILITY :	<b>All PILOTS PT. SAS</b> /
PREPARED BY :	
VERIFIED BY :	
APPROVED BY :	
SUBJECT :	<b>AIRCRAFT POSITION BROADCAST S O P</b>

1. THIS NOTICE TO **PILOTS** WAS ISSUED BASED ON DATAS FACTUAL FROM PK-FSO ACCIDENT AT OKSIBIL AREA 12<sup>TH</sup> APRIL 2017.

2. TO ALL PT. SPIRIT AVIA SENTOSA **PILOTS**, MANAGEMENT INSTRUCT YOU TO GIVE A **AIRCRAFT POSITION AND TRAFFIC AREA BROADCAST** AT THE CERTAIN PRE-SET BROADCAST AREA FREQUENCY (SEE BROADCAST FREQUENCY RADIO CHART) AND VFR CHECK POINTS.


3. **AIRCRAFT POSITION AND TRAFFIC AREA BROADCAST MUST BE GIVEN;**

A. WHEN AIRCRAFT ENTERING OR LEAVING TRAFFIC AREA BROADCAST (SEE BROADCAST FREQUENCY RADIO CHART).

B. WHEN AIRCRAFT REACHING CRUISING ALTITUDE (TOP OF CLIMB) OR LEAVING CRUISING ALTITUDE (START DESCEND).

C. WHEN AIRCRAFT REACHING OR OVER HEAD CHECK POINT.


D. WHEN REPLYING TO OTHER TRAFFIC IN THE SAME BROADCAST FREQUENCY AREA AND THERE WILL BE A POSSIBILITY OF POSITION CONFLIC / HEAD ON / COLLISION.

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E. WHEN THE PILOTS FEELS THAT THE AIRCRAFT POSITION BROADCAST IS NEEDED AND NECESSARY.

4. PLEASE ACTKNOWLEDGE, FOLLOW SUIT AND DO ALL THIS INSTRUCTION WITH FULL RESPONSIBILITY AND PROFFESIONALISM. THANK YOU FOR YOUR COOPERATIONS.

6.2.9 12/OD/ON/V/2017

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DATE OF EFFECTIVENESS :	1 <sup>ST</sup> MAY 2017
DISTRIBUTION :	DX, DB,DD,DF, FX, FO, FS, OP
APPLICABILITY :	<b>All PILOTS PT. SAS</b>
PREPARED BY :	
VERIFIED BY :	
APPROVED BY :	
SUBJECT :	<b>AIRCRAFT ONBOARD WEATHER RADAR TEST</b>


1. THIS NOTICE TO **PILOTS** WAS ISSUED BASED ON DATAS FACTUAL FROM PK-FSO ACCIDENT AT OKSIBIL AREA 12<sup>TH</sup> APRIL 2017.

2. TO ALL PT. SPIRIT AVIA SENTOSA **PILOTS**, MANAGEMENT INSTRUCT YOU TO CONDUCT A **PRE-FLIGHT TEST** OF THE AIRBORNE WEATHER RADAR SYSTEM FOR GOOD FUNCTIONALITY AND SERVIABILITY BEFORE ANY FLIGHT (REFER / PLEASE READ TO YOUR DAILY OPERATIONAL CHECKLIST).

3. ATTACHED HERE THE AIRBORNE WEATHER RADAR SYSTEM PILOT USER GUIDE ACCORDING TO YOUR TYPE OF AIRCRAFT. **SEE ALSO STANDARD OPERATIONAL PROCEDURES STATED IN THE PT. SPIRIT AVIA SENTOSA OPERATIONS MANUAL PART – B VOL. 3, CHAPTER SUPPLEMENT FOR YOUR TYPE OF AIRCRAFT.**

4. PLEASE ACTKNOWLEDGE, FOLLOW SUIT AND DO ALL THIS INSTRUCTION WITH FULL RESPONSIBILITY AND PROFFESIONALISM. THANK YOU FOR YOUR COOPERATIONS.

6.2.10 13/OD/ON/V/2017

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DATE OF EFFECTIVENESS :	1 <sup>ST</sup> MAY 2017	
DISTRIBUTION :	DX, DB,DD,DF, FX, FO, FS, OP	
APPLICABILITY :	All PILOTS PT. SAS	
PREPARED BY :		
VERIFIED BY :		
APPROVED BY :		
SUBJECT :	AIRCRAFT ONBOARD T A W S TEST	


1. THIS NOTICE TO PILOTS WAS ISSUED BASED ON DATAS FACTUAL FROM PK-FSO ACCIDENT AT OKSIBIL AREA 12<sup>TH</sup> APRIL 2017.

2. TO ALL PT. SPIRIT AVIA SENTOSA PILOTS, FOR GPWS OR TAWS FEATURE, MANAGEMENT INSTRUCT YOU TO CONDUCT A PRE-FLIGHT TEST OF THE GPWS OR TAWS SYSTEM FOR GOOD FUNCTIONALITY AND SERVICEABILITY BEFORE COMMENCE ANY FLIGHT (REFER / PLEASE READ TO YOUR DAILY OPERATIONAL CHECKLIST).

3. ATTACHED HERE GPWS AND TAWS PILOT USER GUIDE ACCORDING TO YOUR TYPE OF AIRCRAFT. SEE ALSO STANDARD OPERATIONAL PROCEDURES STATED IN THE PT. SPIRIT AVIA SENTOSA OPERATIONS MANUAL PART – B VOL. 3, CHAPTER SUPPLEMENT FOR YOUR TYPE OF AIRCRAFT.

4. PLEASE ACTKNOWLEDGE, FOLLOW SUIT AND DO ALL THIS INSTRUCTION WITH FULL RESPONSIBILITY AND PROFFESIONALISM. THANK YOU FOR YOUR COOPERATIONS.


6.2.11 14/OD/ON/V/2017

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DATE OF EFFECTIVENESS :	1 <sup>ST</sup> MAY 2017
DISTRIBUTION :	DX, DB,DD,DF, FX, FO, FS, OP
APPLICABILITY :	All PILOTS PT. SAS
PREPARED BY :	
VERIFIED BY :	
APPROVED BY :	
SUBJECT :	AIRCRAFT OPERATIONAL CHECKLIST USAGE

1. THIS NOTICE TO PILOTS WAS ISSUED BASED ON DATAS FACTUAL FROM PK-FSO ACCIDENT AT OKSIBIL AREA 12<sup>TH</sup> APRIL 2017.
2. TO ALL PT. SPIRIT AVIA SENTOSA PILOTS, MANAGEMENT INSTRUCT YOU TO READ THE AIRCRAFT OPERATIONAL CHECKLIST PROVIDED TO YOU FOR YOUR TYPE OF AIRCRAFT AND LOCATED IN THE BOTH SIDE COCKPIT POCKET.  
THE AIRCRAFT OPERATIONAL CHECKLIST MUST BE READ ACCORDING TO A CERTAIN PHASE OF FLIGHT (DAILY NORMAL OR ABNORMAL AND EMERGENCY PHASE) AS A STANDARD OPERATIONAL PROCEDURES STATED IN THE PT. SPIRIT AVIA SENTOSA OPERATIONS MANUAL PART – B.
3. AS TO REMINDER THAT ITEMS IN THE AIRCRAFT OPERATIONAL CHECKLIST ARE NOT TO BE MEMORIZED BY PILOTS TO AVOID MISSING ITEMS DURING MAKING A SELECTION OR TAKING ACTION (EXCEPT FOR EMERGENCY CHECKLIST MEMORY ITEMS). SEE STANDARD OPERATIONAL PROCEDURES STATED IN THE PT. SPIRIT AVIA SENTOSA OPERATIONS MANUAL PART – B.
4. PLEASE ACTKNOWLEDGE, FOLLOW SUIT AND DO ALL THIS INSTRUCTION WITH FULL RESPONSIBILITY AND PROFFESIONALISM. THANK YOU FOR YOUR COOPERATIONS.

6.2.12 15/OD/ON/V/2017

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DATE OF EFFECTIVENESS :	1 <sup>ST</sup> MAY 2017
DISTRIBUTION :	DX, DB,DD,DF, FX, FO, FS, OP
APPLICABILITY :	All PILOTS PT. SAS
PREPARED BY :	
VERIFIED BY :	
APPROVED BY :	
SUBJECT :	WATCH ON FEATURE ON SPIDERTRACK


1. THIS NOTICE TO PILOTS WAS ISSUED BASED ON DATAS FACTUAL FROM PK-FSO ACCIDENT AT OKSIBIL AREA 12<sup>TH</sup> APRIL 2017.

2. TO ALL PT. SPIRIT AVIA SENTOSA PILOTS, FOR SPIDERTRACK MONITORING FEATURE, MANAGEMENT INSTRUCT YOU TO **ACTIVATE WATCH ON WHEN AIRCRAFT BLOCK OFF AND WATCH OFF WHEN AIRCRAFT REACHING APPROXIMATELY 2 (TWO) MINUTES BEFORE TOUCH DOWN IF A LANDING IS ASSURED.**

3. ATTACHED HERE SPIDERTRACK S7 PILOT USER GUIDE CHECKLIST REVISION 2 (HARD COPY OF CHECKLIST WILL BE AVAILABLE IN THE COCKPIT POCKET).

4. PLEASE ACTKNOWLEDGE, FOLLOW SUIT AND DO ALL THIS INSTRUCTION WITH FULL RESPONSIBILITY AND PROFFESIONALISM. THANK YOU FOR YOUR COOPERATIONS.

6.2.13 16/OD/ON/V/2017

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DATE OF EFFECTIVENESS :	1 <sup>ST</sup> MAY 2017
DISTRIBUTION :	DX, DB,DD,DF, FX, FO, FS, OP
APPLICABILITY :	All PILOTS PT. SAS /
PREPARED BY :	
VERIFIED BY :	
APPROVED BY :	
SUBJECT :	SMOKING DURING FLIGHT

1. THIS NOTICE TO **PILOTS** WAS ISSUED BASED ON DATAS FACTUAL FROM PK-FSO ACCIDENT AT OKSIBIL AREA 12<sup>TH</sup> APRIL 2017.

2. TO ALL PT. SPIRIT AVIA SENTOSA **PILOTS**, MANAGEMENT FORBIDS YOU TO SMOKE IN THE AIRCRAFT DURING ALL PHASE OF FLIGHT. NO EXCEPTION IS ALLOWED. SEE ALSO PT. SPIRIT AVIA SENTOSA OPERATION MANUAL PART – A, CHAPTER 7 – CREW HEALTH PRECAUTIONS.


**" NO SMOKING IN THE AIRCRAFT DURING ALL PHASE OF FLIGHT"**

3. **SOME EFFECT OF SMOKING DURING FLIGHT;**

- A. REDUCE YOUR LUNG CAPACITY TO ABSORB OXYGEN.
- B. SHORTEN YOUR BREATH PERIOD.
- C. REDUCE YOUR EYES CAPABILITY.
- D. POSSIBILITY OF CARBONMONOXIDE (CO) INHALING AND ACCUMULATION.
- E. REDUCE PILOTS CONCENTRATION.
- F. INCREASE SYMPTOM OF HYPOXIA.

4. PLEASE ACTKNOWLEDGE, FOLLOW SUIT AND DO ALL THIS INSTRUCTION WITH FULL RESPONSIBILITY AND PROFFESIONALISM. THANK YOU FOR YOUR COOPERATIONS.

6.2.14 17/OD/ON/V/2017

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DATE OF EFFECTIVENESS :	1 <sup>ST</sup> MAY 2017
DISTRIBUTION :	DX, DB,DD,DF, FX, FO, FS, OP
APPLICABILITY :	All PILOTS PT. SAS
PREPARED BY :	
VERIFIED BY :	
APPROVED BY :	
SUBJECT :	CREW REST TIME MANAGEMENT

1. THIS NOTICE TO **PILOTS** WAS ISSUED BASED ON DATAS FACTUAL FROM PK-FSO ACCIDENT AT OKSIBIL AREA 12<sup>TH</sup> APRIL 2017.

2. TO ALL PT. SPIRIT AVIA SENTOSA PILOTS, MANAGEMENT ENCOURAGE YOU TO **REGULATE AND HAVE YOUR OWN DICIPLINE TO MAINTAIN YOUR OWN FITNESS, HEALTH AND HAVE ENOUGH REST TIME BEFORE EVERY FLIGHT DURING FLIGHT DUTY PERIOD.**

SEE ALSO PT. SPIRIT AVIA SENTOSA OPERATION MANUAL PART – A GENERAL, CHAPTER 6 – FLIGHT AND DUTY TIME AND CHAPTER 7 – CREW HEALTH PRECAUTION.


**3. MANAGEMENT SUGGEST TO PILOTS;**

A. PILOTS SHALL NOT TO TAKE A NAP AFTER A FLIGHT DUTY THAT ENDED AFTER 14.00 HOURS LOCAL TIME.

B. PILOTS MUST HAVE LIGHT EXERCISE EVERY AFTERNOON BETWEEN 16.00 – 18.00 HOURS LOCAL TIME.

C. PILOTS MUST HAVE THEIR DINNER NOT LATER THAN 19.00 HOURS LOCAL TIME.




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D. PILOTS MUST RETURN TO THEIR ACCOMODATION ROOM AND PREPARE FOR TAKE A REST NOT LATER THAN 22.00 HOURS LOCAL TIME.

4. PLEASE ACTKNOWLEDGE, FOLLOW SUIT AND DO ALL THIS INSTRUCTION WITH FULL RESPONSIBILITY AND PROFFESIONALISM. THANK YOU FOR YOUR COOPERATIONS.


6.2.15 18/OD/ON/V/2017

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DATE OF EFFECTIVENESS :	1 <sup>ST</sup> MAY 2017
DISTRIBUTION :	DX, DB,DD,DF, FX, FO, FS, OP
APPLICABILITY :	All PILOTS PT. SAS /
PREPARED BY :	
VERIFIED BY :	
APPROVED BY :	
SUBJECT :	USE OXIGEN DURING HIGH ALTITUDE FLIGHT

1. THIS NOTICE TO PILOTS WAS ISSUED BASED ON DATA FACTUAL FROM PK-FSO ACCIDENT AT OKSIBIL AREA 12<sup>TH</sup> APRIL 2017.
2. TO ALL PT. SPIRIT AVIA SENTOSA PILOTS, MANAGEMENT INSTRUCTS YOU TO USE THE OXYGEN SUPPLY PROVIDED IN THE COCKPIT DURING HIGH ALTITUDE FLIGHT START FROM ALTITUDE OF 7000 FEET MSL. SEE ALSO PT. SPIRIT AVIA SENTOSA OPERATION MANUAL PART – A GENERAL, CHAPTER 13 – OXYGEN REQUIREMENT.
3. PLEASE ACTKNOWLEDGE, FOLLOW SUIT AND DO ALL THIS INSTRUCTION WITH FULL RESPONSIBILITY AND PROFFESIONALISM. THANK YOU FOR YOUR COOPERATIONS.


6.2.16 19/OD/ON/V/2017

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DATE OF EFFECTIVENESS :	1 <sup>ST</sup> MAY 2017
DISTRIBUTION :	DX, DB,DD,DF, FX, FO, FS, OP
APPLICABILITY :	<b>ALL PILOTS PT. SAS</b>
PREPARED BY :	
VERIFIED BY :	
APPROVED BY :	
SUBJECT :	<b>TAWS AUDIO OR AURAL WARNING INHIBIT</b>

1. THIS NOTICE TO **PILOTS** WAS ISSUED BASED ON DATAS FACTUAL FROM PK-FSO ACCIDENT AT OKSIBIL AREA 12<sup>TH</sup> APRIL 2017.
2. TO ALL PT. SPIRIT AVIA SENTOSA PILOTS, FOR REMINDER THAT PT. **SPIRIT AVIA SENTOSA AIRCRAFT OPERATION BASE ON THE RULE OF DAY LIGHT VFR FLIGHT.**
3. TO ALL PT. SPIRIT AVIA SENTOSA PILOTS. **T A W S AUDIO OR AURAL WARNING MAY BE INHIBIT ONLY WHEN PILOTS CAN RECOGNIZE, BY VISUALLY, TERRAIN AHEAD THAT HAS BEEN A SUBJECT WARNED BY TAWS SYSTEM, WILL NOT BE A "C F I T" FACTOR IN THE AIRCRAFT FLIGHT PATH.**
4. BEFORE PILOT INHIBIT THE TAWS AUDIO OR AURAL WARNING, **CONFIRMATION THE ACTION MUST BE ASK TO THE SECOND PILOT, PIC, SIC OR SECOND PERSON OCCUPYING RIGHT PILOT SEAT.**
5. PLEASE ACTKNOWLEDGE, FOLLOW SUIT AND DO ALL THIS INSTRUCTION WITH FULL RESPONSIBILITY AND PROFFESIONALISM. THANK YOU FOR YOUR COOPERATIONS.

6.2.17 20/OD/ON/V/2017

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DATE OF EFFECTIVENESS :	8TH MAY 2017
DISTRIBUTION :	DX, DB,DD,DF, FX, FO, FS, OP
APPLICABILITY :	All FOO PT. SAS
PREPARED BY :	
VERIFIED BY :	
APPROVED BY :	
SUBJECT :	FLIGHT RELEASE FORM AND LOADSHEET CONFORMITY

1. THIS NOTICE TO FOO WAS ISSUED BASED ON PT. SPIRIT AVIA SENTOSA DGCA SPECIAL AUDIT FINDING 4<sup>TH</sup> APRIL 2017.

2. TO ALL PT. SPIRIT AVIA SENTOSA FOO, MANAGEMENT INSTRUCTION TO ALL FOO TO FILL IN THE DATA IN THE *FLIGHT RELEASE FORM* AND THE *OPERATIONAL FLIGHT PLAN* AND THE *LOADSHEET* AND THE *MANIFEST*.

3. TO ALL PT. SPIRIT AVIA SENTOSA FOO, MANAGEMENT INSTRUCTION TO ALL FOO TO FILL IN THE DATA IN POINT 1 DOCUMENTS **MUST WITH ACTUAL** FIGURE ON THAT ACTUAL FLIGHT, WITH FULL ACCURACY AND CONFORMITY.

4. TO ALL PT. SPIRIT AVIA SENTOSA FOO, MANAGEMENT INSTRUCTION THAT THE DOCUMENTS IN POINT 1 MUST BE SIGN BY THE PILOT IN COMMAND ON THAT FLIGHT BEFORE THE FLIGHT DEPARTS.

SEE PT. SPIRIT AVIA SENTOSA OPERATION MANUAL PART – A CHAPTER 8 OPERATING PROCEDURES, SECTION 8.14.4 INFORMATION TO BE RETAIN ON GROUND

5. PLEASE ACTKNOWLEDGE, FOLLOW SUIT AND DO ALL THIS INSTRUCTION WITH FULL RESPONSIBILITY AND PROFFESIONALISM. THANK YOU FOR YOUR COOPERATIONS.

## 6.2.18 Aviation Medical Center Circular



**KEMENTERIAN PERHUBUNGAN  
DIREKTORAT JENDERAL PERHUBUNGAN UDARA  
BALAI KESEHATAN PENERBANGAN**

KOTA BARU BANDAR KEMAYORAN  
BLOK B11 KAV. NO. 4  
JAKARTA 10610

TELP. : (021) 65867830  
FAX. : (021) 65867832

email : tu\_hatpen@yahoo.com

**SURAT - EDARAN**

Nomor : SE/15 TAHUN 2018

**TENTANG**

**PEMERIKSAAN ATAS INDIKASI TERHADAP  
KONDISI MEDIS OBESITAS PADA PERSONEL PENERBANGAN**

- I. Berdasarkan hasil medical review board dan diskusi bersama Komite Nasional Keselamatan Transportasi tentang investigasi Kecelakaan C208 PK-FSO PT. Spirit Aviasi Sentosa
- II. Bahwa analisis lebih lanjut terhadap personel penerbangan dengan kondisi medis obesitas adalah hal yang sangat penting dan diperlukan dalam evaluasi rekomendasi aeromedis, maka diperlukan adanya penyampaian informasi kepada personil penerbangan sebagai berikut :
  - a. Bagi personil penerbangan dengan Index Masa Tubuh (BMI) di atas 30 kg/m<sup>2</sup>, Balai Kesehatan Penerbangan perlu melaksanakan pemeriksaan tambahan berdasarkan pertimbangan atas indikasi dari dokter pemeriksa, yang diantaranya dapat meliputi treadmill test, rontgen thorax, pemeriksaan laboratorium atau pemeriksaan lainnya.
  - b. Kondisi kesehatan seseorang bersifat dinamis sehingga diperlukan kesadaran dan usaha aktif dalam menjaga kesehatan dengan mengatur pola diet seimbang, olahraga teratur, istirahat optimal, hentikan kebiasaan merokok atau minuman alkohol atau obat-obatan tanpa resep dan manajemen stress yang efektif.
- III. Demikian untuk dapat dilaksanakan bersama



**KEMENTERIAN PERHUBUNGAN  
DIREKTORAT JENDERAL PERHUBUNGAN UDARA  
BALAI KESEHATAN PENERBANGAN**

KOTA BARU BANDAR KEMAYORAN  
BLOK B11 KAV. NO. 4  
JAKARTA 10610

TELP. : (021) 65867830  
FAX. : (021) 65867832

email : tu\_hatpen@yahoo.com

**SURAT - EDARAN**

Nomor : SE.16/TAHUN 2018

**AVIATION MEDICAL EXAMINER (AME) MINUTES**

**11 JULI 2018**

**TENTANG**

**REKOMENDASI AEROMEDIS TERHADAP OBESITAS PADA  
PERSONEL PENERBANGAN DENGAN *MEDICAL CERTIFICATE CLASS 1***

- I. Berdasarkan hasil *medical board* dan kajian bersama dengan Komite Nasional Keselamatan Transportasi tentang *medical examination* pilot PK-FSO, bahwa obesitas dengan risiko gangguan metabolisme dan kardiorespirasi yang belum dapat disingkirkan perlu dilakukan analisis lebih lanjut sebagai berikut:
  1. Anamnesis dipertajam dengan kebiasaan pola hidup seperti diet, merokok, olah raga, alkohol, faktor psikis dan obat-obatan.
  2. Obesitas dengan Indeks Masa Tubuh di atas 30 kg/m<sup>2</sup>, harap dikaji terhadap risiko sindroma metabolik seperti prehipertensi, gula darah di atas 110 mg/dl, profil lemak dengan HDL < 40 mg/dl atau ratio HDL/LDL kurang dari ¼, dan trigliserid > 150 mg/dl.
  3. Obesitas dengan Indeks Masa Tubuh di atas 35 kg/m<sup>2</sup>, harap dikaji sebagai berikut:
    - a. Kemungkinan *Obstructive Sleep Apnoe* dengan kajian anamnesis pola tidur, kuesioner *Epworth Sleepiness Scale*, pemeriksaan lingkar perut (perhatikan jika >90 cm) dan lingkar leher (perhatikan jika > 43 cm).
    - b. Kemungkinan gangguan kardiorespirasi dengan pemeriksaan rontgen thorax dan atau spirometri.
    - c. Kemungkinan gangguan sindroma metabolik seperti pada butir 2.
- II. Pada kondisi medis dengan faktor risiko seperti di atas, maka disposisi aeromedis "FIT" dapat diberikan jika semua faktor risiko tersebut dapat disingkirkan. Jika salah satu faktor risiko tersebut memberikan hasil yang signifikan untuk tatalaksana lebih lanjut, maka perlu memberikan edukasi tentang tatalaksana, konsul kepada Dokter Spesialis Penyakit Dalam dan atau Dokter Spesialis Gizi Klinik untuk tatalaksana lanjut, dan menentukan disposisi aeromedis "DEFER" kepada Medical Board.
- III. Demikian *AME Minutes* ini disampaikan agar menjadi perhatian dan dilaksanakan bagi Medical Examiner dalam memutuskan rekomendasi aeromedis.

### 6.3 Direct Involved Parties Draft Report Comments

#### 6.3.1 Balai Kesehatan Penerbangan (Aviation Medical Center)

No	Reference Chapter, Page, Paragraph	Proposed Amendment	Reason For Proposed Change	Remarks
1.	1.5.3 Pilot Medical Records	<p>The medical examination was conducted in Balai Kesehatan Penerbangan (Aviation Medical Center) and the area examination was on physical <b>and mental health</b>, visual <del>and hearing condition of the pilot</del>. The Aviation Medical Center performed several checks as follows: physical assessment including dental check, blood test, chest radiography, vision and hearing test. <b>audiometry, laboratory, chest x-ray and dental examination.</b></p> <p>The ECG was not performed due to the treadmill test which has been performed during his last examination met the requirement standard.</p> <p>The <del>Electrocardiographic (ECG) examination</del> was not performed due to <b>the treadmill test which has been performed during his</b> last <del>medical</del> examination met result of the pilot was meeting the requirement standard.</p>	Correction of sentence.	<b>Accepted</b>
2.	1.5.3 Pilot Medical Records	<del>The chest radiography examination indicated that the pilot unable to breathe deeply.</del>	The chest radiography result stated that the cor looked big because of the inspiration phase was not deep enough.	<b>Accepted</b>

No	Reference Chapter, Page, Paragraph	Proposed Amendment	Reason For Proposed Change	Remarks												
3.	1.5.3 Pilot Medical Records	<table border="1" data-bbox="613 384 1245 663"> <thead> <tr> <th data-bbox="613 384 927 432">Date Examination</th> <th data-bbox="927 384 1245 432">Body Mass Index</th> </tr> </thead> <tbody> <tr> <td data-bbox="613 432 927 480">7 November 2012</td> <td data-bbox="927 432 1245 480"><del>26</del> 27</td> </tr> <tr> <td data-bbox="613 480 927 528">22 January 2015</td> <td data-bbox="927 480 1245 528">30</td> </tr> <tr> <td data-bbox="613 528 927 576">20 August 2015</td> <td data-bbox="927 528 1245 576">31</td> </tr> <tr> <td data-bbox="613 576 927 624">18 December 2015</td> <td data-bbox="927 576 1245 624">31</td> </tr> <tr> <td data-bbox="613 624 927 663">6 March 2017</td> <td data-bbox="927 624 1245 663">33</td> </tr> </tbody> </table>	Date Examination	Body Mass Index	7 November 2012	<del>26</del> 27	22 January 2015	30	20 August 2015	31	18 December 2015	31	6 March 2017	33	Correction of BMI based on the Aviation Medical Center data.	<b>Accepted</b>
Date Examination	Body Mass Index															
7 November 2012	<del>26</del> 27															
22 January 2015	30															
20 August 2015	31															
18 December 2015	31															
6 March 2017	33															
4.	1.5.3 Pilot Medical Records	<p data-bbox="573 724 1283 828"><del>The chest radiography, the blood test result and the BMI condition were not highlighted to the FlyingSAS since the result was met the requirement standard.</del></p> <p data-bbox="573 844 1283 1059">The result of medical examination met the requirement standard thus the aeromedical disposition was fit. The BMI and laboratory blood test result were highlighted to the applicant for life style modification, but were not highlighted to the FlyingSAS due to medical confidentiality.</p>	Correction of sentence.	<b>Accepted</b>												
5.	2.1 Aircraft Flight Profile	<p data-bbox="573 1118 1283 1222"><del>The last pilot medical record showed that the pilot had high cholesterol, increased Body Mass Index (BMI) and unable to breathe deeply.</del></p> <p data-bbox="573 1238 1283 1342"><del>The last medical record indicated that the pilot unable to breathe deeply, in addition</del> The pilot had a habit of smoking while flying.</p>	The chest radiography result stated that the cor looked big because of the inspiration phase was not deep enough.	<b>Accepted</b>												



No	Reference Chapter, Page, Paragraph	Proposed Amendment	Reason For Proposed Change	Remarks
6.	2.2 Organization Oversight	The last pilot medical record showed that the pilot had high cholesterol, obesity and unable to breathe deeply which might affect to the pilot felt sleepy while flying.	The chest radiography result stated that the cor looked big because of the inspiration phase was not deep enough.	<b>Accepted</b>

### 6.3.2 FlyingSAS

No	Reference Chapter, Page, Paragraph	Proposed Amendment	Reason For Proposed Change	Remarks
1.	1.17.2 Aviation Medical Center	<p><del>The Civil Aviation Safety Regulation (CASR) part 67 subchapter 67.13 required every aircraft operator to monitor the medical condition of their aviation personnel. In order to do the monitoring, the aircraft operator must have doctor with competency of aviation medical specialist. The monitoring result must be reported to the DGCA.</del></p> <p><del>The detail of monitoring guidelines was contained in the DGCA decree number 572 of 2015. The article 31 on the DGCA decree described that every aircraft operator must have medical unit led by aviation medical specialist doctor which was also as risk manager. Considering the complexity and number of fleets, some of aircraft operator could make join cooperation to have one shared medical unit.</del></p>	Considered to be deleted as reference since the CASR Part 67 mentioned in the report had been updated with the CASR Part 67 Edition 1 published on 4 August 2017.	<b>Accepted</b>

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