



**KOMITE NASIONAL KESELAMATAN TRANSPORTASI  
REPUBLIC OF INDONESIA**

**FINAL**

**KNKT.17.11.35.04**

**Aircraft Serious Incident Investigation Report**

**Garuda Indonesia**

**Airbus A330-200, PK-GPM**

**About 164 Nm South of Hong Kong International Airport**

**South China Sea**

**22 November 2017**

**2022**

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

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

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Jakarta, 8 November 2022  
**KOMITE NASIONAL  
KESELAMATAN TRANSPORTASI  
CHAIRMAN**



**SOERJANTO TJAHJONO**

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## ABBREVIATIONS AND DEFINITIONS

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AOC	:	Airline Operator Certificate
ATPL	:	Air Transport Pilot License
C of A	:	Certificate of Airworthiness
C of R	:	Certificate of Registration
CDC	:	Center of Disease and Prevention
ECG	:	Electrocardiogram
FA	:	Flight Attendant
FL	:	Flight Level
GSM	:	<i>Garuda Sentra Medika</i>
KNKT	:	<i>Komite Nasional Keselamatan Transportasi</i>
LT	:	Local Time
MRI	:	Magnetic Resonance Imaging
OM-A	:	Operation Manual part A
PF	:	Pilot Flying
PIC	:	Pilot in Command
PM	:	Pilot Monitoring
SIC	:	Second in Command
UTC	:	Universal Coordinated Time

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## SYNOPSIS

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On 22 November 2017, an Airbus A330-200 aircraft, registered PK-GPM was being operated by Garuda Indonesia as a scheduled passenger flight from Hong Kong International Airport (VHHH), Hong Kong to Soekarno Hatta International Airport (WIII), Jakarta. On the previous day, the Pilot in Command (PIC) had local culinary for dinner and prior to depart to Hong Kong, the PIC had a beef burger and cold soda drink. The SIC did not go with the PIC for these meals.

Upon landing at Hong Kong, the PIC went to the aircraft lavatory and informed to the SIC that he felt nausea. During stayed in Hong Kong, the PIC had stomachache and defecated seven times since arrived at the hotel. The PIC did not take any medication prior to the flight. The PIC felt that he was ready for the flight. The investigation was unable to determine the fluid intake and fluid loss of the PIC.

At 1737 LT (0937 UTC), on daylight condition, the aircraft departed from Hong Kong with 167 persons on board consisted of two pilots, 10 flight attendants and 155 passengers. The PIC acted as Pilot Flying (PF) and the Second in Command (SIC) acted as Pilot Monitoring (PM). The flight was the first flight of the day for both pilots. Prior to the departure, there was no report or record of aircraft technical system abnormality.

About 15 minutes after the aircraft was airborne, when the aircraft climbed passed Flight Level (FL) 200 (altitude of 20,000 feet), the PIC incapacitated. The SIC declared emergency and requested return to Hong Kong to the air traffic controller due to pilot incapacitation. The aircraft landed and after the aircraft parked and stopped, the PIC was evacuated by the paramedics to the nearest hospital. The aircraft was undamaged, and no one injured in this occurrence.

After aircraft landed at Hong Kong, the PIC was transferred by ambulance to the nearest hospital for medical treatment. The result of medical examination, the PIC was diagnosed with gastroenteritis. The PIC was suggested to take one day rest and was not provided with medication. The PIC returned to the hotel and while having the meals, the PIC vomited, then the PIC transported to the same hospital by an ambulance. The PIC was released from the hospital and still suggested to take one day rest at the hotel.

On the following day, the PIC still did not feel well and went to another hospital. The PIC was admitted at the hospital for three days.

The investigation believed that the stomachache without medical treatment and dehydration might have made the pilot incapacitated.

The KNKT concluded the continuation to perform the duty while having untreated gastroenteritis and dehydration might have made the pilot incapacitated.

The KNKT acknowledged the safety actions taken by Garuda Indonesia and considered that the corrective safety action was relevant to improve safety. Therefore, the KNKT did not issue safety recommendations.

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# 1 FACTUAL INFORMATION

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## 1.1 History of the Flight

On 22 November 2017, an Airbus A330-200 aircraft registered PK-GPM was being operated by Garuda Indonesia as a scheduled passenger flight from Hong Kong International Airport (VHHH), Hong Kong<sup>1</sup> to Soekarno Hatta International Airport (WIII), Jakarta<sup>2</sup>.

At 1737 LT (0937 UTC)<sup>3</sup>, on daylight condition, the aircraft departed from Hong Kong with 167 persons on board consisted of two pilots, 10 flight attendants and 155 passengers. The Pilot in Command (PIC) acted as Pilot Flying (PF) and the Second in Command (SIC) acted as Pilot Monitoring (PM).

The flight was the first flight of the day for both pilots. Prior to the departure, there was no report or record of aircraft technical system abnormality. The flight since departure until climb was uneventful.

About 15 minutes after the aircraft was airborne, when the aircraft passed Flight Level (FL) 200 (altitude of 20,000 feet), the PIC commanded the SIC to take the aircraft control as the PIC planned to hang his coat. After got up from the seat, the PIC felt dizzy and went back to the seat then fainted. The SIC called the flight attendant (FA) to come to the cockpit and informed that the PIC was incapacitated.

The FA1 came to the cockpit and found the PIC was unconscious. The FA1 then restrained the PIC's seat and shoulder harness. The SIC asked the FA1 to get the portable oxygen and call a company pilot who travelled as passenger to come to the cockpit. The FA1 and the company pilot came to cockpit brought a portable oxygen.

When the FA1 attempted to put on the oxygen mask, the PIC vomited. After the oxygen mask was put on, the FA1 returned to the cabin, meanwhile the company pilot remained in cockpit and seated in the jump seat to assist the SIC.

The SIC declared emergency and requested return to Hong Kong to the air traffic controller due to pilot incapacitation. The air traffic controller then provided radar vector and priority for the aircraft to land Runway 07R.

The aircraft descended, and about 10,000 feet, the PIC was conscious and asked the SIC what has happened. The SIC advised the PIC that the aircraft were returning to Hong Kong. The PIC then continued to rest on the seat.

About 1045 LT, the aircraft landed and taxied to Parking Stand 105. After the aircraft stopped, the PIC was evacuated by the paramedics to the nearest hospital.

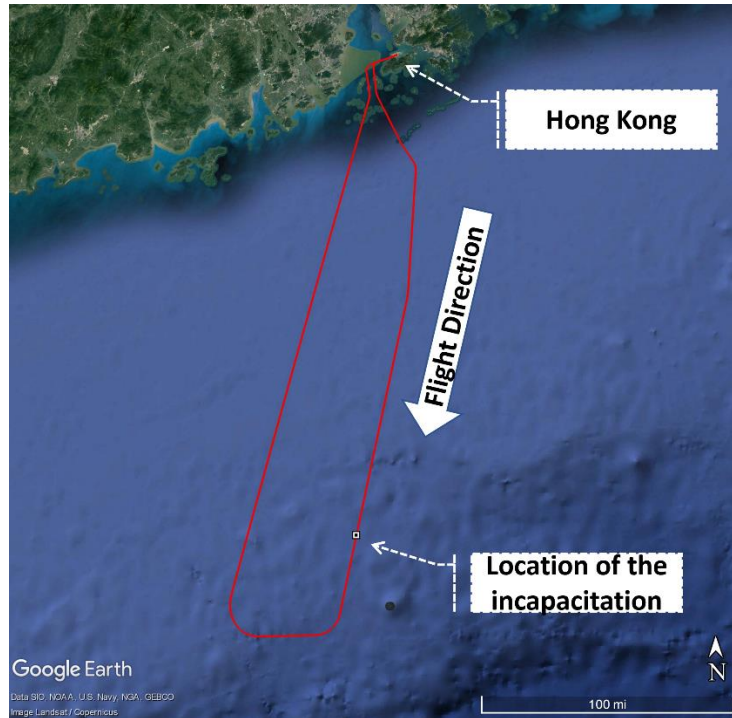
The aircraft was undamaged, and no one injured in this occurrence.

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1 Hong Kong International Airport (VHHH), Hong Kong will be named as Hong Kong for the purpose of this report.

2 Soekarno Hatta International Airport (WIII), Jakarta will be named as Jakarta for the purpose of this report.

3 The 24-hours clock in Universal Time Coordinated (UTC) is used in this report to describe the local time as specific events occurred. Local time is UTC+8 hours.



**Figure 1: The aircraft flight path**

## **1.2 Personnel Information**

### **1.2.1 Pilot in Command**

Age	64 years old
License	ATPL
Date of issue	14 February 1981
Aircraft type rating	Airbus A330
Date of joining company	23 September 1976
Instrument rating validity	30 April 2018
Medical certificate	First class
Last of medical	16 November 2017
Validity	16 May 2017
Medical limitation	Holder shall wear lenses that correct for distant vision and possess glasses that correct for near vision.
Last line check	2 August 2017
Last proficiency check	11 August 2017
<b>Flying experience</b>	
Total hours	25,442 hours 45 minutes



Total on type	12,870 hours 1 minute
Last 90 days	168 hours 21 minutes
Last 60 days	85 hours 53 minutes
Last 7 days	33 hours 14 minutes
Last 24 hours	15 hours 55 minutes
This flight	5 hours

On 19 November 2017, the PIC began the flight schedule from Soekarno Hatta International Airport (WIII), Jakarta to Sultan Hasanuddin International Airport (WAAA), Makassar<sup>4</sup> and remained overnight. The flight departed Jakarta at 1100 UTC (1800 LT)<sup>5</sup> and arrived at 1333 UTC (2133 LT)<sup>6</sup>. The PIC stayed at the assigned hotel.

On 20 November 2017, the PIC had a day off and went for some local culinary in the evening.

On 21 November 2017, the flight schedule was from Makassar to Jakarta. The PIC left the hotel at 2030 UTC (0430 LT) and was provided breakfast (fried chicken and steamed rice) by the hotel. The flight departed from Makassar at 2310 UTC (0610 LT) and the PIC had the breakfast during cruising.

The flight arrived at Jakarta at 0033 UTC (0733 LT) and after landing, the PIC went to a restaurant in the airport terminal and had a beef burger and cold soda drink. The next flight schedule was flight from Jakarta to Hong Kong. The aircraft departed Jakarta at 0303 UTC (1003 LT) and arrived Hong Kong at 0822 UTC (1622 LT). Upon landing at Hong Kong, the PIC went to the aircraft lavatory and informed to the SIC that he felt nausea. The PIC stayed at the assigned hotel in Hong Kong.

On 22 November 2017, during breakfast at the hotel, the PIC informed to the SIC that he was having stomachache and defecated six times since arrived at the hotel. The SIC asked about the PIC's readiness for the upcoming flight, the PIC said he felt ready.

At 1500 LT, the PIC and all crewmember met at the hotel lobby before went to the airport. The PIC informed to the SIC that he had another defecation and was offered an antidiarrhea tablet. The PIC did not take the tablet as he had not defecated again until the PIC incapacitated. The investigation was unable to determine the fluid intake and fluid loss of the PIC.

### 1.2.2 Second in Command

Age	43 years old
License	ATPL
Date of issue	30 August 2002
Aircraft type rating	Airbus A330
Date of joining company	12 August 1996

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4 Sultan Hasanuddin International Aiport (WAAA), Makassar will be named as Makassar for the purpose of this report.

5 The Local Time at Jakarta is UTC+7 hours.

6 The Local Time at Makassar is UTC+8 hours.

Instrument rating validity	31 March 2018
Medical certificate	First Class
Last of medical	4 August 2017
Validity	28 February 2018
Medical limitation	Holder shall possess glasses that correct for near vision.
Last line check	22 October 2017
Last proficiency check	12 October 2017
<b>Flying experience</b>	
Total hours	14,406 hours 57 minutes
Total on type	628 hours 23 minutes
Last 90 days	191 hours 50 minutes
Last 60 days	121 hours 15 minutes
Last 7 days	52 hours 25 minutes
Last 24 hours	15 hours 55 minutes
This flight	5 hours

The SIC flew with the PIC since 19 November 2017. During day off on 20 November 2017, the SIC stayed at the hotel. The SIC also did not join the PIC having meals in Jakarta before flight to Hong Kong on 21 November 2017.

### **1.3 Aircraft Information**

The aircraft was manufactured in France by Airbus company with serial number 1214 and the type/model was A330-200. The aircraft registered as PK-GPM and had valid Certificate of Airworthiness (C of A) and Certificate of Registration (C of R).

### **1.4 Medical and Pathological Information**

After the incapacitation and the aircraft landed at Hong Kong, the PIC was transferred by ambulance to the nearest hospital for medical treatment.

The medical examinations were conducted to the PIC, consisted of physical examination, chest X-ray, the Electrocardiogram (ECG) and blood test. The result of physical examination, chest X-ray and Electrocardiogram (ECG) were normal. The white blood cell count was 12,700/mm<sup>3</sup> (the normal range was between 5,000/mm<sup>3</sup> to 10,000/mm<sup>3</sup>). The result of medical examination, the PIC was diagnosed with gastroenteritis<sup>7</sup>. The PIC was suggested to take one day rest and was not provided with medication.

About 1300 UTC (2100 LT), the PIC was released from the hospital and went back to the hotel. The PIC had dinner at the hotel restaurant and the PIC had mashed potatoes.

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<sup>7</sup> Gastroenteritis is a catchall term for infection or irritation of the digestive tract, particularly the stomach and intestine. The detail explanation of the Gastroenteritis can be found in the subchapter 1.6.

While having the meals, the PIC vomited, then the PIC transported to the same hospital by an ambulance. About 0300 LT, the PIC was released from the hospital and still suggested to take one day rest at the hotel.

On 24 November 2017, the PIC still did not feel well and went to another hospital. At the hospital, general examination, blood and feces test were conducted. The feces examination result showed *E. coli*<sup>8</sup> and *Plesiomonas*<sup>9</sup> infection. The PIC was diagnosed with gastroenteritis with *E. coli* and *P. shigelloides* infection. The PIC was given medication consisted of antibiotic, tranquilizer, antidiarrhea, stomach acid reducer, and antimotility agent. The PIC was admitted at the hospital until 26 November 2017.

On 27 November 2017, the PIC went back to Jakarta as passenger.

On 30 November 2017, the PIC went to aircraft operator medical facility to report his current health status. The PIC underwent medical examination. The physical examination showed an increased bowel movement and the laboratory result showed that the white blood cells count was 12,030/mm<sup>3</sup> and HbA1c<sup>10</sup> result was 6.3 (normal value was below 6.0). ECG and Echocardiography test result were normal. The PIC was suggested to have a Magnetic Resonance Imaging (MRI) examination.

On 4 December 2017, the PIC conducted MRI examination and the result showed that there was deep white ischemia fronto-parietal (Fazekas 2). There was no bleeding, infarction<sup>11</sup> or space occupying lesion intracranial<sup>12</sup>.

On 18 December 2017, the PIC underwent medical examination after incident at Aviation Medical Center. Physical examination, laboratory and treadmill test result were normal, and the PIC was declared as fit to fly.

## 1.5 Organizational and Management Information

### 1.5.1 Aircraft Operator

Aircraft Owner : MSN 1214-I Spring Ltd., Ireland

Aircraft Operator : PT. Garuda Indonesia

Address : Jalan Kebon Sirih Nomer 17, Jakarta Pusat, Indonesia

AOC Number : AOC 121-001

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8 *E. coli* or *Escherichia coli* is a one of several types of bacteria that normally inhabit the intestine of humans and animals (commensal organism). The further explanation of the *E. coli* can be found in the following link <https://medical-dictionary.thefreedictionary.com/e+coli>

9 *P. shigelloides* or *Plesiomonas shigelloides* is a genus of gram-negative, facultatively anaerobic, chemoorganotropic, rod-shaped, motile bacteria. It possesses the enterobacterial common antigen. The further explanation of the *P. shigelloides* can be found in the following link <https://medical-dictionary.thefreedictionary.com/plesiomonas>

10 HbA1c is any one of four hemoglobin A fractions (A1a1, A1a2, A1b, or A1c) to which D-glucose and related monosaccharides bind; concentrations are increased in the erythrocytes of patients with diabetes mellitus and can be used as a retrospective index of glucose control over time in such patients. The further explanation of the HbA1c can be found in the following link <https://medical-dictionary.thefreedictionary.com/Glycated+Hemoglobin>

11 Infarct is a localized area of ischemic necrosis produced by anoxia following occlusion of the arterial supply or the venous drainage of the tissue, organ, or part. (<https://medical-dictionary.thefreedictionary.com/infarct>)

12 Space occupying lesion intracranial is a mass lesion in the cranial cavity with a diverse aetiology like benign or malignant neoplasm, inflammatory or parasitic lesion, haematoma, or arterio-venous malformation. (<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5028572/>)

The procedure and policy regarding pilot medical condition is described in the Garuda Indonesia Operating Manual Part A (OM-A). The relevant subchapters were as follows:

#### **1.5.1.1 Procedure Related to fitness for duty**

Subchapter 5.1.01 as follows:

*Every crewmember must maintain their utmost performance in Knowledge, Skill as well as Physical and Mental Fitness appropriate to their functions.*

Subchapter 5.3 described that the Garuda Indonesia prohibit aircrew from flying if:

- *They are not fit for duty;*
- *Alcohol and psychoactive substance use;*
- *Pregnancy; she shall not fly for duty as soon as determined pregnant by doctor;*
- *Illness or use of medication(s), unless certified by doctor;*
- *Minimum 14 days following Internal Surgery;*
- *Fatigue occurring in one flight, successive flights or accumulated over a period of time, beyond Flight Duty Time limits according OM-A Chapter 7.*

Subchapter 7.1.06 described that pilot can refuse their duty if there are medical reasons agrees by the company doctor. In addition, the *Pedoman Awak Pesawat* (Flight Crew Guidance) subchapter 3.1.1.4 described that to expedite the flight rescheduling process, the pilot may submit an unfit statement letter to the crew scheduling unit. Thereafter, the pilot goes to the company doctor or other doctor to get medical recommendation.

#### **1.5.1.2 Incapacitation of Crewmember**

The OM-A chapter 15 describes procedure when incapacitation of crewmember occurred during the flight operation. The Subchapter 15.1 defined crewmember incapacitation as:

*Crewmember incapacitation is defined as any condition which affects the health of crewmember during the performance of duties associated with the duty assigned to him/her which renders him/her incapable of performing assigned duties, either total or partial incapacitation which does not allow the fulfillment of duties in normal way.*

The Subchapter 15.2 describes type of incapacitation as follows:

*(a) Obvious incapacitation;*

*Means total functional failure and loss of capabilities. In general will be easily detectable and of prolonged occurrence. Among possible causes are heart disorders severe brain disorders, internal bleeding, food poisoning, etc.*

*(b) Subtle incapacitation;*

*Is a more significant operational hazard, because it is difficult to detect and the effect can range from partial loss of function to complete unconsciousness. Among the possible causes might be minor brain seizures, hypoglycemia (low blood*

sugar), other various medical disorders, extreme fatigue or pre-occupation with personal problems. Because a flight crewmember may not be aware of, or capable of rationally evaluating his/her situation, this type of incapacitation is the more dangerous.

#### *Causes and effects*

*Incapacitation may range from minor cases of physiological upsets associated with inter-current mild disease or mental stress which may result in reduced levels of judgment or physical coordination up to a complete collapse.*

*Things that can cause mild incapacitation:*

- *Body pain such as toothache, headache, gastroenteritis, delayed effects of alcohol, drug or medications, common disorder (i.e. cold).*
- *Heart trouble, an acute infection thrombosis, epilepsy, hypo-glycerin (extremely low level sugar) and others belong to the more serious causes of a sudden collapse.*

The subchapter 15.2 highlighted the importance to recognize an incapacitation as follows:

*Early recognition of incapacity is very important. A silent collapse shall hardly be detected during normal cruise phase, as communications may sometimes decline to minimum. This requires that all crewmembers monitor each other very closely.*

*“Closely” means observing other crewmember for any “abnormal” reaction, action and/or behavior. One good method is to use the term “two communication rule”, meaning that one crewmember’s comment must be answered by the other.*

...

*Other symptoms of the beginning of an incapacitation are:*

- *Incoherent speech;*
- *Strange behavior;*
- *Irregular breathing;*
- *Pale fixed facial expression;*
- *Jerky motions that are either delayed or too rapid.*

*If any of these are present, incapacitation must be suspected and action taken to check the state of a crewmember.*

The subchapter 15.4 describes action to be taken when pilot incapacitate as follows:

- *First Step*
  - *Take over control by announcing “I Have Control”, engage autopilot. Aviate, Navigate and Communicate;*
  - *Declare emergency either Distress or Urgency whichever is applicable;*
  - *Summon Flight Attendant(s) immediately for assistance;*

- *The objective is not to interfere with the pilot duties performance that might endanger to safety of the flight.*
- *Take whatever steps are possible to ensure the incapacitated pilot cannot interfere with the handling of the aircraft. This may include involving FA to restrain the incapacitated pilot.(e.g. have the incapacitated pilot seat pulled back, reclined, shoulder harness fastened and locked (OM-B2 Ch 10.10.1));*
- *If above action might interfere or endanger to the safety of the flight, have the incapacitated crewmember removed from his seat. In any case his seat shall be moved fully back to prevent obstruction of flight controls, switches, levers, etc. Assistance of other crewmember might be required;*
- *If necessary, reset COMM and NAV to remaining pilot side.*
- *Second Step*
  - *Take care of the incapacitated crewmember by trying to provide first aid treatment with prior consultation if (and ask for presence) doctor or other medical persons are aboard;*
  - *Whenever feasible, a GA (GSM) doctor must be contacted, even when a medical doctor or nurse is onboard. This can be done via the flight dispatcher/RGW/OCC.*
  - *Check if a type qualified company pilot is on board to replace the incapacitated crewmember;*
  - *Arrange a landing as soon as practicable after considering all pertinent factor (condition of the incapacitated, remaining flight time and suitability of en-route airport for emergency landing);*
  - *Arrange medical assistance after landing – giving as many details about the condition of the affected crewmember as possible.*
- *Third Step*
  - *Prepare for landing (cockpit and cabin), but do not press for a hasty approach;*
  - *Perform approach checklist earlier than normal (request assistance from other crewmembers or “Capable” persons);*
  - *Request radar vectoring and make an extended approach, where possible, to reduce workload;*
  - *For landing, do not change seats – fly airplane from the position remaining crew were assigned to;*
  - *Organize work after landing, and this shall include:*
    - *Depending on the situation, a change of seat for taxiing in, but only after the airplane has come to a complete stop;*
    - *Having the incapacitated crew member offloaded and to the ambulance as quickly as possible;*
    - *Arrange for the parking of the aircraft.*
  - *Complete the air safety reporting and other required form.*

## 1.6 Additional Information<sup>13</sup>

According to Center for Disease Control and Prevention of United States of America (CDC), gastroenteritis is an infection caused by a variety of germs that results in vomiting or diarrhea. Gastroenteritis which related to travel often referred as travelers' diarrhea. Among the most common pathogens identified in travelers' diarrhea are *E. coli* and *Plesiomonas* spp. These pathogens are commonly found on contaminated foods and drinks. Bacterial pathogens have and incubation period of six to 72 hours.

The prevention of gastroenteritis among traveler are not consuming raw or undercooked food and uncooked water, using agents other than antimicrobial drugs for prophylaxis, using prophylactic antibiotics, and carefully washing hands with soap where available. The treatments of gastroenteritis are oral rehydration therapy, antimotility agents and antibiotics.

## 1.7 Useful or Effective Investigation Technique

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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<sup>13</sup> The description of this subchapter is based on the Center for Disease Control and Prevention of United States of America (CDC) article in the following links:

<https://www.cdc.gov/disasters/disease/infectevac.html>

<https://wwwnc.cdc.gov/travel/page/travelers-diarrhea>

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## 2 ANALYSIS

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The investigation did not find any issue related to aircraft system malfunction or weather therefore, the analysis will discuss about the medical aspect of the pilot and the procedure of incapacitation recognition.

### 2.1 Pilot Medical Aspect

About 15 minutes after the aircraft was airborne, when the aircraft passed Flight Level (FL) 200 (altitude of 20,000 feet), the Pilot in Command (PIC) fainted while getting up from his seat.

The medical tests result after the occurrence in two different hospitals indicated that the PIC suffered gastroenteritis with *E. coli* and *P. shigelloides* infection. This condition made the PIC had stomachache and defecated six times at the night after arrived at Hong Kong and had another defecation in prior to leave the hotel. The PIC was offered antidiarrhea tablet from the SIC which had not been taken until the occurrence. The PIC did not take the tablet as he had not defecated again.

The investigation was unable to determine the fluid intake and fluid loss of the PIC. However, defecated seven times most likely made the pilot dehydrated. Therefore, the stomachache without medical treatment and dehydration might have made the pilot fainted while getting up from his seat.

According to the Center for Disease Control and Prevention (CDC), the gastroenteritis with *E. coli* and *P. shigelloides* infection was most likely caused by consumption of contaminated food and drinks. The CDC described that the *E. coli* and *P. shigelloides* had an incubation period of six to 72 hours.

During the period of six to 72 hours prior the stomachache, the PIC had local culinary, fried chicken and steamed rice, burger and soda, which were different foods and beverages consumed by the SIC.

The cause of the stomachache to the PIC was consumption of food and/or beverages which contaminated with the *E. coli* and *P. shigelloides* during the period of six to 72 hours prior the stomachache. Considering that the SIC did not have stomach problem, therefore, it was possible that the cause of the stomachache were the foods and beverages which was not consumed by the SIC.

### 2.2 Procedure to Recognize Medical Degradation

The Garuda Indonesia Operation Manual Part A (OM-A) subchapter 5.1.01 and 5.3 described that pilot must maintain their performance in physical fitness and pilot was prohibited to fly when unfit. The OM-A subchapter 15.2 also described gastroenteritis could be the cause of incapacitation. The pilot might submit an unfit statement letter to the crew scheduling unit and refused the flight schedule, in accordance with the *Pedoman Awak Pesawat* (Flight Crew Guidance).

The PIC had stomachache and defecated seven times since the night prior to the occurrence flight, and those condition was an indication of gastroenteritis. The SIC was aware of the PIC condition and had offered antidiarrhea tablet. The PIC statement ready to fly might have made the SIC considered the PIC was fit to fly. After leaving the hotel the PIC had not defecated again which might make him believe that his



condition was better and considered fit to fly. In addition, the pilot might not aware that gastroenteritis is one of the conditions that could lead to incapacitation.

The assumption of the condition of the PIC was getting better and the possibility of the pilot was unaware that gastroenteritis could lead to incapacitation resulted in the pilot continued to perform his duty.

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## 3 CONCLUSIONS

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### 3.1 Findings

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

1. The aircraft had valid Certificate of Airworthiness (C of A) and Certificate of Registration (C of R).
2. Both pilots held valid licenses and medical certificates.
3. The PIC had stomachache and defecated six times at the night after arrived at Hong Kong and had another defecation in prior to leave the hotel.
4. The PIC informed to the SIC that he had another defecation and was offered an antidiarrhea tablet. The PIC did not take the tablet as he had not defecated again.
5. The Garuda Indonesia Operation Manual Part A (OM-A) subchapter 5.1.01 and 5.3 described that pilot must maintain their performance in physical fitness and pilot was prohibited to fly when unfit.
6. The OM-A subchapter 15.2 described gastroenteritis could be the cause of incapacitation.
7. According to the *Pedoman Awak Pesawat* (Flight Crew Guidance), the pilot might submit an unfit statement letter to the crew scheduling unit and refused the flight schedule.
8. The assumption of the condition of the PIC was getting better and the possibility of the pilot was unaware that gastroenteritis could lead to incapacitation resulted in the pilot continued to perform his duty.
9. Prior to the departure, there was no report or record of aircraft technical system abnormality.
10. The Pilot in Command (PIC) acted as Pilot Flying (PF) and the Second in Command (SIC) acted as Pilot Monitoring (PM).
11. About 15 minutes after the aircraft was airborne, when the aircraft climbed passed Flight Level (FL) 200 (altitude of 20,000 feet), the PIC commanded the SIC to take the aircraft control as the PIC planned to hang his coat. After got up from the seat, the PIC felt dizzy and went back to the seat then fainted.
12. After the PIC incapacitated, the SIC called the flight attendant (FA) to come to the cockpit and informed that the PIC was incapacitated. The SIC asked the FA1 to get the portable oxygen and call a company pilot who travelled as passenger to come to the cockpit.
13. When the FA1 attempted to put on the oxygen mask, the PIC vomited. After the oxygen mask was put on, the FA1 returned to the cabin, meanwhile the company pilot remained in cockpit and seated in the jump seat to assist the SIC.

14. The SIC declared emergency and requested return to Hong Kong to the air traffic controller due to pilot incapacitation. The air traffic controller then provided radar vector and priority for the aircraft to land.
15. The aircraft descended, and about 10,000 feet, the PIC was conscious and asked the SIC what has happened. The SIC advised the PIC that the aircraft were returning to Hong Kong. The PIC then continued to rest on the seat.
16. The medical tests result after the occurrence in two different hospitals indicated that the PIC suffered gastroenteritis with *E. coli* and *P. shigelloides* infection. This condition made the PIC had stomachache and defecated several times.
17. The investigation was unable to determine the fluid intake and fluid loss of the PIC. However, defecated seven times most likely made the pilot dehydrated. Therefore, the stomachache without medical treatment and dehydration might have made the pilot fainted while getting up from his seat.
18. According to the Center for Disease Control and Prevention (CDC), the gastroenteritis with *E. coli* and *P. shigelloides* infection was most likely caused by consumption of contaminated food and drinks.
19. The CDC described that the *E. coli* and *P. shigelloides* had an incubation period of six to 72 hours.
20. During the period of six to 72 hours prior the stomachache, the PIC had local culinary, fried chicken and steamed rice, burger and soda, which were different foods and beverages consumed by the SIC.
21. The cause of the stomachache to the PIC was consumption of food and/or beverages which contaminated with the *E. coli* and *P. shigelloides* during the period of six to 72 hours prior the stomachache.
22. Considering that the SIC did not have stomach problem, therefore, it was possible that the cause of the stomachache were the foods and beverages which was not consumed by the SIC.
23. The continuation to perform the duty while having untreated gastroenteritis and dehydration might have made the pilot incapacitated.

## **3.2 Contributing Factors**

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

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

The KNKT concluded the contributing factors as follows:

The continuation to perform the duty while having untreated gastroenteritis and dehydration might have made the pilot incapacitated.

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## 4 SAFETY ACTION

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At the time of issuing this short final report, the KNKT had been informed of safety actions taken by the operator resulting from this occurrence.

### 4.1 Garuda Indonesia

On 2020, KNKT investigated aircraft proximity event of PK-GRJ and issued safety recommendation to Garuda Indonesia with number 04.O-2018-18.02. The safety recommendation issued on the investigation of PK-GRJ is considered relevant to address safety issue identified in the PK-GPM investigation.

The safety recommendation was as follows:

*The OM-Part A of Garuda Indonesia described that pilot must maintain their performance in physical fitness and pilot is prohibited to fly when unfit. The pilot may refuse their duty if unfit by submitting an unfit statement letter according to the Pedoman Awak Pesawat (Flight Crew Guidance).*

*The continuation to perform the duty indicated that the pilot did not consider that his medical condition might degrade his performance.*

*Therefore, the KNKT recommend to emphasize the reporting system including self-assessment report for ensuring medical condition that may degrade the pilot performance can be identified and mitigated in timely manner.*

Responding to this safety recommendation, the Garuda Indonesia had conducted corrective safety action issuing operational notice which encouraged all pilot to conduct self-assessment to determine health condition (physically or mentally) and to refuse the duty if the assessment result indicated pilot is not fit for duty.

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## **5 SAFETY RECOMMENDATIONS**

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The KNKT acknowledged the safety actions taken by Garuda Indonesia and considered that the corrective safety action was relevant to improve safety. Therefore, the KNKT did not issue safety recommendations.

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