Statens haverikommission
Swedish Accident Investigation Board

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Final report RL 2011:11e

Serious incident to aircraft, registration SE-RAC, in the airspace SW Umeå airport, AC County, on 19 September 2010

Case No. L-147/10
14 September 2011

The report is also available on our web site: www.havkom.se

In case of discrepancies between the English and the Swedish texts, the Swedish text is to be considered the authoritative version.

Statens haverikommission (SHK) Swedish Accident Investigation Board

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Swedish Accident Investigation Board

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Report RL 2011:11

The Swedish Accident Investigation Board (Statens haverikommission, SHK) has investigated a serious incident that occurred on 19 September 2010 in the airspace SW of Umeå airport, AC County, with an aircraft with registration SE-RAC.

The Board hereby submits under the Regulation (EU) No. 996/2010 on the investigation and prevention of accidents and incidents in civil aviation, a report on the investigation.

The Board requests from EASA by 31 December 2011 at the latest, particulars of how the recommendations included in this report are being followed up.

Carin Hellner Stefan Christensen

General

The Swedish Accident Investigation Board (Statens haverikommission – SHK) is a state authority with the task of investigating accidents and incidents with the aim of improving safety. SHK accident investigations are intended so far as possible to determine both the sequence of events and the cause of the events, along with the damage and effects in general. An investigation shall provide the basis for decisions which are aimed at preventing similar events from happening again, or to limit the effects of such an event. At the same time the investigation provides a basis for an assessment of the operations performed by the public emergency services in respect of the event and, if there is a need for them, improvements to the emergency services.

SHK accident investigations try to come to conclusions in respect of three questions: *What happened? Why did it happen? How can a similar event be avoided in future?*

SHK does not have any inspection remit, nor is it any part of its task to apportion blame or liability concerning damages. This means that issues concerning liability are neither investigated nor described in association with its investigations. Issues concerning blame, responsibility and damages are dealt with by the judicial system or, for example, by insurance companies.

The task of SHK does not either include as a side issue of the investigation that concerns emergency actions an investigation into how people transported to hospital have been treated there. Nor are included public actions in the form of social care or crisis management after the event.

The investigation of aviation incidents are regulated in the main by the Regulation (EU) No 996/2010 on the investigation and prevention of accidents and incidents in civil aviation. The investigation is carried out in accordance with the Chicago Convention Annex 13.

The investigation

On 27 October 2010, SHK was informed that a serious incident had occurred with an aircraft, registration SE-RAC, which had taken place in the airspace SW of Umeå on 19 September 2010 at approximately 14.30.

The incident was investigated by SHK, represented by Carin Hellner, Chairperson, and Stefan Christensen, Investigator in Charge. SHK was represented by Liselotte Yregård, as medical expert. The investigation was followed by Jan Führ, Swedish Transport Agency.

The investigation has been limited; it does not include any technical details relating to the aircraft.

Report RL 2011:11

Aircraft: registration and type	SE-RAC, Embraer EMB-145LR
Class/airworthiness	Normal, Certificate of Airworthiness (CofA) and Airworthiness Review Certificate (ARC)
Owner/Operator	Investment AB Janus/City Airline
Time of occurrence	19-09-2010, at 14.30 in daylight Note: All references to time relate to Swedish summertime (UTC + 2 hours)
Place	In the airspace SW Umeå airport, AC County
Type of flight	Commercial air transport
Weather	According to METAR ESNU 14.20: Wind 350°, 8 kn, visibility over 10 km, few clouds with a base of 1,700 feet, scattered clouds with a base of 3,100 feet, broken cloud coverage with a base of 3,600 feet. Temperature/dew point 11.7°C, QNH 997 hPa
People on board:	
crew members	3
passengers	43
Injuries to people	None
Damage to the aircraft	None
Other damage	None
Pilot in command	
Age/licence	36 years/ATPL
Total flying time	3,590 hours, of which 2,890 hours on aircraft type
Flying hours, previous 90 days	105 hours, on all types of aircraft
Number of landings, previous 90 days	26
Co-pilot/Student	
Age/licence	26 years/CPL
Total flying time	2,870 hours, of which 2,568 hours on aircraft type
Flying hours, previous 90 days	130 hours, on all types of aircraft
Number of landings, previous 90 days	83
Cabin crew	1 person

Summary

During a regular flight from Gothenburg to Umeå, the co-pilot began to suffer from stomach pains during the flight. The co-pilot's condition worsened during the final approach when the co-pilot vomited and, for a short period of time, lost consciousness. The situation meant that the commander during the final approach and landing had to carry out the co-pilot's work assignments as the co-pilot was incapacitated.

After landing, the commander contacted the company's operative management and was advised to discuss the continued flight duty with the co-pilot. They agreed to carry out the return flight to Gothenburg as the co-pilot felt better. During the flight, the co-pilot's stomach pains returned and the co-pilot vomited on two occasions. When the aircraft had landed, the co-pilot went to the hospital. At Sahlgrenska University Hospital, the co-pilot was later diagnosed as having acute appendicitis.

According to medical and operative instructions, flight duties should not commence if you are aware of a deteriorating health condition which can affect

the exercise of duty. However, there are no instructions or recommendations – either in the company's manuals or in the regulatory framework – with regard to the termination of active flight duty following an incident when a member of the cockpit crew has become incapacitated.

The incident that occurred, whereby the co-pilot flew the aircraft as an active pilot after having been incapacitated, was due to the fact that the condition of the pilot's health had been incorrectly evaluated. Contributing factors are shortcomings in the regulatory framework in EU-OPS with regard to continued flight duty following incapacitation.

Recommendations

It is recommended that EASA:

Ascertain that the instructions relating to the incapacitation of the cockpit crew are supplemented with restrictions for continued flight duty following the occurrence of an incident *(RL 2011:11, R1)*.

1. FACTUAL INFORMATION

1.1 An account of the sequence of events

1.1.1 Prerequisites

The operator intended to carry out a regular flight from Gothenburg/ Landvetter airport to Umeå airport with an Embraer 145 aircraft, registration SE-RAC. There were 43 passengers on board and 3 crew members. The crew was planned to fly back to Gothenburg, which would be subsequently followed by a round trip to Skellefteå.

Planning and preparations prior to the flight continued without problems and no deviations were reported. The aircraft took off and commenced its flight towards Umeå in accordance with normal routines. It was decided that the co-pilot would be Pilot Flying (PF) along the route in question.

1.1.2 The flight

During the flight, the co-pilot informed the commander of incipient stomach pains. The pain increased as the flight progressed, but the crew decided to continue the flight to Umeå. During the final approach to the airport, the co-pilot's pain intensified and the co-pilot could no longer handle the aircraft, and had to surrender the controls to the commander.

The co-pilot did not participate in the aircraft's handling during the final phases of the approach and landing. The commander had to operate the aircraft and, at the same time, carry out the co-pilot's work duties. During the final approach, the commander could see that the co-pilot fainted momentarily and also vomited. No radio communication or distress call was sent to air traffic control in response to the situation.

According to the commander, the co-pilot was unable to remember all parts of the final phases of the final approach. However, the landing took place without further complications and the aircraft taxied to the terminal building. The commander informed the ground staff that the co-pilot did not feel well and that they therefore wanted to defer their decision regarding the return flight to Gothenburg.

1.1.3. The return flight

During the ground stop in Umeå – which was scheduled for 20 minutes – the commander called the company's operational management to seek advice about the situation that had arisen. The commander was informed that the responsibility for any decision was the commander's following consultation with the co-pilot. During the conversation, the commander was also informed of the importance of the co-pilot being able to take over command of the aircraft in the event of the commander becoming incapacitated. The commander also contacted the company's planning department and announced that another co-pilot would be called out to Gothenburg/Landvetter to carry out the remainder of the period of duty so that the return flight could be carried out.

The co-pilot's condition had stabilised during the stop and the co-pilot reportedly felt much better. The co-pilot and the commander discussed the options and they made a joint decision to carry out the return flight to Gothenburg. According to information from the commander, the decision was based on the fact that the co-pilot now felt better and that there would not be any problems with regard to the co-pilot's flight duties on board.

The decision to continue the flight was announced to the ground staff at Umeå airport, and the passengers were allowed to board the aircraft. The take-off and the initial part of the flight passed without problems. After about 30 minutes, the co-pilot's abdominal pains returned and the co-pilot vomited on two occasions. However, the flight was completed without further complications. The commander contacted the company as the aircraft approached Gothenburg and requested that a vehicle should be dispatched to pick up the co-pilot.

After landing, the co-pilot was diagnosed with acute appendicitis at the hospital.

1.2 Injuries to people

	Crew members	Passengers	Total	Others
Fatal	–	–	–	–
Serious	–	–	–	–
Minor	–	–	–	Not applicable
None	3	43	46	Not applicable
Total	3	43	46	–

1.3 Damage to the aircraft

None.

1.4 Other damage

None.

1.5 Crew members

1.5.1 The commander

At the time of the incident, the commander was 36 years old and had a valid ATPL.

Flying hours				
Previous	24 hours	7 days	90 days	Total
All types	1.5	8.2	105	3,590
This type	1.5	8.2	105	2,890

Number of landings of this type over the previous 90 days: 26.
Type rating was carried out on 6 November 2005.

1.5.2 The co-pilot

At the time of the incident, the co-pilot was 26 years old and had a valid CPL.

Flying hours				
Previous	24 hours	7 days	90 days	Total
All types	1,5	0	130	2,870
This type	1,5	0	130	2,568

Number of landings of this type over the previous 90 days: 83.
Type rating was carried out on 8 October 2006.

1.5.3 The cabin crew

One person.

1.5.4 The pilots' duty schedule

The flight in question was the first of the crew's planned programme of duties for the day, which consisted of four flights. For the commander and the co-pilot, the programme for the day formed day one of their new roster. This was the co-pilot's first working day after a long period without active flight duty.

1.6 The aircraft

The aircraft, type Embraer 145, had a Certificate of Airworthiness and a valid ARC.

EMB-145, SE-DZB. Photo: Maarten Wagemans

1.7 Meteorological information

According to METAR ESNU 14.20: Wind 350°, 8 kn, visibility > 10 km, few clouds with a base of 1,700 feet, scattered clouds with a base of 3,100 feet, broken clouds with a base of 3,600 feet. Temperature/dew point 11.7°C, QNH 997 hPa.

1.8 Navigation aids

Not applicable.

1.9 Radio communications

In a two-pilot system, the pilot who is the PF handles all manoeuvring of the aircraft. The other pilot – Pilot Non Flying (PNF) – should, as instructed by the PF, assist with other tasks, such as handling the controls and radio communications.

In this case, the commander, in addition to manoeuvring the aircraft, had to deal with all radio communications during the latter part of the flight.

1.10 Aerodrome information

The airport's status was according to AIP[1] Sverige/Sweden.

[1] AIP – Aeronautical Information Publication.

1.11 Flight recorders

No flight recorder information has been used in this particular incident.

1.12 Site of occurrence

The incident occurred in the airspace SW of Umeå.

1.13 Medical information

The co-pilot had completed the required medical examination and had a valid medical certificate.

Five days before the flight in question the co-pilot suffered from abdominal pains. The symptoms were mild and were mostly in the form of stomach pains, but the co-pilot did not feel nauseous or suffer from any vomiting. The symptoms persisted, remaining more or less unchanged. During these days the co-pilot was not scheduled for duty. The co-pilot did not feel any worse, and judged to be capable of working according to the flight schedule.

During the flight in question, as the aircraft made its final approach, the symptoms worsened and the co-pilot developed severe abdominal pains and felt nauseous. After landing, the co-pilot felt much better. The co-pilot's stomach pains had abated and the nausea had disappeared.

Carrying out flight duties to Gothenburg was, at this point, no problem for the co-pilot. However, on the return flight the nausea and the pain intensified and the co-pilot vomited on two occasions when the plane was at cruising altitude. During the landing, the co-pilot had severe abdominal pains. Despite the co-pilot's deteriorating condition, work duties were completed in the cockpit during the return flight.

During the afternoon, the co-pilot was admitted to the emergency ward at Sahlgrenska University Hospital and was then kept in for observation, having been diagnosed with acute appendicitis. The co-pilot was released from hospital the following afternoon and prescribed a course of antibiotics.

1.14 Fire

Not applicable.

1.15 Survival aspects

1.15.1 The rescue operation

In this situation, air traffic control and the rescue services had not been informed and, therefore, had not been called out.

1.16 Tests and research

None.

1.17 Organisational and management information

1.17.1 General

The company was founded in 2001 and is based in Gothenburg. Operations consist primarily of scheduled passenger traffic from Gothenburg/Landvetter to domestic and international destinations. The company is privately owned and operated, at the time of the incident, with a fleet of Embraer 135/145 and MD80 aircraft.

1.17.2 Manuals

The company's Operational Manual (OM) describes the procedures for situations when crew members are incapacitated. The manual describes how to identify problems and what to do in a given situation when a crew member, for any reason, becomes incapacitated during a flight.

The manual describes, in three steps, the measures that must be taken by the (remaining) pilot who must then perform all the work duties in the cockpit. The first measure consists of a checklist of urgent operational measures as follows:

- Take over control of the aeroplane by announcing "My Controls".
- Engage auto pilot.
- Declare an emergency by transmitting MAYDAY and squawk 7700 on the transponder.
- Notify the cabin crew.
- If possible have the incapacitated flight crewmember removed from his seat. In any case his seat should be moved fully back to prevent obstruction of the flight controls, switches, levers, etc.

The second step describes the possible medical interventions and – taking into consideration the circumstances prevailing at the time – how to arrange for appropriate care after landing.

The third step deals with operational management in connection with the landing, taxiing and parking of the aircraft, and the transfer of the crew member to a waiting ambulance (if required).

There are no instructions or support in the OM regarding the requirements for continued flight duty in connection with situations when a crew member has become incapacitated during a flight. Earlier editions of the OM (see 1.18.3), prescribed that the entire crew would be relieved of their duties following an incident with an incapacitated crew member.

1.18 Additional information

1.18.1 General instructions

SHK has studied of some of the regulations that generally apply to flight duties in connection with ill health or deteriorating health. Regulations are also issued that relate to the obligation to provide a report in the event of hospitalisation. In this case, no information has been provided to SHK regarding the post-medical compulsory notification prescribed.

In the event of a deteriorating health condition, a holder of a medical licence may not exercise their powers inherent in their licenses and their associated permissions or authorisations at any time when they are aware of a deteriora-

tion in their health, which could make them unable to safely exercise those powers (LFS 2008:30).

A person may not work on board an aircraft if he/she is ill, fatigued, under the influence of alcohol or other substances or if he/she, for any other such reason, cannot fulfil their duties in a satisfactory manner (The Aviation Ordinance 2010:770, chapter 5, section 9).

A holder of a medical licence shall, without undue delay, consult an aero medical examiner if he/she has been admitted to a hospital or clinic for a period greater than 12 hours (LFS 2008:30, annex 1, 1040 c1).

1.18.2 Operative instructions

The rules governing "pilot incapacitation" can be found in EU-OPS, Operating Procedures. The section in paragraph 8.3.14 requires the operator to establish procedures in order to identify and manage incapacitation during a flight. There are also prescribed rules for education and training for such emergencies (OPS 1.965, Appendix 1).

Regarding medical status, it is prescribed that crew members should not perform their duties on board when requisite medical conditions are not met, or when a crew member has any doubt regarding the conditions of the duties he/she must perform on board (OPS 1085).

The licence rules that relate to stomach problems, "Gastro-intestinal upsets", have been described specifically, i.e. that a flight should not be undertaken until the symptoms have ceased (JAR-FCL 3, General advice, Chapter 4.5).

However, SHK has established that there are no guidelines or regulations – neither national nor international – that relate to the procedures to be taken in the event of a planned continuation of duties following an outbreak of sickness having occurred on board. It can also be mentioned that the requirements in the current EU-OPS regarding incapacitation have been unchanged since 2002 (the then JAR-OPS 1).

1.18.3 Previous events

The operator in question has experienced a similar event of incapacitation on board, see SHK Report RL 2003:25. When this incident took place, the co-pilot took over the controls when the pilot in command became sick and was incapacitated. According to the then prevailing rules in the company's OM, the entire crew was relieved of their duties and the remaining part of the flight was cancelled.

1.18.4 Gender issues

The actual event has also been examined from a gender perspective, i.e. against the background that there are circumstances which suggest that the actual event or its effects were caused or influenced by the fact that the men and women concerned do not have the same opportunities, rights and obligations in various respects. Such circumstances were not found.

1.18.5 Measures taken

After the incident, the operator in question clarified the rules of the company's OM so that active duty is suspended for a crew member who had been incapacitated.

2. ANALYSIS

2.1 General

The investigation of the events on board SE-RAC has been based on current law and the definitions in Annex 13, Attachment C, to the Chicago Convention, which describes serious aviation incidents that are to be investigated by the Member State concerned. This annex includes “Flight crew incapacitation in flight” listed among the incident categories.

In this case, a pilot’s incapacitation has occurred on the first flight of the day and is therefore being investigated in this report. However, SHK has focused the investigation on the return flight (where no formal incapacitation took place as no report was specifically filed), with appurtenant decisions and regulations regarding medical conditions for flight duties.

The reason for SHK extending the investigation in this regard is also that the concept of incapacitation has been covered in the regulations governing commercial aviation, but that the same rules to prevent continued service after such incapacitation have not been prescribed.

The focus on the return flight is also reflected in the cause analysis in the report with an attached recommendation.

2.2 The flight to Umeå

2.2.1 The co-pilot

The co-pilot experienced symptoms approximately five days before the incident, which remained at a constant level during the period. The medical regulations in force state that you are not allowed to commence flight duties if you are aware of deterioration in your health that can affect the safe performance of flight duties.

However, everyone may have “good and bad” days. It is not difficult to imagine that the co-pilot – after feeling unwell for a few days – felt better on the day of the incident and believed that there would not be any problems with the flight. As an individual, it may be difficult to evaluate the risks with the type of symptoms that occurred in order to be able to make an accurate diagnosis – or “risk assessment” – as to whether the condition would worsen and possibly affect flight duties.

On the other hand, it is not reasonable to demand that individuals should always seek medical attention for symptoms that are considered to be mild. For example, this may include headaches, colds or minor pain. With hindsight, it is easy to imagine that the co-pilot should have considered not commencing flight duties on that day. The present system, whereby an individual is responsible for his/her medical status, is considered satisfactory.

2.2.2 The commander

After the aircraft had taken off, the co-pilot began to feel unwell and informed the commander. When the pain worsened, the commander made the decision to take over the controls and the co-pilot’s work duties. In this context, a transfer of duties in this way means that the remaining pilot’s work duties would increase significantly. In addition to operating the aircraft, the, by definition, “sole” pilot now had to manipulate the controls and radio communications and other duties that the co-pilot would have performed.

However, air traffic control was not informed, and measures such as a Mayday call and the activation of the transponder's emergency code were never executed. The situation that arose – with a supposed concern for a sick colleague – can possibly explain why parts of the company's instructions in situations such as these were not carried out. With consideration to the co-pilot's condition during the later part of the final approach – i.e. vomiting and fainting – advance warning to Umeå airport would probably have resulted in an ambulance being put on alert.

2.3 The flight from Umeå

2.3.1 The co-pilot

After landing in Umeå, the co-pilot reported feeling better. Following a discussion with the commander, a decision was made to carry out the return flight to Gothenburg. The circumstances that prevailed prior to the beginning of the flight duties in Gothenburg cannot be considered to have existed when the decision was made to continue with the return flight.

In all probability, the co-pilot's medical status did not meet, at the time of the return flight, with the medical requirements for flight duties. The previous day's symptoms, which culminated in severe pain, vomiting and fainting during the flight, were, according to SHK, very clear indicators that flight duties should not commence. The certification rules also prescribe, in relation to stomach pains, that a flight may not be carried out until the symptoms have disappeared.

The decision to fly was not an individual decision by the co-pilot, but the result of a discussion with the commander. Reportedly, the discussion ensued without any pressure or influence from the commander. In a situation where passengers are waiting and aircraft and crew are at an outstation, it is not difficult to understand that a relatively strong – though unspoken – pressure rested on the co-pilot.

It is also possible that other factors – such as practical and economic consequences – influenced the co-pilot to, despite the co-pilot's medical status, carry out the return flight to Gothenburg, which was also the co-pilot's home base. The discussion that took place cannot be considered to be unprejudiced, when a person who had recently experienced a serious state of ill health is capable of always being able to make a rational decision.

2.3.2 The commander

After landing in Umeå, the commander had to make a decision with regard to alternatives to the planned return flight to Gothenburg. The main options that were available can be summarised as follows:

- cancel the flight.
- delay the flight.
- continue the (return) flight.

In the absence of support in the company's OM, the commander contacted the company's operational management. The commander was advised to not feel any pressure to conduct the flight and to ensure that the co-pilot would be able to manage the controls safely in the event the commander became sick. This conversation took place during the brief stop on the ground (20 minutes) in Umeå. In interviews or reports, it has not emerged that the commander informed ground personnel in Umeå that the flight would be cancelled or de-

layed, only that there would be a delay before allowing the passengers to board.

The commander also phoned the company's traffic department to announce that a standby should be called out to Gothenburg/Landvetter for the return flight to be carried out. SHK finds this quite remarkable because it shows that the commander realised that the co-pilot's current condition would not permit continued service from Gothenburg.

It should also be mentioned that there are no obstacles to the pilot in command's action and decision in the company's manuals or other regulations. In situations like the one that emerged – where support was lacking– it is the pilot in command who has the final responsibility for the decision as to whether a flight should be made. According to SHK, there is a big difference in completing an ongoing flight with an incapacitated pilot compared with beginning a new flight which carries a much greater risk for a repetition of the previous state of ill health.

2.4 OM

As mentioned earlier, the company in question had a similar incident with a person becoming incapacitated on board. The then prevailing wording of the OM stipulated that the entire crew would be relieved of their duties after an incident of this nature. However, the present wording of the OM has no regulations governing continued duties after an incident with an incapacitated pilot.

SHK has verified with EASA as to when – and if – the current wording of the EU-OPS has been changed for "crew incapacitation". However, it has emerged that the current rules have not been changed since 2002. The changes that have been made in the operator's OM have therefore not been based on any regulatory changes.

The previous wording, in which the entire crew was relieved of their duties, has possibly resulted in a disproportionate action when a crew member become incapacitated, so it is understandable that the section has been revised. What is more difficult to understand is why the operator in the OM did not prescribe that an incapacitated crew member should immediately be prevented from continuing active flight duty.

2.5 OPS

As previously mentioned, the regulations in EU-OPS include the measures to be taken in the event of incapacitation during a flight. There are no rules or guidelines with regard to continued duties following an incident which has led to the incapacitation of a crew member. From a flight safety point of view, it is not acceptable for a pilot who had just had a serious medical incident on board to continue a flight in a commercial operation with paying passengers.

The incident in question demonstrates clearly to SHK that the current regulatory framework needs to be complemented by measures to deal with – occurred or suspected – incapacitation. During the return flight to Gothenburg the co-pilot fell ill again, and suffered from severe pain, and was probably periodically incapacitated on that flight.
Normally, the decision to start work or not to continue to work in the event of a medical condition is easy to make at your home base. At an outstation how-

ever, a number of factors may influence individuals to make decisions that are not always the result of rational thinking and action.

One way to avoid these situations is to supplement the regulatory framework relating to incapacitation with restrictions on the continued active flight duty following the occurrence of a medical incident. A pilot who has suffered a traumatic event, such as incapacitation during flight duty, should never have to risk a discussion as to whether he/she can immediately sit behind the controls again. The regulatory framework can also be supplemented with the requirement that a medical check-up should be conducted before an individual is allowed to continue his/her flight duties again.

3 CONCLUSIONS

3.1 Findings

a) The pilots were qualified to perform the flight.
b) The aircraft had a Certificate of Airworthiness and a valid ARC.
c) The co-pilot had periodically had stomach pains over a period of five days prior to the day of duty in question.
d) The co-pilot became incapacitated during the flight.
e) The commander took over the controls and also performed the co-pilot's duties during the approach and landing.
f) No distress message was sent from the aircraft.
g) The transponder was not set to the emergency code 7700.
h) The landing and taxiing occurred without any problems.
i) The company's operational management allowed the crew to make the decision with regard to the return flight.
j) The commander decided to go through with the return flight, following consultation with the co-pilot.
k) The co-pilot was again incapacitated and suffered a renewed attack of pain and vomiting during the return flight.
l) The regulations relating to medical conditions with regard to the exercise of active flight duty were not fulfilled for the return flight.
m) There are no restrictions for continued flight duty following incapacitation.
n) The co-pilot was diagnosed with acute appendicitis.

3.2 Reasons for the incident

The incident that occurred, whereby the co-pilot flew the aircraft as an active pilot after having been incapacitated, was caused by the fact that the co-pilot's health condition was incorrectly evaluated. Shortcomings in the regulatory framework in EU-OPS with regard to continued duty following incapacitation also contributed to this.

4. RECOMMENDATIONS

It is recommended that EASA:

Ascertain that the instructions relating to the incapacitation of the cockpit crew are supplemented with restrictions for continued flight duty following the occurrence of an incident *(RL 2011:11, R1)*.