FINAL REPORT

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In accordance with the provisions of SI 205 of 1997, the Chief Inspector of Air Accidents, on 28 January 2008 appointed Mr. Leo Murray as the Investigator-in-Charge to carry out an Investigation into this Serious Incident and prepare a Synoptic Report.

Aircraft Type and Registration:	Boeing 767-333, C-FMXC
No. and Type of Engines:	2 x Pratt & Whitney PW4060
Aircraft Serial Number:	25588
Year of Manufacture:	1995
Date and Time (UTC):	28 January 2008 @ 06.42 hrs
Location:	Oceanic Reporting Point MALOT (53° N 015°W)
Type of Flight:	Public Transport
Persons on Board:	Crew – 9 Passengers – 146
Injuries:	Crew – 1 Passengers – Nil
Nature of Damage:	None
Commander's Licence:	Airline Transport Pilot's Licence (Canada)
Commander's Details:	Male, aged 58 years
Commander's Flying Experience:	18,570 hours, of which 6,744 were on type
Notification Source:	Watch Manager, Shannon ATC
Information Source:	AAIU Field investigation

SYNOPSIS

The aircraft was operating a scheduled passenger service from Toronto (Pearson) to London (Heathrow). On first contact with Shannon ATC the Commander made a PAN call and requested a diversion to Shannon Airport due to a medical emergency. ATC were advised that the First Officer was incapacitated. The aircraft landed safety at Shannon where medical assistance was waiting to meet the aircraft.

FINAL REPORT

1. FACTUAL INFORMATION

1.1 History of the flight

The First Officer joined the flight after positioning as a passenger by air from Montreal. The First Officer arrived later than planned for his assigned duties and appeared in the opinion of the Commander to be '*quite harried'*. The Commander had prepared and completed all the pre-flight paperwork and arranged to meet his First Officer at the aircraft. He told his First Officer that all flight preparations were complete and to *'settle down and take his time'*. The flight departed Toronto (Pearson) on schedule.

The flight climbed to Flight Level (FL) 360 and proceeded normally on North Atlantic Track W[1]. As the aircraft proceeded on track, the Commander became increasingly concerned with behaviour of his First Officer. Communications at this point were with Gander Oceanic on HF[2] pending handover to Shanwick Oceanic. The First Officer had left the flight deck several times for short periods, and on attempting to re-enter the flight deck, standard procedure was not followed. In conversation he remarked several times that he was very tired. With the workload now light in the cruise, the Commander suggested that the First Officer take a controlled rest break on the flight deck. The Commander was concerned not only for the well-being of his First Officer but of the possibility of having to carry out a CAT III Autoland[3] approach in Heathrow due to low weather minima. He considered it prudent to let his colleague rest now and be fully alert for the descent and approach at the destination. The First Officer took the break as suggested on the flight deck, and was later brought some food from the galley. Following the meal he continued on the controlled rest break, about 1 hour later the aircraft approached the mid-ocean point at 30 degrees West (30W). At this point the First Officer began conversation which was rambling and disjointed in nature and not at all in character, as the Commander knew him to be an outgoing and talkative person.

Past the mid-ocean point the First Officer took another extended break after which his attempt to re-enter the flight deck was contrary to procedures. The Commander again briefed his colleague on correct procedures. The First Officer re-occupied his seat but did not fasten his seat belt as is normally done. The First Officers behaviour then became belligerent and uncooperative which convinced the Commander he was now dealing with a crewmember who was effectively incapacitated. The Commander called the Incharge Flight Attendant[4] to the Flight deck to witness what was occurring and told him that he was now of the opinion that he was dealing with a flight crew incapacitation. The First Officer was informed by the Commander that he was to secure his seat belt and become co-operative or he would have to consider him incapacitated and with the resulting repercussions. The First Officer was unresponsive to this communication. The Commander then directed the Incharge Flight Attendant to 'secure the First Officer away from the flight controls, then with the help of other crew members, remove him from the cockpit'. The crew then checked if medical assistance was available on board. One Cabin Attendant sustained a wrist injury bringing the First Officer to his seat. Two Doctors on board, one resident in the UK and the other in Canada, attended the patient. Their reports indicated that the First Officer was in a confused and disorientated state.

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[1] **Track W**: Air routes across the North Atlantic are assigned letter codes to differentiate between tracks.
[2] **Oceanic HF**: Procedural communications by means of High Frequency radio equipment.
[3] **CAT III Autoland**: Category III minima apply; aircraft performs an automatic landing under these conditions.
[4] **Incharge Flight Attendant**: Operators term for the most Senior Cabin Crew Member or Purser.

The Commander reported to the Company Flight Dispatch via data-link on what had taken place. After verifying good weather at Shannon, Dublin and Manchester the Commander decided to divert the flight to Shannon. This decision was made in conjunction with the Company Flight Dispatch in Toronto. At point MALOT, where the flight was back under VHF[5] control, the Commander advised his intent to divert due to a medical emergency on board. After making a PAN (distress) call, Shannon ATC were informed that the medical emergency was due to a pilot incapacitation (the First Officer) and the flight was now a single pilot (Captain only) flight for descent, approach and landing. Prior to descent, the Commander asked the *Incharge Flight Attendant* to go the Passenger Information List (PIL) to see if there were any flight crew on board who might be available to assist on the Flight deck for the remainder of the flight. In the event no line pilots were on board, but one of the Cabin attendants held a Commercial Pilot's Licence, with a Multi-engine Rating, and a non-current Instrument Rating. The Commander requested that the Flight Attendant occupy the right-hand (First Officers) seat for the remainder of the flight to assist as necessary. The Flight Attendant provided useful assistance to the Commander, who remarked in a statement to the Investigation that she was '*not out of place'* while occupying the right-hand seat. As the descent was commenced the Passengers were informed that an early descent was to be made and diversion to Shannon due to a medical emergency. The descent, approach and landing were uneventful. The aircraft landed at 07.19 hrs and parked on Stand 39 at Shannon at 07.23 hrs.

1.2 Subsequent events

The flight was met by a Doctor who rendered assistance to the ill crewmember. The First Officer was medically assessed at Shannon on arrival and then transferred to Ennis Regional Hospital for treatment. Personnel from the Airport Authority and those of the handling agent were noted by the Commander to be of great understanding and assistance. The First Officer was later joined by his wife, and remained under hospital care for 11 days where a gradual improvement in his condition was made. On 8 February he was flown home to Canada by Air Ambulance where his care continued.

1.3 Licensing Information

The Commander was the holder of an Airline Transport Pilot's Licence (Aeroplanes) issued by Transport Canada on 13 December 2006. This licence was valid for single and multi-engine land aeroplanes, and included a type rating on the B767. He held a Group 1 Instrument rating valid to 1 November 2008. His medical certificate (Class 1) was dated 13 December 2007.

The First Officer was the holder of an Airline Transport Pilot's Licence (Aeroplanes) issued by Transport Canada on 25 September 2006. This licence was valid for single and multi-engine land aeroplanes, and included a type rating on the B767. He held a Group 1 Instrument rating valid to 1 October 2008. His medical certificate (Class 1) was dated 25 October 2007. The First Officer was an experienced pilot with 6,581 hours total flying time, of which 3,173 hours were on the Boeing 767. As is the case for all Flight Crew, revalidation or renewal of a Medical Certificate after an extended period of illness, is subject to the individual passing the required Medical tests to the satisfaction of an Authorised Medical Examiner. Following this, the individual would have to regain currency on type which would involve training as necessary and standard Licence Proficiency Checks.

[5] **VHF**: ATC communications using standard Very High Frequency radio equipment.

1.4 Crew Resource Management

Crew Resource Management (CRM) is an essential element in the operation of commercial aircraft. Both Flight Crew and Cabin Crew are trained in CRM procedures, which involve good crew co-ordination, effective communications, good situational awareness and conflict resolution techniques. The use of CRM make optimum use of all available resources resulting in safe and effective operation of the aircraft.

1.5 Crew Incapacitation General

Transport Canada, responsible for the regulation of transport in Canada, provide guidance on flight crew incapacitation under a Document TP11629 entitled 'Pilot Incapacitation'. The following is a brief extract from that document, the full text is available through the Transport Canada website at: www.tc.gc.ca

TP11629-Pilot Incapacitation

Recognizing Incapacitation

Incapacitation generally falls into two groups:

1) Subtle or Incomplete

- *Skills or judgement may be lost with little or no outward sign.*
- *The victim may not respond to stimulus, may make illogical decisions, or may appear to be manipulating controls in an effective or hazardous manner.*
- *Failure to respond normally to two consecutive challenges or one significant warning ('You're 100 feet below decision height') should trigger action.*
- *Symptoms may be evident only in moments of high stress or workload.*
- *The victim's condition may lead to more dramatic or complete incapacitation.*

Subtle incapacitation is most commonly caused by hypoxia, hypoglycaemia, extreme fatigue, alcohol, drugs or other toxic substances. Neurological problems, such as stroke or brain tumour, may also be a cause.

2. ANALYSIS

During the pre-flight preparations there was a potential for the flight to depart behind schedule. When the First Officer reported for duty he was undoubtedly under considerable pressure, reporting after positioning flight later than planned. The Commander however had the situation very much in hand with the flight planning and pre-flight duties taken care of. On his arrival on the flight deck, he made this known to his First Officer and set a good tone prior to commencing the flight. During the cruise the Commander became aware all was not well with his colleague. He suggested he take a break, not only for his immediate well-being, but considering the high workload in London airspace and expected Autoland approach. The situation continued to deteriorate and it soon became apparent that the First Officer was quite ill. For his own well-being and the safety of the aircraft, the most appropriate course of action was to stand him down from duty and seek medical attention which was available on board. The decision to divert to the nearest suitable Aerodrome was prudent.

Operations were briefed via data link and as soon as standard VHF communications were available at MALOT the situation was made known to Shannon ATC who arranged for Medical personnel to meet the aircraft on arrival.

Incapacitation of a member of flight crew is a serious incident. The onset of subtle incapacitation is sometimes difficult to detect, and then in all probability more difficult to deal with. The Commander realising he was faced with a difficult and serious situation used tact and understanding and kept control of the situation at all times. The situation was dealt with in a professional manner, employing the principles of Crew Resource Management (CRM). As such the Commander and Flight Attendants should be commended for their professionalism in the handling of this event.

3. CONCLUSIONS

(a) Findings

1. The Flight Crew were properly licensed for the flight undertaken.

2. As the flight progressed, it became apparent to the Commander that the First Officer was suffering from an unknown medical condition which impaired his ability to carry out his required duties on the flightdeck.

3. The Commander utilised the principles of CRM to deal effectively with a difficult situation.

4. The Cabin Crew (Flight Attendants) assisted the Commander in dealing with the situation and facilitated in the safe outcome of this event.

5. The flight was diverted to the nearest suitable airport where a safe landing was made.

4. SAFETY RECOMMENDATIONS

This Investigation does not sustain any Safety Recommendations.

- END -