

民航意外調查機構

AAIA

Air Accident Investigation Authority



Runway Incursion (RI)

Serious Incident Investigation Final Report

**Air Cargo Global Boeing 747-400SF,
OM-ACB and Hong Kong Airlines
Airbus A330-343, B-LNS at
Hong Kong International Airport
22 September 2017**

02-2021

AAIA Investigations

Pursuant to Annex 13 to the Convention on International Civil Aviation and the Hong Kong Civil Aviation (Investigation of Accidents) Regulations (CAP. 448B), the sole objective of the investigation and the Final Report is the prevention of accidents and incidents. It is not the purpose of the investigation to apportion blame or liability.

The then Chief Inspector of Accidents-cum-Director-General of Civil Aviation ordered an inspector's investigation into the serious incident in accordance with the provisions in CAP. 448B. As the powers of accident investigation were transferred to the Air Accident Investigation Authority (AAIA) with effect from 10 September 2018, the investigation of the serious incident was carried on by AAIA.

This investigation Final Report contains information of a serious incident involving a Boeing 747-400SF, registration OM-ACB, operated by Air Cargo Global, and an Airbus A330-343, registration B-LNS, operated by Hong Kong Airlines, which occurred at Hong Kong International Airport on 22 September 2017.

The Hong Kong Civil Aviation Department and the aircraft operators provided assistance to the investigation.

Unless otherwise indicated, recommendations in this Final Report are addressed to the regulatory authorities of the State or Administration having responsibility for the matters with which the recommendation is concerned. It is for those authorities to decide what action is to be taken.

This Final Report supersedes previous Preliminary Report and Interim Statement concerning this serious incident investigation.

All times in this Final Report are in Hong Kong Local Times unless otherwise stated. Hong Kong Local Time is Coordinated Universal Time + 8 hours.

Chief Accident and Safety Investigator

Air Accident Investigation Authority

Transport and Housing Bureau

Hong Kong

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Synopsis

At 0855 on 22 September 2017 a runway incursion occurred at Hong Kong International Airport (VHHH) when Air Cargo Global CCC831, a Boeing B747-400SF (B744F) , entered Runway 07R (RWY07R) from Taxiway J6 while Hong Kong Airlines CRK236, an Airbus A330-343 (A333), was about to depart on RWY07R.

A few seconds after commencing take-off roll, the CRK236 pilots noticed that further down the runway another aircraft had entered RWY07R from the left hand side. The CRK236 pilots immediately rejected the take-off. Air Traffic Control (ATC) also instructed CRK236 to stop immediately. CRK236 came to a halt on RWY07R abeam Taxiway K2.

The closest distance between the two aircraft was about 1,100m. There was no damage to either aircraft and no injury was reported. CCC831 continued to cross RWY07R and taxied to the cargo apron. CRK236, after vacating the runway, rejoined the departure queue and subsequently departed RWY07R at 0910 without further incident.

The investigation team has made two Safety Recommendations.

Contents

AAIA Investigations	1
Synopsis	2
Contents	3
1. FACTUAL INFORMATION	5
1.1. Sequence of Events	5
1.2. Injuries to Persons	7
1.3. Damage to Aircraft	7
1.4. Other Damage	7
1.5. Personnel Information	7
1.5.1. Flight Crew	7
1.5.2. Air Traffic Controllers	7
1.6. Aircraft Information	7
1.6.1. Aircraft 1	7
1.6.2. Aircraft 2	7
1.6.3. Maintenance History	8
1.7. Meteorological Information	8
1.8. Navigation Aids	8
1.9. Communications	8
1.10. Aerodrome Information	8
1.10.1. VHHH	8
1.10.2. Additional Information on VHHH	8
1.11. Flight Recorders and ATC Records	10
1.12. Wreckage and Impact	10
1.13. Medical and Pathological Information	11
1.14. Smoke, Fire, and Fumes	11
1.15. Survival Aspects	11
1.16. Tests and Research	11
1.17. Organizational and Management Information	11
1.17.1. Air Cargo Global	11
1.17.2. Hong Kong Airlines	11
1.17.3. ATC at Hong Kong International Airport	11
1.18. Additional Information – ATC Standard Operating Procedures	12
1.18.1. Division of Controller Responsibilities	12
1.18.2. Manning of Control Positions	12
1.18.3. AMS and Tower Electronic Flight Strip System (TEFS)	13
1.18.4. Supervision of Trainee Controller	13
1.19. Useful or Effective Investigation Techniques	13
2. Safety Analysis	14
2.1. Introduction	14
2.2. ATC Operation	14
2.2.1. Workload of GMC	14
2.2.2. Interaction between Instructor and Trainee	14
2.2.3. Ground Traffic Prior to the Occurrence	15
2.2.4. The Instructor's Decision to Take Control	15
2.2.5. Instruction Issued to Aircraft 1	15
2.2.6. The Instructor's Situational Awareness	16

2.2.7. Record of Electronic Flight Strips	16
2.2.8. Action of AMS	17
2.3. Action of Flight Crew	18
2.3.1. Aircraft 2 Flight Crew.....	18
2.3.2. Aircraft 1 Flight Crew.....	18
2.4. Safety Measures	19
3. Conclusions.....	21
3.1. Findings	21
3.2. Causes.....	22
3.3. Contributing Factors	22
4. Safety Actions Already Implemented	23
5. Safety Recommendations	24
5.1. Safety Recommendation 06-2021	24
5.2. Safety Recommendation 07-2021	24
6. General Details.....	25
6.1. Occurrence Details	25
6.2. Pilot and ATC Personnel Information.....	25
6.2.1. CCC831 (Aircraft 1).....	25
6.2.2. CRK236 (Aircraft 2)	26
6.2.3. ATC Personnel.....	26
6.3. Aircraft Details	27
6.3.1. Aircraft 1.....	27
6.3.2. Aircraft 2.....	27
6.4. Destination Aerodrome Information	28
7. Abbreviations.....	29
8. Table of Figures, Tables	30
9. Appendix	31
9.1. Records of A-SMGCS display	31
9.2. Communications Transcript of CCC831 and HK Ground (GMC)	35
9.3. Communications Transcript of CRK236 and HK Tower South (AMS)	37

1. FACTUAL INFORMATION

1.1. Sequence of Events

1.1.1. At 0848 a B744F (hereafter “Aircraft 1”) operated by Air Cargo Global landed on RWY07L of VHHH. The flight was a two-sector scheduled cargo flight from Prague-Ruzyne International Airport (LKPR) to Turkmenbashi Airport (UTAK) of Turkmenistan and then from UTAK to VHHH.

The Pilot-in-Command was the Pilot Flying on the left hand seat and the First Officer was the Pilot Monitoring on the right hand seat. Another Captain, who was the augmented flight crew for the UTAK to VHHH sector, was sitting on the observer’s seat in the cockpit monitoring the flight operation.

1.1.2. An Airbus A333 (hereafter “Aircraft 2”) operated by Hong Kong Airlines as a scheduled passenger flight from VHHH to Shanghai Pudong International Airport (ZSPD) was taxiing for departure from RWY07R.

The Pilot-in-Command was the Pilot Monitoring on the left hand seat and the Pilot Flying on the right hand seat was a Right Hand Seat Qualified (RHSQ) Captain. The third pilot on the observer’s seat was a non-operating pilot undergoing an Airbus A333 familiarisation flight.

1.1.3. At this time, Hong Kong Ground Movement Control (GMC) operating on Hong Kong Ground frequency 122.55 MHz was handling aircraft and vehicle movements on both the north and south manoeuvring areas at VHHH. GMC was manned by an Aerodrome Control Trainee (hereafter “trainee”) under the supervision of an Aerodrome Control On-the-Job Training Instructor (hereafter “instructor”).

1.1.4. At 08:48:41 after vacating RWY07L, the Pilot Monitoring of Aircraft 1 contacted GMC and the instructor, who had momentarily taken over control from the trainee, issued progressive taxiing instructions to Aircraft 1 to taxi via Taxiway A, W, J to J6 holding point which was on the north side of RWY07R. (See Figure 1 for depiction of the taxi route assigned to Aircraft 1)

1.1.5. At 08:53:05 the Tower South Controller, also referred as Air Movements South Controller (AMS), operating on Hong Kong Tower frequency 118.4 MHz gave clearance for Aircraft 2 to line up and wait on RWY07R from J1 holding point.

1.1.6. Around 0854 the instructor observed that the trainee was again having difficulty coping with the traffic. The instructor took control of GMC and started handling aircraft movements on the manoeuvring area.

1.1.7. At 08:54:25 AMS cleared Aircraft 2 for take-off on RWY07R and Aircraft 2 read back accordingly.

1.1.8. At 08:54:45 Aircraft 1 was approaching J6 holding point and reported its position to GMC, pending further taxi instructions to cross RWY07R for the cargo apron. In response, the instructor issued instruction to Aircraft 1 to taxi via K, L2 to parking bay C12 which was in the cargo apron on the south side of RWY07R. Aircraft 1 read back accordingly. No clearance to cross RWY07R was issued to Aircraft 1.

1.1.9. At 08:54:57 Aircraft 2 commenced its take-off roll on RWY07R. A few seconds later, Aircraft 1 started to enter RWY07R from J6 holding point.

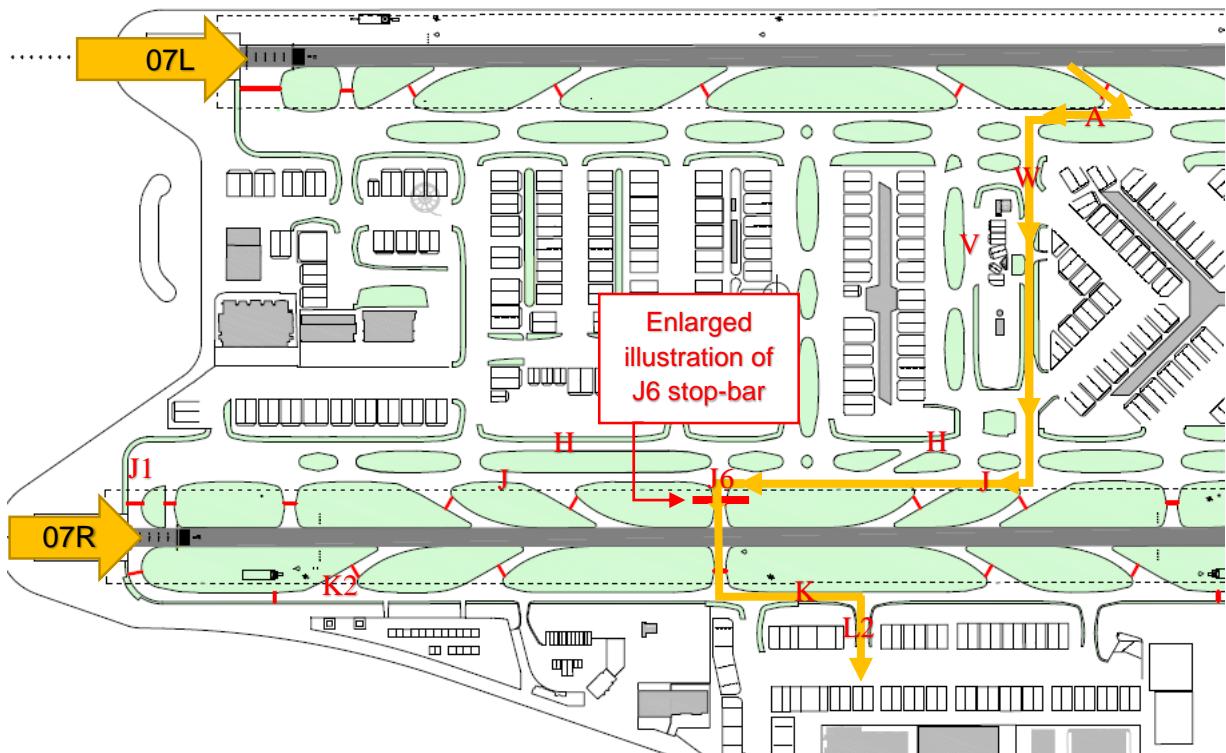


Figure 1: Taxi route of Aircraft 1 depicted on Hong Kong International Airport Chart

1.1.10. At 08:55:08 a visual red conflict alert was triggered and displayed on the Advanced Surface Movement Guidance and Control System (A-SMGCS) at the workstations of AMS and GMC (see Figure 5 at Appendix 9.1), but no audio alarm was heard.

1.1.11. At 08:55:11 the pilots of Aircraft 2 noticed that another aircraft was entering RWY07R and rejected the take-off immediately. Data downloaded from the Digital Flight Data Recorder (DFDR) of Aircraft 2 indicated the aircraft's ground speed reached 69 knots before the take-off was rejected.

1.1.12. At 08:55:19 Aircraft 2 reported to AMS rejecting the take-off due to another aircraft on the runway. AMS instructed Aircraft 2 to stop immediately and provided traffic information to Aircraft 2. The A-SMGCS red conflict warning ceased after 08:55:21.

1.1.13. At 08:55:30 Aircraft 2 came to a halt on RWY07R abeam Taxiway K2. Aircraft 1 also vacated RWY07R about the same time and continued taxiing to cargo parking bay C12. The closest distance between the two aircraft was about 1,100m. (See Appendix 9.1 Figure 4-7 for records of the A-SMGCS display)

1.1.14. At 08:55:57 AMS provided instructions to Aircraft 2 to vacate the runway via Taxiway J6, J and to hold at J1 holding point for another take-off. Aircraft 2 indicated no assistance was required. At 0910 Aircraft 2 departed on RWY07R for ZSPD.

(See Appendix 9.2 and 9.3 for communications transcript between Aircraft 1 / Aircraft 2 and GMC / AMS)

1.2. Injuries to Persons

There was no injury to any person on board either aircraft or to any third party.

Injuries to Persons						
Persons on board:	Crew	3	Passengers	1	Others	0
Injuries	Crew	0	Passengers	0		

Table 1: Persons on board Aircraft 1

Injuries to Persons						
Persons on board:	Crew	13	Passengers	174	Others	0
Injuries	Crew	0	Passengers	0		

Table 2: Persons on board Aircraft 2

1.3. Damage to Aircraft

There was no damage to either aircraft.

1.4. Other Damage

There was no other damage to property and the environment.

1.5. Personnel Information

1.5.1. Flight Crew

The flight crew of both aircraft held valid licences and medical certificates. Details are in Section 6.2.

1.5.2. Air Traffic Controllers

The involved air traffic controllers held valid ATC licences with appropriate ratings and medical certificates. Details are in Section 6.2.

1.6. Aircraft Information

1.6.1. Aircraft 1

The B744F had been operated by Air Cargo Global since 2016. The aircraft had valid Certificate of Registration and Certificate of Airworthiness. Details are in Section 6.3.

1.6.2. Aircraft 2

The Airbus A333 passenger aircraft had been operated by Hong Kong Airlines since 2016. The aircraft had valid Certificate of Registration and Certificate of Airworthiness. Details are in Section 6.3.

1.6.3. Maintenance History

Not related to this serious incident.

1.7. Meteorological Information

The aerodrome weather report for RWY07R at 0830 indicated the following: wind was from 060 degrees at 5 knots, visibility was more than 10 kilometres, temperature was 26 °C, cloud coverage of 3-4 oktas (scattered) was at 2,800 feet and the runway surface was wet as a result of a light shower.

1.8. Navigation Aids

There were no reports of abnormal operation of any ground-based navigation aids or aerodrome visual ground aids.

1.9. Communications

Both aircraft were equipped with VHF radio communication systems. All VHF radios were serviceable. All communications between Hong Kong ATC and the aircraft were recorded by the Digital Recording System¹ (DRS) of the Air Traffic Management System which supported Hong Kong ATC in the provision of air navigation services. There was no interruption to such communications.

1.10. Aerodrome Information

1.10.1. VHHH

Detailed information on the destination aerodrome VHHH is in Section 6.4.

1.10.2. Additional Information on VHHH

1.10.2.1. Parallel Runway Operations

Hong Kong Aeronautical Information Publication (HKAIP) states the following:

When both runways are available the operating mode is normally segregated operations, i.e. one runway for arrival and one runway for departure. The north runway, RWY 07L/25R, is the normal arrival runway and the south runway, RWY 07R/25L, is the normal departure runway.

During the occurrence, RWY07L (the north runway) was the landing runway under the control of the Air Movements North Controller (AMN), RWY07R (the south runway) was the departure runway under the control of the Air Movements South Controller (AMS), and one single control position GMC was handling aircraft and vehicle movements on both the north and south manoeuvring areas. Aircraft 1 was an arrival freighter aircraft landed on RWY07L and was assigned a parking bay in the cargo apron which was located on the south side of RWY07R.

¹ Digital Recording System is an ATC system that provides recording, playback and real time monitoring functions for radio transmissions, intercom and audio reception at controller workstations from the headset microphone and the surrounding area.

1.10.2.2. Control of Traffic Crossing Runway

According to the Manual of Air Traffic Control (MATC²), GMC shall instruct aircraft requiring to cross the south runway to “*taxi to the runway holding point and contact AMS for the runway crossing*”, also “*close co-ordination between GMC and AMS shall be effected to ensure a smooth operation*”.

GMC will inform AMS and switch the aircraft to AMS frequency when the aircraft is approaching/reaches the holding point. AMS will arrange the crossing in accordance with actual traffic situation. When AMS clears the aircraft to cross, AMS will also inform GMC so that GMC will be ready to take control of the aircraft after crossing. AMS will switch the aircraft back to GMC when the aircraft is clear of the runway.

The purpose of having all parties requiring to use the south runway to be on AMS control frequency is to facilitate utilisation of the south runway coming under one single control i.e. AMS. At the same time situational awareness of all involved parties can be enhanced. In the occurrence Aircraft 1 established radio contact with GMC after landing on and vacating the north runway. The aircraft remained on GMC frequency for the rest of the flight until completion of parking in the cargo apron.

1.10.2.3. Control of Stop-bars

Stop-bars are ground light installations at airports located across taxiways at the point where it is desired that traffic (including aircraft and vehicles) stop, and consist of red lights spaced across the taxiway. In VHHH stop-bars are located across all taxiways leading onto the runways. According to MATC, “*stop-bar lights shall be displayed whenever the runway lights are switched ON for operational use*”. Also the “*approach and runway lighting shall be displayed by day whenever the visibility is less than 6 km and/or the cloud ceiling is less than 1,000 feet*”. As the weather conditions during the occurrence (1.7) were better than the stated criteria, in accordance with MATC procedures runway lighting and stop-bar lights were not required to be switched ON. This practice was also in line with ICAO Doc 4444 *Procedures for Air Navigation Services – Air Traffic Management* requirements.

1.10.2.4. Surface Movement Radar (SMR)

The SMR is a short range (5 km) radar for the monitoring of all movements on the manoeuvring areas at VHHH. The SMR system processes data from the Sha Chau Approach Radar and Tai Mo Shan Terminal Radar systems together with information from the Flight Data Processing System, to provide a number of functions, including runway incursion and conflict alert warnings. The SMR signal is normally integrated into the A-SMGCS and displayed on A-SMGCS workstations.

2 MATC is a CAD internal controlled document containing standard operating procedures controllers are to follow.

1.10.2.5. Advanced Surface Movement Guidance & Control System (A-SMGCS)

The A-SMGCS is an airport traffic management tool using a combination of SMR data and transponder³ multilateration⁴ sensors to establish the positions and identities of aircraft and vehicles on and around the airport surface including runways and manoeuvring areas. The positions and identities of aircraft and vehicles are continuously tracked and displayed at A-SMGCS workstations for reference of air traffic controllers.

1.10.2.6. Use of A-SMGCS and SMR

MATC stated that prior to providing guidance or instruction to an aircraft based on A-SMGCS or SMR-derived information, air traffic controllers are required to establish positive aircraft identification by one of the following methods:

- (i) Correlate the position of an aircraft as visually observed to that indicated on the A-SMGCS or SMR display;
- (ii) Ensure the automatic association by A-SMGCS or SMR of a label to an arriving aircraft;
- (iii) Correlate the exact position of an aircraft as reported by pilot's radio transmission to that indicated on the A-SMGCS or SMR display.

1.10.2.7. Safety Logic Functions of A-SMGCS

There are many Safety Logic functions in A-SMGCS to help prevent potential collisions on the airport surface. Based on target surveillance and prediction data, A-SMGCS continually monitors (i) single tracks on or approaching closed runways, (ii) tracks that are too close together, and (iii) tracks predicted to be too close together. When the system detects tracks that are too close under any of these conditions, it generates visual and audible alert to notify air traffic controllers of the situation.

One of these Safety Logic functions is to provide 'Runway Incursion Monitoring and Conflict Alert' for departure aircraft. When a departure aircraft is tracked at a speed of 50 knots or greater, the A-SMGCS monitors the runway ahead of the departing aircraft and if another target is detected on the runway, the colour of the relevant aircraft or vehicle labels on A-SMGCS display will turn red and audio alert will also be triggered.

1.11. Flight Recorders and ATC Records

Cockpit Voice Recorders (CVR) with recording duration of two hours, and Digital Flight Data Recorders (DFDR) with recording duration of 25 hours were installed on both aircraft. The DFDR data of Aircraft 2 and records from ATC systems including DRS, A-SMGCS and Tower Electronic Flight Strip System (TEFS) were retrieved and analysed.

1.12. Wreckage and Impact

Neither aircraft were damaged.

³ Transponder is a type of radio or radar transmitter-receiver that transmits signals automatically when it receives predetermined signals. It can be installed in an aircraft or vehicle.

⁴ Multilateration is the process of determining a transponder's location based on the time difference between the transponder's signal receptions at multiple sensors. A total of 19 sensors are installed at VHHH for full airport coverage.

1.13. Medical and Pathological Information

There was no evidence that physiological factors or incapacitation affected the performance of flight crew members or air traffic controllers.

1.14. Smoke, Fire, and Fumes

Not applicable in this investigation.

1.15. Survival Aspects

No evacuation was required as a result of this occurrence.

1.16. Tests and Research

On-site assessment was conducted in the Control Tower to ascertain visual conditions from AMS and GMC workstations to Taxiway J6, holding point J6, holding point J1 and the beginning portion of Runway 07R. There was no evidence that sighting of aircraft from the two workstations might be impaired.

1.17. Organizational and Management Information

1.17.1. Air Cargo Global

Air Cargo Global held an Air Operator's Certificate (AOC) issued by the Transport Authority of Slovak Republic to operate various aircraft types, including the B744F aircraft.

1.17.2. Hong Kong Airlines

Hong Kong Airlines held an AOC issued by the Hong Kong Civil Aviation Department (CAD). The operator uses VHHH as the base for passenger operations. The existing fleet consists of Airbus A320 and A330 aircraft types.

1.17.3. ATC at Hong Kong International Airport

ATC service is one of the air navigation services provided by the Air Traffic Management Division of CAD to all flights operating within the Hong Kong Flight Information Region as assigned by the International Civil Aviation Organization (ICAO). The Air Traffic Management Standards Office is a separate office established under a separate Division namely, Air Services and Safety Management Division, within CAD, responsible for the safety oversight of the provision of air navigation services, including ATC service, in Hong Kong, China.

1.18. Additional Information – ATC Standard Operating Procedures

1.18.1. Division of Controller Responsibilities

Figure 2 shows division of controller responsibilities when both Runway 07L and 07R are in use.

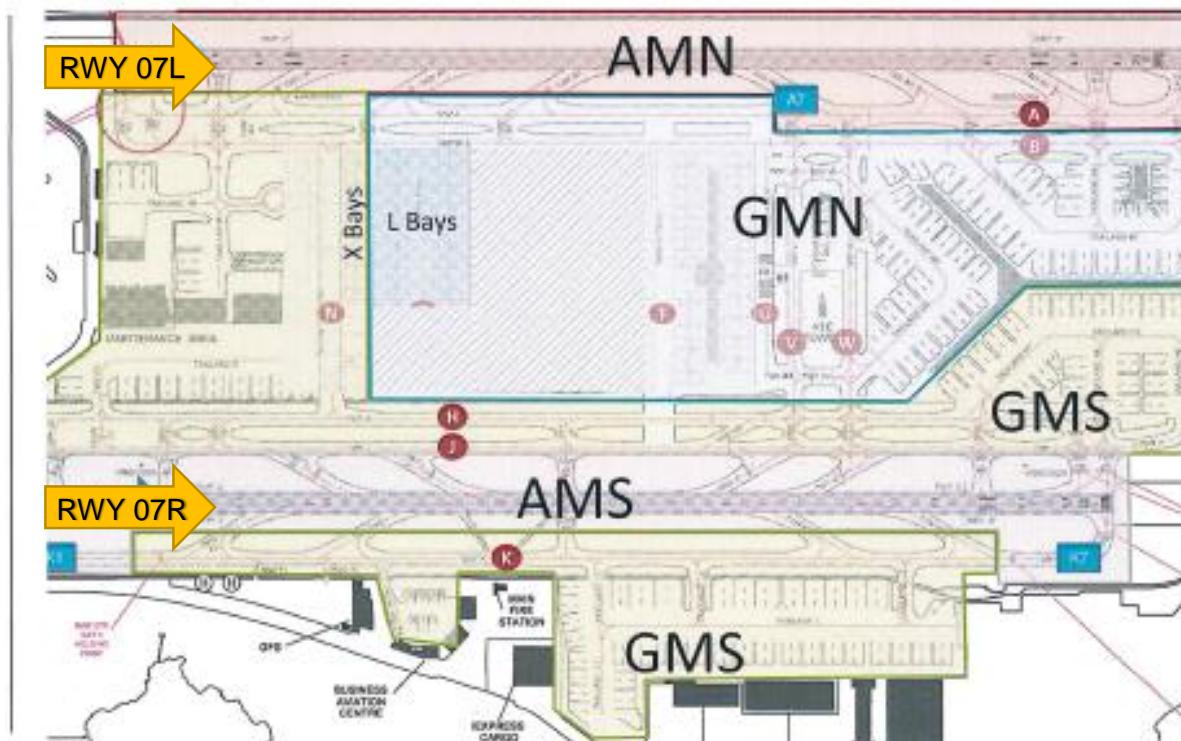


Figure 2: Division of controller responsibilities for Runway 07 operation

Acronyms for Aerodrome control positions:

AMN/AMS = Air Movements (North / South) Controller

GMN/GMS = Ground Movements (North / South) Controller

1.18.2. Manning of Control Positions

1.18.2.1. Depending on traffic needs, the duty Aerodrome Supervisor would determine the opening and/or closing of individual control positions in the Control Tower and the associated deployment of controllers to man the operating positions.

1.18.2.2. It was the first hour of a morning shift during the occurrence when normally a combined ground control position could be deployed to handle all ground traffic.

1.18.2.3. The Supervisor assessed the projected ground traffic within the first hour period to be moderate and assigned the instructor, who was supervising the trainee, to man GMC as a combined position taking up GMN and GMS responsibilities. (1.1.3) (1.10.2.1)

1.18.2.4. These staff deployment decisions need to be made after careful consideration of various factors including anticipated traffic, resources available, expected training value for trainees, and the risk involved as a result of any eventuality for example sudden weather changes or unusual occurrences, in which case controllers might be overwhelmed by a sudden surge of workload.

1.18.2.5. In this respect the experience of the supervisor becomes crucial. The supervisor on the day of the occurrence had assigned a controller to be on standby during the second half of the first hour when GMC would still be a combined control position. This controller could readily open up a control position or act as a relief controller if deemed necessary.

1.18.3. AMS and Tower Electronic Flight Strip System (TEFS)

1.18.3.1. AMS has control over the south runway and is responsible for all aircraft and vehicle movements on the south runway. AMS therefore has a crucial role to play in runway crossing operations. With the support of TEFS, aircraft landed on the north runway requiring to cross the south runway will be displayed in the form of electronic flight strips at AMS workstation well in advance to enhance controller situational awareness.

1.18.3.2. The TEFS provides controllers with a touchscreen interface to input real time ATC instructions and operational annotations onto active and pending electronic strips. It is also an efficient means of distributing flight data to other Tower control positions and for exchange of flight data with other ATC systems of CAD. Together with functions to manipulate the electronic strips, the TEFS assists controllers to build up and maintain a mental picture of aircraft currently and going to be under the jurisdiction of individual controllers thereby enhancing their situational awareness.

1.18.3.3. In the TEFS an accurate record of displayed electronic strips and controller inputs is kept and can be retrieved for review or investigation purposes.

1.18.4. Supervision of Trainee Controller

When a trainee controller is working at an ATC control position under the supervision of an instructor controller, the trainee is making use of the instructor's control rating to discharge ATC duties. The instructor controller is responsible for all ATC actions taken by the trainee controller.

1.19. Useful or Effective Investigation Techniques

Not applicable in this investigation.

2. Safety Analysis

The Safety Analysis provides a detailed discussion of the safety factors identified during the investigation, providing the evidence required to support the findings, contributing factors and the safety recommendations.

2.1. Introduction

The runway incursion involved two aircraft that operated according to ATC instructions. Aircraft 1 followed taxi instructions issued by the instructor controller who was manning ground traffic. Aircraft 2 lined up on RWY07R and commenced take-off in accordance with instructions issued by the Tower controller AMS. As there was no evidence indicating aircraft maintenance, prevailing weather, ground-based navigation aids or communication systems utilized by pilots and air traffic controllers had any bearing on the serious incident, the investigation focused on analysing operations of ATC and Aircraft 1 personnel involved as well as any probable human factors observed. (1.6 – 1.11) (1.16 – 1.18)

2.2. ATC Operation

2.2.1. Workload of GMC

Based on ATC recordings, during the occurrence GMC was handling 3 taxiing arrivals namely Aircraft 1 on Taxiway J approaching J6, a second arrival about to reach the assigned parking bay on the west side of the Tower and a third arrival on Taxiway V southbound towards Taxiway H. There were also 4 departure aircraft on GMC frequency with two of them on the south side of Runway 07R and the other two on the north side. In addition 3 aircraft-under-tow operating on a dedicated domestic frequency⁵ were at various locations moving in accordance with GMC instructions. All the aforementioned aircraft were moving along assigned taxi/tow routes either not going to cross or without imminent crossing. The workload of GMC appeared commensurate with the assessment of the supervisor (in 1.18.2.3).

2.2.2. Interaction between Instructor and Trainee

2.2.2.1. The instructor was qualified as an on-the-job training instructor in May 2017 after completing a required training course conducted in-house by the Air Traffic Management Division. The trainee commenced training in late June 2017 and was frequently under the supervision of the instructor since July 2017. In other words the instructor and the trainee had been working together for more than two months prior to the occurrence.

⁵ Only aircraft-under-tow requiring to cross runway have English speaking personnel to contact AMS on control frequency 118.4 MHz for runway crossing clearance.

2.2.2.2. The trainee stated that on the day of the occurrence the instructor had taken over the handling of ground traffic (from the trainee) on more than two occasions prior to taking over again just before the occurrence. The instructor explained in the investigation interview that taking over from the trainee was to avoid ground traffic building up as a result of the trainee's handling. (1.1.4) (1.1.6)

2.2.2.3. Both the instructor and the trainee stated that they did not feel their performance on the day of occurrence was affected by fatigue. The occurrence took place about one hour after they commenced working the morning shift as GMC.

2.2.3. Ground Traffic Prior to the Occurrence

Based on ATC recordings, in the 70 seconds before Aircraft 1 reached Taxiway J6, the trainee was discharging GMC duties under the supervision of the instructor. An arrival just vacated RWY07L was given an intermediate taxi clearance. A departure aircraft requested to start and pushback from a cargo bay but was not positively acknowledged by the trainee who responded briefly using callsign of a different airline. The departure aircraft requested a second time and the trainee gave approval. Another departure aircraft at the North Satellite Concourse then requested to start and pushback. The trainee instructed the aircraft to standby but did not use the correct aircraft callsign which was right away clarified by the aircraft pilot. Aircraft 1 then reported to GMC "holding short of RWY07R on Taxiway J6". The instructor took control at this point and gave a taxi instruction to Aircraft 1. The instruction was to taxi via Taxiways K and L2 to parking bay C12. (1.1.6) (1.1.8)

2.2.4. The Instructor's Decision to Take Control

Performance of the trainee in response to aircraft requests elaborated in 2.2.3 might have given the instructor an impression that the trainee was not able to maintain a complete and up-to-date mental picture of the developing ground traffic. This probably led to the instructor's decision to take over. Within the 30 seconds after giving Aircraft 1 the taxi instruction, the instructor consecutively issued three more instructions namely (i) start and pushback approval to the aircraft at North Satellite Concourse, (ii) further taxi clearance to the RWY07L arrival, and (iii) a taxi clearance to another departure aircraft from the south apron. This series of action appeared in line with the instructor's explanation (in 2.2.2.2) and had been taken to avoid ground traffic building up.

2.2.5. Instruction Issued to Aircraft 1

2.2.5.1. The taxi instruction given to Aircraft 1 was "to taxi via K, L2 to parking bay C12". When Aircraft 1 was on Taxiway J6 holding short of an active runway, the only option for Aircraft 1 to follow the taxi instruction was to cross RWY07R in order to join Taxiway K. A specific runway crossing clearance therefore would be required for Aircraft 1 to cross RWY07R. Although this runway crossing clearance was not issued, the crew of Aircraft 1 misconstrued that the taxi instruction included a runway crossing clearance (see 2.3.2.6). (1.1.8)

2.2.5.2. In the investigation interview the instructor admitted not looking out the Tower window or using the A-SMGCS to verify the position of Aircraft 1 before issuing the taxi instruction. (1.10.2.6)

2.2.6. The Instructor's Situational Awareness

2.2.6.1. According to MATC (1.10.2.2), the instructor should have instructed Aircraft 1 to contact AMS for the runway crossing. This did not take place and Aircraft 1 was not told to switch to AMS frequency. Neither was there any evidence showing close co-ordination between GMC and AMS regarding Aircraft 1 had been effected.

2.2.6.2. Without Aircraft 1 changing to AMS frequency, the opportunity for both Aircraft 1 and Aircraft 2 to be on the same frequency at the same time and aware of each other's presence and intention was obviated.

2.2.6.3. It was likely that when the instructor decided to take control of the ground traffic from the trainee, the instructor was prepared to restore positive ATC control in the shortest time possible, hence the series of instructions quickly issued as soon as the instructor took over.

2.2.6.4. Up to this point, since the instructor had already intervened and taken over from the trainee on more than two occasions in that morning to avoid traffic build-up, it was also possible that the instructor had been distracted to a certain degree unknowingly by the performance of the trainee.

2.2.6.5. Under the circumstances and pre-occupied with the task to establish positive ATC control without delay, the instructor probably had a lapse of concentration and did not follow standard operating procedure (1.10.2.6) to verify the position of Aircraft 1 before issuing instructions.

2.2.6.6. Consequently the instructor had a loss of situational awareness and did not realize that Aircraft 1 was only waiting to cross the runway and the required frequency change to AMS had not been given previously.

2.2.6.7. The instructor incorrectly assumed that Aircraft 1 had returned to GMC frequency after crossing RWY07R and was looking for a taxi route to parking bay.

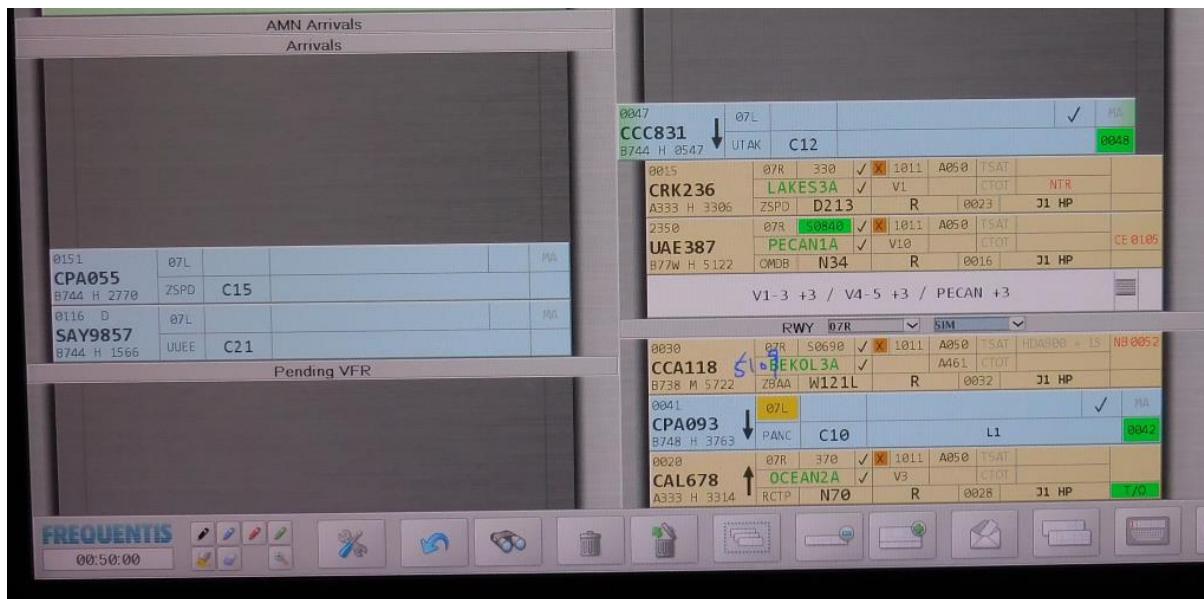
2.2.6.8. It was highly likely that when Aircraft 1 reported to GMC holding short of RWY07R at J6, the instructor was in the process of taking over from the trainee and did not actually register the exact content of the transmission of Aircraft 1.

2.2.7. Record of Electronic Flight Strips

2.2.7.1. In analysing AMS and GMC electronic strip records on the day of occurrence, it was noticed that another cargo flight had landed on RWY07L just six minutes ahead of Aircraft 1. This earlier arrival was also assigned parking in the cargo apron and crossing RWY07R was also required.

2.2.7.2. The fact that this earlier arrival followed ATC instructions and crossed RWY07R via J6 onto Taxiways K and L1 without any incident indicated that there had been close coordination between GMC and AMS. (See Figure 3 for the actual traffic situation at UTC 00:50:00 (Local Time 08:50:00) as illustrated by the TEFS display at the AMS workstation.)

2.2.7.3. However the runway incursion in which Aircraft 1 was involved showed that if standard procedures were not followed as a result of distraction or other factors, the built-in procedure-based defence may not work as expected. (2.2.5.2) (2.2.6.1)



**Figure 3: Electronic flight strips displayed at AMS workstation
at UTC 00:50:00 (Local Time 08:50:00)**

Explanation of Figure 3 traffic situation

Arrival strips are blue in colour. Departure strips are yellow in colour. Right half of the display is the AMS Active Strip Bay containing aircraft that would take turn to use RWY07R according to AMS instructions.

Arrivals CPA093 and CCC831 had landed on RWY07L and would need to cross RWY07R for parking in the cargo apron. CAL678, CCA118, UAE387 and CRK236 would depart in sequence.

CPA093 was under AMS control and would cross RWY07R after departure of CAL678 and before CCA118.

All strips in the Active Strip Bay were placed in the middle with the exception of CCC831 being indented to the left. This indicated all aircraft, except CCC831, were in radio contact with AMS. AMS indented the CCC831 strip as a reminder that communication with the aircraft had not been established.

2.2.8. Action of AMS

2.2.8.1. The AMS stated that the performance on the day of occurrence was not affected by fatigue. The occurrence took place about one hour after the AMS commenced working the morning shift at that control position.

2.2.8.2. In this occurrence the AMS was expecting Aircraft 1 to call on the control frequency for a runway crossing clearance and GMC to initiate the related coordination. As no call from either party was received, it could mean to the AMS that either Aircraft 1 or GMC was not yet ready for the runway cross because of certain reasons. The AMS therefore continued with the handling of departure aircraft.

2.2.8.3. A playback review of A-SMGCS records indicated that after giving Aircraft 2 the take-off clearance, AMS was engaged in an operational intercommunication with another ATC unit. Shortly after the intercommunication AMS began handing over duties to the oncoming relief controller.

2.2.8.4. It was at this time that the Runway Incursion Monitoring and Conflict Alert warning (1.10.2.7) started showing on the A-SMGCS but the audio alarm could not be heard. Seconds later Aircraft 2 rejected the take-off. AMS also noticed the visual runway incursion warning displayed on the A-SMGCS. Aircraft 2 then informed AMS that the take-off was being rejected. AMS instructed Aircraft 2 to stop immediately.

2.2.8.5. The audio alarm of the A-SMGCS runway incursion conflict alert should have sounded simultaneously with the display of the visual warning at 08:55:08, not long after Aircraft 1 started entering RWY07R (1.1.10). The reason for the audio alarm being not sounded is discussed in 2.4 below.

2.2.8.6 Had the audio alarm sounded, it possibly would have caught the attention of AMS earlier thereby prompting AMS to stop Aircraft 2 before the crew made the report to AMS at 08:55:19 after rejecting the take-off. (1.1.12)

2.3. Action of Flight Crew

2.3.1. Aircraft 2 Flight Crew

2.3.1.1. The involved operating flight crew stated that they were not being affected by fatigue at the time of the occurrence. When Aircraft 2 was rolling for take-off, the flight crew noticed a B747 was entering RWY07R from an intersection taxiway further down the runway. They rejected the take-off immediately and informed AMS who also instructed them to stop. Aircraft 2 then followed AMS instructions and vacated RWY07R. After confirming normal operation in the cabin, the crew prepared for another departure. (1.1.9) (1.1.11) (1.1.12) (1.1.14)

2.3.1.2. A playback review of A-SMGCS records indicated two Runway Incursion Monitoring and Conflict Alert warnings (UTC 00:55:08-00:55:14 & UTC 00:55:16-00:55:21 or Local Time 08:55:08-08:55:14 & Local Time 08:55:16-08:55:21) were generated during the occurrence. From the time Aircraft 2 commenced take-off roll until the crew reported rejecting the take-off, Aircraft 2 had travelled a distance of approximately 630m. The closest distance between the two aircraft when Aircraft 2 came to a halt was about 1,100m. (1.1.13) (Appendix 9.1 Figure 5-7)

2.3.2. Aircraft 1 Flight Crew

2.3.2.1. With reference to 'Flight and Duty Time Limitations and Rest Requirements' in Operations Manual Part A of Aircraft 1, the flight crew achieved more than the minimum required pre-flight and in-flight rest. In the investigation interview⁶, the involved operating flight crew indicated that they were not being affected by fatigue at the time of the occurrence.

2.3.2.2. With reference to Operations Manual Part A of Aircraft 1 on "Taxiing of Aircraft", the following precaution to achieve safe taxiing through enhanced situational awareness shall be observed by the flight crew:

"An aircraft taxiing on the manoeuvring area shall stop and hold at all lighted stop-bars, and may proceed further when an explicit clearance to enter or cross the runway has been issued by the aerodrome control tower, and when the stop-bar lights are switched off."

⁶ The Pilot-in-Command (the Pilot Flying) and the relief pilot occupying the jump seat were interviewed. The First Officer (the Pilot Monitoring) was on duty for the outbound flight after operating Aircraft 1 and an interview could not be conducted.

2.3.2.3. Both the Pilot-in-Command and the relief pilot stated that there was no red stop-bar lights at J6 and ATC did not issue runway crossing clearance. They believed that the taxi instruction meant Aircraft 1 was cleared to cross RWY07R to join Taxiway K for L2. They followed the Operations Manual runway crossing procedure by turning ON the strobe light and checking the runway as they started to cross. They saw another aircraft lined up on RWY07R with landing lights ON and the aircraft appeared to be stationary.

2.3.2.4. The flight crew of Aircraft 1 would be expected to observe company standard operating procedures regarding taxiing of aircraft. The company procedures however only referred to lighted stop-bars. During the occurrence stop-bars at VHHH were OFF as, in accordance with MATC, they were not required to be switched ON, which was also in line with ICAO Doc 4444 requirements.

2.3.2.5. Notwithstanding, the objective of the procedure to achieve safe taxiing through enhanced situational awareness should not be disregarded simply because stop-bar lights were not ON.

2.3.2.6. According to interview records, the fact that GMC's taxi instruction did not include a runway crossing clearance was discussed among the flight crew. However no clarification was requested and the crew assumed an implied runway crossing clearance had been given.

2.3.2.7. For safety assurance, any ambiguous, unclear or doubtful ATC instructions or pilot read-backs must be promptly clarified. This applies to flight operations and ATC operations alike.

2.3.2.8. Had the flight crew of Aircraft 1 clarified with GMC, it possibly would have prompted the instructor taking a different course of action, for instance reviewing the given instruction, verifying the actual position of Aircraft 1 and rectifying the unnoticed slip.

2.4. Safety Measures

2.4.1. All existing safety measures in ATC and flight operations were available and functioning, except for the audio alarm of the Runway Incursion Monitoring and Conflict Alert of A-SMGCS being not heard (1.1.10). Post-incident inspection by technical staff found that the volume settings of the A-SMGCS were turned down and there was no technical issue with the audio function of the system.

2.4.2. It was likely that the volume settings had been previously turned down to minimize unwanted alarms generated by the system during scheduled runway closure periods when vehicles would carry out maintenance works on the closed runway and aircraft taxiing or under tow to or from the cargo apron would still need to cross the closed runway. The exact time when the volume settings of the A-SMGCS were turned down could not be ascertained.

2.4.3. The A-SMGCS conflict alert applicable to a departing aircraft on the runway is designed to indicate a potential hazard resulting from reduction of distance between two targets simultaneously detected on the runway and is useful in identifying a runway incursion.

2.4.4. In this occurrence, the flight crew of Aircraft 2 noticed the runway incursion and took immediate recovery action to mitigate the risk of an accident.

2.4.5. Had the audio alarm of the A-SMGCS conflict alert sounded, it possibly would have enabled ATC initiating remedial action at an even earlier time that would further mitigate the risk of an accident.

2.4.6. In order that the risk of runway incursion can be effectively mitigated, air navigation service providers and airline operators should continually review existing procedures and safety measures and learn from runway safety occurrences with a view to enhancing safety nets through addition of controls or safety measures where appropriate, such that a single error would not lead to a serious incident or accident.

2.4.7. In this connection, ATC should review the runway crossing procedure, proper use of the A-SMGCS conflict alert function, and utilization of the technological advantage of TEFS to complement the safety nets and mitigate further the risk of runway incursion.

2.4.8. The operator of Aircraft 1 should review the relevant part(s) of the Operations Manual concerning Taxiing of Aircraft.

3. Conclusions

3.1. Findings

- 3.1.1 The flight crew of both aircraft held valid licences and medical certificates.
- 3.1.2 All involved air traffic controllers held valid ATC licences and medical certificates.
- 3.1.3 Both aircraft had valid Certificate of Registration and Certificate of Airworthiness.
- 3.1.4 A trainee controller was manning GMC position handling aircraft and vehicle movements on both the north and south manoeuvring areas under the supervision of an instructor controller. The instructor took control on several occasions to avoid build up of traffic. (1.1.3) (1.1.4) (1.1.6) (2.2.2.2)
- 3.1.5 The instructor issued taxi instructions to Aircraft 1 to holding point J6. (1.1.4)
- 3.1.6 The instructor did not follow ATC standard operating procedure to change Aircraft 1 to AMS frequency due to probable lapse of concentration. (2.2.6.1) (2.2.6.5)
- 3.1.7 In accordance with MATC procedures and in line with ICAO Doc 4444 requirements, stop-bar lights at J6 were not switched ON. (1.10.2.3) (2.3.2.4)
- 3.1.8 AMS cleared Aircraft 2 for take-off RWY07R and Aircraft 2 complied. (1.1.7)
- 3.1.9 Aircraft 1 reported holding short of RWY07R on Taxiway J6 and the instructor issued a taxi instruction without a specific runway crossing clearance. The crew of Aircraft 1 misconstrued that the taxi instruction included a runway crossing clearance. (1.1.8) (2.2.5.1)
- 3.1.10 The instructor did not verify the position of Aircraft 1. (2.2.5.2) (2.2.6.5)
- 3.1.11 The instructor had a loss of situational awareness and incorrectly assumed Aircraft 1 had already crossed RWY07R. (2.2.6.6) (2.2.6.7)
- 3.1.12 The flight crew of Aircraft 1 believed the taxi instruction meant Aircraft 1 was cleared to cross RWY07R and proceeded to enter the runway. (2.3.2.3)
- 3.1.13 The flight crew of Aircraft 1 did not clarify with ATC despite no specific runway crossing clearance was given. (2.3.2.6)
- 3.1.14 The flight crew of Aircraft 2 noticed a B747 entering the runway from the left and immediately rejected the take-off. (1.1.11) (2.3.1.1)
- 3.1.15 Conflict alert warnings began showing on the A-SMGCS at UTC 00:55:08 (Local Time 08:55:08) and ceased after UTC 00:55:21 (Local Time 08:55:21). (1.1.10) (1.1.12) (2.3.1.2)
- 3.1.16 No audio alarm of the conflict alert was heard. The volume setting was turned down. (1.1.10) (2.2.8.4) (2.2.8.5) (2.4.1) (2.4.2)
- 3.1.17 Aircraft 2 reported rejecting take-off to AMS and was instructed to stop immediately. (1.1.12) (2.2.8.4) (2.3.1.1)

3.1.18 Aircraft 2 came to a halt on RWY07R abeam Taxiway K2 after rolling for approximately 630m. The closest distance between the two aircraft was about 1,100m. (1.1.13) (2.3.1.2)

3.2. Causes

3.2.1 A taxi instruction without a specific runway crossing clearance was misconstrued to have included a runway crossing clearance and Aircraft 1 entered RWY07R from J6 while Aircraft 2 was commencing take-off on RWY07R. This resulted in a runway incursion. (3.1.9) (3.1.12)

3.3. Contributing Factors

3.3.1. An instruction for Aircraft 1 to contact AMS for a runway crossing clearance was not effected as a result of probable lapse of concentration. (3.1.6)

3.3.2. Verification of the position of Aircraft 1 was not effected and subsequently an incorrect assumption that the aircraft had already crossed RWY07R was made as a result of loss of situational awareness when instruction was issued. (3.1.10) (3.1.11)

3.3.3. Clarification with ATC was not effected before entering an active runway without a specific runway crossing clearance. (3.1.13)

4. Safety Actions Already Implemented

Whether or not the AAIA identifies safety issues in the course of an investigation, relevant organizations may proactively initiate safety action in order to reduce their safety risk.

The AAIA has been advised by CAD of the following proactive safety actions that had been immediately taken after the occurrence to mitigate the risk of runway incursion:

- (a) Operational staff of the Aerodrome discipline were reminded to follow standard operating procedures and heighten situational awareness during runway crossing operations. Relevant description in MATC has been rewritten accordingly.
- (b) Operational staff of the Aerodrome discipline were reminded not to adjust the volume settings of the A-SMGCS that might adversely affect the effectiveness of audible conflict alert generated by the system.
- (c) Stop-bars at all runway entry points are illuminated at all times (H24).
- (d) Electronic flight strips of aircraft planning to cross any active runway are to be indented by GMC as an additional reminder. The strip should only be un-indented after transferring the aircraft to AMC frequency for runway crossing clearance, with verbal coordination between GMC and AMC about the crossing activity, and the aircraft has returned back to the GMC frequency.

5. Safety Recommendations

5.1. Safety Recommendation 06-2021

It is recommended that the Air Navigation Service Provider should continuously review the runway crossing procedures together with the effective use of stop-bar lights, conflict alert functions of ground surveillance equipment and Tower Electronic Flight Strip System to further mitigate the risk of runway incursion.

Safety Recommendation Owner: Hong Kong Civil Aviation Department

5.2. Safety Recommendation 07-2021

It is recommended that the airline operator should review the relevant part(s) of the Operations Manual concerning Taxiing of Aircraft and consider including a requirement for the flight crew to obtain an explicit clearance to cross any runway.

Safety Recommendation Owner: Air Cargo Global

6. General Details

6.1. Occurrence Details

Date and time:	22 September 2017, 0855 hours (local time)	
Occurrence category:	Serious Incident	
Primary occurrence type:	RI: Runway incursion	
Location:	Runway 07R, Hong Kong International Airport, Hong Kong	
	Latitude: 22°18'06.10"N	Longitude: 113°54'55.17"E

6.2. Pilot and ATC Personnel Information

6.2.1. CCC831 (Aircraft 1)

6.2.1.1. Pilot in Command

Licence:	Luxembourg, European Union ATPL(A)
Aircraft ratings:	B747-400
Date of first issue of aircraft rating on type:	1 April 1998 (perpetual)
Medical certificate:	Class 1 issued on 26 April 2017
Flying Experience:	
Total all types:	10 408.6 hours
Total on type (B747-400) :	4 296.3 hours

6.2.1.2. First Officer

Licence:	Belgium, European Union ATPL(A)
Aircraft ratings:	B747-400
Date of first issue of aircraft rating on type:	11 March 2014 (perpetual)
Medical certificate:	Class 1 issued on 8 November 2016
Flying Experience:	
Total all types:	4 457.6 hours
Total on type (B747-400) :	909.9 hours

6.2.2. CRK236 (Aircraft 2)

6.2.2.1. Pilot in Command

Licence:	Hong Kong ATPL(A)
Aircraft ratings:	Airbus A330
Date of first issue of aircraft rating on type:	14 December 2006 (perpetual)
Medical certificate:	Class 1 issued on 19 April 2017
Flying Experience:	
Total all types:	10 290 hours
Total on type (A330) :	1 384.4 hours

6.2.2.2. RHSQ Captain

Licence:	Hong Kong ATPL(A)
Aircraft ratings:	Airbus A330
Date of first issue of aircraft rating on type:	14 December 2006 (perpetual)
Medical certificate:	Class 1 issued on 19 September 2017
Flying Experience:	
Total all types:	14 160.9 hours
Total on type (A330) :	2 960.9 hours

6.2.3. ATC Personnel

6.2.3.1. Instructor controller

Licence:	Hong Kong Air Traffic Controller Licence
Ratings:	Aerodrome Control
Date of first issue of rating:	28 November 2014
Medical certificate:	Class 3 issued on 26 March 2015
Instructor certificate:	Aerodrome Control issued on 19 May 2017

6.2.3.2. Trainee controller

Licence:	Hong Kong Air Traffic Controller Licence
Ratings:	Nil (under training)
Date of first issue of rating:	Nil
Medical certificate:	Class 3 issued on 25 September 2014

6.2.3.3. AMS

Licence:	Hong Kong Air Traffic Controller Licence
Ratings:	Aerodrome Control
Date of first issue of rating:	17 July 2015
Medical certificate:	Class 3 issued on 7 March 2016

6.3. Aircraft Details

6.3.1. Aircraft 1

Manufacturer and model	Boeing 747-400SF
Registration	Republic of Slovak, OM-ACB
Aircraft Serial Number	24998
Flight Number	CCC831
Year of Manufacture	1991
Engine	Four Pratt & Whitney PW4056 turbo-fan engines
Operator	Air Cargo Global
Type of Operation	Commercial Air Transport (Cargo)
Certificate of Airworthiness	Issued on 19 November 2016, Large Aeroplanes Category and remains valid unless revoked by the Transport Authority of the Slovak Republic
Departure	Turkmenbashi International Airport (UTAK)
Destination	Hong Kong International Airport

6.3.2. Aircraft 2

Manufacturer and model	Airbus A330-343
Registration	Hong Kong, China, B-LNS
Aircraft Serial Number	1105
Flight Number	CRK236
Year of Manufacture	2010
Engine	Two Rolls-Royce Trent 772B-60 turbo-fan engines
Operator	Hong Kong Airlines
Type of Operation	Commercial Air Transport (Passenger)
Certificate of Airworthiness	Issued on 13 July 2017 and valid till 21 July 2018, Transport Category (Passenger)
Departure	Hong Kong International Airport (VHHH)
Destination	Shanghai Pudong International Airport (ZSPD)

6.4. Destination Aerodrome Information

Aerodrome Code	VHHH
Airport Name	Hong Kong International Airport
Airport Address	Chek Lap Kok, Lantau Island
Airport Authority	Airport Authority Hong Kong
Air Navigation Services	Approach Control, Aerodrome Control, Ground Movement Control, Zone Control, Flight Information Service, Clearance Delivery Control, Automatic Terminal Information Service
Type of Traffic Permitted	IFR/VFR
Coordinates	22° 18' 32" N, 113° 54' 53" E
Elevation	28 feet
Runway Length	3,800 m
Runway Width	60 m
Stopway	Nil
Runway End Safety Area	240 m x 150 m
Azimuth	07L / 25R, 07R / 25L
Category for Rescue and Fire Fighting Services	CAT 10

7. Abbreviations

AMC	Air Movement Control
AMS	Air Movements South Controller
AMN	Air Movements North Controller
AOC	Air Operator's Certificate
ASMGCS	Advanced Surface Movement Guidance and Control System
ATC	Air Traffic Control
°C	Degree Celsius
CAD	Hong Kong Civil Aviation Department
CCC	Air Cargo Global
CRK	Hong Kong Airlines
CVR	Cockpit Voice Recorder
DFDR	Digital Flight Data Recorder
DRS	Digital Recording System
GMC	Ground Movement Control
HKAIP	Hong Kong Aeronautical Information Publication
ICAO	International Civil Aviation Organization
km	kilometers
LKPR	Prague-Ruzyne International Airport
m	meters
MATC	Manual of Air Traffic Control
MHz	Mega Hertz
RHSQ	Right Hand Seat Qualified
RWY	Runway
SMR	Surface Movement Radar
TEFS	Tower Electronic Flight Strip System
UTAK	Turkmenbashi Airport
UTC	Coordinated Universal Time
VHHH	Hong Kong International Airport
ZSPD	Shanghai (Pudong) Airport

8. Table of Figures, Tables

FIGURE 1: TAXI ROUTE OF AIRCRAFT 1 DEPICTED ON HONG KONG INTERNATIONAL AIRPORT CHART	6
FIGURE 2: DIVISION OF CONTROLLER RESPONSIBILITIES FOR RUNWAY 07 OPERATION	12
FIGURE 3: ELECTRONIC FLIGHT STRIPS DISPLAYED AT AMS WORKSTATION	17
FIGURE 4: CRK236 COMMENCED TAKE-OFF ON RUNWAY 07R AT UTC 00:54:57 (LOCAL TIME 08:54:57) AND THE LOCATION OF CCC831	31
FIGURE 5: POSITIONS OF CRK236 AND CCC831 WHEN RUNWAY INCURSION WARNING WAS DISPLAYED AT UTC 00:55:09 (LOCAL TIME 08:55:09).....	32
FIGURE 6: POSITIONS OF CRK236 AND CCC831 WHEN RUNWAY INCURSION WARNING WAS DISPLAYED AT UTC 00:55:20 (LOCAL TIME 08:55:20).....	33
FIGURE 7: DISPLAY OF A-SMGCS AT UTC 00:55:30 (LOCAL TIME 08:55:30) WHEN CRK236 CAME TO A HALT AND CCC831 VACATED RUNWAY 07R.....	34
TABLE 1: PERSONS ON BOARD AIRCRAFT 1.....	7
TABLE 2: PERSONS ON BOARD AIRCRAFT 2.....	7

9. Appendix

9.1. Records of A-SMGCS display

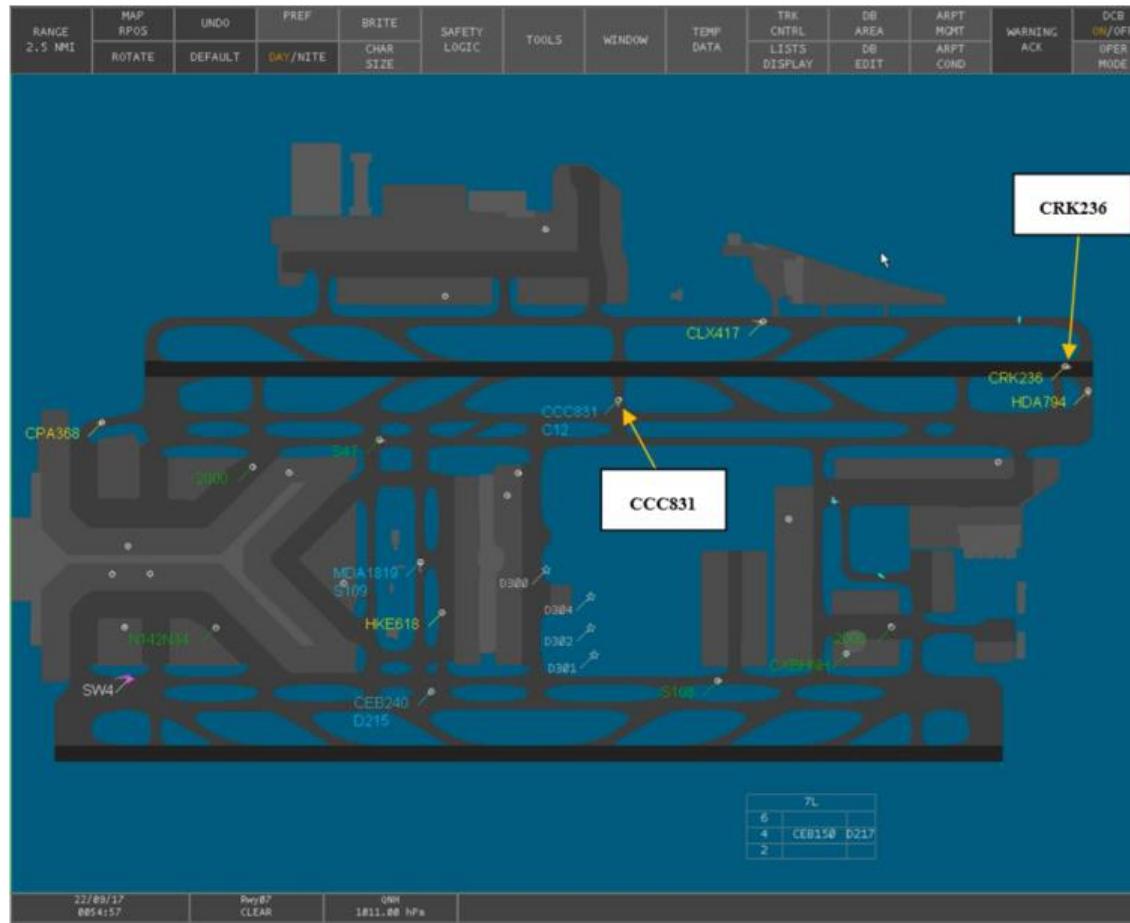


Figure 4: CRK236 commenced take-off on Runway 07R at UTC 00:54:57 (Local Time 08:54:57) and the location of CCC831



Figure 5: Positions of CRK236 and CCC831 when Runway Incursion Warning was displayed at UTC 00:55:09 (Local Time 08:55:09)

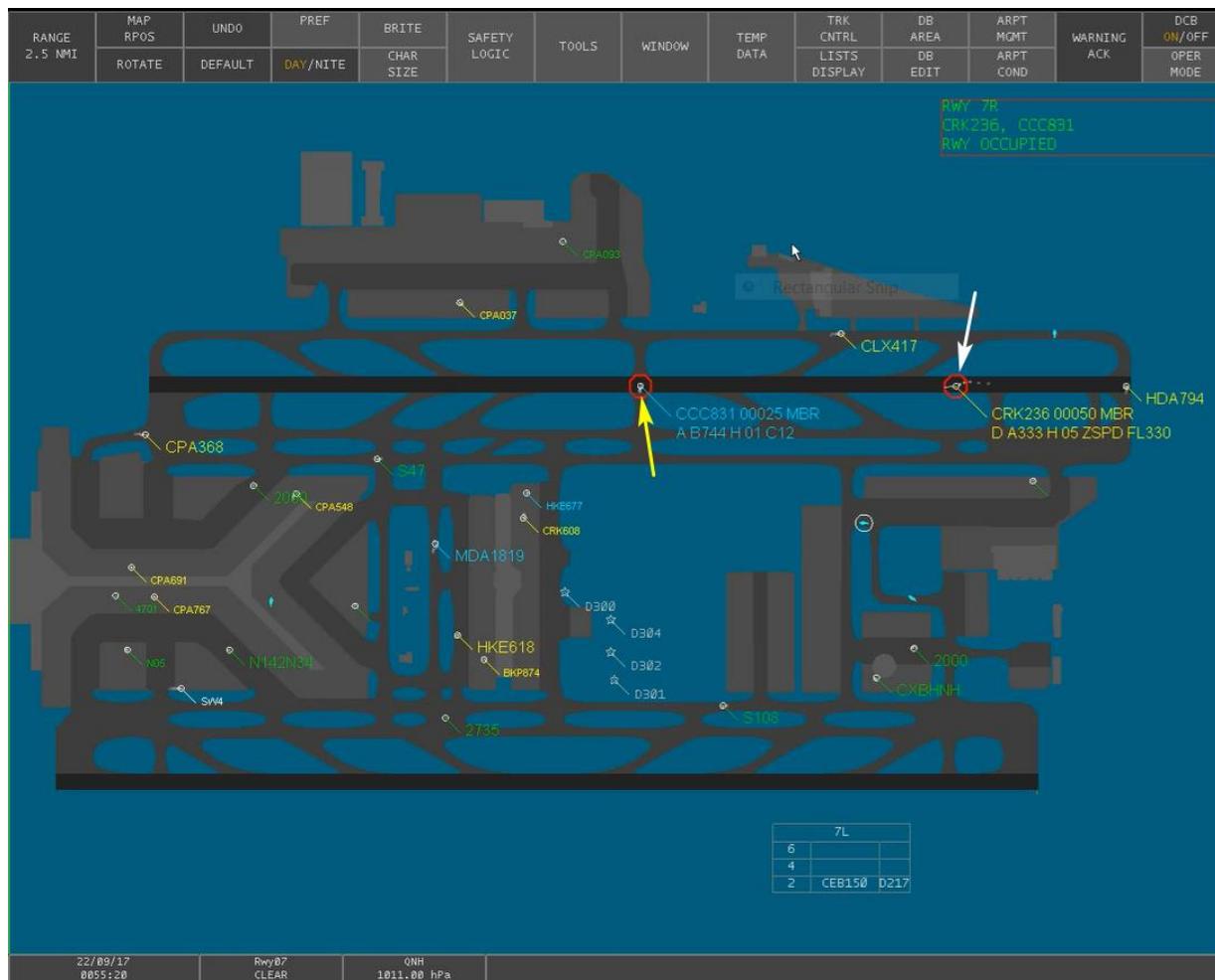


Figure 6: Positions of CRK236 and CCC831 when Runway Incursion Warning was displayed at UTC 00:55:20 (Local Time 08:55:20)

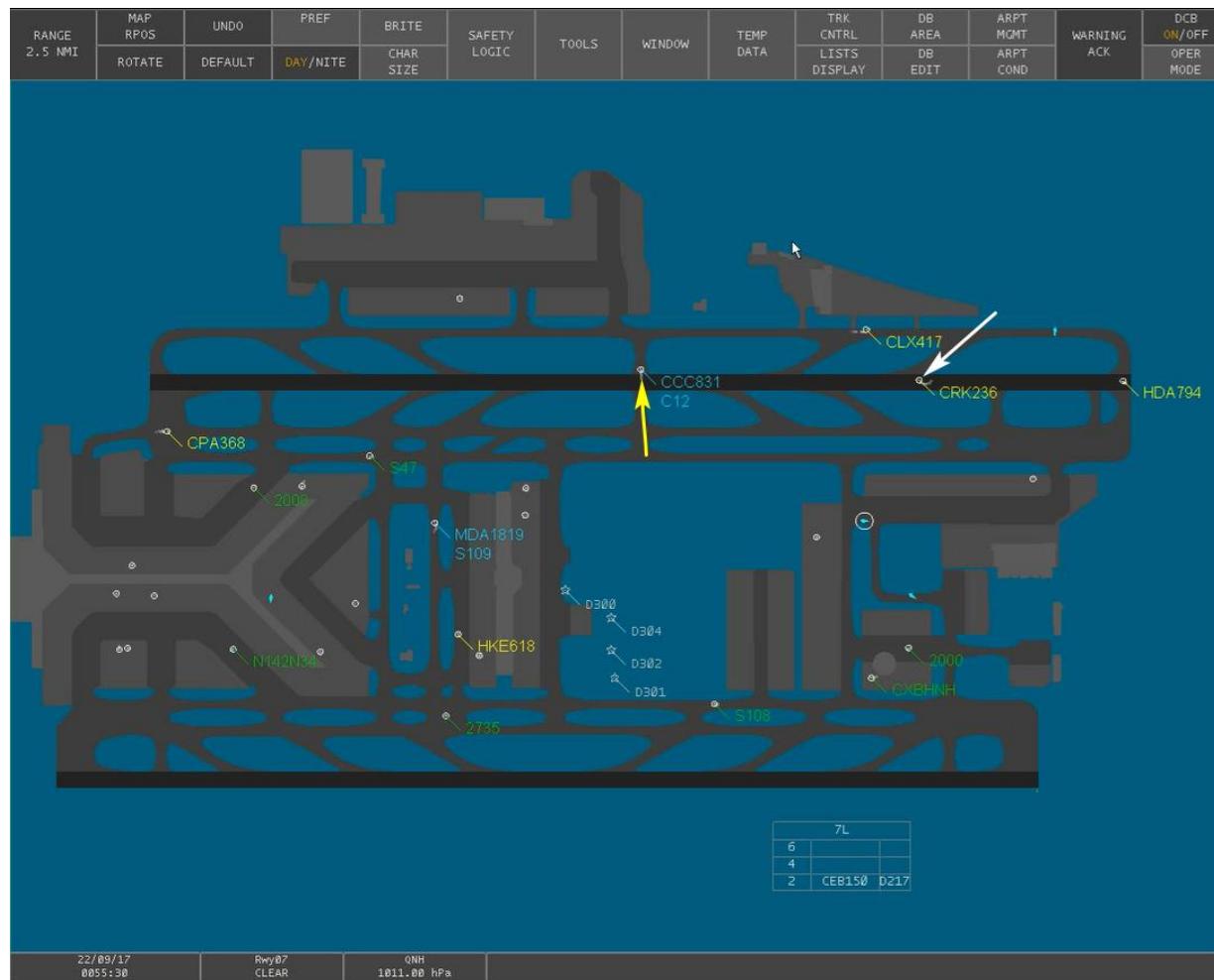


Figure 7: Display of A-SMGCS at UTC 00:55:30 (Local Time 08:55:30) when CRK236 came to a halt and CCC831 vacated Runway 07R

9.2. Communications Transcript of CCC831 and HK Ground (GMC)

(Note: UTC+8 = Local Time e.g. 00:54:45 UTC = 08:54:45 Local Time)

<u>TIME (UTC)</u>	<u>STATION</u>	<u>R/T COMMUNICATION</u>
00:48:41	CCC831	TOWER GOOD MORNING GLOBAL CARGO EIGHT TREE ONE.....TURNING RIGHT ON ALPHA
00:48:46	HK GROUNDSOUTH GLOBAL CARGO EIGHT THREE ONE ER TAXI ER.....WHISKEY HOLD SHORT OF HOTEL
00:48:52	CCC831	TAXI TO THE LEFT WHISKEY HOLD SHORT HOTEL GLOBAL CARGO EIGHT TREE ONE
00:50:47	CCC831	GLOBAL CARGO EIGHT TREE ONE APPROACHING HOTEL
00:50:52	HK GROUND	GLOBAL CARGO EIGHT THREE ONE TAXI VIA JULIET JULIET SIX HOLDING POINT
00:50:56	CCC831	JULIET JULIET SIX HOLDING POINT RUNWAY ZERO SEVEN RIGHT GLOBAL CARGO EIGHT TREE ONE
00:54:45	CCC831	GLOBAL CARGO EIGHT TREE ONE HOLD SHORT ZERO SEVEN RIGHT JULIET SIX
00:54:49	HK GROUND	GLOBAL CARGO EIGHT TREE ONE TAXI KILO LIMA TWO CHARLIE ONE TWO
00:54:52	CCC831	KILO LIMA TWO CHARLIE ONE TWO GLOBAL CARGO EIGHT TREE ONE
00:55:33	HK GROUND	GLOBAL CARGO EIGHT TREE ONE
00:55:35	CCC831	GO AHEAD GLOBAL CARGO EIGHT TREE ONE
00:55:37	HK GROUND	GLOBAL CARGO EIGHT TREE ONE YOU DO NOT HAVE CLEARANCE TO CROSS THE..... ACTIVE RUNWAY YOU HAVE CROSSED YOU ARE CAUSING RUNWAY INCURSION ER CONTINUE TAXIING KILO LIMA TWO FOR BAY CHARLIE ONE TWO
00:55:47	CCC831	OH SORRY YOU TOLD US LIMA TWO AND BAY CHARLIE ONE TWO VIA KILO
00:55:56	CCC831	AND I READBACK THAT ER.... WHEN WE WERE AT HOLDING POINT JULIET SIX SIR

<u>TIME (UTC)</u>	<u>STATION</u>	<u>R/T COMMUNICATION</u>
00:56:00	HK GROUND	GLOBAL CARGO EIGHT TREE ONE YOU DO NOT HAVE CLEARANCE TO CROSS ACTIVE RUNWAY
00:56:09	HK GROUND	GLOBAL CARGO EIGHT TREE ONE ER.....JUST CONTINUE TAXI KILO LIMA TWO FOR CHARLIE ONE TWO FOR NOW
00:56:15	CCC831	KILO LIMA TWO CHARLIE ONE TWO BUT I TELL YOU THAT CLEARANCE YOU GIVE US WHEN WERE AT JULIET SIX AND THAT'S WHAT I READBACK SIR
00:56:24	HK GROUND	ER.....UNDERSTOOD WE WOULD CHECK FOR THAT

END

9.3. Communications Transcript of CRK236 and HK Tower South (AMS)

(Note: UTC+8 = Local Time e.g. 00:53:05 UTC = 08:53:05 Local Time)

<u>TIME (UTC)</u>	<u>STATION</u>	<u>R/T COMMUNICATION</u>
00:53:05	HK TOWER SOUTH	BAUHINIA TWO TREE SIX LINE UP RUNWAY ZERO SEVEN RIGHT
00:53:08	CRK236	LINE UP AND WAIT RUNWAY ZERO SEVEN RIGHT BAUHINIA TWO TREE SIX
00:54:25	HK TOWER SOUTH	BAUHINIA TWO TREE SIX WIND ZERO SEVEN ZERO DEGREES SIX KNOTS RUNWAY ZERO SEVEN RIGHT CLEAR FOR TAKE-OFF
00:54:31	CRK236	CLEAR FOR TAKE-OFF RUNWAY ZERO SEVEN RIGHT BAUHINIA TWO TREE SIX
00:55:19	CRK236	BAUHINIA TWO TREE SIX REJECTING TAKE-OFF TAXI.....AIRCRAFT ON RUNWAY
00:55:24	HK TOWER SOUTH	BAUHINIA TWO TREE SIX ROGER STOP IMMEDIATELY
00:55:27	CRK236STOP
00:55:37	HK TOWER SOUTH	BAUHINIA TWO TREE SIX FOR INFORMATION THE JUMBO DOES NOT HAVE ANY AUTHORIZATION TO CROSS RUNWAY AT MID-FIELD
00:55:45	CRK236	ROGER EM.....REQUEST TO EXIT.... EXIT..... THE RUNWAY AND RETURN TO THE HOLDING POINT TO SEE IF WE CAN..... PROCEED..... PROCEED FOR ANOTHER TAKE-OFF THANK YOU VERY MUCH
00:55:57	HK TOWER SOUTH	BAUHINIA TWO TREE SIX VACATE VIA JULIET SIX LEFT TURN ON JULIET
00:56:03	CRK236	OKAY VIA JULIET SIX LEFT TURN ON JULIET BAUHINIA TWO TREE SIX
00:57:13	CRK236	BAUHINIA TWO TREE SIX VACATING LEFT ON JULIET SIX
00:57:17	HK TOWER SOUTH	BAUHINIA TWO TREE SIX ROGER YOU ARE NUMBER ONE TO THE CATHAY AND JULIET FOR JULIET ONE HOLDING POINT

<u>TIME (UTC)</u>	<u>STATION</u>	<u>R/T COMMUNICATION</u>
00:57:22	CRK236	ROGER ER LEFT ON JULIET SIX AND LEFT ON JULIET JULIET ONE HOLDING POINT BAUHINIA TWO TREE SIX
00:58:02	HK TOWER SOUTH	BAUHINIA TWO TREE SIX ROGER NUMBER ONE LEFT ON JULIET TO JULIET ONE
00:58:06	CRK236	AFFIRM LEFT ON JULIET TO JULIET ONE WE'LL NEED.....WE REQUIRE A FEW MINUTES ER TO PREPARE THE AIRCRAFT FOR ANOTHER TAKE-OFF BAUHINIA TWO TREE SIX
00:58:14	HK TOWER SOUTH	BAUHINIA TWO TREE SIX ROGER ER UNDERSTOOD AND ER DO YOU NEED ANY ASSISTANCE LET ME KNOW
00:58:20	CRK236	NEGATIVE ER EVERYTHING IS FINE HERE AND ER WE JUST NEED A FEW MINUTES TO PREPARE THE AIRCRAFT
00:58:26	HK TOWER SOUTH	ROGER THANK YOU

END