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AAIA

Air Accident Investigation Authority

Collision between Aircraft and Tow Tractor (Ground Handling)

Serious Incident Investigation Final Report

Airbus A330-343, B-HLT,

Hong Kong International Airport

24 January 2020

01-2021

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 Final Report is the prevention of accidents and incidents. It is not the purpose of the investigation to apportion blame or liability.

The Chief Inspector ordered an inspector's investigation into the serious incident in accordance with the provisions in Cap.448B.

This serious incident investigation final report contains information of an occurrence involving an Airbus A330-343, registration B-HLT, operated by Hong Kong Dragon Airlines Limited on 24 January 2020.

The operator, Hong Kong Aircraft Engineering Company Limited (HAECO), Airport Authority Hong Kong (AAHK), the Civil Aviation Department (CAD), Bureau d'Enquêtes et d'Analyses pour la sécurité de l'aviation civile and Airbus provided assistance to the investigation.

This final report supersedes all previous Preliminary Report and Interim Statements 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 (UTC) + 8 hours.

Chief Accident and Safety Investigator
Air Accident Investigation Authority
Transport and Housing Bureau
Hong Kong
May, 2021

Synopsis

On 24 January 2020 at 1645 hrs, a Hong Kong Dragon Airlines Limited Airbus A330-343, registration mark B-HLT, located at Parking Bay N66 of Hong Kong International Airport (HKIA) was pushed back for positioning onto Taxilane B7 by a tractor for departure to Kaohsiung. During the pushback, the flight crew started both engines in sequence.

After the aircraft was aligned with the centreline of Taxilane B7 abeam Parking Bay N64, the headset man and the wing walker disconnected the towbar without confirming that the parking brake light was 'ON' and a chock was placed in front of the Nose Landing Gear (NLG) wheels. With both engines at idle power, the aircraft moved forward slowly and collided with the left-hand side of the tractor, causing damage to the NLG.

There was no injury to the crew and the passengers on board the aircraft or the ground personnel.

The investigation team has made four safety recommendations.

Contents

1. FACTUAL INFORMATION

1.1. Sequence of Events

(1) On 24 January 2020 at 1645 hrs, a Hong Kong Dragon Airlines Limited (Cathay Dragon) Airbus A330-343, with registration mark B-HLT and located at Parking Bay N66 of HKIA, was pushed back onto Taxilane B7 for departure to Kaohsiung.

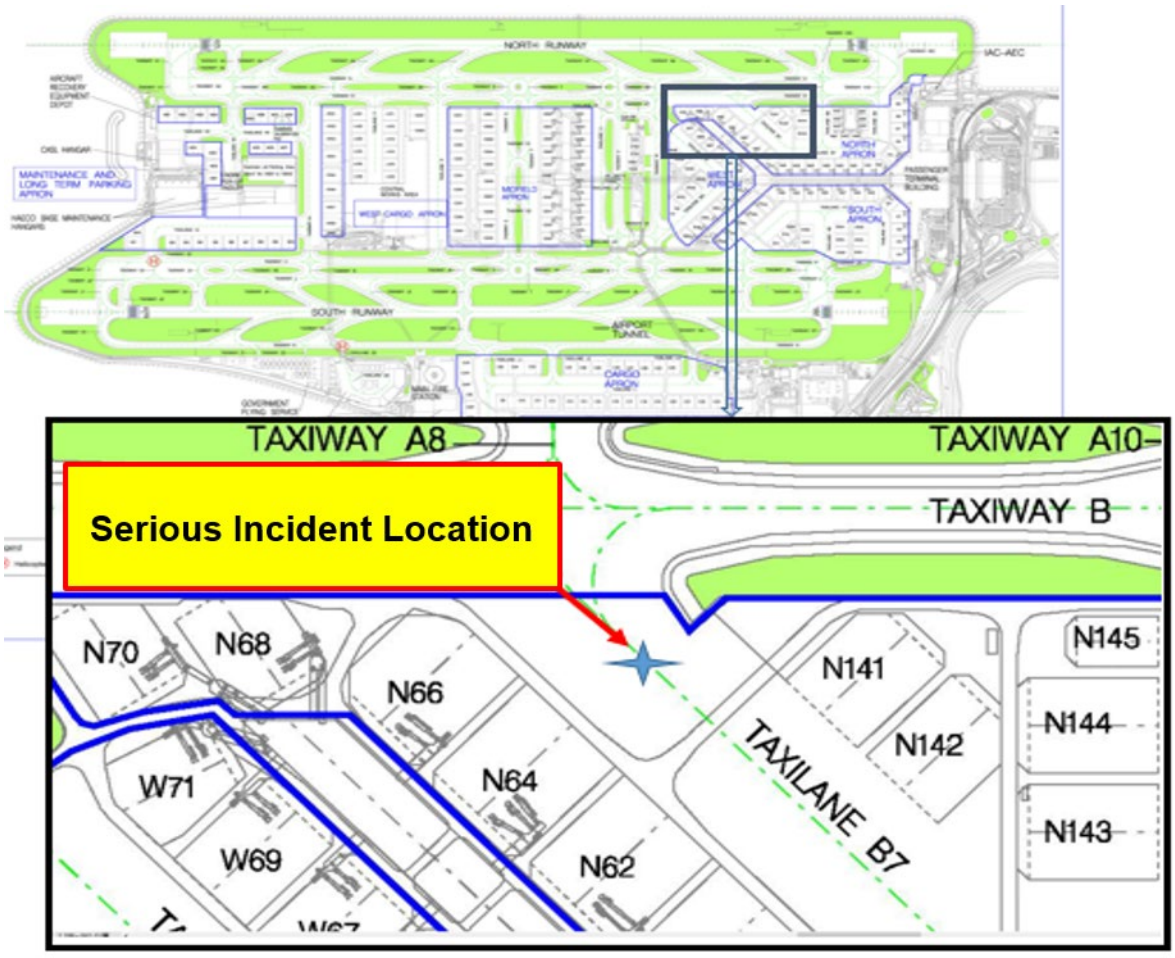

Figure 1: Serious Incident Location at HKIA

(2) The ground handling crew consisted of an Aircraft Maintenance Mechanic as the crew leader and the headset man, an Aircraft Facility Handler as the wing walker, and an Aircraft Tractor Operator as the tractor driver. The headset

man established communication with the flight crew using a wireless headset setup[1].

(3) According to the Standard Operating Procedure (SOP) of HAECO, the tractor driver should prepare two chocks in the tractor before pushback but the preparation of the chock was not done. When the wing walker noticed that there was no chock in the tractor, he tried to get a spare chock in the vicinity of the parking bay but was unsuccessful. He reported the situation to the headset man but received no instructions. According to HAECO, there were rubber chocks supplied by AAHK available in the aircraft bay but both the headset man and the wing walker did not consider those chocks as the alternative to the chocks owned by HAECO. As such, the pushback commenced without any chock in the tractor.

(4) During the pushback from the parking bay, the flight crew started both engines in sequence with the acknowledgement from the headset man and set them at idle power in accordance with the operator's procedures.

(5) When the aircraft was aligned with the centreline of Taxilane B7 abeam Parking Bay N64, the headset man notified the flight crew to set the parking brake. According to the flight crew statements and the cockpit voice recorder (CVR) record, the flight crew did not receive this message and the parking brake was not set. The headset man did not confirm with the flight crew whether the parking brake had been set. Without verifying that the parking brake light on the NLG was ON and placing a chock in front of the NLG wheels, the wing walker and the headset man disconnected the towbar from the tractor and the NLG respectively.

(6) With both engines at idle power and parking brake not set, the aircraft moved forward slowly. At this stage, the towbar end at the tractor side was fully disconnected from the tractor. However, the towbar end at the NLG side remained entangled with the NLG despite the locking mechanism was unlatched. Due to the unexpected aircraft movement, both the headset man and the wing walker had to escape from the moving aircraft with the entangled towbar. The headset man immediately informed the flight crew to set the parking brake but there was no response. He then disconnected the wireless adapter at the NLG External Power Control Panel[2] and connected the headset jack of the headset directly to the Control Panel. While the aircraft was moving forward, the entangled towbar separated from the NLG and swayed to the forward left side of the aircraft. Subsequently, the NLG collided with the left-hand side of the tractor before the flight crew

[1] Refer to paragraph 1.7 for the details of the wireless headset setup.

[2] Refer to Figure 2 for the location of the NLG External Power Control Panel.

received the message for setting the parking brake to stop the aircraft movement. The NLG was damaged during the collision. (See Photo 1.)

(7) With the confirmation of the ground crew that the NLG was damaged, the captain shut down both engines. All passengers disembarked via the mobile passenger steps on site after the serious incident.

Photo 1: NLG impacted with the Left Hand Side of the Tractor

1.2. Injuries to Persons

The aircraft carried 13 crew and 269 passengers. No person on board or on ground was injured in the serious incident.

1.3. Damage to Aircraft

The nose steering actuators of the NLG and the NLG door were damaged. There is no other structural damage evident. The investigation team did not establish any evidence of aircraft system fault that might be relevant to the serious incident.

1.4. Personnel Information

The ground handling crew were checked out by HAECO and qualified to conduct the pushback operation. The headset man took charge of the operation and led the crew for handling any emergency situations, such as tractor overspeed and towbar shear pin breakage, etc. Refer to paragraph 6.1 for the experience of the ground handling crew and the flight crew.

1.5. Aircraft Information

Refer to paragraph 6.2 for aircraft details.

1.6. Meteorological Factors

The Meteorological Aerodrome Weather Report (METAR) for HKIA at 1630 hours indicated that the wind speed was 11 knots. The surface wind direction was 110 degrees with wind direction variation from 80 to 150 degrees. The visibility was 10 kilometres or above. There were few clouds at 1000 feet above sea level. The air temperature was 22 degrees Celsius and the dew point was 19 degrees Celsius.

1.7. Ground and Cockpit Communication

(1) The wireless headset operation is achieved by connecting a traditional headset into a Bluetooth transceiver carried by the headset man. The transceiver of the headset man communicates with another Bluetooth transceiver (also called Wireless Headset Adaptor). (See Photos 2 and 3.) The Wireless Headset Adaptor is plugged into the flight interphone jack on the External Power Control Panel located at the aft of the NLG. (See Figure 2.) The headset man communicated with the flight crew using this wireless setup during the pushback operation.

Photo 2: Wireless Headset Setup for Headset Man

Photo 3: Wireless Headset Setup for Aircraft Side

Figure 2: Wireless Headset Adapter Connection (Aircraft Side)

(2) The headset man stated in the interview that the wireless headset operation was normal for communication with the flight crew at the commencement of the pushback and during the engine start. However, no response or acknowledgement was received from the flight crew on his instruction to set the parking brake after the aircraft had stopped on the taxilane.

(3) After the serious incident, the functions of the headset and the two Bluetooth transceivers were checked and found normal.

1.8. Flight Recorders

The data of the Flight Data Recorder and the CVR was downloaded and decoded for the investigation.

1.9. Tractor Footage Information

A surveillance camera installed on the tow tractor captured the relevant footage which provided evidence for the investigation. The tractor footage indicated that the hand signal of the headset man (i.e. thumb-up) to the wing walker for disconnecting the towbar was not evident. The wing walker and the headset man disconnected the respective towbar end from the tractor and the aircraft NLG respectively.

1.10. Ground Handling Crew Roster

The ground handling crew attended their scheduled Day duties (0800hrs to 2000hrs) on the day of the serious incident. The serious incident happened at around 1645 hrs. When the crew handled the subject pushback, the crew did not know their next assignment. They did not express any fatigue and time pressure issues in the interview.

1.11. Pushback Operation and Procedures

(1) The SOPs relevant to pushback operation were published in HAECO Line Service Technical Operations (LSTO) and Ramp Equipment (RE) documents:

(a) For headset man, LSTO-SOP-001a Standard Operating Procedure for LSTO at Rev 14 dated 04 Dec 2019

(b) For wing walker, LSTO-SOP-001b Standard Operating Procedure for LSTO at Rev 14 dated 04 Dec 2019

(c) For tractor driver, RE-SOP-044 Standard Operating Procedure for RE at Rev 14 dated 01 Jan 2020

(2) Each particular SOP gives different scope of tasks and responsibilities to the respective ground handling crew member.

1.11.1. SOP LSTO-SOP-001a

(1) In LSTO-SOP-001a paragraph 4.1 Before Pushback and paragraph 4.3 After Pushback, the investigation team found the following procedures for the headset man that are relevant to the serious incident:

(a) Paragraph 4.1

- Confirm ‘chocks are prepared by tractor drivers (If shortage of chock, inform tractor driver to provide)’.

(b) Paragraph 4.3

- Notify cockpit ‘Ground to cockpit, pushback complete. Set parking brake’.

- Check NLG park brake light ‘ON’.

- Confirm ‘Wing walker place a chock in front of nose wheel for safety’.

- Confirm ‘Disconnect towbar by wing walker from tractor side’.

- Confirm ‘Wing walker disconnect towbar from the aircraft side and stay at NLG area’.

- Confirm ‘Wing walker remove and hold NLG chock’.

Refer to Photo 4 for Parking Brake Light.

Photo 4: Parking Brake Light on the NLG

(2) Refer to Appendix 9.1 for the extract of SOP LSTO-SOP-001a.

1.11.2. SOP LSTO-SOP-001b

(1) In LSTO-SOP-001b paragraph 3.1 Before Pushback and paragraph 3.3 After Pushback, the investigation team found the following procedures for the wing walker that are relevant to the serious incident:

(a) Paragraph 3.1

- Confirm ‘Chocks are prepared by tractor drivers’.

(b) Paragraph 3.3

- Check NLG park brake light ‘On’’.
- Place a chock in front of nose wheel for safety.
- Disconnect towbar from the tractor side.
- Disconnect towbar from the aircraft side and stay at NLG area.
- Remove and hold NLG chock after clearance signal from headset man.

(2) Refer to Appendix 9.2 for the extract of SOP LSTO-SOP-001b.

1.11.3. SOP RE-SOP-044

RE-SOP-044 did not specifically require the tractor driver to prepare the chocks.

1.12. Personnel Interview

1.12.1. Interview of Ground Handling Crew

(1) From the respective interviews of the headset man, the wing walker and the tractor driver, the investigation team revealed the following information.

(a) The wing walker disconnected the towbar from the tractor without the instruction, i.e. thumb-up, of the headset man. The headset man did not stop it and disconnected the towbar from the aircraft instinctively.

(b) It was a usual practice for the wing walker to disconnect the towbar from the tractor and for the headset man to disconnect the towbar from the NLG.

(c) It is the understanding of the tractor driver that the preparation of chocks and their placing / handling are not the responsibility of RE.

(d) They all experienced past pushback operations without the use of chock for NLG wheels.

(e) Both the headset man and the wing walker did not intend to use chocks of the AAHK for pushback operation.

(f) There was contingency procedure requiring the headset man to communicate with the pilots at the forward left side of the aircraft when the wireless headset was inoperative.

1.12.2. Interview of Flight Crew

(1) From the respective interviews of the Pilot-in-Command and the First Officer, the investigation team revealed the following information.

(a) The interphone communication between the flight crew and the ground crew was clear before the pushback.

(b) The parking brake set request was not received by the flight crew until after the aircraft impacted and stopped.

(2) These are corroborated by the CVR records.

1.13. Organisation

1.13.1. HAECO

HAECO is a CAD approved aircraft maintenance organisation based at HKIA. Other than maintenance, the company offers a wide range of aircraft engineering services to local and foreign operators, including ground handling services such as aircraft towing and pushback operation, etc.

1.13.2. AAHK

AAHK is a statutory body wholly owned by the Hong Kong SAR Government. It is responsible for the daily operation of HKIA. It is empowered to allow persons to engage in or carry on any airport-related activity, such as ground handling services for local and foreign operators in Hong Kong.

1.14. Airport Operations Manual

The ground handling companies operating at HKIA shall follow the requirements of the Airport Operations Manual (AOM) of the AAHK. According to paragraph 3.1 of Part D-Section 4, Aircraft Departure Procedures of the Airport Operations Manual - Airfield Operations, company operating procedures and safety precautions specific to the type of aircraft must be observed. The AOM does not specifically require the placement of a chock in front of the NLG wheels before disconnecting the towbar but requires ground handling companies to observe company operating procedures and safety precautions specific to the type of the aircraft.

2. 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. Compliance with Procedures

2.1.1. SOP LSTO-SOP-001a and SOP LSTO-SOP-001b

(1) In a typical pushback operation, when an aircraft is pushed to its final position and fully stops, the headset man should notify the flight crew to set the parking brake, get their confirmation by using the interphone system, and verify that the parking brake light on the NLG is 'ON'. The headset man should ensure that the wing walker placed a chock in front of the NLG wheels as a safety requirement before disconnecting the towbar.

(2) SOP LSTO-SOP-001a and SOP LSTO-SOP-001b were not fully complied with by the three ground crew members.

(a) No chock was prepared by the tractor driver before the pushback.

(b) Both the headset man and the wing walker did not confirm that chocks were prepared by the tractor driver, despite the wing walker attempted to find one but was unsuccessful.

(c) The wing walker reported to the headset man of the unavailability of chock. However, the headset man did not take action or give instruction after the wing walker reported the issue to him before the pushback. It was probable that the decision of the headset man to commence the pushback in the absence of chocks was influenced by his past experience on pushback without the use of chocks.

(d) The pushback commenced without chocks, thus no chock was available for its placement in front of the NLG after pushback.

(e) The headset man did not confirm with the flight crew that the parking brake was 'ON' after advising them to do so.

(f) Both the headset man and the wing walker did not confirm the parking brake light on the NLG was ON before disconnecting the towbar.

(g) The headset man disconnected the towbar from the NLG. This did not comply with SOP LSTO-SOP-001a which required the headset man to confirm that the wing walker had disconnected the towbar from the tractor and the NLG in turn, and then to stay at NLG area.

(3) Having gone through the two SOPs, the investigation team was of the view that the SOPs aimed to require the headset man to focus on ground / cockpit communication and to take charge of the whole pushback operation, including the supervision of the placement of chock in front of the NLG wheels and the disconnection of the towbar by the wing walker.

(4) According to the information of the interview statement of the headset man, there were contingency procedures requiring the headset man to communicate with the pilots at the forward left side of the aircraft when the wireless headset was inoperative. However, the investigation team was unable to establish such contingency procedures during the investigation. The investigation team considered that such contingency procedures should be incorporated in SOP LSTO-SOP-001a for the headset man to follow.

2.1.2. Ramp Equipment RE-SOP-044

According to the interview statement of the tractor driver, he did not consider that it was his responsibility, as an RE staff, to prepare the chocks. This might be due to fact that SOP RE-SOP-044 did not specifically require the tractor driver to prepare the chocks and he was not conversant with SOP LSTO-SOP-001a and SOP LSTO-SOP-001b for the headset man and the wing walker respectively. After the serious incident, HAECO had revised SOP RE-SOP-044 to require the tractor driver to ensure two chocks are available.

2.2. Human Factors

2.2.1. Authority Gradient

Both the wing walker and the tractor driver had not questioned the headset man's decision of not having a chock before the commencement of the pushback. It was probable that the headset man was perceived as the leader of the team. Both the tractor driver and wing walker were reluctant to challenge the decision due to authority gradient.

2.2.2. Confirmation Bias / Norms

The headset man, the wing walker and the tractor driver expressed in the interview that they had experienced previous pushback operations without using chocks. Such past experience might be indicative of a norm, which in turn might have induced a confirmation bias to accept the disconnection of the towbar without the placement of a chock in front of the NLG wheels. From the interview, the investigation team was of the view that pushback operation without the use of chock was occasional, especially when chock was not readily avaliable. HAECO should reinforce the surveillance activities to ensure compliance with the SOPs. See further analysis on this in paragraph 2.3 below.

2.2.3. Peer Pressure

The headset man stated in the interview that he started to disconnect the towbar from the NLG when he saw the wing walker disconnecting the towbar from the tractor. It was probable that the perceived peer pressure might have influenced the headset man, leading to his instinct to disconnect the towbar from the NLG while the task was not his responsibility per SOP LSTO-SOP-001a.

2.2.4. Lack of Communication

The tractor footage indicated that the hand signal of the headset man (i.e. thumb-up) to the wing walker for disconnecting the towbar was not evident. The wing walker and the headset man disconnected the towbar end from the tractor and the aircraft NLG respectively. While such actions did not comply with the SOP, the lack of effective communication between the headset man and the wing walker was obvious.

2.3. Provision of Chock

(1) Chock is an important ground equipment for providing barrier or stopper to aircraft movement should the parking brake system of an aircraft fail. Although both SOP LSTO-SOP-001a and SOP LSTO-SOP-001b required the headset man and the wing walker to confirm that chocks were prepared by the tractor driver, no chock owned by HAECO was available in the parking bay of the aircraft and the area nearby. HAECO should ensure that sufficient chocks were available for ground handling operation to minimise risk of non-compliance with the SOPs by the ground handling crew due to the difficulty in obtaining the chocks. After the serious incident, the company had taken safety actions to ensure two chocks were available on each tractor for pushback operation.

(2) In the respective interviews of headset man, wing walker and tractor driver, they all expressed experience on past pushback operations without the use of chock for NLG wheels. HAECO should reinforce the surveillance of

ground handling activities to ensure compliance with the company procedures by the personnel concerned, and to discourage unsafe norms.

(3) The placement of chock in front of NLG wheels before disconnecting the towbar should be a standard practice for all pushback operation. At the time of the serious incident, the AOM of AAHK required ground handling company to observe company operating procedures and safety precautions specific to the type of aircraft. To set up an additional safety net, it would be beneficial for the AOM to explicitly require the placement of chock in front of the NLG wheels before disconnecting the towbar.

2.4. Headset Communication System

The wireless headset setup, including the Bluetooth transceivers were checked and found normal after the serious incident. The cause of the communication interruption between ground and cockpit could not be identified. However, the possibility of system interruptions during the pushback operation could not be ruled out.

2.5. Miscellaneous Information

Having reviewed the METAR, the investigation team found that the weather condition was fine at the time of the serious incident and not a relevant factor. Also, the investigation team did not identify any issue on aircraft system and flight operations that might contribute to the serious incident.

3. Conclusions

3.1. Findings

(1) The ground handling crew commenced the pushback operation without chock as no chock of the HAECO was available in the parking bay and the nearby area. [1.1(3)]

(2) The wing walker did not place a chock in front of the NLG wheels before disconnecting the towbar. [1.1(5)]

(3) The flight crew did not receive the request for “Parking Brake Set” from the ground crew when the pushback was completed. [1.1(5)]

(4) The headset man and the wing walker did not confirm that the parking brake light on the NLG was ON before disconnecting the towbar. [1.1(5)]

(5) The wing walker and the headset man disconnected the towbar from the tractor and the NLG respectively. [1.1(5)]

(6) Without parking brake set and chock in place, the aircraft, with both engines in idle power, rolled forward and collided with the tractor. [1.1(6)]

(7) The headset man resumed communication with flight crew after connecting his headset directly onto the flight interphone jack on the External Power Control Panel without using the wireless headset adapter. [1.1(6)]

(8) The aircraft held a valid Certificate of Airworthiness. [1.5]

(9) SOP RE-SOP-044 of HAECO did not specifically require the tractor driver to prepare the chocks. [1.11.3]

(10) The headset man, the wing walker and the tractor driver expressed in the interview that they had experienced previous pushback operations without the use of chock for NLG wheels. [1.12.1(d)]

(11) AOM of AAHK did not explicitly require the placement of a chock in front of the NLG wheels before disconnecting the towbar although AOM requires ground handling companies to observe company operating procedures and safety precautions specific to the type of the aircraft. [1.14]

(12) No contingency procedure was published by HAECO for guiding the ground handling crew in case of loss of interphone communication with the pilots. [2.1.1(4)]

(13) Human factors related to authority gradient, confirmation bias / norms, peer pressure, and lack of communication affected the actions and decisions of the ground handling crew leading to non-compliance with the SOPs. [2.2]

(14) The wireless headset setup was checked and found to operate normally after the serious incident but the possibility of system interruptions during the pushback operation could not be ruled out. [2.4]

(15) No issue on weather, aircraft system or flight operations relevant to the serious incident was found. [2.5]

3.2. Cause

(1) The ground handling crew disconnected the towbar without confirming the parking brake light on the NLG was ON. [3.1.(4)]

(2) A chock was not placed in front of the NLG wheel before disconnecting the towbar. [3.1.(2)]

3.3. Contributing Factor

(1) No chock of HAECO was available for the pushback operation. [3.1.(1)]

(2) Human factors including authority gradient, confirmation bias / norms, peer pressure, and communication affected the actions and decisions taken by the ground crew leading to non-compliance with relevant SOPs. [3.1.(13)]

4. Safety Actions Already Implemented

After the serious incident, HAECO has implemented the following safety actions:

(1) Revising the aircraft pushback SOP for eliminating confusion on the sequence of actions among the ground handling crew members and highlighting the need for confirmation of the parking brake set.

(2) Conducting briefings to all relevant ground handling personnel to reinforce the use of chock before disconnecting towbar from the aircraft at the final stage of the pushback operation.

(3) Revising RE SOP to ensure two chocks are available on each tractor for pushback operation.

5. Safety Recommendations

5.1. Safety Recommendation 02-2021

It is recommended that the Hong Kong Aircraft Engineering Company Limited reinforces the training of ground handling personnel to ensure that they are conversant with the assigned ground handling operations and related human factor issues.

Safety Recommendation Owner: Hong Kong Aircraft Engineering Company Limited

5.2. Safety Recommendation 03-2021

It is recommended that the Hong Kong Aircraft Engineering Company Limited reinforces the surveillance activities for ensuring compliance with SOPs by the ground handling personnel.

Safety Recommendation Owner: Hong Kong Aircraft Engineering Company Limited

5.3. Safety Recommendation 04-2021

It is recommended that the Hong Kong Aircraft Engineering Company Limited establishes procedures in SOP for guiding ground handling personnel in case of loss of interphone communication with the flight crew during pushback operation.

Safety Recommendation Owner: Hong Kong Aircraft Engineering Company Limited

5.4. Safety Recommendation 05-2021

It is recommended that the Airport Authority Hong Kong considers amending Aircraft Departure Procedures of the Airport Operations Manual - Airfield Operations to require all ground handling companies to place chock in front of the NLG wheels before disconnecting the towbar from an aircraft after pushback operation.

Safety Recommendation Owner: Airport Authority Hong Kong

6. General Details

6.1. Personnel Details

6.1.1. Ground Handling Crew

The experience of the ground handling crew is listed below:

Post	Date Joined	Qualified Since	Experiences (Months)
Headset Man	February 2014	August 2016	40
Wing Walker	July 2018	August 2018	16
Tractor Driver	January 2008	August 2015	52

6.1.2. Flight Crew

The experience of the flight crew is listed below:

Position	Total Flying Hours	Total Flying Hours on A330 Type
Pilot in Command	24,376	7,129
Copilot	5,396	3,607

6.2. Aircraft Details

Aircraft Type	Airbus A330-343
Aircraft Registration	B-HLT
Aircraft Serial Number	439
No. & Type of Engines	2 Rolls-Royce Trent 772B-60 turbofan engines
Year of Manufacture	2001
Certificate of Airworthiness	Dated 2 September 2019 valid until 1 September 2020
Last Maintenance Check	Last A1 Check dated 18 June 2019 Last 4C Check dated 23 July 2019

7. Abbreviations

AAHK	Airport Authority Hong Kong
HAECO	Hong Kong Aircraft Engineering Company Limited
HKIA	Hong Kong International Airport
LSTO	Line Services Technical Operations
METAR	Meteorological Aerodrome Weather Report
NLG	Nose Landing Gear
RE	Ramp Equipment
SOP	Standard Operating Procedure

8. Table of Figures, Photos, Tables

9. Appendices

9.1. HAECO SOP LSTO-SOP-001a for Headset Man

Standard Operating Procedure for LSTO
(This SOP does not override any AMM or company procedure)

HAECO

3. Departure Procedure

4.1 Before Pushback

Before Pushback Procedures	Headset Man - Confirmation
1. Installation of NLG Steering Bypass Pin (SBP)  *Note: Bungee cord add-on to all B744/B748 SBP for holding SBP in position after installation*	• Confirm **CORRECT** type and **ball lock function** of SBP before installed • Make sure SBP **securely locked** with fingers checking • Elastic lanyard connect between SBP and wireless adaptor ****Refer to Appendix 2 for details procedure****  

Standard Operating Procedure for LSTO
(This SOP does not override any AMM or company procedure)

HAECO

Before Pushback Procedures	Headset Man - Confirmation
2. Open and login the LS RAMP Mobile App	• Login 
3. Search correct aircraft *Note: Could be searched by Aircraft Registration / Flight Number / Bay*	• Select correct aircraft
4. Scan SBP QR Code *Note: A best practice is to install the SBP and scan the QR code in the earliest opportunity after aircraft met* *Note: report unreadable QR code SBP to Tool room for repair* 	• Press the "Scan QR code" button and scan the QR code from the tag • In case the App is not working, sign off the SBP Installation Record (Provided by tractor driver) and inform team controller for record. 
5. Check 2ea safety chocks available on tractor	• Safety chocks are prepared by tractor drivers (If shortage of chock, inform tractor driver to provide)

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Figure 3: Extract of HAECO SOP LSTO-SOP-001a (Rev 14 dated 04 Dec 2019) for Headset Man

4.3 After Pushback

After Pushback Procedures	Headset Man - Confirmation
1. Aircraft fully stopped	• Confirm stop at designated Tug Stop Point • Confirm aircraft stop signal from tractor driver
2. Notify cockpit for parking brake set	• **"Ground to cockpit, pushback complete. Set parking brake"**
3. Parking brake light "ON"	• Check NLG park brake light **'ON'** • "Thumb up" signal to driver for parking brake set
4. If towbarless tractor, driver disconnect tractor	• Confirm to disconnect
5. Nose chock in position	• Confirm Wing Walk place a chock in front of nose wheel for **safety**
6. For conventional towbar tractor, disconnect towbar	• Disconnect towbar by Wing walker from tractor side
7. Disconnect towbar from the aircraft side and wait for signal from driver	• For towbarless tractor, skip this step and go to step 9 Wing Walker disconnect towbar from the aircraft side and stay at NLG area. After tractor reverse, move forward and turn 135°left/right forward, tractor rear end facing NLG and driver activates Hazard Warning Lights as a signal for Wing Walker to reconnect towbar to tractor side

Figure 4: Extract of HAECO SOP LSTO-SOP-001a (Rev 14 dated 04 Dec 2019) for Headset Man (Cont'd)

9.2. HAECO SOP LSTO-SOP-001b for Wing Walker

Standard Operating Procedure for LSTO
(This SOP does not override any AMM or company procedure)

HAECO

3. Departure Procedure

3.1 Before Pushback

Before Pushback Procedures	Wing Walker - Confirmation
1. Check 2ea safety chocks available on tractor	• Safety chocks are prepared by tractor drivers
2. Pre-departure check	• WAC (Including FOD check) • Ensure all doors/panels closed • Confirm all landing gear downlock pins removed • Check elastic lanyard connected between SBP and wireless adaptor ****Refer to Appendix 2 for details procedure****
3. Connect towbarless tractor / towbar *Note: Nose chocks could be removed for towbaless tractor*	• **CORRECT type** of towbar connect / tractor connect
4. Ensure pushback color	• Acknowledge with headset man for the pushback color (**Red**, **Blue** or **Green**
5. Verify tractor driver the pushback color *Note: Beacon light may ON at this stage*	• Checked indicator bar shown the **CORRECT color** 

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Standard Operating Procedure for LSTO
(This SOP does not override any AMM or company procedure)

HAECO

3.3 After Pushback

After Pushback Procedures	Wing Walker - Confirmation
1. Parking brake light "ON"	• Check NLG park brake light **'ON'**
2. Nose chock in position	• Place a chock in front of nose wheel for **safety**
3. For conventional towbar tractor, disconnect towbar	• Disconnect towbar by Wing walker from tractor side
4. Disconnect towbar from the aircraft side and wait for signal from driver	• For towbarless tractor, skip this step and go to step 9 • Disconnect towbar from the aircraft side and stay at NLG area. After tractor reverse back, move forward and turn 135°left/right forward, tractor rear end facing NLG and driver activates Hazard Warning Lights
5. Connect towbar to tractor rear end	• Wing walker connect towbar to tractor rear end • Give signal to tractor driver after confirm the towbar correctly connected and both headset man and Wing Walker stand in safe area (Beside NLG wheel) for tractor leave
6. NLG chock removal	• Remove and hold NLG chock after clearance signal from headset man
7. Check SBP and adaptor remove and standby for leave	• Standby at aircraft wing tip until aircraft has passed their standing position and leave • ****Refer to Appendix 2 for details procedure****
8. Ground equipment place back at designated area	• Confirm Wing Walker place chocks/earthing cable at designated area
9. Tractor driver confirm the towbar correctly connect and chock placed in the designated area.	• For information only.

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Figure 5: Extract of HAECO SOP LSTO-SOP-001b (Rev 14 dated 04 Dec 2019) for Wing Walker