

AAIB Bulletin No: 1/96

Ref: EW/C95/10/5

Category: 1.1

INCIDENT

Aircraft Type and Registration:	Boeing 747-400, HL7482	
No & Type of Engines:	4 Pratt & Whitney PW4056 turbofan engines	
Year of Manufacture:	1991	
Date & Time (UTC):	30 October 1995 at 1718 hrs	
Location:	Stand L27 at London Heathrow Airport	
Type of Flight:	Scheduled Passenger	
Persons on Board:	Crew - 22	Passengers - 297
Injuries:	Crew - None	Passengers - None
Nature of Damage:	Minor to upper surface of left wing	
Commander's Licence:	Airline Transport Pilot's Licence	
Commander's Age:	58 years	
Commander's Flying Experience:	17,000 hours (of which 4,000 were on type)	
	Last 90 days - 200 hours	
	Last 28 days - 75 hours	
Information Source:	AAIB Field Investigation	

The aircraft departed Seoul, Korea at 0350 hrs on a scheduled passenger flight to London Heathrow landing at 1705 hrs. The flight crew, who were well rested before they commenced duty, consisted of a commander and first officer augmented by a second captain and first officer. The secondary crew acted as an in-flight relief allowing the primary crew to take 6.5 hours rest during the cruise phase of the flight.

After landing the commander was instructed to taxi to Stand L27 for parking. Stand L27, a 'nose in' stand on Pier 5 at Terminal 3, consists of one fixed and one movable airbridge jetty and is equipped with an AGNIS (Azimuth Guidance Nose In Stands) and a PAPA (Parallax Aircraft Parking Aid) system for aircraft parking guidance. Prior to the aircraft's arrival on stand the ramp dispatcher checked that the wheels of the moveable jetty were positioned within their designated parking area and that the AGNIS and PAPA lights were selected on and serviceable.

The aircraft was initially aligned to the right of the lead-in line as it taxied onto the stand and hence the commander's attention was occupied primarily with the aircraft's correct azimuth alignment. The first officer's duty during this manoeuvre was to monitor the alignment and advise the commander of the aircraft's ground speed displayed on the EFIS (Electronic Flight Instrument System). He could not comment on the aircraft's progress in relation to the PAPA as his view of it was obstructed by a windscreen pillar and its alignment was set up for use only by the aircraft's left seat occupant.

The first officer reported that the aircraft's ground speed was 3 kt as it approached the stand. Data recorded on the aircraft's DFDR (Digital Flight Data Recorder), analysed by the AAIB, showed that the ground speed was in fact 6 kt. Furthermore, the dispatcher standing in the mouth of the fixed jetty, stated that the aircraft's taxi speed was "very fast indeed" and "a lot faster than normal". The commander stated that he inadvertently missed the correct stopping position, as indicated in the PAPA, because his attention was split between the AGNIS display ahead of the aircraft and the PAPA display board some 60° to his right.

The dispatcher realised that the aircraft was not going to stop at its designated position when he saw the passenger door travel past the jetty opening. He had no means of signalling to the crew. The commander stopped the aircraft when he realised that he was beyond the correct position but he was not aware that the left wing upper surface had been damaged as it came into contact with the lower section of the moveable jetty. At the time of the collision the aircraft's nosewheel was some 21 feet beyond its normal stopping position. The crew were informed that the aircraft had hit the jetty by a ground crew member via the aircraft's external interphone system after the engines had been shut down. The passengers were disembarked normally via mobile steps positioned at the rear door.

Previous AAIB recommendation (92-52)

On 9 April 1992 a Boeing 747SP-31 collided with an airbridge jetty on Stand 29 at London Heathrow. The top surface of the left wing 2 metres out from the wing root was damaged when it came into contact with the electrical motor projecting from the outboard side of the mobile airbridge. The AAIB report into this accident identified the fact that there was no device for signalling to crews that they had moved too far forward, nor any form of "emergency stop" signal which could have been activated by the ground staff. As a result of this accident the AAIB made, amongst others, the following recommendation:

92-52: The CAA should begin a consultative process with aerodrome operators, with a view to the introduction of a prominent "emergency stop" indicating system for each self manoeuvring stand, to be activated in the event of an unforeseen occurrence where the aircraft is required to stop urgently.

CAA response

The CAA responded to the above recommendation thus:

'The Authority (CAA) accepts this Recommendation and recognises the advantage of being able to instruct aircraft to stop during the docking manoeuvre. The Authority will undertake a consultation with industry in order to establish the most effective method of implementing 'emergency stop' indicating systems on self manoeuvring stands.'

CAA action

The CAA established a Working Group with Industry to address Recommendation 92-52. The Working Group agreed that this accident arose from a combination of factors relating primarily to the marking of the stop position indicator and aircrew human factors, with the added complication of the incorrectly positioned mobile airbridge. The underlying cause was more concerned with inadequate safety management and human factors. It concluded that an emergency stop system (ESS) would not have prevented this particular accident.

In order to ensure that the potential benefits resulting from the introduction of ESS on self manoeuvring stands were comprehensively assessed the Working Group reviewed all aircraft parking apron jetty accidents recorded on the Safety Regulation Group's database over a 10 year period. Of the 28 occurrences examined, 4 involved aircraft overrunning the designated parking stop position and 3 involved impact with the mobile airbridge and minor damage to the aircraft. The Group came to the view that, had ESS been available in each of the events thus reviewed, its contribution in terms of accident prevention would have been negligible. In fact there was only one accident where the Group could agree that the provision of ESS would have had any influence at all. As a result of these deliberations the Working Group was unable to support the introduction of emergency stop indicating systems for all self manoeuvring stands.

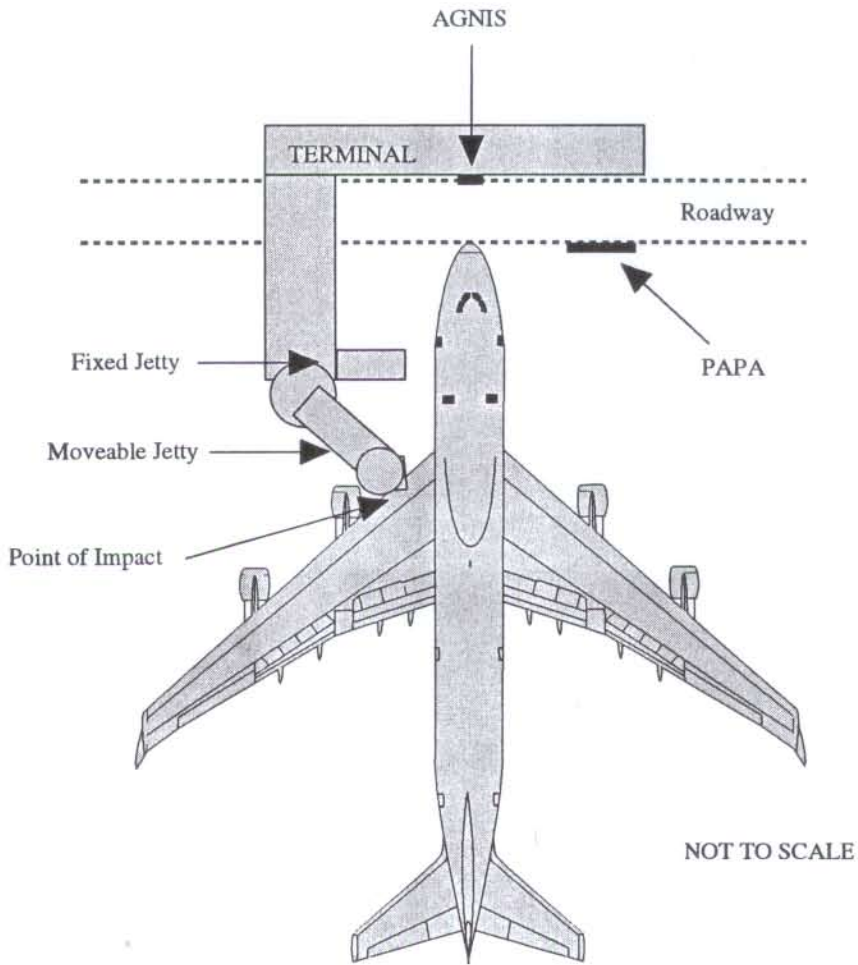
The CAA considered this conclusion both within the context of implementation and the relatively low incidence of the type of accidents in which provision of ESS would have significant safety benefits. The CAA decided that it will not propose mandatory introduction of emergency stop systems. However, in the course of its review the Working Group concluded that there are significant problems associated with wider questions concerned with the training, judgement and discipline of apron staff and that this in turn indicates underlying problems associated with inadequate apron safety procedures and safety management systems. This work persuaded the CAA to re-convene the Working Group with new terms of reference to address apron safety management issues more comprehensively.

Resulting from this work is a new Civil Aviation Publication (CAP 642 - Airside Safety Management). The document gives guidance to airport operating authorities, referencing certain mandatory provisions and 'best practice'. The first Parts of this new CAP were published in March 1995 with subsequent Parts being published as they received CAA approval. Part 5, which has been published recently, sets out '....both broad and detailed requirements to be incorporated in the Safety Management System. Following them will promote safe and effective handling procedures for aircraft and equipment and will maintain a safe working environment for all staff. There is an emphasis on the need for effective training and supervision and the 'best practice' advice given is for a wide range of airports, aerodromes and associated operators; all should be applied in the various apron operations.' Paragraph 3 of part 5 covers aircraft parking safety practices and sub paragraph 3.5.2 deals with the Emergency Stop System. It states:

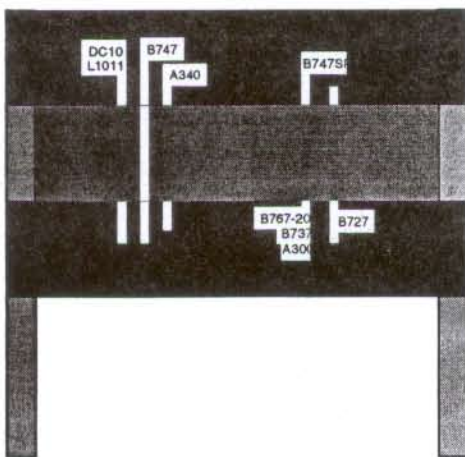
' In order to deal with no-notice contingencies, failures and emergency situations on nose-in stands, consideration should be given to an indicator system to warn the pilot to make an emergency stop. Where signs are provided they should be located where easily visible to pilots, directly in front of the pilots and at a suitable height. The sign should be conspicuous and may take the form of a red flashing electronic warning sign indicating EMERGENCY STOP or STOP. The emergency stop warning should be capable of being activated both from the airbridge cab and from apron level.'

Whilst not a mandatory requirement, the provision of ESS constitutes 'best practice'. The CAA Safety Regulation Group have indicated that their routine audits of aerodrome operations will require confirmation that a positive approach which reflects this 'best practice' guidance is being adopted

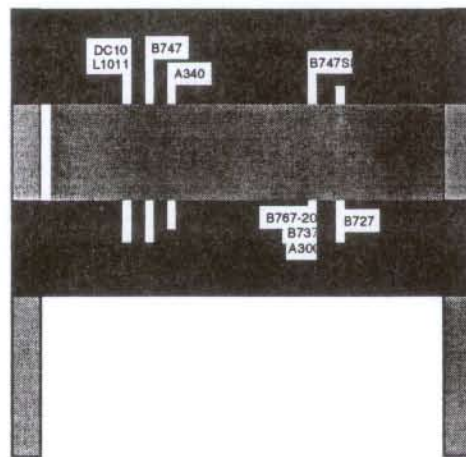
DIAGRAM OF AIRCRAFT POSITION ON STAND



PAPA BOARD INDICATIONS



Pilot's view of PAPA Board indications for correct parking position.



Pilot's view of PAPA Board indications at time of collision.