Aviation Safety Investigation Report 199002004

**Boeing B707** 

21 September 1990

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NOTE: All air safety occurrences reported to the ATSB are categorised and recorded. For a detailed explanation on Category definitions please refer to the ATSB website at <u>www.atsb.gov.au</u>.

Occurrence Number: Location: Date:		199002004 Sydney NSW 21 September 1990			Occurrence Type: Accident Time: 925	
Hignest Injury	Level:	N1I				
Injuries:			Fatal	Serious	Minor	None
		Crew	0	0	3	3
		Ground	0	0	0	-
		Passenger	0	0	0	2
		Total	0	0	0	5
	-					
Aircraft Details:	Boeing B/0/					
Registration:	VR-HKK					
Serial Number:	20517					
<b>Operation Type:</b>	Charter					
Damage Level:	Substantial					
<b>Departure Point:</b>	Sydney NSW					
Departure Time:	N/A					
Destination:	Hong K	long				

## Approved for Release: 15th January 1992

## **Circumstances:**

The aircraft was being prepared for a normal push-back DEPARTURE from the Sydney freight apron position V2. A towing tug was connected to the nose gear and number two engine was running at idle power. The aircraft was cleared to be pushed back to taxiway GOLF where the other engines would be started. The aircraft brakes were released but as the tug took the weight for the push back, there was a loud report and the nose of the aircraft collapsed onto the cabin roof of the tug. The nose wheels folded back under the fuselage and arrested its fall, saving the tug cabin from further collapse. The engine was immediately shut down and the crew departed the aircraft to assess the damage. Investigation revealed the nose landing gear oleo outer cylinder, fabricated from 7079-T6 alloy, had failed at the upper end of the cylinder bore. The failure was found to be .039 inches, marginally less than the manufacturer's minimum dimension of .040 inches. Extension of the crack due to stress corrosion was extremely rapid and may have occurred whilst the aircraft was parked at Sydney. Because of numerous reports of cracking in this area, the manufacturer issued a service letter recommending that operators consider replacement of nose landing gear cylinders fabricated from 7079-T6 alloy with cylinders of 7075-T3 or 7049-T73 alloy at overhaul.

## **Significant Factors:**

The following factors were considered relevant to the development of the accident

1. A fatigue crack developed in the bore top radius of the nose landing gear cylinder.

2. The marginal dimension of the bore top radius may have contributed to the development of the initial fatigue crack.

3. Stress corrosion then developed the crack at a rapid rate to final failure.

## **Reccomendations:**

A recommendation to improve the strength of towing tug cabins is being prepared.