



**FINAL REPORT  
AIC 19-1004**

**Air Sanga Limited  
P2-ASZ**

**PAC 750**

**Abnormal airstrip contact during landing**

**Efogi Airstrip, Central Province**

**Papua New Guinea**

**7 October 2019**



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## ABOUT THE AIC

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The Accident Investigation Commission (AIC) is an independent statutory agency within Papua New Guinea (PNG). The AIC is governed by a Commission and is entirely separate from the judiciary, transport regulators, policy makers and service providers. The AIC's function is to improve safety and public confidence in the aviation mode of transport through excellence in: independent investigation of aviation accidents and other safety occurrences within the aviation system; safety data recording and analysis; and fostering safety awareness, knowledge and action.

The AIC is responsible for investigating accidents and other transport safety matters involving civil aviation in PNG, as well as participating in overseas investigations involving PNG registered aircraft. A primary concern is the safety of commercial transport, with particular regard to fare-paying passenger operations.

The AIC performs its functions in accordance with the provisions of the *PNG Civil Aviation Act 2000 (As amended)*, and the *Commissions of Inquiry Act 1951*, and in accordance with *Annex 13* to the *Convention on International Civil Aviation*.

The objective of a safety investigation is to identify and reduce safety-related risk. AIC investigations determine and communicate the safety factors related to the transport safety matter being investigated.

It is not a function of the AIC to apportion blame or determine liability. At the same time, an investigation report must include relevant factual material of sufficient weight to support the analysis and findings. At all times the AIC endeavours to balance the use of material that could imply adverse comment with the need to properly explain what happened, and why it happened, in a fair and unbiased manner.



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## ABOUT THIS REPORT

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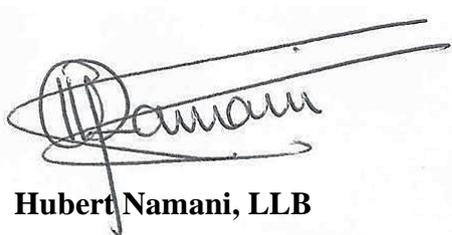
The AIC was informed by Air Sanga Limited on 9 October 2019 of an accident of a PAC 750 aircraft that occurred on 7 October 2019 at Efogi airstrip, Central Province. AIC received the notification through an email correspondence around 12:35 and immediately commenced an office investigation.

This *Final Report* was produced by the PNG AIC, PO Box 1709, Boroko 111, NCD, Papua New Guinea and the Commission has made it publicly available in accordance with ICAO Annex 13, Chapter 3, paragraph 6.5. It will be published on the PNG AIC website

The report is based on the investigation carried out by the AIC under the Papua New Guinea *Civil Aviation Act 2000 (As Amended)*, and *Annex 13 to the Convention on International Civil Aviation*. It contains factual information, analysis of that information, findings and contributing (causal) factors, other factors, safety actions, and safety recommendations.

Although AIC investigations explore the areas surrounding an occurrence, only those facts that are relevant to understanding how and why the accident occurred are included in the report. The report may also contain other non-contributing factors which have been identified as safety deficiencies for the purpose of improving safety.

Readers are advised that in accordance with *Annex 13 to the Convention on International Civil Aviation*, it is not the purpose of an AIC aircraft accident investigation to apportion blame or liability. The sole objective of the investigation and the final report is the prevention of accidents and incidents (Reference: *ICAO Annex 13, Chapter 3, paragraph 3.1*). Consequently, AIC reports are confined to matters of safety significance and may be misleading if used for any other purpose



**Hubert Namani, LLB**

*Chief Commissioner*

16 October 2020



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## **GLOSSARY OF ABBREVIATION**

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AD	:	Airworthiness Directive
AFM	:	Aircraft Flight Manual
AIC	:	Accident Investigation Commission
AOC	:	An Air Operator Certificate
ASL	:	Air Sanga Limited
ATS	:	Air Traffic Service
CAANZ	:	Civil Aviation Authority of New Zealand
CASAPNG	:	Civil Aviation Safety Authority of Papua New Guinea
INCERFA	:	Uncertainty phase
LAME	:	Licence Aircraft Maintenance Engineer
MEL	:	Minimum equipment list
MSB	:	Mandatory Service Bulletin
NAS	:	National Aviation Services
RAA	:	Rural Airstrip Agency
RPM	:	Revolution Per Minute
SAR	:	Search and Rescue
SARWATCH	:	Search and Rescue Watch
SB	:	Service Bulletin
STOL	:	Short Take-Off and Landing
TAIC	:	Transport Accident Investigation Commission
VFR	:	Visual flight rules



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# INTRODUCTION

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## SYNOPSIS

On 7 October 2019, at about 11:30 (01:30 UTC) a PAC 750XL aircraft, registered P2-ASZ, owned and operated by Air Sanga Limited, was involved in a landing accident subsequent to touchdown at the Efogi airstrip in the Central Province.

The aircraft departed Jacksons International Airport at 11:10 on a VFR charter flight to Efogi with six passengers onboard. The flight was a VFR charter flight transporting six passengers and cargo.

According to the pilot, when he arrived at Efogi, the weather was fine with patches of cloud around the area but clear of his approach path. During the final approach, he encountered tailwind and several downdraughts. He subsequently increased airspeed and maintained his approach profile. Upon touchdown, the aircraft reportedly lifted back off the ground.

The aircraft remained airborne and travelled about 50 m above the airstrip before the nosewheel impacted a soft opposing face of a depression in the ground. The aircraft bounced as the nosewheel separated from the strut. As the aircraft returned to the ground the propeller blades struck the ground and the nose landing gear strut collapsed. The aircraft scraped on its bare nose for about 10 meters before eventually coming to rest.

The aircraft came to a complete stop less than 100 m from its touchdown point with its nose and cargo pod resting on the ground.

All the passengers and pilot evacuated without injuries.



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# 1 FACTUAL INFORMATION

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## 1.1 History of the flight

On 7 October 2019, at 11:10 local time (01:10 UTC<sup>1</sup>), a PAC 750XL aircraft registered P2-ASZ owned and operated by Air Sanga Limited departed from Jacksons International Airport, Port Moresby, National Capital District to Efogi Airstrip, Central Province, Papua New Guinea, when, during its landing roll at Efogi, the nose landing gear collapsed.



**Figure 1: Efogi Airstrip in relation to Port Moresby.**

Earlier the day of the occurrence, the pilot called an agent residing in Efogi prior to commence the flight at Jacksons International Airport, to get a weather report for the airstrip. The agent reported that that it was windy and variable but the sky was clear. With the local weather obtained, the pilot departed Jacksons International Airport on a VFR<sup>2</sup> charter with six passengers and cargo on board. The aircraft departed at 11:10 tracking outbound on 050 degrees, VFR route Golf at a cruise altitude of 7000 ft.

The pilot called Moresby Flight Service at 11:27 on High Frequency (HF) and reported that he had arrived in the Efogi circuit area and would cancel SARWATCH<sup>3</sup> after landing.

During the final approach the pilot noticed that he had a tailwind of about 10 kt, with gusts. He also encountered several downdraughts, so he decided to adjust his reference airspeed from 75 kt to 80 kt.

Upon touchdown, while the nosewheel was still in the air, the pilot selected reverse thrust and retracted the flap. About 10 m from touchdown, as the nosewheel contacted the ground, the aircraft encountered a gust of wind and became airborne again. It travelled 50 m gradually descending back to the ground. The pilot stated that he attempted to flare the aircraft again to land but the aircraft did not pitch up as intended and instead wheelbarrowed into a soft depression in the strip surface.

The nosewheel concurrently separated from the nose gear assembly at the fork as the aircraft abruptly bounced off the surface.

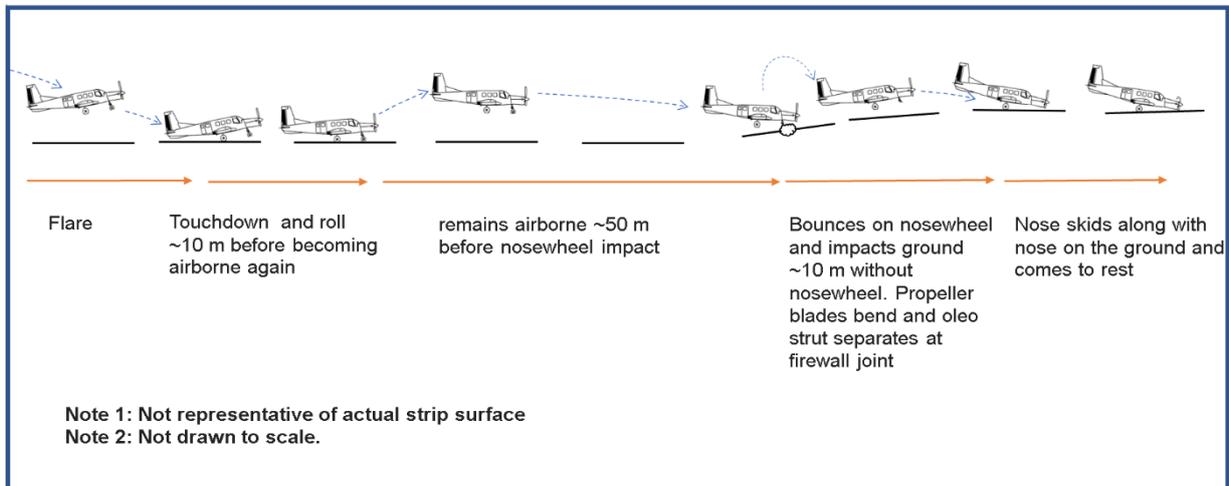
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1 Coordinated Universal Time is the primary time standard by which the world regulates clocks and time.

2 Visual Flight Rules

3 Monitoring of a flight to activate emergency services if not cancelled by a specific time

The aircraft travelled about 10 m before the nose dropped towards the ground bringing the propeller and oleo strut to eventually impact the ground. The propeller blades were bent significantly, the oleo strut separated at its firewall joint as the nose plunged into the ground.



**Figure 2: General sequence of events during landing.**

The aircraft continued for another 10 m with the nose grinding against the ground as the pilot quickly shut the engine down. As soon as the aircraft came to rest, the pilot evacuated the passengers.

The pilot did not cancel SARWATCH on the ground after the accident.

## 1.2 Injuries to persons

Injuries	Flight crew	Passengers	Total in Aircraft	Others
Fatal	-	-	-	-
Serious	-	-	-	-
Minor	-	-	-	Not applicable
Nil Injuries	1	6	7	Not applicable
<b>TOTAL</b>	<b>1</b>	<b>6</b>	<b>7</b>	<b>-</b>

**Table 1. Injuries to persons**

## 1.3 Damage to aircraft

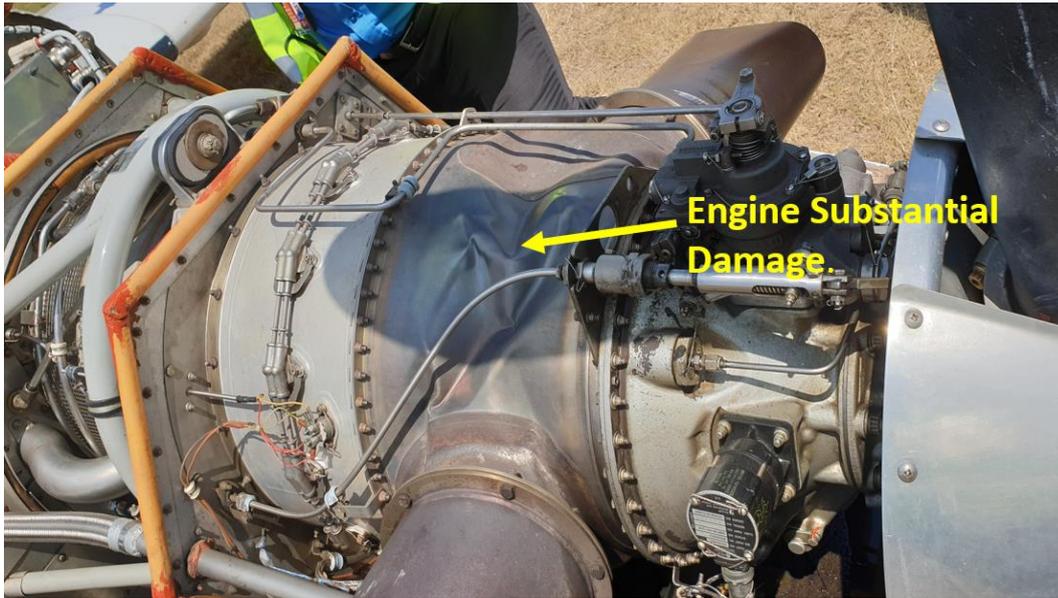
The aircraft was substantially damaged during the accident. Most of the damage was found towards the forward section of the aircraft. These included the engine, propellers, cargo pod, nose landing gear and the airframe section under the engine air intake.



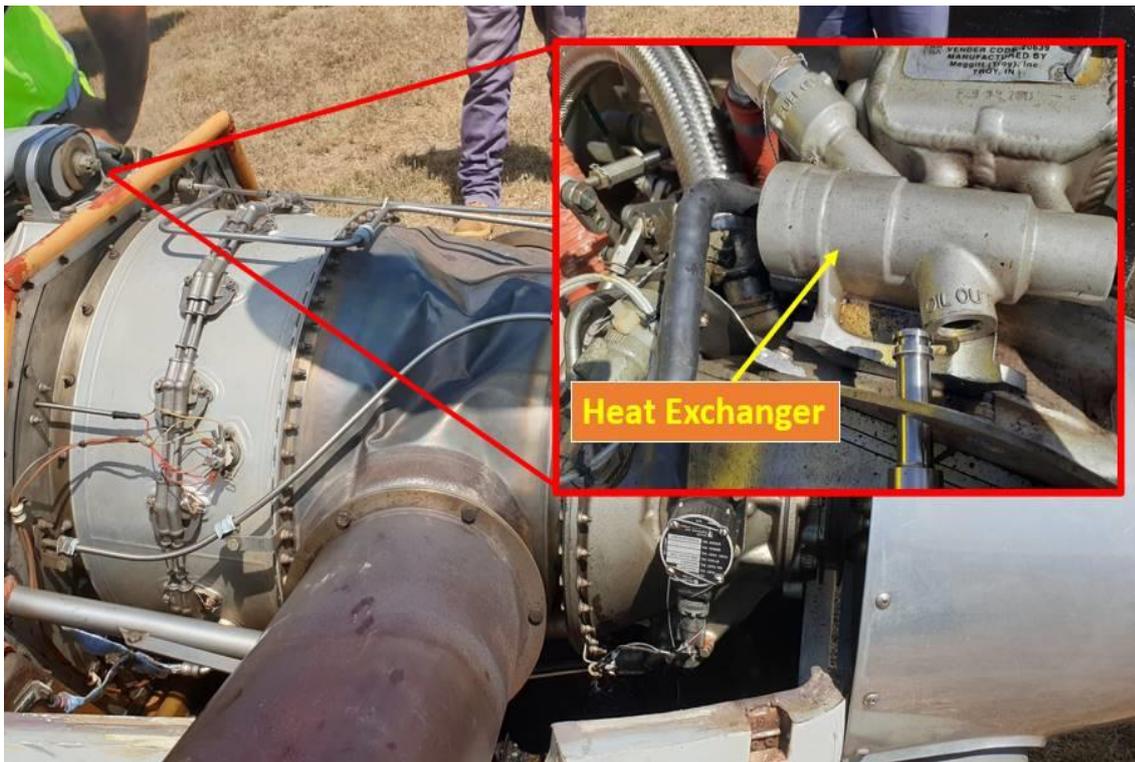
**Figure 3: The nose wheel separation and nose landing gear strut damage.**



**Figure 4: Propeller damage.**



**Figure 5: Substantial damage of the engine reduction and exhaust section.**



**Figure 6: Damage to the fuel and oil heat exchanger.**

#### **1.4 Other damage**

No damage to property or environment was observed or reported.

## 1.5 Personnel information

### 1.5.1 Pilot in command

Age	: 61 years
Gender	: Male
Nationality	: Papua New Guinean
Position	: Pilot in command
Type of license	: PNG CPL
Type rating	: PAC-750XL, C206
Total flying time	: 13123.8 hours
Total on PAC 750	: 3231.1 hours
Total hours last 30 days	: 62.3 hours
Total hours last 7 days	: 16.2 hours
Total hours last 24 hours	: 5.4 hours
Medical class	: One
Valid to	: 15 October, 2019
Medical limitation	: Nil

The pilot was qualified and was experienced with remote airstrip operations within Papua New Guinea. According to his statement, he was particularly familiar with Efogi as he had operated into that airstrip more than 800 times.

## 1.6 Aircraft Information

According to the manufacturer, the PAC 750XL, is a utility aircraft of conventional all-metal low-wing monoplane design, with fixed tricycle undercarriage and Extremely Short Take-Off and Landing (XSTOL) capabilities. Combining the engine and wings of the PAC Cresco with a new large fuselage and modified tail, all versions to date have been powered by a 750 horse power (hp) PT6 engine.

### 1.6.1 Aircraft data

Aircraft manufacturer	: Pacific Aerospace Limited
Model	: PAC 750XL
Serial number	: 179
Year of manufacture	: 2005
Registration	: P2-ASZ
Name of the operator	: Air Sanga Limited
Certificate of Airworthiness number	: 181
Certificate of Airworthiness issued	: 29 November 2011
Valid to	: Non-Terminating
Certificate of Registration number	: 181
Certificate of Registration issued	: 29 November 2011
Certificate of Registration valid to	: Non-Terminating
Total airframe hours	: 3668.3

## 1.6.2 Engine data

Engine type	: Turbo-propeller
Manufacturer	: Pratt and Whitney Canada (P&WC)
Type	: PT6A-34
Serial Number	: PCE-RB0556
Time Since New	: 3668.3
Cycles Since New	: 6682

## 1.6.3 Propeller

Manufacturer	: Hartzell
Model	: B3TN
Serial Number	: BUA-31309
Type	: 3 blade, constant speed, full feathering reversible pitch

## 1.6.4 PAC 750XL Nose Landing Gear Assembly

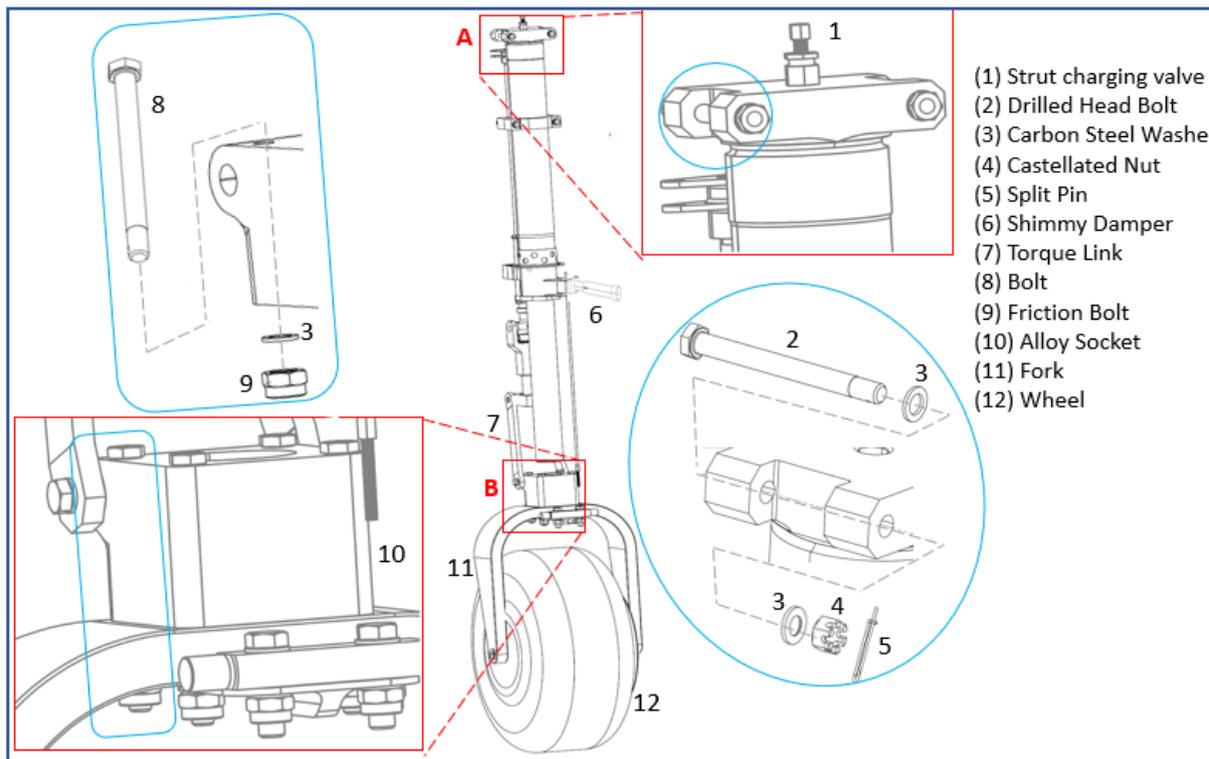
The PAC 750XL has a fixed tricycle landing gear with oleo type struts; two landing gears at each wing (Main Landing Gear) and nose landing gear.

The nose landing gear is located between two reinforcing angles on the forward face of the stainless-steel firewall diaphragm.

The steerable nosewheel is actuated by a steering post and mechanical linkage attached to the piston. With weight on the nose wheel the linkage assumes a geometric configuration through which direct control of the nose wheel is achieved by rotating the steering post by means of pushrods connecting to the rudder pedals. When weight is removed, as in flight, the linkage extends disengaging the steering, locking the wheel in a line of flight position and freeing the rudder pedal for control of the rudder only.

Bolted to an alloy socket at the base of the piston are the nose wheel fork and the lower portion of the steering linkage. The upper portion of the linkage connects to the steering post which in turn is supported at its lower end to the shock strut cylinder in a trunnion type bearing. A nylon bumper pad is set in the lower portion of the linkage to limit the extension of the piston when the wheel is clear of the ground, in addition as a safety feature in the event of a linkage failure, two cables are connected between the cylinder and the nose landing gear fork.

During the investigation, the nosewheel was tested and found to be rotating freely as designed. There was no evidence of gear hydraulic failure.



**Figure 7: Nose Landing Gear Assembly**

The bolts holding the nosewheel fork to the strut socket snapped and caused the fork and wheel to separate from the strut. (see Figure 7)

Subsequently, the strut impacted the ground and the two bolts attaching the strut to the firewall were forced out of their nuts through thread stripping. The threads on both nuts were stripped and separated from their bolts. The split pins holding the nuts in place were segmented when the nut released from the bolt threads.

## 1.6.5 Maintenance

### 1.6.5.1 Scheduled Maintenance Program

*The 750XL MAINTENANCE MANUAL Chapter 5 INSPECTION & CHECK sates:*

(1) The check inspection pattern is as follows:

(a) **CHECK 1:** 150 hours or 1500 landings (whichever occurs first).

(b) **CHECK 2:** 300 hours or 3000 landings (whichever occurs first).

It is important to note that as in other general maintenance practices, Check 2 is a cumulative inspection that includes the requirements of Check 1.

The investigation reviewed the operator's maintenance records with regard to Check 1 and Check 2. It was found that previous Check 1 and Check 2 were overdue when conducted. The following table shows the specific dates, airframe hours and landings associated to these scheduled maintenance activities.

Maintenance Schedule	Maintenance schedule completion			Next maintenance due		Interval due	
	Date completed	Airframe hours	Landings	Airframe hours	Landings	Airframe hours	Landings
Check 2	28-Mar-2018	2915	5398				
Check 1	24-Jul-2018	3284.1	5733	3065	6898	369.1	335
Check 2	24-Jan-2019	3418.2	5979	3215	7233	503.2	581
Check 1	14-Aug-2019	3568.2	6388	3568.2	7479	150	409

**Table 2. Time intervals for Check 1 and Check 2. Source: Air Sanga maintenance records**

The investigation determined that the operator did not comply with the *750XL MAINTENANCE MANUAL*.

#### 1.6.5.2 Mandatory Service Bulletins (MSB) action

The Operator was subscribed to the Pacific Aerospace Limited (PAL) website to access technical documents for maintenance.

In June 2018, two *Mandatory Service Bulletins (MSB) PACSB/XL/105* were issued by PAL for service of the PAC750 XL aircraft nose landing gear (NLG):

- *PACSB/XL/105 Issue 1 - 12 June 2018*
- *PACSB/XL/105 Issue 2 - 28 June 2018*

The maintenance records showed that on 21 July 2018, an inspection was carried out by National Aviation Services (NAS) in accordance with the above MSBs.

In December 2018, two more Mandatory Service Bulletins (MSB) *PACSB/XL/105* were issued by PAL for service of the PAC750 XL aircraft nose landing gear (NLG):

- *PACSB/XL/105 Issue 3 - 14 Dec 2018*
- *PACSB/XL/105 Issue 4 - 19 Dec 2018.*

These MSBs specified an additional instruction for a daily inspection of the PAC750 XL aircraft nose landing gear (NLG). The latest issue (*issue 4*) *Part A*, included a separate step for an inspection of the NLG lower bolts and clamp to be carried out daily until the requirements of Part B are satisfied (Refer to Appendix B).

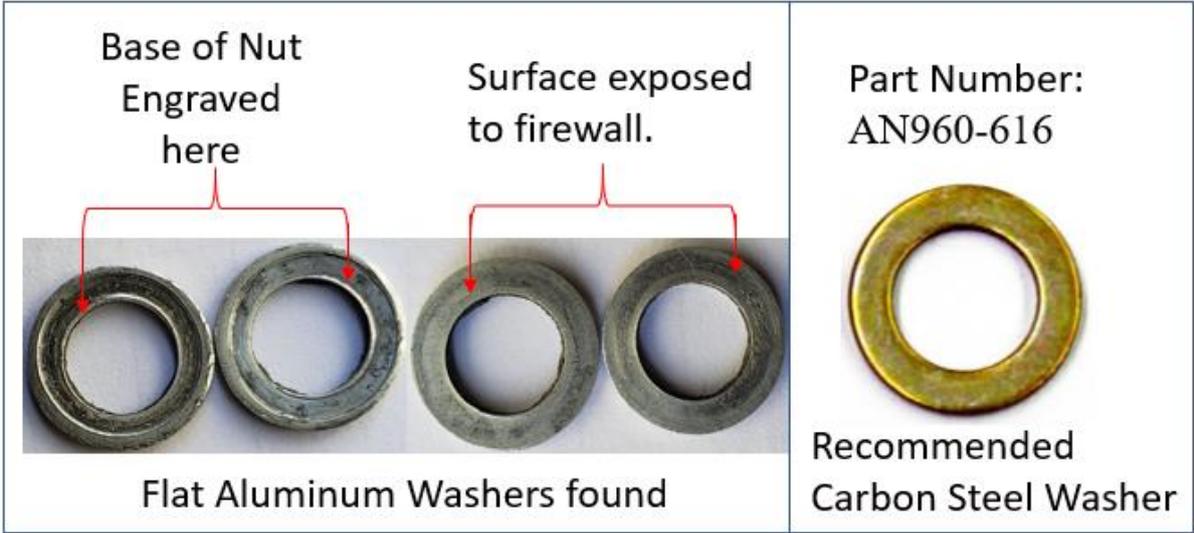
The maintenance records showed that on 14 August 2019, an inspection and subsequent incorporation of the requirements of Part B was carried out in accordance with MSB Issue 4 (See appendix B). The investigation also found that between 14 December 2018 and 14 August 2019, the daily inspection instruction in *PACSB/XL/105 Issue 3 and 4, Part A, Step 5* was not incorporated into the Operators daily check procedures. The part B of the MSB *PACSB/XL/105 Issue 4* specified the part numbers for the nuts, bolts, split pins and washers and their alternatives for the service to be completed. The nuts and bolts were recovered after the accident and were found to have met the specifications of the MSB.

The AIC also recovered two aluminum washers on the attachment at the firewall inside the cockpit. The shape of the base of the nuts were engraved into the washer.

As per the PAC750XL MSB, the part number specified was AN960-616. The material specification for washers with this part number is carbon steel.

NAS stated that during the MSB maintenance action carried out on 14 August 2019, the existing washers were removed and reinstalled with the castellated nuts. The investigation found that during that maintenance, the engineers did not recognize that incorrect washers were installed.

The AIC was unable to find records of the fitment of the aluminum washers.



**Figure 8: Aluminium washers found and Manufacturer’s recommended washers.**

**1.6.6 Fuel information**

The aircraft had 405.06 Litres of Jet A1 fuel. The planned fuel burn was 75.94 Litres (ie:25.31litres for taxi and 20.6 litres for the flight).

The evidence gathered during the investigation showed that the engine was operating at the time of the accident. The pilot also corroborated this evidence by stating that the engine was operating normally during the flight.

The AIC determined that fuel was not a contributing factor to this accident.

**1.6.7 Weight and Balance**

The weight and center of gravity of the aircraft for the flight were considered during the investigation. The data reviewed from the Air Sanga PAC 750XL Load SYSTEM DMA chart suggests that the aircraft was within its weight and balance Limits (Refer to Appendix C).

According to the *Air Sanga Operations Manual*, all cargo must be restrained using approved nets or tie-downs must be secured to the *Aircraft Flight Manual (AFM)* specified tie down points. The AIC did not find any evidence to show that any cargo shifted position during the flight.

**1.6.8 Collision Avoidance Systems**

The aircraft was equipped with a Mode S transponder and its serviceability was not a factor in this occurrence.

## 1.7 Meteorological information

### 1.7.1 Terminal Aerodrome Forecast<sup>4</sup> (TAF) for Port Moresby

**01:00 am 15:00 UTC 06/10/19**

Wind : 000° at 00 kt, (Calm)  
Visibility : 9999 (more than 10 km)  
Cloud/Precip : Few at 1,200 feet, Broken at 3,000 feet  
6 hr interval Temperature/QNH : 24°C/1008hPa, 24°C/1009hPa, 28°C/1011hPa, 29°C/1010hPa

**From 10:00 am (00:00 UTC) on 07/10/19**

Wind : 140° at 10 kt  
Visibility : 9999 (more than 10 km)  
Cloud/Precip : Scattered at 1,800 feet, Broken at 4,000 feet  
QNH<sup>5</sup> : 1011 (6 hour intervals)  
Temperature : 28°C

**Between 07 06:00 and 10:00 07/10/19**

40% probability of intermittent (30minute durations) deterioration of weather to:

**Wind** : Variable at 015 kts with gusts up to 25 kts  
**Visibility** : 4000 m (less than 4 km)  
**Cloud/Precip** : Few at 1,800 feet (Cumulonimbus), Broken at 800 feet  
**Precipitation** : Thunderstorms and Rain

### 1.7.2 Area Forecast (ARFOR)

**Wind** : 2000 ft, 160° 20 kts  
: 5000 ft 140° 25 kts  
: 7000 ft 140° 25 kts  
**Cloud** : Isolated Cumulonimbus 1600 ft to 45000 ft  
: Broken Stratus clouds at 800 ft to 3,000 ft including precipitation  
: Scattered Cumulus 1500 ft to 15000 ft and broken with showers  
: Scattered 3000 ft to 8000ft

### 1.7.3 Efogi Local Weather

The meteorological information provided by an agent on the ground at Efogi to the pilot was:

**Sky:** Blue (clear)

**Wind:** Variable gusting winds.

The conditions observed by the pilot on arrival were:

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<sup>4</sup> is a format for reporting weather forecast information

<sup>5</sup> The pressure set on the subscale of the altimeter so that the instrument indicates its height above sea level. The altimeter will read runway elevation when the aircraft is on the runway.

**Wind:** Variable gusting winds with a predominant tailwind of around 10 kt with gusts and downdraughts on final approach and landing.

**Visibility:** greater than 10 km.

**Cloud:** Scattered clouds, clear of airstrip area.

## 1.8 Aids to navigation

Efogi is a remote airstrip and does not have any ground-based navigation, approach or landing aids.

## 1.9 Communications

The aircraft was equipped with a High Frequency (HF) and Very High Frequency (VHF) two-way communication radio. Both communication systems were determined to have been serviceable.

All communications were normal from departure to the Efogi circuit area. The Flight progress strip reported data showed that at 11:20 the pilot transferred to Moresby Flight Information Service (FIS) and the pilot stated that he called on VHF 124.1. On entering the circuit area at 11:23, where reception on the VHF was lost, the pilot began communicating on HF 6622.

At 11:27 the pilot reported in the circuit area and was to call again on the ground to cancel SARWATCH. The FIS, therefore, anticipated another call from the pilot after landing for the cancellation of that service. However, no further communication was received from the pilot.

The quality of the HF audio recording received from PNG Air Services Limited (PNG ASL) was poor and could not identify the circuit area call made by the pilot. However, the flight progress strip of the FIS officer recorded the time of the circuit area call.

## 1.10 Airstrip information

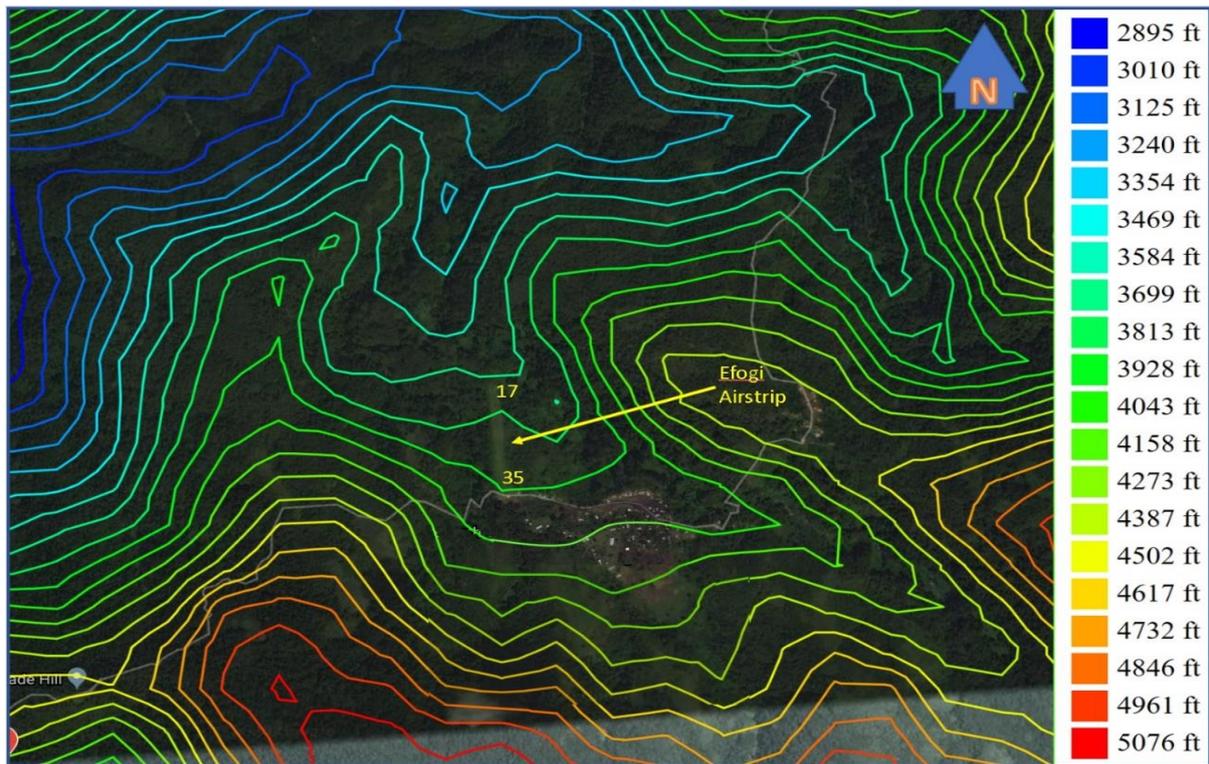
Efogi Airstrip is located in the Central Province about 30 nm North East of Port Moresby. The airstrip is just under 500 m long with obvious undulations and an average upslope of about 6.7% towards the Southern end. The steep Northern slope of the ridge situated immediately to the South of the airstrip makes it a one-way landing and take-off strip.

Southern ridge Slopes is where the village of Efogi is located towards the South East.

As per the topographical data, the Efogi airstrip is situated in a valley with elevated terrain towards the North all the way around to the East which extend up to the Owen Stanley ranges. The ridges extend down towards the South of the airstrip. To the West of the airstrip, the ridges peak at about 5,900 ft. (see Figure 9)

There are about five creeks following Efogi, and there are two rivers which run across immediately to the North and West of the airstrip (approach end) and there is a mountain that extends to the South West. The pilot stated that landing into Efogi, the flight goes between the two rivers and the turbulence experience there is quite strong.

The geographical position of the airstrip and surrounding give the area its own local wind and weather patterns.



**Figure 9: Efogi Area topography**

During an interview, Rural Airstrip Agency (RAA), organisation engaged in surveying and restoring a number of airstrips by the Central Province Government through a Memorandum of Agreement, informed AIC that they conducted a survey on Efogi airstrip in March 2019. The report on the survey identified the following surface conditions:

- Short grass
- Fine grain soil
- Moist soil
- Rough surface
- Very undulating surface and noticeable during take-off and landing
- Soft top layer of approximately 5cm thick.

RAA survey also identified other relevant data of the airstrip including:

- Latitude: 09° 09.342 S
- Longitude: 147° 39.603 E
- Elevation: 3,965 ft
- Average slope: 6.7%
- Undulations: Very undulated

RAA explained AIC that the expected process to be followed after conducting a survey would include restoring the airstrip, conduct a test flight if necessary and then add it to RAA airstrip maintenance program. Once the restoration is completed, RAA informs the operators about the condition of the airstrip.

In the case of Efogi, the process never went beyond the stage of conducting the survey. RAA informed AIC that this was due to the lack of funding committed by the Central Provincial Government.

Even when the results of the survey were never sent to Air Sanga, the investigation also found that the pilot was familiarised with the airstrip and was fully aware of the conditions of the airstrip and particularly a soft patch at the beginning of the strip 17.

During the investigation it was also noticed that the Operator was using an airstrip guide which contained outdated and erroneous information of Efogi airstrip, which did not provide information on the soft top layer of the strip, as shown in the following table:

STRIP	LAT	LONG	ABBR	GP	RWY	ELEV	LDA	SLOPE	REMARKS
EFOGI	09°09.45S	147°39.56E	EFO	4	17/35	3,800	487	9.5 N	L17 T/O35; undul; updraft with t/winds

Table 3. Extract of the PNG Airstrip Guide 2009 Edition used by Air Sanga.

### 1.11 Flight Recorders

The aircraft was not equipped with a flight data recorder or a cockpit voice recorder, neither were they required by PNG Civil Aviation Rules.

### 1.12 Wreckage and impact information

The aircraft initially touched down about 10 meters after the strip 17 threshold and became airborne again, travelling about 50 meters. This was marked by the nose-wheel marks on the ground.

The nosewheel was found near a soft depression on the strip. This was determined to be where the nose wheel separated from the nose landing gear oleo at the fork.

There were no grounds marks observed between the depression and the aircrafts oleo impression and propeller strike marks. Propeller strike marks and oleo impression marks were observed about 7 m from the depression. This suggests that the aircraft bounced off the ground and as it contacted the ground again, the oleo collapsed allowing the propeller blades to strike the ground. All three propeller blades were significantly bent along the mid sections, indicating that they impacted the ground with engine power. The engine sustained substantial damage at the exhaust segment while oil and fuel heat exchanger mounting snapped off exposing of oil line. Moreover, the nose landing gear assembly was separated from the firewall and collapsed towards the forward face of the cargo pod causing it to dent.



Figure 9: Aircraft touch down to the final resting position (not drawn to scale)

## 1.13 Medical and pathological information

No medical or pathological investigations were conducted as a result of this occurrence, nor were they required.

## 1.14 Fire

There was no evidence of pre- or post-impact fire.

## 1.15 Survival aspects

### 1.15.1 Search and Rescue

The pilot called ATS at 11:27 when he had arrived in the circuit area and advised them that he would cancel SARWATCH on the ground after landing. However, the pilot never cancelled SARWATCH.

The AIC determined that right after the accident the pilot was focused on evacuating the passengers immediately and did not call ATS to cancel SARWATCH.

The pilot informed AIC that with the assistance of the locals they used the Kokoda Trekking HF radio and contacted the Operator back in Port Moresby, reporting the occurrence.

According to the Centre Supervisor (CS) journal for the day of the accident, an INCERFA was declared at 11:45. Subsequently, ATS commenced to contact the operator via telephone, unsuccessfully. At 13:34 ATS received a call from the operator, which was registered on the CS's journal as "*P2-ASZ safely on the ground Efogi, nil emergencies. Pilot request officer to assist aircraft out regarding issues with tyres*". At that time, INCERFA was cancelled.

The company engineers were sent to Efogi, to check the aircraft and transport the pilot back to base, however due to local weather conditions they only able to get into Efogi the next day.

## 1.16 Tests and research

There was no test and research conducted in this investigation.

## 1.17 Organisational Information

### 1.17.1 The Operator

#### 1.17.1.1 General

Air Sanga Limited was an aircraft operator which conducts charter and regular Fares & Freight (F&F) operations within PNG. Most of its operations were into remote areas servicing rural communities.

Air Sanga Limited held an Air Operator's Certificate issued under CAR 119 for fixed wing air operations in accordance with CAR Part 125 and Part 135.

The scope of Air Sanga Limited operations includes:

- Hire and reward air operations throughout PNG
- Regular and Irregular carriage of passengers
- Regular and Irregular carriage of cargo
- VFR operations

### 1.17.1.2 Maintenance Facilities

According to the Air Sanga company profile provided to the AIC, dated 2 November 2018, the organisation had a Service Level agreement (SLA) with Adventist Aviation Services for maintenance.

According to records of an audit conducted by CASA PNG between 21 to 24 May 2019, the Operator had a SLA with National Aviation Services (NAS) for the maintenance of the PAC 750XL in Port Moresby. Maintenance records also showed that latest maintenance activities were conducted by NAS. The AIC requested the SLA between the operator and NAS, however the operator was unable to produce such evidence.

### 1.17.1.3 Documentation Record Control

The PNG CAR Part 100.113 paragraph (c) states;

*For the purpose of this rule, a record is a means of providing permanent evidence that the requirements of the Civil Aviation rules and the operator's exposition have been complied with and required activities have been carried out.*

The investigation found that the operator complied with CAR Part 100.113 by establishing the document control procedures in Chapter 27 of the Air Sanga Safety and Quality Management Manual. However, effectively implementing the procedure was an issue. Audit records obtained from CASA PNG showed non-compliances with regards to Manual updates. The company structure in the manuals had previous senior person who was no longer with the company. No corrective action was taken as identified during the investigation as the structure still had names of senior persons no longer with the company. Audit records also identified that periodic reviews were not carried out on all the manuals. Corrective measures were provided by CASA PNG and the finding closed. However, the investigation found that there was no evidence of reviews being done on the operator's manuals. Certain rules parts in the company's Manuals have not been updated to reflect changes to rule parts.

The operator stated during an investigation interview that Manual reviews were done every twelve months or when required. They further stated that because of the twelve-month review period was not up yet, they had not done any reviews.

*Air Sanga Safety and Quality Manual, section 27.2.4.2 states;*

*The controlled documents (and/or exposition) must be reviewed and evaluated regularly by the document holders to ensure compliance with applicable CASA Rules, conformance with company policies and contain accurate and up to date information. The document owner must remove all obsolete and superseded documentation from all points of issue.*

The investigation determined that the use of outdated, incomplete and not properly organized information in manuals and other documents was present throughout different levels of the Air Sanga network.

When requested by the AIC, the operator informed that due to lack of proper handover process when the responsible for the function of reviewing and updating company expositions was changed, the person currently in charge was not able to ensure upkeep of the system.

### 1.17.1.4 Quality and Safety Management

Air Sanga Limited had an integrated Safety and Quality Management system that defined the management processes to encompass all functions of the company. The procedures showed how the safety and quality management activities integrate with operational activities and how the organisation's desired outcomes were attained.

The Manager Quality and Safety was responsible to the Chief Executive for developing, implementing and managing the company's Safety Management System (SMS) and Quality Management System (QMS) outlined on PNG Civil Aviation Rule Part 100.

The investigation found that there was no proper quality assurance processes in place to ensure operational, maintenance and safety related documents were maintained and records kept up-to-date, including training records in the areas of safety management system and emergency response.

It was also found that there were no records of hazards identified nor safety actions taken, as part of the Safety Management System processes.

*ICAO Doc. 9859 Safety Management Manual Section 3.2 Safety Culture and Safety Management, paragraph 3.2.2 states:*

*How safety values are incorporated into practices by management and personnel directly affects how key elements of the SSP and SMS are established and maintained. As a consequence, safety culture has a direct impact on safety performance. If someone believes that safety is not that important then workarounds, cutting corners, or making unsafe decisions or judgements may be the result, especially when the risk is perceived as low and there is no apparent consequence or danger. The safety culture of an organization therefore significantly influences how their SSP or SMS develops and how effective it becomes. Safety culture is arguably the single most important influence on the management of safety. If an organization has instituted all the safety management requirements but does not have a positive safety culture, it is likely to underperform.*

## **1.17.2 Regulatory Authority**

### **1.17.2.1 Civil Aviation Safety Authority of PNG**

The Civil Aviation Safety Authority of Papua New Guinea (CASA PNG) was established in 2010 by the Civil Aviation Act 2000 (as amended). CASA PNG is a statutory body with a legal mandate to promote aviation safety and security through effective safety regulation of the civil aviation industry, with particular emphasis on preventing aviation accidents and incidents within the civil aviation system in Papua New Guinea.

While the safety regulation of civil aviation remains its primary role, CASA PNG also provides aviation security, safety education and training programs including responsibilities for airspace regulation.

According to the *PNG Civil Aviation Rules Part 39.11 Compliance*:

*(a) An operator of a Papua New Guinea registered aircraft must not operate the aircraft unless the operator complies with—*

*(2) every applicable airworthiness directive issued by the State of Design of—*

*(i) the aircraft;*

During the investigation, it was found that the State of Manufacturer and Design of the PAC 750XL aircraft through the New Zealand Civil Aviation Authority (NZ CAA) issued an Airworthiness Directive (AD) in respect to DCA/750XL/32B. This AD was sent by NZ CAA to CASA PNG by email on 31 January 2019. However, CASA PNG informed AIC that due to technical email and storage system issues, there was no record of that email being received or distributed to the operators. Air Sanga informed AIC that they did not receive the AD from CASA PNG (Refer to Appendices D and E).

### **1.17.2.2 Pilot Records**

The *Civil Aviation Act 2000 (As Amended) Section 66*, states:

*(1) CASA shall establish a Civil Aviation Registry,*

*(2) Copies or appropriate evidence of the following shall be recorded and maintained at the Registry,*

*(b) every current aviation document.*

The *Civil Aviation Act 2000 (As Amended)* defines aviation document as:

*A licence, permit, certificate, or other document issued under this Act to or in respect of any person, aircraft, aerodrome, aeronautical procedure, aeronautical product or aviation related service.*

During the investigation, the AIC requested CASA PNG for pilot records. CASA PNG was unable to produce the requested information, and stated that they were unable to locate the pilot's file in their registry.

### **1.17.2.3 Aeronautical Information Publication (AIP)**

The PNG AIP is published by CASA PNG. PNG Air Services Ltd provides the AIP service as specified under the provisions of *CAR Part 175*.

The AIP is divided up in three parts, and part three contains all national aerodrome information provided by the National Airports Corporation. There is also a section for *minor aerodromes/airstrips AD 5.1-1 16 Oct 2014*. According to RAA, they have been working with CASA PNG incorporating the rural airstrip data into the AIP once RAA finalise all the airstrip data in their database. However, no information on Efogi or any other airstrip was available in the airstrip section of the AIP at the date of the accident.

According to CAR Part 135, Section 135.77 (c):

*The certificate holder shall, where its aeroplanes use an aerodrome not promulgated in the PNGAIP, maintain a register containing-*

- (1) the aerodrome data; and*
- (2) procedures for ensuring that the condition of the aerodrome is safe for that operation; and*
- (3) procedures for ensuring that the condition of any required equipment, including safety equipment, is safe for that operation; and*
- (4) any limitations on the use of the aerodrome*

The investigation identified that Air Sanga was using a PNG Airstrip Guide from 2009 to maintain a register of airstrip data. However, it was found that Efogi data was outdated.

No other registers or procedures were produced by the operator.

### **1.18 Additional Information**

Not applicable.

### **1.19 Useful or effective investigation techniques**

The investigation was conducted in accordance with the Papua New Guinea *Civil Aviation Act 2000 (As Amended)*, and the Accident Investigation Commission's approved policies and procedures, and in accordance with the Standards and Recommended Practices of *Annex 13* to the Chicago Convention on International Civil Aviation.



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## **2 ANALYSIS**

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### **2.1 General**

The analysis section of this report discusses relevant facts which contributed to the on-set of an emergency and subsequent accident.

The accident did not have a single causal factor. There were a number of conditions, both active and latent that contributed to the final outcome of the accident.

### **2.2 Flight Operations**

According to the pilot, during the final approach into Efogi strip 17, he experienced a tailwind of about 10 kt, with gusts. The pilot subsequently increased the reference airspeed from 75 to 80 kt, which resulted in a groundspeed of about 90 kt.

The pilot also stated that he experienced downdraughts during the final approach and during the flare. This sharp changes in wind direction near the ground could have caused the aircraft to lose altitude and, therefore, requiring the pilot to maintain a higher airspeed to counter those effects and to maintain positive control of the aircraft. This was also necessary to maintain a safety speed buffer from stalling the aircraft.

As the pilot entered the flare, he maintained a higher aircraft attitude and airspeed to counter the effects of the downdraught. As the aircraft touched down, a sudden gust of tailwind acted on the tail of the aircraft subsequently lifting the tail.

The investigation determined that on touchdown, due to the combinational effects of downdraughts and the tailwind gust acting on the tail of the aircraft, the aircraft could not get into a proper landing attitude due to the excess lift induced on the tail of the aircraft with increased groundspeed.

The investigation also determined that as the pilot applied reverse thrust upon touchdown, this action would have subsequently transferred the weight on wheels from the main landing gear towards the nose landing gear. All this factors and variables would have caused to lift the aircraft off the ground and flying a further 50 m.

The investigation determined that after the aircraft lifted back off the ground, the pilot attempted to perform the flare but due to the airspeed reducing the aircraft did not respond accordingly to the pilot's control inputs. The aircraft subsequently wheelbarrowed/nose-dived into a soft depression in the strip surface. The impact force exerted on the nosewheel concurrently separated the nosewheel from the nose gear assembly at the fork as the aircraft abruptly bounced off the surface.

### **2.3 Maintenance**

#### **2.3.1 Washers**

The investigation found that the two aluminum washers recovered from the attachment of the firewall inside the cockpit did not conform to specifications of the PAC750XL MSB, which required to use carbon steel washers.

The investigation determined that during the maintenance carried out on 14 August 2019, the engineers did not recognize that the washers installed were not in accordance with the specifications set out in the MSB.

The investigation also determined that during the nosewheel impact into the soft patch/depression on the airstrip, the use of aluminum washers was not sufficient to contain the force of the impact, causing the washers to dent as a result of the stress on the nut and bolt causing thread stripping which allowed the attachment of the firewall to move freely enabling the nose landing gear to collapse rearwards. This

rearward motion induced stress to the nosewheel fork subsequently separating from the nose gear assembly.

## **2.4 Organisational aspects**

### **2.4.1 Safety Culture**

The investigation determined that the operator did not have effective control of airframe hours and landings, and also found a number of inconsistencies in the Operator's maintenance records. Moreover, scheduled maintenance was not being conducted following the timeframes required by the manufacturer.

The investigation also found that other operational, maintenance and safety related documents throughout the Air Sanga network were outdated or non-existent and no proper record keeping was in place. These findings revealed a poor safety culture and a lack of proper quality assurance at different levels of the organisation, which created an environment conducive to underperformance.

With regard to maintenance, evidence of organisational underperformance was clearly identified during the investigation when reviewing compliance with scheduled maintenance. The scarce evidence provided by the operator showed that maintenance actions were not conducted in accordance with the inspection time intervals specified by the manufacturer.

Additionally, the investigation also determined operational underperformance due to the use of outdated information with regard to airstrips. Particularly, the investigation established that the pilot was aware of the conditions at Efogi airstrip, including its soft surface. However, this information was not captured by the organisation due to the lack of proper hazard identification and, therefore, no effective actions to ensure safe operations were adopted prior to the accident.

### **2.4.2 Airstrip information dissemination**

Although not directly a cause of the accident, the AIC found that information on the conditions of Efogi airstrip detected during the survey conducted by RAA were not disseminated to the air operators as the process for airstrip restoration was not carried out.

Safety information as the one that can be obtained from the results of airstrip surveys, if timely disseminated to air operators, becomes an important source of updated data to allow identifying hazards and implementing safety risk management strategies when proper Safety Management Systems are in place.

### **2.4.3 Airworthiness Directive (AD) dissemination**

Although not directly a cause of the accident, the AIC found that there were no procedures for disseminating AD's from CASA PNG to the operators. As a result of this, the AD regarding the MSB issued by CAA NZ and sent via email to CASA PNG was not distributed to Air Sanga.

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## **3 CONCLUSIONS**

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### **3.1 Findings**

#### **3.1.1 Aircraft**

- a) The aircraft was certified and equipped in accordance with existing Civil Aviation Rules and approved procedures.
- b) Scheduled maintenance of the aircraft was not carried out as per the time intervals specified by the manufacturer.
- c) The aluminium washers installed in the nose landing gear did not conform to the specifications of the manufacturer.
- d) The aluminium washers were unable to assist in containing the force of the impact, facilitating the collapse of the nose landing gear.

#### **3.1.2 Pilot**

- a) The pilot was licensed and qualified for the flight in accordance with existing Civil Aviation Rules.
- b) The pilot was medically fit to operate the flight.
- c) The pilot was familiar with the Efogi airstrip and the relative characteristics.

#### **3.1.3 Flight operations**

- a) The flight was conducted in accordance with the Air Sanga Operations Manual.
- b) The PIC carried out normal radio communications with the relevant ATS units.
- c) During the final approach the pilot encountered tailwind with gusts and downdraughts.
- d) The pilot performed the final approach with a reference airspeed increased from 75 to 80 kt, and a groundspeed of about 90 kt.
- e) During touchdown, the aircraft could not get in to a proper landing attitude due to the excess lift induced on the tail of the aircraft.
- f) The pilot applied reverse thrust upon touchdown, transferring the weight on wheels from the main landing gear towards the nose landing gear.
- g) The aircraft wheelbarrowed/nose-dived into a soft depression on the strip surface.
- h) The impact forces exerted on the nosewheel concurrently separated the nosewheel from the nose gear assembly at the fork as the aircraft abruptly bounced off the surface.

#### **3.1.4 Operator**

- a) The operator had a poor safety culture and lack of proper quality assurance at different levels of the organisation, creating an environment conducive to underperformance.
- b) The operator did not maintain effective control of airframe hours and landings nor of maintenance records.

- c) Operational, maintenance and safety related documents throughout the operator's network were outdated or non-existent and no proper record keeping was in place.
- d) The operator showed lack of proper hazard identification and effective actions to ensure safe operations at Efogi airstrip.

### **3.1.5 Civil Aviation Authority of PNG (CASA PNG)**

- a) CASA PNG registry did not contain records of the pilot.
- b) The AD issued by CAA NZ and sent to CASA PNG was not disseminated to the operator.

### **3.1.6 Rural Airstrip Agency (RAA)**

- a) The survey conducted by RAA on Efogi airstrip, identified a soft top layer on the strip.
- b) RAA did not conduct activities to restore the airstrip after the survey.
- c) Information on Efogi airstrip conditions identified in the survey were not disseminated to the operators as the restoration process was not carried out.

### **3.1.7 Medical**

- a) There was no evidence that incapacitation or physiological factors affected the pilot's performance.
- b) There was no evidence that the pilot suffered any sudden illness or incapacity which might have affected his ability to control the aircraft.

### **3.1.8 Survivability**

- a) The emergency evacuation was conducted by the pilot.
- b) The pilot and passengers egressed the aircraft without injuries.
- c) The pilot did not cancel SARWATCH after the accident which resulted in a declaration of INCERFA by ATS.
- d) The INCERFA phase was cancelled when the operator contacted ATS, after being informed about the occurrence by the pilot.

### **3.2 Causes [Contributing factors]**

During the final approach into Efoji strip 17, the pilot encountered tailwind, gusts and downdraughts. The pilot increased the reference airspeed from 75 to 80 kt resulting in a groundspeed of about 90 kt.

Due to the combinational effects of downdraughts and the tailwind gust, the aircraft could not get into a proper landing attitude and lifted back off the ground.

The pilot applied reverse thrust upon touchdown, transferring the weight on wheels from the main landing gear towards the nose landing gear.

The aircraft nose-dived into a soft patch/depression on the upslope of the airstrip. The impact forces concurrently separated the nosewheel from the nose gear assembly.

The fork separated when the four bolts holding the fork to the oleo strut snapped. The bolts snapped due to the combined forces of weight and significant momentum acting through it on impact with the steep inclination of the depression.

Propeller damage was caused and resulted when the nose collapsed towards the ground with reverse power present.

The oleo strut separated from the firewall when the lower section impacted the ground.



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## 4 RECOMMENDATIONS

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### 4.1 Recommendations

As a result of the investigation into the accident involving P2-ASZ, the Papua New Guinea Accident Investigation Commission issued the following recommendations to address concerns identified in this report.

#### 4.1.1 Recommendation number AIC 20-R19/19-1004 to Air Sanga Limited

On 12 August 2020, the PNG AIC issued the following recommendation:

The PNG Accident Investigation Commission (AIC) recommends that Air Sanga Limited should ensure Safety Management System procedures are effectively in place to allow proper hazard identification and timely risk management.

##### **Action requested**

The AIC requests that Air Sanga Limited note recommendation AIC 20-R19/19-1004, and provide a response to the AIC within 90 days, but no later than 11/10/2020, and explain including evidence how Air Sanga has addressed the safety deficiency identified in the safety recommendation.

**Status of the AIC Safety Recommendation: Open**

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#### 4.1.2 Recommendation number AIC 20-R20/19-1004 to Air Sanga Limited

On 12 August 2020, the PNG AIC issued the following recommendation:

The PNG Accident Investigation Commission (AIC) recommends that Air Sanga Limited should implement effective maintenance control measures to ensure scheduled maintenance is conducted within the time intervals prescribed by the manufacturer.

##### **Action requested**

The AIC requests that Air Sanga Limited note recommendation AIC 20-R20/19-1004, and provide a response to the AIC within 90 days, but no later than 11/10/2020, and explain including evidence how Air Sanga has addressed the safety deficiency identified in the safety recommendation.

**Status of the AIC Safety Recommendation: Open**

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#### 4.1.3 Recommendation number AIC 20-R21/19-1004 to Air Sanga Limited

On 12 August 2020, the PNG AIC issued the following recommendation:

The PNG Accident Investigation Commission (AIC) recommends that Air Sanga Limited should implement effective procedures to ensure maintenance, operations and safety related documents and records are kept up-to-date and a proper record keeping system is in place.

##### **Action requested**

The AIC requests that Air Sanga Limited note recommendation AIC 20-R21/19-1004, and provide a response to the AIC within 90 days, but no later than 11/10/2020, and explain including evidence how Air Sanga has addressed the safety deficiency identified in the safety recommendation.

**Status of the AIC Safety Recommendation: Open**

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#### **4.1.4 Recommendation number AIC 20-R22/19-1004 to CASA PNG**

On 12 August 2020, the PNG AIC issued the following recommendation:

The PNG Accident Investigation Commission (AIC) recommends that the Civil Aviation Safety Authority of PNG (CASA PNG) should implement effective procedures to ensure timely dissemination of Airworthiness Directives issued by other States to PNG operators.

##### **Action requested**

The AIC requests that CASA PNG note recommendation AIC 20-R22/19-1004, and provide a response to the AIC within 90 days, but no later than 11/10/2020, and explain including evidence how CASA PNG has addressed the safety deficiency identified in the safety recommendation.

**Status of the AIC Safety Recommendation: Open**

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#### **4.1.5 Recommendation number AIC 20-R23/19-1004 to CASA PNG**

On 12 August 2020, the PNG AIC issued the following recommendation:

The PNG Accident Investigation Commission (AIC) recommends that the Civil Aviation Safety Authority of PNG (CASA PNG) should ensure that the Civil Aviation Registry contains all the aviation document records as required by the *Civil Aviation Act 2000 (As Amended)* and that such records can be accessible and retrieved in a timely manner.

##### **Action requested**

The AIC requests that CASA PNG note recommendation AIC 20-R23/19-1004, and provide a response to the AIC within 90 days, but no later than 11/10/2020, and explain including evidence how CASA PNG has addressed the safety deficiency identified in the safety recommendation.

**Status of the AIC Safety Recommendation: Open**

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#### **4.1.6 Recommendation number AIC 20-R24/19-1004 to RAA**

On 12 August 2020, the PNG AIC issued the following recommendation:

The PNG Accident Investigation Commission (AIC) recommends that the Rural Airstrip Agency (RAA) should timely disseminate to the appropriate air operators any safety related information on airstrip conditions identified during a survey or by any other means.

##### **Action requested**

The AIC requests that RAA note recommendation AIC 20-R24/19-1004, and provide a response to the AIC within 90 days, but no later than 11/10/2020, and explain including evidence how RAA has addressed the safety deficiency identified in the safety recommendation.

**Status of the AIC Safety Recommendation: Open**

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# 5 APPENDICES

## 5.1 Appendix A: PAC750XL Load system DNA

FLIGHT No. <i>OKR</i>	DATE. <i>07/10/19</i>	<b>P2-ASZ</b> PAC 750 XL LOAD SYSTEM DMA- 395 issue 2 <small>Serial No.184</small>	
FRUM. <i>Pku</i>	TO. <i>EFOG</i>		
CAPTAIN. _____			

AIRCRAFT BASIC WEIGHT	WEIGHT KG	INDEX	AIRCRAFT INDEX (2 UNIT INCREMENTS)
OCCUPANTS-ROW 1 -CREW	<i>100</i>	86 KG	
-ROW 2		86 KG	
-ROW 3	<i>194</i>	86 KG	
-ROW 4	<i>104</i>	86 KG	
-ROW 5	<i>63</i>	86 KG	
CARGO CABIN Sta 82 thru 115	<i>83</i>	100 KG	
CARGO CABIN Sta 118 thru 166		100 KG	
CARGO CABIN Sta 116 thru 240		100 KG	
CARGO POD -NOSE BAY-45kg	<i>37</i>	20 KG	
CARGO POD -FWD BAY 226kg	<i>200</i>	50 KG	
CARGO POD -MID BAY 226kg	<i>200</i>	50 KG	
CARGO POD -AFT BAY - 45kg		20 KG	
CARGO POD -SINGLE - 226kg		NIL SCALE- ADD WEIGHT ONLY	
ZERO FUEL WEIGHT	<i>2951</i>		
FUEL-FRONT	<i>160</i>	NIL SCALE- ADD WEIGHT ONLY	
FUEL-AFT	<i>160</i>	50 KG	
FUEL-TAXI BURN	<input type="checkbox"/> <i>20</i>		
TAKE OFF WEIGHT 3402 kg	<i>3251</i>	<i>3251</i> TAKE OFF WT	
FUEL-BURN	<input type="checkbox"/> <i>40</i>	<i>3211</i> LANDING WT	

**METHOD OF USE (SEE ON R/H MARGIN OF SHEET)**

1. OBTAIN THE BASIC INDEX & STARTING FROM THIS POINT ON THE INDEX SCALE DROP A VERTICAL LINE TO THE SLOPING LINE IN THE FIRST COMPARTMENT IN USE. MOVE HORIZONTALLY (DO NOT SLIDE DOWN THE SLOPING LINE) ALONG THIS SCALE IN THE INDICATED DIRECTION FOR THE APPROPRIATE LOAD INCREMENT BEFORE MOVING VERTICALLY DOWN OR UP TO OTHER SCALES IN USE, MOVING ALONG EACH SCALE IN THE SAME MANNER.

DRAW A VERTICAL LINE FROM THE LAST COMPARTMENT SCALE IN USE DOWN TO THE C OF G ENVELOPE (NEGLECTING THE FUEL SCALE) STOPPING AT APPROPRIATE WEIGHT. THIS POINT SHOWS THE C OF G AT ZERO FUEL WEIGHT.

THE C OF G AT TAKE OFF WEIGHT MAY BE FOUND BY RETURNING TO THE FUEL SCALE AND MAKING THE APPROPRIATE ALLOWANCE FOR FUEL BEFORE DROPPING ANOTHER VERTICAL LINE TO THE C OF G ENVELOPE STOPPING AT THE TAKE-OFF.

NOTE: THIS TRIM SHEET INCORPORATE A NON STANDARD DATUM DO NOT USE DATE RELATING TO THE STANDARD DATUM

THIS LOAD SYSTEM TRIM SHEET IS COPYRIGHT PROTECTED INFRINGEMENT OF COPYRIGHT ATTRACTS HEAVY PENALTIES. FLIGHT MANUAL COPY MUST BE COLOURED ORIGINAL.

COPYRIGHT © D.I. MACARTHUR 11 PARADISE COURT, CLONTARF, QUEENSLAND AUSTRALIA 4019

PHONE: (07) 3283 3817 FAX: (07) 3319 6171 MOBILE: 0639 328 338

**CERTIFICATION**

I AM SATISFIED THAT THE AIRCRAFT IS CORRECTLY LOADED FOR SAFETY IN ACCORDANCE WITH REGULATIONS SPECIFIED BY C.A.A.

DATE *07/10/19* TIME *1040*

CAPTAIN/CO-PILOT

THE OWNER/OPERATOR OF P2-ASZ IS HEREBY AUTHORISED TO REPRODUCE LOAD SYSTEM DMA-395 ISSUE 3 PROVIDED THAT IT IS REPRODUCED WITHOUT ANY ALTERATIONS WHATSOEVER (HOWEVER IT MAY BE INCLUDED ON OPERATIONS MANIFEST ETC.) BUT MUST NOT BE USED FOR ANY AIRCRAFT FOR SAFETY & COPYRIGHT REASONS.

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APPROVED 19-07-2013

Print Shop Ltd

## 5.2 Appendix B: Email from CAA NZ

### Email from Civil Aviation Authority of New Zealand

**Subject:** Notification of New Zealand Airworthiness Directive DCA/750XL/32B applicable to Pacific Aerospace 750XL aircraft.

Attached please find New Zealand Airworthiness Directive DCA/750XL/32B with effective date 7 February 2019 applicable to Pacific Aerospace 750XL aircraft

**DCA/750XL/32B NLG and MLG Attachment Bolts – Inspection**

Air Transport Association (ATA) Chapter 32, Landing Gear.

DCA/750XL/32B with effective date 7 February 2019 is prompted by several reports of finding loose nose landing gear attachment lock nuts and pal nuts.

This AD revised to mandate Pacific Aerospace Mandatory Service Bulletin (MSB) PACSB/XL/105 issue 4, dated 19 December 2018, which introduces alternate bolts for P/N NAS6606D63 and NAS6606D68.

Compliance with requirements 2 and 3 of DCA/750XL/32A prior to the issue of this revised AD is a terminating action to the AD requirements.

A copy of DCA/750XL/32B is attached.

NZ ADs applicable to 750XL aircraft are available from the CAA web site at [http://www.caa.govt.nz/assets/legacy/Airworthiness\\_Directives/750XL.pdf](http://www.caa.govt.nz/assets/legacy/Airworthiness_Directives/750XL.pdf)

The attached Mandatory Service Bulletin is for NAA use only.

Operators can obtain service information for PAL 750XL aircraft from:

Pacific Aerospace Ltd  
Private Bag 3027  
Waikato Mail Centre  
Hamilton 3240  
New Zealand

Phone: 0064 7 843 6144

Fax: 0064 7 843 6134

Web: <http://www.aerospace.co.nz/>

Best regards

Owen Olls

Airworthiness Specialist

Civil Aviation Authority of New Zealand

Tel: +64 4 560 9569 (Direct Dial)

Fax: +64 4 560 9452

email: [owen.olls@caa.govt.nz](mailto:owen.olls@caa.govt.nz)

Web: <http://www.caa.govt.nz>

### 5.3 Appendix C: MSB Issue 4

**PACIFIC AEROSPACE**

Pacific Aerospace Limited  
Airport Road, Hamilton  
Private Bag 3027, Hamilton 3240, New Zealand  
TEL +64 7 843 6144 FAX +64 7 843 6134  
EMAIL [pa@pacific.aerospace.co.nz](mailto:pa@pacific.aerospace.co.nz)  
WEB [www.pacific.aerospace.co.nz](http://www.pacific.aerospace.co.nz)

## MANDATORY SERVICE

PACSB / XL / 105  
ISSUE 4

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### INSPECTION – NLG / MLG – PALNUTS

#### 1. PLANNING INFORMATION

##### A. EFFECTIVITY

Part A/B  
MODEL S/N  
750XL (NZ) Up to S/N 216, and S/N 220  
750XL (CN) 8001 and 8002

Part C  
MODEL S/N  
750 (NZ) Up to S/N 185 (excluding  
S/N 177).

##### B. REASON

To replace the Nose Landing Gear attachment fasteners, installing castellated nuts and locking pins, replacing the friction locking nuts previously installed.

To inspect the Main Landing Gear attachment bolts and installing Palnuts as required.

Issue 4 adds alternatives to the bolt P/N NAS6606D63 and NAS6606D68.

##### C. DESCRIPTION

Part A – Daily until Part B is completed. Inspect the NLG lower bolts and clamp for security. Replace nuts if found loose.

Part B – Procedures for replacement of locking nut and pal nut with a castellated nyloc locking nut and split pin in Nose Landing Gear.

Part C – Procedures for inspection and installation of Palnuts on the 3/8 bolts in the Main Landing Gear of the Short range wing and the 7/16 bolts of aircraft embodied with MOD PAC/XL/ 0451, 0509 and 0663).

NOTE: Part C is not applicable for Extended Range Wing aircraft (which were all fitted with Palnuts during manufacture).

- |                              |  |
|------------------------------|--|
| D. <u>COMPLIANCE</u>         | Part A: Daily until Part B is accomplished.<br>Part B/C: Within the next 165 flight hours. |
| E. <u>APPROVAL</u>           | By delegated authority.  |
| F. <u>TOOLING</u>            | N/A.   |
| G. <u>WEIGHT AND BALANCE</u> | No change.   |
| H. <u>REFERENCE</u>          | AMM Supplements PAC/XL/0389, 0451,<br>0509, 0663 and 750XL Maintenance<br>Manual.          |
| I. <u>HOURS REQUIRED</u>     | Part A – 2 Min.<br>Part B – 1 Hour.<br>Part C – 4 Hours.                                   |
| J. <u>WARRANTY COVER</u>     | Normal warranty conditions apply.  |

2. PART A – INSPECTION INSTRUCTIONS

NOTE: The initial inspection (Steps 1 to 4) should be performed by a qualified and approved LAME.

- 1) Inspect the lower attachment bolts on the nose landing gear.
- 2) Check for loose bolts and gaps between the clamp and firewall.
- 3) If the bolts or the clamp look or feel loose, you must proceed to Part B prior to operating the aircraft.
- 4) Upon first inspection, add torque stripe at bolt head checking daily for relative movement.

NOTE: Daily visual inspections (Step 5) may be performed by a qualified pilot.

- 5) Check daily if there is any misalignment on the stripe added in Step 4. If there is, you must proceed to Part B prior to operating the aircraft.

3. PART B - ACCOMPLISHMENT INSTRUCTIONS (NOSE LANDING GEAR)

- 1) Raise the nose Landing Gear of the ground (or alternatively, depressurise the nose Landing Gear).
- 2) Remove LH or RH Cockpit Seats (Ref. 750XL MM, Section 25-10-00 or AMM Supplement PAC/XL/0389 - MCI Model 2023 Crew Seats).
- 3) Remove the Hose Clip from the Diffuser Cockpit Footwell in the Cover Panel Assembly - Centre, if PAC/XL/0182 – Bleed Air Cabin Heater is installed (See Figure 1).



DIFFUSER COCKPIT FOOTWELL (REF)

FIGURE 1 COCKPIT FLOOR – DIFFUSER COCKPIT FOOTWELL (IF INSTALLED)

- 4) Remove the Cover Panel Fwd of the Cover Panel Assembly - Centre P/N 11-16365-1 (See Figure 2).

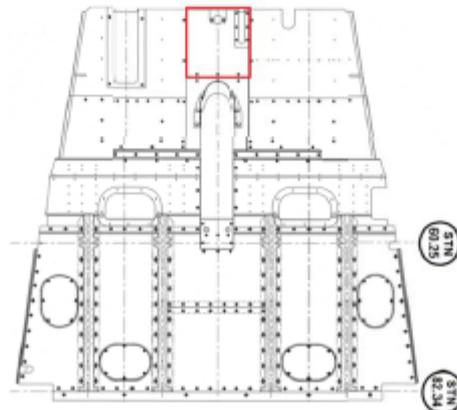


FIGURE 2 COCKPIT FLOOR (ONLY FOR REFERENCE)

- 5) Remove the Upper Engine Cowl to get access to the upper attachment area of the Nose Landing Gear (Ref. 750XL MM, Chapter 71).
- 6) Replace existing hardware with the following:
  - Bolts – NAS6606D63 or alternate parts (refer to Section 6. Material List)
  - Nuts – MS17825 – 6 [Torque to 160-260 lb.in]
  - Spring Pin / Split Pin – AN416-2 or MS24665-283

**NOTE:** The Bolts P/N NAS6606D63 may be fabricated from P/N NAS6606-63 iaw PAL DWG BOL6606 (refer to the attached drawing).

**NOTE:** The Bolts P/N NAS6606D64 may be fabricated from P/N NAS6606-64 iaw PAL DWG BOL6606 (refer to the attached drawing). If using this bolt you must use an additional washer P/N AN960-616 directly behind the nut.

- 7) In the Lower Engine Cowl area, access the lower attachment bolts of the Nose landing gear.
- 8) Replace existing hardware with the following:
  - Bolts – NAS6606D68 or alternate parts (refer to Section 6. Material List)
  - Nuts – MS17825 – 6 [Torque to 160-260 lb.in]
  - Spring Pin / Split Pin – AN416-2 or MS24665-283

**NOTE:** The Bolts P/N NAS6606D68 may be fabricated from P/N NAS6606-68 iaw PAL DWG BOL6606 (refer to the attached drawing).

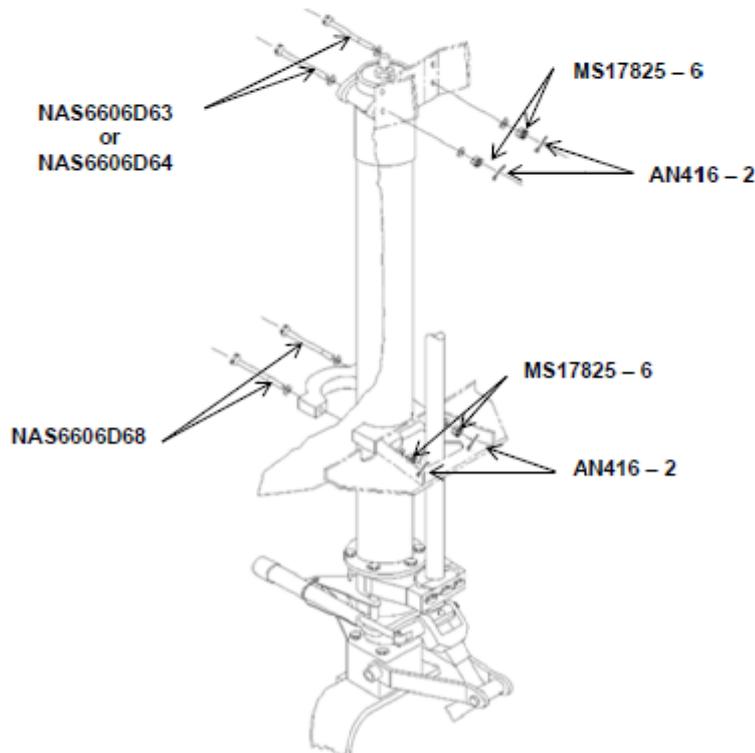


FIGURE 3 NOSE LANDING GEAR – HARDWARE REPLACEMENT

- 9) Reinstall the Upper Engine Cowl (Ref. 750XL Maintenance Manual, Chapter 71).
- 10) Reinstall the Hose Clip to the Diffuser Cockpit Footwell in the Cover Panel Assembly - Centre, if PAC/XL/0182 – Bleed Air Cabin Heater is installed (See Figure 1).
- 11) Reinstall LH or RH Cockpit Seats (Ref. 750 XL MM, Section 25-10-00 or AMM Supplement PAC/XL/0389 - MCI Model 2023 Crew Seats).
- 12) Check NLG Oleo pressure (Ref. 750XL MM, Section 12-70-00).
- 13) Carry out nose wheel shimmy check (Ref. 750XL MM, Section 32-50-00).

**4. PART C - ACCOMPLISHMENT INSTRUCTIONS (MAIN LANDING GEAR)**

- 1) Remove the Leading Edge Protection Panels (LH / RH) (Ref. 750XL MM, Section 51-90-00).
- 2) Remove the Lower Inner Protection Panels (LH / RH) (Ref. 750XL MM, Section 51-90-00).



**FIGURE 4 LOWER WING SURFACE (SHORT RANGE WING)**

- 3) Remove the Inboard and Outboard Cover Panels (LH / RH) (See Figure 5) (Ref. 750XL MM, Section 32-10-00).

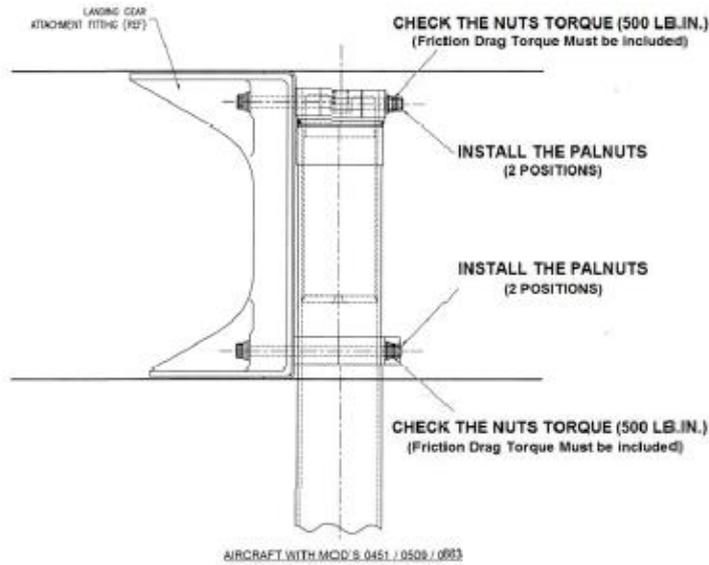


FIGURE 8 MAIN LANDING GEAR (AIRCRAFT WITH MODS 0451 / 0509 / 0663) – TORQUE CHECK AND PALNUTS INSTALLATION

5. CERTIFICATION

Record compliance with Part A, Part B and/or Part C of this bulletin in the Aircraft Log Book. Completion of Part B and Part C (if applicable) is terminating action to this Service Bulletin.

6. MATERIAL REQUIRED

PART B - NOSE LANDING GEAR

<u>Description</u>	<u>Part Number</u>	<u>Qty Required</u>
BOLT	NAS6606D63	2
	OR	
	NAS1306-63D	
	OR	
	PAL BOL6606D63	
	OR	
	NAS6606-63 (hole drilled iaw PAL DWG BOL6606)	
	OR	
	NAS6606D64	
	OR	
PAL BOL6606D64		
OR		
NAS6606-64 (hole drilled iaw PAL DWG BOL6606)		

	NAS6606D68 OR NAS1306-68D OR	2
BOLT	PAL BOL6606D68 OR NAS6606-68 (hole drilled iaw PAL DWG BOL6606)	
NUT	MS17825 – 6	4
SPRING PIN OR SPLIT PIN	AN416-2 OR MS24665-283	4
WASHER **	AN960-616	2 (if applicable)

\*\* An additional washer P/N AN960-616 is installed only with the Bolts P/N NAS6606D64 or alternative bolts.

**PART C - MAIN LANDING GEAR**

<u>Description</u>	<u>Part Number</u>	<u>Qty Required</u>
PALNUT (SHORT RANGE WING AIRCRAFT)	MS27151-19	A/R (MAX. 8)
<u>OR</u>		
PALNUT (MODS 0451, 0509 AND 0663)	MS27151-21	A/R (MAX. 8)

NOTES:

1. COMPONENTS ON THIS DRAWING TO BE MADE IN ACCORDANCE WITH COMPANY APPROVED MANUFACTURING STANDARDS AND PROCEDURES.

2. MANUFACTURE FROM: NAS6603-xx THRU NAS6620-XX OR NAS6603-xxX THRU NAS6620-xxX

⚠ ALL DIMENSIONS TO CONFORM TO THE EQUIVALENT NAS SPECIFICATIONS. PROVIDED DIMENSIONS REF. ONLY

⚠ VIBRO ETCH OUT MANUFACTURER'S MARK AND MARK WITH PAL MARK WHERE INDICATED.

⚠ COTTER PIN HOLE CENTRELINE: WITHIN .010 AND NORMAL WITHIN Z' OF BOLT CENTRELINE.

⚠ "BOL" REPLACES "NAS" FOR THE DRILLED BOLT PART NUMBER. ADD "D" AFTER BASIC PART No. FOR DRILLED SHANK BOLTS. ADD "H" AFTER BASIC PART No. FOR DRILLED HEAD BOLTS.

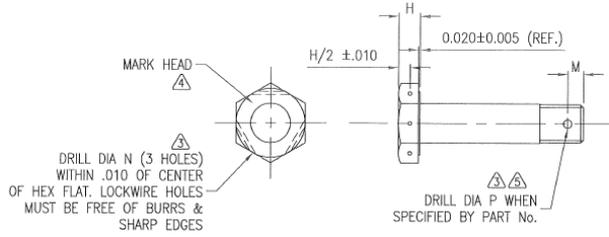
Eg. WHERE DRILLED HEAD BOLT IS MANUFACTURED FROM NAS6603-xx BOLT THE NEW PART NUMBER IS BOL6603Hxx

Eg. WHERE DRILLED HEAD BOLT IS MANUFACTURED FROM NAS6603-xxX BOLT THE NEW PART NUMBER IS BOL6603HxxX

Eg. WHERE DRILLED SHANK BOLT IS MANUFACTURED FROM NAS6606-xx BOLT THE NEW PART NUMBER IS BOL6606Dxx

WHERE xx = GRIP DASH NUMBER.

7. MODIFIED BOLTS TO BE PROTECTED BY APPLICATION OF CRC 3-36 CORROSION INHIBITING COMPOUND OR EQUIVALENT CONFORMING TO MIL-C-81309E, APPLIED TO THE HEADS AND DRILLED HOLES.



NEW BASIC NUMBER	ORIGINAL BASIC NUMBER	H (REF.) <sup>+015</sup> / <sub>-.000</sub>	M ± .010	N DIA <sup>+010</sup> / <sub>-.000</sub>	P DIA <sup>+010</sup> / <sub>-.000</sub>
BOL6603	NAS6603	.110	.164	.046	.070
BOL6604	NAS6604	.125	.178	.046	.076
BOL6605	NAS6605	.156	.181	.070	.076
BOL6606	NAS6606	.188	.197	.070	.106
BOL6607	NAS6607	.219	.201	.070	.106
BOL6608	NAS6608	.250	.216	.070	.106
BOL6609	NAS6609	.281	.218	.070	.141
BOL6610	NAS6610	.312	.249	.070	.141
BOL6612	NAS6612	.375	.252	.070	.141
BOL6614	NAS6614	.438	.257	.070	.141
BOL6616	NAS6616	.500	.264	.070	.141
BOL6618	NAS6618	.562	.357	.070	.141
BOL6620	NAS6620	.625	.389	.070	.141

IF IN DOUBT ASK

ITEM	PART NUMBER	DESCRIPTION - SIZE - SPECIFICATION	NEXT ASSY	
A	NC	ISSUE	UNLESS OTHERWISE SPECIFIED	
A1	-	CHANGE No.	THIRD ANGLE PROJECTION DIMENSIONS IN INCHES DIMENSIONS BEFORE PLATING BREAK SHARP CORNERS DEBURR	
DETAILS FOR DRILLED SHANK BOLTS ADDED	FIRST PRODUCTION ISSUE	CHANGE	TOLERANCES	
			FINISH NOTED	DRAWN G.JONES 20-08-14
			WEIGHT -	CHECK R.J. BECK 22-08-14
			SCALE N.T.S.	STRESS
			MFG. -	APPROVAL AvW 22-08-14
DR	GAJ	DRAWN	DESCRIPTION	
	AW	APPR'D	DRILLED NAS6603 THRU 6620 SERIES BOLTS	
		DATE	DRAWING NUMBER	
			BOL6603 THRU 6620	
			SHEET 1 OF 1	



Release To Service Statement

**RELEASE TO SERVICE STATEMENT**

**SCHEDULE INSPECTION**

AIRCRAFT TYPE: PAC 750XL AIRCRAFT REG.: P2-ASZ JOB NO: NAS 010/18  
INSPECTION TYPE: CHECK 1 INSPECTION DATE: 24/07/18  
AIRFRAME TIME Hrs: 3284.1 LANDINGS: 5733 CYCLES 5730

**CO-ORDINATING CERTIFICATE**

I hereby certify for the completion and co-ordination of the entire inspection and that this aircraft is fit for release to service.

NAME: \_\_\_\_\_ SIGNATURE: \_\_\_\_\_  
LICENSE NO#: \_\_\_\_\_ AUTHORISATION NO#: \_\_\_\_\_  
DATE: 24/07/18 For and on behalf of NAS MOC 145/020

*"The maintenance recorded has been carried out in accordance with the requirements of Papua New Guinea Civil Aviation Rule Part 43 and in respect of that maintenance the aircraft is released to service".*

<b>DCA/750XL/32B</b>	<b>NLG and MLG Attachment Bolts – Inspection</b>
<b>Applicability:</b>	Pacific Aerospace Limited 750XL aircraft, all S/N up to and including 216, 220, 8001 and 8002.
<b>Note 1:</b>	DCA/750XL/32B revised to mandate Pacific Aerospace Mandatory Service Bulletin (MSB) PACSB/XL/105 issue 4, dated 19 December 2018. This MSB introduces alternate bolts for P/N NAS6606D63 and NAS6606D68. Compliance with requirements 2 and 3 of DCA/750XL/32A prior to the issue of this revised AD is a terminating action to the AD requirements.
<b>Requirement:</b>	To ensure that the NLG and MLG attachment bolts have dual retaining devices, accomplish the following: <ol style="list-style-type: none"> <li>1. <u>For S/N up to and including 216, 220, 8001 and 8002:</u> Inspect the <u>nose landing gear</u> lower bolts and clamp for security in accordance with the instructions in Part A of Pacific Aerospace Mandatory Service Bulletin (MSB) PACSB/XL/105 issue 4, dated 19 December 2018, or later approved revision and accomplish corrective actions as required, before further flight.</li> <li>2. <u>For S/N up to and including 216, 220, 8001 and 8002:</u> Replace the <u>nose landing gear</u> attachment lock nuts and pal nuts with castellated nyloc locking nuts and spit pins in accordance with the instructions in Part B of Pacific Aerospace MSB PACSB/XL/105.</li> <li>3. <u>For short range wing aircraft with S/N up to and including 185 (excluding S/N 177):</u> For aircraft fitted with 3/8 inch <u>main landing gear</u> attachment bolts, inspect and install Palnuts in accordance with the instructions in Part C of Pacific Aerospace MSB PACSB/XL/105.  For aircraft fitted with 7/16 inch <u>main landing gear</u> attachment bolts (i.e. aircraft embodied with PAL modifications PAC/XL/0451, 0509 and 0663), inspect and install Palnuts in accordance with the instructions in Part C of Pacific Aerospace MSB PACSB/XL/105.</li> </ol>
<b>Note 2:</b>	Requirement 1 of this AD may be accomplished by adding the <u>nose landing gear</u> inspection requirement to the tech log. The visual inspection may be performed and certified under the provision in Part 43 Appendix A.1 (7) by the holder of a current pilot licence, if that person is rated on the aircraft, appropriately trained and authorised (Part 43, Subpart B refers), and the maintenance is recorded and certified as required by Part 43.
<b>Note 3:</b>	Requirement 3 of this AD is not applicable to extended range wing aircraft, which were fitted with palnuts on the <u>main landing gear</u> attachment bolts at manufacture.
<b>Compliance:</b>	<ol style="list-style-type: none"> <li>1. At every daily inspection, until requirement 2 of this AD is accomplished.</li> <li>2. Within the next 165 hours TIS from 20 December 2018 (the effective date of DCA/750XL/32A).</li> <li>3. Within the next 165 hours TIS from 20 December 2018 (the effective date of DCA/750XL/32A).</li> </ol>
<b>Effective Date:</b>	DCA/750XL/32 - 26 July 2018 DCA/750XL/32A - 20 December 2018 DCA/750XL/32B - 7 February 2019

## 5.4 Airworthiness Directive Schedule

### Airworthiness Directive Schedule

#### Aeroplanes

#### Pacific Aerospace 750XL

29 August 2019

- Notes:**
1. This AD schedule is applicable to Pacific Aerospace Limited 750XL aircraft manufactured under the Civil Aviation Authority of New Zealand Type Certificate No. A-14.
  2. The date above indicates the amendment date of this schedule.
  3. New or amended ADs are shown with an asterisk \*

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DCA/750XL/5	Outer Wing Attachments – Inspection	4
DCA/750XL/6	Wiring Insulation Protection – Inspection	4
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DCA/750XL/11	Rudder Trim Tab Pivot – Inspection	7
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* DCA/750XL/38A	Flap Assembly Screw Jack – Inspection	21
* DCA/750XL/39	Fuel Condition Lever – Inspection	21

**DCA/750XL/32B NLG and MLG Attachment Bolts – Inspection**

- Applicability:** Pacific Aerospace Limited 750XL aircraft, all S/N up to and including 216, 220, 8001 and 8002.
- Note 1:** DCA/750XL/32B revised to mandate Pacific Aerospace Mandatory Service Bulletin (MSB) PACSB/XL/105 issue 4, dated 19 December 2018. This MSB introduces alternate bolts for P/N NAS6606D63 and NAS6606D68. Compliance with requirements 2 and 3 of DCA/750XL/32A prior to the issue of this revised AD is a terminating action to the AD requirements.
- Requirement:** To ensure that the NLG and MLG attachment bolts have dual retaining devices, accomplish the following:
1. For S/N up to and including 216, 220, 8001 and 8002:  
Inspect the nose landing gear lower bolts and clamp for security in accordance with the instructions in Part A of Pacific Aerospace Mandatory Service Bulletin (MSB) PACSB/XL/105 issue 4, dated 19 December 2018, or later approved revision and accomplish corrective actions as required, before further flight.
  2. For S/N up to and including 216, 220, 8001 and 8002:  
Replace the nose landing gear attachment lock nuts and pal nuts with castellated nyloc locking nuts and spit pins in accordance with the instructions in Part B of Pacific Aerospace MSB PACSB/XL/105.
  3. For short range wing aircraft with S/N up to and including 185 (excluding S/N 177):  
For aircraft fitted with 3/8 inch main landing gear attachment bolts, inspect and install Palnuts in accordance with the instructions in Part C of Pacific Aerospace MSB PACSB/XL/105.  
  
For aircraft fitted with 7/16 inch main landing gear attachment bolts (i.e. aircraft embodied with PAL modifications PAC/XL/0451, 0509 and 0663), inspect and install Palnuts in accordance with the instructions in Part C of Pacific Aerospace MSB PACSB/XL/105.
- Note 2:** Requirement 1 of this AD may be accomplished by adding the nose landing gear inspection requirement to the tech log. The visual inspection may be performed and certified under the provision in Part 43 Appendix A.1 (7) by the holder of a current pilot licence, if that person is rated on the aircraft, appropriately trained and authorised (Part 43, Subpart B refers), and the maintenance is recorded and certified as required by Part 43.
- Note 3:** Requirement 3 of this AD is not applicable to extended range wing aircraft, which were fitted with palnuts on the main landing gear attachment bolts at manufacture.
- Compliance:**
1. At every daily inspection, until requirement 2 of this AD is accomplished.
  2. Within the next 165 hours TIS from 20 December 2018 (the effective date of DCA/750XL/32A).
  3. Within the next 165 hours TIS from 20 December 2018 (the effective date of DCA/750XL/32A).
- Effective Date:** DCA/750XL/32 - 26 July 2018  
DCA/750XL/32A - 20 December 2018  
DCA/750XL/32B - 7 February 2019

## 5.5 Appendix F:

Airstrip name: Efogi			
Airstrip code:	AYEF	Date surveyed:	27/03/2019
Province:	Central	Surveyed by: (name)	
District:	Kairuku Hiri	(organisation)	RAA
Airstrip type:	<input checked="" type="checkbox"/> one-way <input type="checkbox"/> two-way	Date last surveyed:	No Previous
Take-off direction:	350°	Season:	<input type="checkbox"/> dry <input checked="" type="checkbox"/> wet
Co-ordinates (at parking bay):	S 09° 09.342'	Runway strip length:	499 m
	E 147° 39.603'	Elevation (at parking bay):	3965 ft
Runway strip width:	32 m	Average overall slope:	6.7 %
Obstacle Limitation Surfaces			
Take-off/ Approach Surface		For two-way airstrips only	
5% up from the horizontal, clear for 600m horizontally:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No/Non-serviceable	5% up from the horizontal, clear for 600m horizontally:	<input type="checkbox"/> Yes <input type="checkbox"/> No/Non-serviceable
5% side splay right, clear for 600m horizontally:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No/Non-serviceable	5% side splay right, clear for 600m horizontally:	<input type="checkbox"/> Yes <input type="checkbox"/> No/Non-serviceable
5% side splay left, clear for 600m horizontally:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No/Non-serviceable	5% side splay left, clear for 600m horizontally:	<input type="checkbox"/> Yes <input type="checkbox"/> No/Non-serviceable
Transitional side surface			
20% side slope, clear for 2m above the runway strip:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No/Non-serviceable		
Visual Aids for Navigation			
Windssock present:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No/Non-serviceable	Marker cones delineate the runway strip	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No/Non-serviceable
Windssock setout:	<input type="checkbox"/> Complying <input checked="" type="checkbox"/> Non-complying	More marker cones required	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
Windssock condition:	<input type="checkbox"/> Adequate <input checked="" type="checkbox"/> Replace	No. marker cones required	#12 Yellow
Surface Type and Condition			
Surface cover: (select one only)	<input type="checkbox"/> Paved	Surface hardness:	<input type="checkbox"/> Soft/Non-serviceable
	<input checked="" type="checkbox"/> Short grass		<input checked="" type="checkbox"/> Medium
	<input type="checkbox"/> Long grass		<input type="checkbox"/> Hard
	<input type="checkbox"/> Patchy grass	Surface roughness:	<input type="checkbox"/> Smooth
	<input type="checkbox"/> Bare		<input checked="" type="checkbox"/> Rough
Soil type: (select one only)	<input checked="" type="checkbox"/> Fine-grain soil (silt, clay)	Surface undulation/evenness comment:	<input type="checkbox"/> Very rough/Non-serviceable
	<input type="checkbox"/> Coarse-grain soil (sand, gravel)		
Soil moisture:	<input type="checkbox"/> Dry	Very undulating and noticeable upon take-off and landing	
	<input checked="" type="checkbox"/> Moist	Other surface comments:	
	<input type="checkbox"/> Wet	Soft top layer approx. 5cm thick	
	<input type="checkbox"/> Saturated /Non-serviceable <input type="checkbox"/> Inundated /Non-serviceable		

