



# Air Niugini Flight 73

On 28 September 2018, at 23:24:19 UTC a Boeing 737-8BK aircraft, registered P2-PXE (PXE), operated by Air Niugini Limited, was on a scheduled passenger flight number PX073, from Pohnpei to Chuuk, in the Federated States of Micronesia (FSM) when, during its final approach, the aircraft impacted the water of the Chuuk Lagoon, about 1,500 ft (460 m) short of the runway 04 threshold.

The aircraft deflected across the water several times before it settled in the water and turned clockwise through 210 deg and drifted 460 ft (140 m) south east of the runway 04 extended

centreline, with the nose of the aircraft pointing about 265 deg.

The pilot in command (PIC) was the pilot flying, and the copilot was the support/monitoring pilot. An Aircraft Maintenance Engineer occupied the cockpit jump seat.

Local boaters rescued 28 passengers and two cabin crew from the left over-wing exits. Two cabin crew, the two pilots and the engineer were rescued by local boaters from the forward door 1L. One life raft was launched from the left aft over-wing exit by cabin crew CC5 with the assistance of a passenger. The US Navy divers

rescued six passengers and four cabin crew and the Load Master from the right aft over-wing exit. All injured passengers were evacuated from the left over-wing exits. One passenger was fatally injured, and local divers located his body in the aircraft three days after the accident.

## Sequence of Events

Prior to top of descent (TOD) the crew briefly discussed brake setting for the landing.

The pilots then commenced a discussion about the approach and landing flap setting. The copilot asked the PIC if they should use Flap 30

and the PIC replying “Yeah, Flaps 30 would do. 141 plus 5 ah”. The discussion continued around whether to use Flap 30 or 40. The copilot entered the relevant conditional data into the electronic flight bag (EFB) Boeing OPT10 and determined that the use of Flap 40 would reduce the landing distance required by about 150 meters. He informed the PIC and the PIC agreed to select Flap 40.

They then discussed the approach and missed approach procedure they would conduct at HAMAX 11 if they found themselves not visual by that point. However, the approach and landing checklist and the briefing on the RNAV12 approach chart briefings were not conducted in accordance with the SOPs and not using standard phraseology. The missed approach was just a cursory mention of DAMAY and did not cover the procedure, nor the flight path to be followed.

At 22:54:36, San Francisco radio contacted the crew with the following decent clearance: ATC clearance. Niugini 73, descend to reach FL340 by time 23:05Z13, requirement to reach FL340 by time 23:05Z, and report level, FL340. Cruise, FL340, to Chuuk airport, report arrival. Report leaving FL280, flight level 180 and flight level 080, time, time check, 254 and a quarter.

At top of descent, the PIC stated to the copilot that they were already high and needed to immediately initiate their descent. The crew commenced their descent leaving FL400 at 22:56:18, at a descent rate of 944 ft/pm. At FL340, the copilot contacted San Francisco radio and reported that they were maintaining FL340. Both pilots discussed the descent clearance for about two minutes, trying to recall and clarify the instructions that they were given.

At 23:05:14, while maintaining FL340,





the PIC stated to the copilot that they were high on profile and needed to descend to get back on the required descent profile.

At 23:08:16, the PIC said “alright, we catching back on profile, so just keep the speed up”.

The copilot contacted Chuuk radio at 23:08:54 and requested a weather update. Chuuk radio acknowledged and asked the crew to standby for the weather update. The PIC, realising that they were still high on profile, instructed the copilot to go on VNAV15.

At 23:11:00, Chuuk radio contacted the crew with the weather update for Chuuk stating: “wind variable at 5, visibility 14 scattered 012 charlie bravo, broken 120 overcast 280, temperature 26 dep point 25, altimeter 2973”.

At 23:11:25, the copilot reported passing FL180 to San Francisco radio.

At 23:15:59, at about 15 nm from Chuuk while passing 8,600 ft, the copilot made an inbound broadcast call stating their intention to track for the RNAV (GPS) runway 04, from the east south-east. Shortly after the broadcast the copilot contacted San Francisco Radio, and reported passing 8,000 ft on descent.

Prior to commencing the approach, while on descent through 4,000 ft, the PIC stated “Alright, the missed approach is” but he did not continue and the copilot did not respond. The PIC did not continue his statement/question with respect to the missed approach briefing.

23:20:53 The PIC stated to the copilot: “okay, we on RNAV at 041 and I’ll go 1,000.” Shortly afterwards at 23:21:07, the copilot made a general broadcast, stating that they were established on 041 inbound via the RNAV (GPS) runway 04.

23:21:27 The PIC called for gear down and flaps 15 and stated: “we just configure as we can ah.” The PIC did not complete his instructions to the copilot.

23:22:33 The copilot mentioned to the PIC that there were some showers in the area and the PIC acknowledged by stating: “That must be some storm, but it’ll be out soon.”

The PIC called for the landing checklist, but the only readout made by the copilot was landing gear, flaps and lights and runway in sight.

23:22:42 The PIC said to the copilot: “ah we’ll probably just go down on the PAPI’s16.” Seven seconds later the PIC said: “alright flaps 30, flaps 40”.

23:22:54 The PIC said: “landing checks.”

At the EGPWS 1,000 ft altitude call-out, the copilot told the PIC: “OK, stable.” Four seconds later the PIC said “continue.” The copilot then said: “and visual, 900 cloud base.”

23:23:41 The copilot set the missed approach altitude on the Mode Control and shortly afterwards, when passing 625 ft (677 ft)17, with the aircraft above the 3° glideslope, the PIC disconnected the auto-pilot and stated: “I’m going back on profile.”

23:23:43 When passing 548 ft (602 ft) on descent, the aircraft entered the storm cell and heavy rain and the PIC called for the wipers to be switched on.

The PIC stated during the investigation interview that he had already made the decision that it was visual up ahead with the runway edge lighting to continue for landing at that stage.

23:23:49 The PIC said: “okay, landing.”

23:23:52 The copilot said “visual, one red,” [pause] “three whites.”

23:23:53 EGPWS MINIMUMS call-out.

23:24:00 As the EGPWS call-out was repeating “Sink Rate, Sink Rate,” the PIC said: “I just wanna get on profile” (over the top of the last “Sink Rate.”)

23:24:03 EGPWS call-out repeated “Glideslope, Glideslope, Glideslope.”

23:24:06 EGPWS call-out repeated “Sink Rate, Sink Rate.” and the PIC said to the copilot: “that’s fine, I’ll just go a little bit more.”

23:24:09 EGPWS call-out repeated “Glideslope, Glideslope.”

23:24:11 The copilot rapidly asked, “See the runway?”

23:24:12 EGPWS call-out “100, Glideslope” and the PIC said “Monitor airspeed. Okay, got it.” (The FDR recorded a Glideslope alert but it was over-ridden by the EGPWS “100 ft” call and was not recorded on the CVR.)

23:24:13 EGPWS call-out repeated “Glideslope.”

23:24:17 (EGPWS call-out “SINK RATE, SINK RATE”). Copilot called rapidly with high intonation: “Too low! We’re too low! We’re too low! We’re too low!”

## Actual flight profile

The aircraft was being flown on a RNAV (GPS)18 approach to runway 04. While the auto-pilot system was engaged, the approach was stabilised, tracking 041° from FIGBI 2,500 ft, passing FASPO at 1,700 ft. The PIC disconnected the auto-pilot at 625 ft (677 ft) and flew the aircraft manually.

The missed approach required a left turn to track 306° with a minimum rate of climb of 375 ft / NM tracking to 960 ft to the Missed Approach Fix DAMAY.

From 548 ft (602 ft) the approach became unstabilised with an excessively high rate of descent and lateral over controlling. During the investigation



interviews the PIC explained that from experience, he found the Boeing 737-800 aircraft laterally less stable with Flap 40 compared with the Flap 30 setting.

During the approach at 23:23:53, when the EGPWS19 Advisory alert (altitude callout) “Minimums” sounded, the aircraft was passing through the published MDA at 420 ft (477 ft) with a rate of descent of 1,490 ft per min. The descent was not arrested by either pilot.

After passing the MAP, the aircraft was progressively flown below the glideslope on an approach path from 411 ft (466 ft) ft to the point of impact that averaged 4.5° (See figure 7). Between the MDA and the impact point, the aircraft flew for another 22 seconds; the EGPWS issued seven Glideslope and six Sink Rate aural alerts.

The first Sink Rate Alert was announced at 23:24:00 when the aircraft was at 307 ft (364 ft) 22 with a descent rate of 1,530 ft per min. The last Sink Rate Alert announced 2 seconds before impact at -13 ft (30 ft) and a rate of descent of 1,200 ft per min. The crew disregarded all these EGPWS alerts and continued the unstable approach at an excessive rate of descent in IMC from 23:24:00 to the time of impact at 23:24:19.

A storm cell situated immediately after HAMAX, the MAP, was painted on the weather radar on the PIC’s EFIS Navigation Display. The crew continued past the MAP and flew into IMC, through light and subsequently heavy rain. The copilot activated the windscreen wipers.

About 3 seconds prior to impact the aircraft was descending through -13 ft (30 ft) at a rate of 1,200 ft/min. Two seconds before impact the copilot rapidly stated with high intonation:

“Too low! We’re too low! We’re too low! We’re too low” and the EGPWS sounded: “Sink Rate, Sink Rate” as the aircraft impacted the water.

During his interview with the investigators, the PIC stated that he believed he was arresting the descent and also that the aircraft was sluggish. However, the recorded data and the video revealed that the PIC was over controlling the aircraft laterally. There was no evidence to indicate that the sink rate was being arrested. There was also no evidence on the recorded data to suggest that environmental forces, such as downdrafts, updrafts, etc, influenced aircraft movement against pilot control inputs.

The recorded information showed that the PIC had lost situational awareness and that he was fixated on the task of completing the approach and landing the aircraft. He continued the approach despite the excessive rate of descent while in IMC, and below the MDA.

During the investigation interviews, the copilot said that he believed they were “pretty much stable in approach all the way down”. The copilot was not aware that the aircraft was deviating from the intended flight path and projecting towards the water. The copilot did not proactively monitor the instruments in response to the EGPWS aural call outs of an unsafe situation throughout the approach. The NAV display showed the storm cell ahead of the MAP on the approach path. However, the CVR and video revealed that the crew did not discuss avoidance actions. During the interview the copilot stated: “The showers came out of nowhere. That caught us by surprise

## Findings

The flight crew did not comply with Air Niugini Standard Operating Procedures Manual (SOPM) and the approach and pre-landing checklists.

The RNAV (GPS) Rwy 04 Approach chart procedure was not adequately briefed.

The aircraft’s flight path became unstable with lateral over-controlling commencing shortly after autopilot disconnect at 625 ft (677 ft). From 546 ft (600 ft) the aircraft was flown in Instrument Meteorological Conditions (IMC) and the rate of descent significantly exceeded 1,000 feet/min in Instrument Meteorological Conditions (IMC) from 420 ft (477 ft).

The flight crew heard, but disregarded, 13 EGPWS aural alerts (Glideslope and Sink Rate), and flew a 4.5° average flight path (glideslope).

The pilots lost situational awareness and their attention was channelised or fixated on completing the landing.

The PIC did not execute the missed approach at the MAP despite: PAPI showing 3 whites just before entering IMC; the unstabilised approach; the glideslope indicator on the PFD showing a rapid glideslope deviation from half-dot low to 2-dots high within 9 seconds after passing the MDA; the excessive rate of descent; the EGPWS aural alerts; and the EGPWS visual PULL UP warning on the PFD.

The copilot (support/monitoring pilot) was ineffective and was oblivious to the rapidly unfolding unsafe situation.

It is likely that a continuous “WHOOOP WHOOP PULL UP” hard aural warning, simultaneously with the visual display of PULL UP on the PFD (desirably a flashing visual display PULL UP on the PFD), could have been effective in alerting the crew of the imminent danger, prompting a pull up and execution of a missed approach, that may have prevented the accident. ■■