**One-Two-Go Airlines Flight OG269, HS-OMG**
**September 16, 2007, Phuket, Thailand**

## A. <u>INTRODUCTION</u>:

This paper relates to the September 16, 2007, accident of One-Two-Go Airlines flight OG269, Thailand registration HS-OMG, a Boeing-McDonnell Douglas MD-82 that crashed during an attempted go-around at the Phuket International Airport (HKT), Phuket, Thailand. The flight departed the Don Muang Airport (DMG), Bankok, Thailand on a regularly scheduled passenger flight destined for (HKT). There were 123 passengers and 7 crewmembers on the flight, of which 89 persons were fatally injured. Among the fatalities were both pilots and 3 of the 5 cabin crewmembers.

As the State of Design and Manufacture of MD-82 airplanes, a U.S. Accredited Representative and advisers[1] participated in the Aircraft Accident Investigation Committee of Thailand (AAIC) investigation.

To evaluate the role of the airplane and its systems in this accident, the investigative team relied on evidence at the site, the cockpit voice recorder (CVR), flight data recorder (FDR), and component systems testing.

## B. <u>SUMMARY</u>:

On September 16, 2007, at 1541 local time, One-Two-Go (OTG) Airlines flight OG269, Thailand registration HS-OMG, a McDonnell-Douglas MD-82, crashed during an attempted go-around at the Phuket International Airport (HKT), Phuket, Thailand.

The flight from DMG was conducted uneventfully and as the flight arrived in the PKT area, the flight crew conducted the ILS RWY 27 approach to the airport, with the first officer as the flying pilot. After the flight crew reported to Air Traffic Control (ATC) that they were "established [on the] localizer," the crew that preceded the accident flight to the airport (HKT), reported weather information that they encountered during their approach. This information included an airspeed gain and loss of 15 knots during the final portion of the approach and noted a "CB over the airport." The flight crew of OTG269 acknowledged the transmission and they were cleared to land at 1537, with a wind report of 240 degrees at 15 knots. One minute later, the controller issued another wind report, "OTG269, strong wind 240 degrees 30 knots." The pilot of OTG269 acknowledged the report, and shortly after, inquired again about the wind

[1] Advisers to the U.S. Accredited Representative included representatives from the National Transportation Safety Board, Federal Aviation Administration, Boeing Commercial Airplanes, Pratt&Whitney and Honeywell.

condition.  The tower responded “240 degrees 40 knots,” and the pilot acknowledged the report.

Information obtained from the CVR and FDR indicated that the flight crew conducted the ILS approach with the airplane aligned just to the north of the runway 27 centerline.

Between 0839:41 and 0839:43, as the airplane was descending through 115 feet above threshold level (ATL),[2] the airspeed dropped from 140 KCAS to 126 KCAS. At 0839:43 the captain called for power, and the engine pressure ratio (EPR) subsequently increased toward ‘go around thrust.’ The EPR for both engines increased from about 1.16 to 2.0 in approximately three seconds and remained about 2.0 for the following 2 seconds[3], until about 0839:48. Between 0839:40 and 0839:0839:47, the pitch angle increased from 0 degrees to 5 degrees, and then decreased to about 2 degrees at 0839:48.

Despite the increase of thrust and pitch, the airplane continued to descend until about 0839:48, reaching an altitude of 48 feet ATL before starting to climb. However, the airspeed increased during this time, from 126 KCAS at 0839:43 to 166 KCAS at 0839:48. At 0839:47, the crew received a “sink rate” warning, and at 0839:48, as the airplane descended below 50 feet ATL, the autothrottle system initiated an automatic reduction of all engine thrust. The engine EPR decreased from 2.0 (‘go around thrust’) at 0839:48 to about 1.14 (‘idle thrust’)[4] at 0839:53.

At 0839:49, the first officer called for a go-around, and the pitch of the airplane increased from about 2 degrees to about 12 degrees at 0839:54, as the airplane climbed. The thrust continued to decrease towards its ‘idle’ position, while the airspeed decreased from 165 KCAS to about 122 KCAS at 0839:57.

At 0839:50, the first officer transferred aircraft control to the captain as the thrust was reaching idle EPR.

The EPR remained at the ‘idle’ level for about 13 seconds (from 0839:53 to 0840:06), as the airplane continued to climb to a maximum altitude of 262 feet ATL at 0840:01, and then started descend again. During this time, the landing gear was retracted, and the flaps were set to 15 degrees; however, the takeoff/go-around (TO/GA) switch was never pressed.[5]

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[2] The ATL altitudes are based on corrected pressure altitude and field elevation at the runway threshold.
[3] According to Boeing, the throttles accelerated faster than the autothrottle system would have commanded (as discussed further in this paper). Therefore, this increase of thrust was most likely a result of manual operation of the throttle levers.
[4] This reduction of power occurred at a rate consistent with an autothrottle command.
[5] The autopilot was “off” during the approach, and the autothrottle was “on,” and selected to the “speed” mode

Between 0839:57 and 0840:08, the pitch angle decreased from 12 degrees to about 0 degrees, while the airspeed remained relatively constant at around 122 KCAS, with about ± 4 knot excursions about this average.

At 0840:06, a "don't sink" warning sounded in the cockpit, as the airplane was descending through approximately 175 feet ATL. The EPR began to increase again, reaching 'go around thrust' at 0840:09; however, the altitude and pitch continued to decrease.

At 0840:09, a "sink rate" warning, followed by a "pull up" warning sounded in the cockpit. During these warnings, the pitch began to increase from 0 degrees. The pitch increased to approximately 5 degrees over the next second, until the sound of impact was heard at 0840:11, and the recording ended.

This paper provides the U.S. investigative team's position on the possible cause(s) of this accident, consistent with available evidence as follows:

- The EGPWS, Windshear and Autothrottle systems functioned as designed.
- Failure to activate the TO/GA switch during the go-around resulted in the airplane's flight management system automatically retarding the throttles, since the approach slat/flap logic for landing was applied[6].
- Lacking power application, the airplane slowed and descended until contact with the terrain.
- The crew did not properly perform the go-around maneuver or monitor the throttles during the go-around.
- Regardless of autopilot or autothrottle use, the throttles remained available to the crew to advance power, during the entire accident sequence.
- A transfer of controls, from the copilot to the pilot, occurred at a critical point in the go-around.
- The FDR data was consistent with the engines producing power as requested by the autothrottle system and/or flight crew up to the beginning of the accident sequence, and the on-scene physical evidence was consistent with both engines rotating during the accident sequence.
- Although the weather deteriorated in the later stages of this flight, windshear was not a factor in this accident.

## C. DETAILS OF THE INVESTIGATION:

### C.1 On-Scene Examination

[6] See Section C.4 for a more inclusive systems description.

The airplane and associated wreckage was removed from the accident site and taken to an outdoor area on the airport, prior to the arrival of the U.S. Team. As heavy equipment was used to clear the accident site, both the condition of the site and wreckage were compromised. Photographs taken prior to wreckage removal were provided and access was granted to the airplane and the actual accident site. The following wreckage description is based on the photographs, examination of the accident site, and observation of the wreckage after it was relocated.

The accident site consisted of a grass area adjacent (to the north) of runway 27, which was divided by a concrete ditch, and which terminated at a vegetation-covered hillside.

A ground scar was noted on the north (runway) side of the pavement surrounding the ditch, approximately adjacent to the 5,000 feet marker on runway 27. Glass and metal fragments were noted in the vicinity of the ground scar.

A measurement was taken from the pavement ground scar to the initial impact point on the berm, which was measured on an angle, in the direction of the wreckage path, and was approximately 128 feet in length. The scar in the berm was measured to be approximately 6 feet, on an approximate 55-degree angle. Three (parallel) ground scars were observed in the grass area, forward of the berm scar, in the direction of the wreckage path. The two outer scars were aligned with each other, and the center scar was just prior to the outer scars, in the direction of the wreckage path. The distance between the two outermost scars was approximately 21 feet, 8 inches, and the distance between the center and outermost (toward berm) scar was approximately 14 feet. The wreckage path continued in the grass area along the berm on an approximate heading of 300 degrees.

The airplane came to rest on an approximate heading of 340 degrees, in the vicinity of the 6,000-foot marker on runway 27. The empennage section of the airplane remained attached to the fuselage, and came to rest across the ditch. Two circumferential breaks were noted on the empennage section of the fuselage, forward of the tail. The post-crash fire burned a hole in the top of the fuselage just aft of the wings. Severe impact damage was concentrated in the forward fuselage and cockpit area.

The cockpit pedestal control quadrant was located along the wreckage path, separated from the cockpit area. Examination of the quadrant revealed the “suitcase handles” (pitch trim) were in the full forward position (note: the handles could be easily moved). The spoiler speed brake was in the full forward/unarmed detent. The throttles were also in the full forward position. The number “11” was observed in the longitudinal trim setting window. The flap handle was observed in the 28-degree detent.

The left wing remained attached to the fuselage at the wing root.

The right wing was separated from the fuselage at the wing root. The following measurements were taken of the right flap actuators (from washer to gland):

- Inboard actuator = 3 and 7/8 inches
- Mid actuator = 5 inches
- Outboard actuator = 3 and 3/8 inches. [7]

A measurement was taken of the horizontal jackscrew (from bottom of ACME nut to top of bottom stop), which was 11 ½ inches. According to Boeing this measurement equates to 10 ½ units of Aircraft Nose Up (ANU) trim. It was noted that the jackscrew was well lubricated.

The nose landing gear separated from the aircraft and was found in the debris field.

The main landing gear remained attached to the fuselage. None of the nose or main gear tires was found deflated. One of the main gears went to an extended position during the post accident relocation of the wreckage.

The number one powerplant, with pylon attached, was separated from the aircraft and positioned next to the wreckage in its approximate correct location and orientation but skewed pointing away from the aircraft centerline. There were no indications of a pre-impact failure including no indications of undercowl fire, case rupture, or uncontainment. There were no indications of casing intrusion into the rotor system. The presence of gentle cusping and bending of the fan blade leading edges (LEs) and tips (soft body damage), sporadic localized tearing and breakout damage on the fan blade LE's (hard body damage), and the finding of a light dirt deposit on the fan blade convex side tips are all consistent with the engine rotating and ingesting dirt and/or mud during the accident sequence.

The number two powerplant separated from the aircraft during the accident sequence. The pylon for the number two powerplant remained attached to the aircraft. The powerplant was located next to the wreckage in the approximate correct location relative to the fuselage but was pointing rearward. There were no indications of a pre-impact failure including no indications of undercowl fire, case rupture, or uncontainment. The fan blades were all bent against the direction of rotor rotation and exhibited transverse airfoil fractures ranging from tip fractures to full span fractures. There was a heavy caking/coating of dirt and mud on the visible gas path surfaces, including the inlet

[7] It should be noted that these measurements may not accurately reflect the position of the flaps at the time of the accident, due to the fact that when hydraulic pressure is lost (during an accident sequence), the actuators are not hydraulically held in position.

to the low pressure compressor, when looking into the front of the engine. Distress consistent with clashing was observed on the rear stage low pressure turbine blades. The distress documented on the number two engine was consistent with the engine rotating at the time of its impacts during the accident sequence.

The thrust reversers separated from both powerplants during the accident sequence. It was not possible to ascertain if the reversers were stowed or deployed during the accident sequence during the on-scene investigation.

**C.2 Meteorological Conditions**

According to a printout of recorded weather information, provided by the AAIC, the weather at the time of the accident was:

0730 UTC: 330/04KT 3000 -RA SCT015 BKN110 BKN300 26/24
0800 UTC: 270/07KT 4000 SCT015 BKN110 BKN300 26/24
0830 UTC: 240/12KT 4000 SCT015 BKN110 BKN300 26/24
SPECI 0835 UTC: 270/09KT 4000 +RA SCT015 BKN110 BKN300 26/24
SPECI 0845 UTC: 270/28KT 0800 +RA SCT015 BKN110 BKN300 25/22
0900 UTC: 270/12KT 1000 RA SCT015 BKN110 BKN300 24/23

Doppler radar images were provided by the AAIC. These images indicated light to moderate rain at the airport between 0833 and 0933 (images were recorded at 0833, 0845, 0853, 0913, and 0933 UTC).

According to recorded weather data and Doppler radar images, at the time of the accident, the wind increased from 270 degrees at 9 knots to 28 knots. The visibility decreased from 4,000 meters 800 meters, and light to moderate rain occurred at the airport.

The airport was equipped with a Low Level Windshear Alert System (LLWAS), which consisted of 6 sensors placed around the airport. At the time of the accident, 3 of the 6 sensors were out of service, resulting in the system being unusable. According to the AAIC, a NOTAM was issued to reflect the LLWAS out of service.[8]

**C.3 Emergency Response**

The Airport Rescue and Fire Fighting (ARFF) response was initiated from the fire station on the airfield. The first responders were on-scene approximately five minutes after the accident.

[8] A search of several databases was unsuccessful in identifying this NOTAM, and a paper copy was not provided to the U.S. Team.

The airplane impacted a grass area located on the north side of Runway 27. An approximate 6-foot-wide ditch dissected the grass area, with no means available to transverse the ditch.

Firefighters, witnesses, and survivors noted difficulty in the rescue response, as there was no road available to cross the ditch, to be able to reach the accident airplane. The airplane was severely damaged by a post-crash fire.

The survival factors associated with this situation should be further examined by the AAIC. The accessibility of all areas on an airport is crucial in the event of an aircraft accident. Further guidance can be found in the following sources:

- *Annex 14, Aerodromes – Volume I: Aerodrome Design and Operations*, Published by ICAO, in July 2004.
- *Title 14, U.S. Code of Federal Regulations Part 139.19, Aircraft rescue and firefighting: Operational requirements*, Published by the Federal Aviation Administration.
- *Advisory Circular 150/5200-31A, Airport Emergency Plan*, Published by the Federal Aviation Administration, in September 1999.
- *Guide for Aircraft Rescue and Firefighting: NFPA 402*, Published by the National Fire Protection Agency, in 1993.

## C.4 Systems Examination

The focus of the systems group study is to determine and analyze how the functions of the autothrottle, enhanced ground proximity system (EGPWS) and windshear system performed during the approach phase of the accident flight

To evaluate the role of the airplane and its systems in this accident, the Systems group relied on evidence such as CVR and FDR information.

It should be noted that the engineering units conversions used for the parameters recorded on the FDR were based on documentation from the previous operator of the accident airplane. A review of the converted data revealed that the majority of the parameters converted as expected. However, the linear conversion provided for the radio altitude parameter did not produce accurate values when compared with recorded FDR pressure altitude data. A review of the unconverted radio altitude data recorded on the FDR indicated that the data trended as expected and did not indicate any problem with the source of the data, the radio altimeter. Other options were pursued to obtain a more accurate radio altitude conversion including using the original piecewise linear/exponential equation obtained from the airplane's manufacturer and using a conversion based on a correlation performed by the accident airplane's former operator on a sister airplane. While these other conversions produced radio altitude values that were more consistent with pressure altitude data at some low altitudes, significant differences remained at other altitudes. This is most likely due to variations among airplanes as modifications were made to the FDR systems. Without being able to perform a correlation on an intact accident airplane, an accurate conversion for radio altitude could not be determined. As a result, all citations of RA values in this section are based on the radio altitude recorded on the Enhanced Ground Proximity System (EGPWS).

The evidence indicated that just prior to landing, a “sink rate” alert was automatically annunciated by the EGPWS. Shortly thereafter, the autothrottle system transitioned into “retard mode” commanding both throttle levers to retract to idle at a radio altitude of about 50 feet. This resulted in the left and right engine EPR being reduced from about 2.0 to about 1.1; EPR remained in this position for about 13 seconds. Approximately two seconds later, the CVR indicated that the flight crew verbalized their intent for a “go-around” and FDR data indicated that flaps started to transition from “flaps 40” to “flaps 15”. The TO/GA palm switches**,** located on the throttle levers, were not selected. After 7 additional seconds, the data indicated that the status of the right main gear transitioned from down to in-transit. An assessment of the FDR data indicates that the only windshear warning issued during the accident flight occurred at about 08:40:09[9] (approximately 1 second before the end of FDR data).

### C.4.1. Autothrottle System

Airplane HS-OMG was equipped with an autothrottle system that is controlled by the Digital Flight Guidance System (DFGS). The autothrottle/speed control functions are available for operation from takeoff to landing. The autothrottle function is engaged by moving the AUTO THROT switch from OFF to the AUTO THROT position. The switch will not remain in the AUTO THROT (on) position unless all interlocks and engage logic requirements are satisfied. The switch will automatically revert to OFF when a malfunction is detected or the autothrottle disconnect button on either throttle is pushed. The red THROTTLE warning light, located on the Flight Mode Annunciator (FMA), flashes when the AUTO THROT switch is manually moved to OFF[10]. Pushing either autothrottle disconnect button or manually turning the AUTO THROT switch on extinguishes the throttle light.

An assessment of the FDR data indicates that throughout the final approach phase of flight 269, the autothrottle system was engaged and functioning; its modes fluctuated between the speed mode (SPD SEL), Clamp Mode and the Low Limit Mode (Low Lim) until the RETD mode was activated at about 08:39:47 (Reference Figure 1.). When the speed mode function of the autothrottle system is operating, the autothrottle system seeks to maintain the reference airspeed/Mach that the flight crew selected in the SPD/MACH window.

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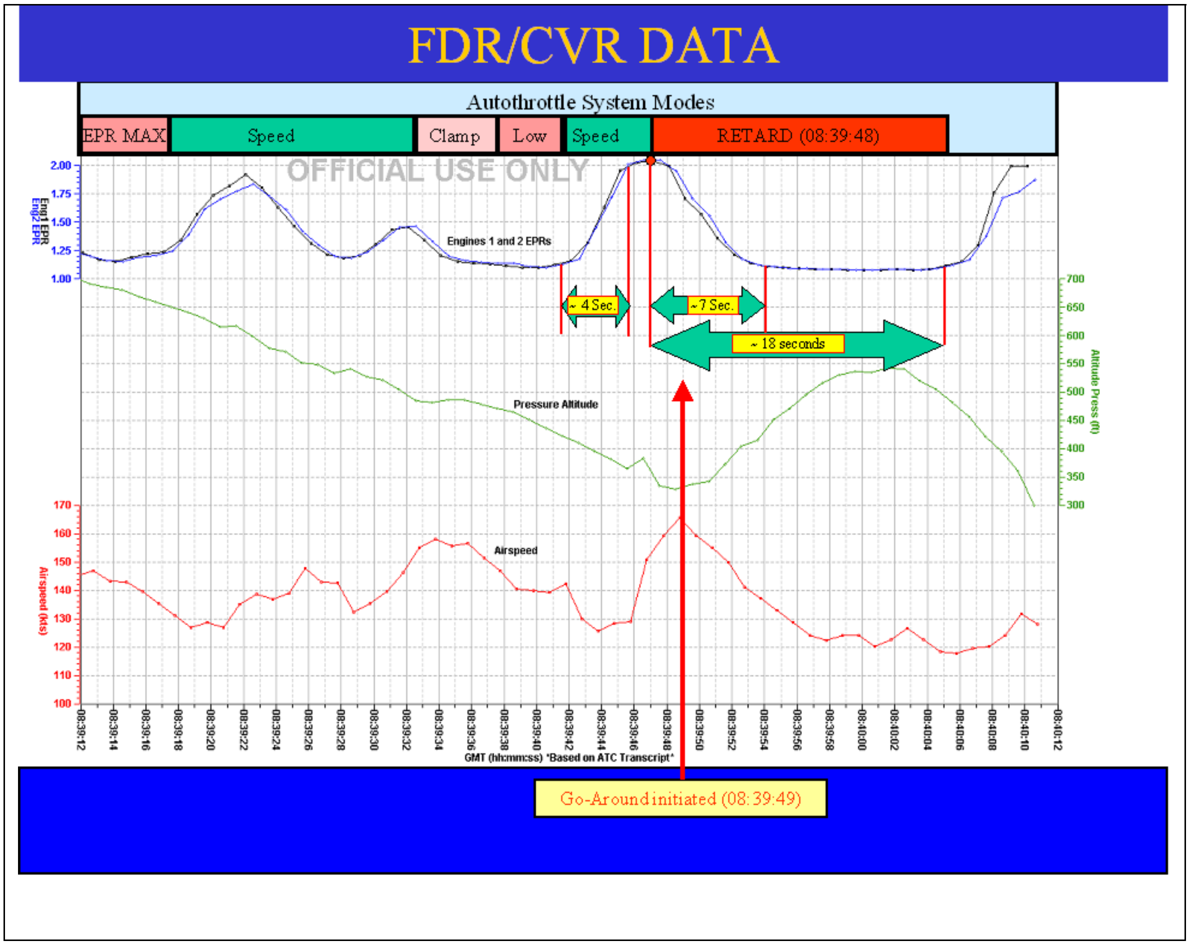
[9] All times in this report are in Greenwich Mean Time (GMT).
[10] The red THROTTLE warning lights flash for all autothrottle disconnects both manual and automatic.

The FDR data did not contain the selected Airspeed/Mach parameter and therefore, the specific airspeed was not confirmed.

At 08:39:41, the data indicated that during decent as airplane HS-OMG descended through about 150 feet (RA), the left and right engines were commanded to accelerate. The EPR for both engines increased from about 1.16 to about 2.0 in approximately three seconds and remained above 2.0 for almost 3 seconds. According to the Boeing Company, the MD-82 autothrottle system has the capability of commanding the autothrottle levers at a maximum rate of about 8 degrees per second. At 8 degrees per second, it would take the throttles approximately 5.5 seconds to go from idle to takeoff position. According to the Boeing Company, the engines are capable of accelerating faster than the autothrottle system can command them. Therefore, the manufacturer concludes that the 3-second engine acceleration rate is consistent with manual operation of the throttle levers. This would have overridden the autothrottles but the autothrottles would remain engaged.

At about 08:39:47, with the aircraft in the SPD mode, at about 50 feet (RA), airplane HS-OMG experienced an automatic reduction of all engine thrust from about 2.0 EPR to about 1.1 EPR because the retard (RETD) mode function of the autothrottle system automatically activated. Both engine's EPR remained at about 1.1 for approximately 13 seconds allowing the airspeed to drop below 120 kts. According to Boeing, the RETD mode is automatically activated as a function of radio altitude and landing flap configuration when the autothrottle is not in the EPR G/A mode. With the approach slat/flap logic applied to the autothrottle system, the flaps positioned to at least 20 degrees and the radio altitude less than or equal to 50 feet, the retard mode of operation is automatically established. The FDR data indicates the RETD mode activated when the flaps were positioned at 40 degrees and the aircraft descended below the 50-foot autothrottle retard altitude. Once activated, the FMA displays "RETD" and both throttles are driven to the aft stop at a rate dependant on the radio altitude. The autothrottle retard mode is independent of the autopilot or flight director-operating mode.

**Figure 1 Autothrottle System Modes**




## C.4.2. Enhanced Ground Proximity Warning System (EGPWS)

### General

At the time of the accident, airplane HS-OMG was equipped with one Honeywell Mark V EGPWS computer having part number 965-0976-003-216-216, and serial number 18254.

As part of the investigation, this EGPWS computer was removed from the accident site and shipped to the National Transportation Safety Board, located in Washington D.C. The computer was removed from its original shipping container, photographed, re-packaged and shipped to the Honeywell, facility located in Redmond Washington. The computer was received into Honeywell's Redmond Washington facility on January 31, 2008, where it was placed in a secured area. Honeywell was asked (by the NTSB) to retrieve and analyze any flight history data that might have been recorded within the computers non-volatile memory.

The initial examination of the unit was conducted in the presence of a representative of the US National Transportation Safety Board and Federal Aviation Administration. After the initial evaluation, the unit was secured pending a more thorough technical evaluation. The technical evaluation of the unit was reconvened on February 28, 2008.

**Description of the Mark V EGPWS Computer**

The Mark V EGPWS is a Terrain Awareness and Alerting system providing terrain alerting and display functions with additional features. It uses aircraft inputs including geographic position, attitude, altitude, groundspeed, and glideslope deviation. These are combined with an internal terrain, obstacle, and airport database to predict potential conflicts between the assumed aircraft flight path and any fixed external objects within the database. The system also utilizes airspeed and groundspeed information to provide warning of potential wind shear conditions. Except, this system is not active on MD80 due to the presence of another windshear system. If the logic for any programmed warning condition is satisfied, the EGPWS system will provide both visual and audio warning in the cockpit. Additionally, the EGPWS provides alerts for excessive sink rate, glideslope deviation, too low with flaps or gear not in landing configuration, and optional bank angle and altitude callouts, based on system configuration from the Honeywell Enhanced Ground Proximity Warning System and Runway Awareness Advisory System Pilot Guide, MK V and MK VII:

The EGPWS contains an internal database consisting of several sets of data:

1. A worldwide terrain database of varying degrees of resolution.
2. A worldwide airport database containing information on runways 3500 feet or longer in length.
3. An Envelope Modulation database

With the use of accurate GPS or Flight Management System (FMS) information, the EGPWS is provided present position, track, and ground speed. This enables the EGPWS to present a graphical plan view of the aircraft relative to the terrain and advise the flight crew of a potential conflict with the terrain or obstacle. Conflicts are recognized and alerts provided when terrain violates specific computed envelope boundaries on the projected flight path of the aircraft. Alerts are provided in the form of visual light annunciation of a caution or warning, audio enunciation based on the type of conflict, and color enhanced visual display of the terrain or obstacle relative to the forward look of the aircraft. The terrain display is provided on the Weather Radar Indicator, EFIS display, or a dedicated EGPWS display and may or may not be displayed automatically.

The MK V EGPWS captures and internally saves flight history information for up to 71 parameters over a timeframe from 20 seconds before to 10 seconds after any warning is triggered. Information for up to 200 EGPWS warning ‘events’ may be retained in memory. New event data replaces the oldest data once the flight history memory area becomes full. Not all parameters are utilized in every installation. Some parameters remain blank, as their slots are saved for future use. Stored information may later be downloaded by the manufacturer. This capability is intended primarily for systems engineering and quality control purposes. There is no formal documentation concerning the definition of the parameters stored in EGPWS memory.

**EGPWS Computer Examination**

The flight history data from the EGPWS computer's non-volatile memory of aircraft HS-OMG, was downloaded by Honeywell Engineering. Honeywell produced a report that provides an overview of the examination and an analysis and summary of the data that was obtained from the computer. This report was provided to the NTSB and is referenced in Appendix A of this report

The data indicates that during the accident aircraft's last flight leg, four alerts were recorded over an approximate 43-second span (Reference Figure 2). The EGPWS computer began recording data when the first alert, M1SK (sink rate), was triggered. The computer recorded 20 seconds of data prior to the first alert and approximately 23 seconds of data after the alert. After the first alert was recorded, the computed recorded an additional three alerts; a Mode 3 sink rate alert occurred 19 seconds after the first alert, then three seconds later another Mode 1 sink rate alert, and a final Mode 1 warning (PULL UP) was given one second later. After the last alert, the data recording ended, presumably at the same time as aircraft impact. Both pressure altitude and radio altitude were recorded by the computer. A comparison of the pressure altitudes and radio altitudes obtained from the FDR and EGPWS are indicated in Figure 3[11].

[11] As mentioned previously, an accurate conversion for radio altitude data recorded on the FDR could not be determined. The FDR radio altitude presented in Figure 3 is based on one of the conversions that was evaluated and is included to show the trend of the data compared to the radio altitude recorded on the EGPWS.

**Figure 2 EGPWS Alerts**

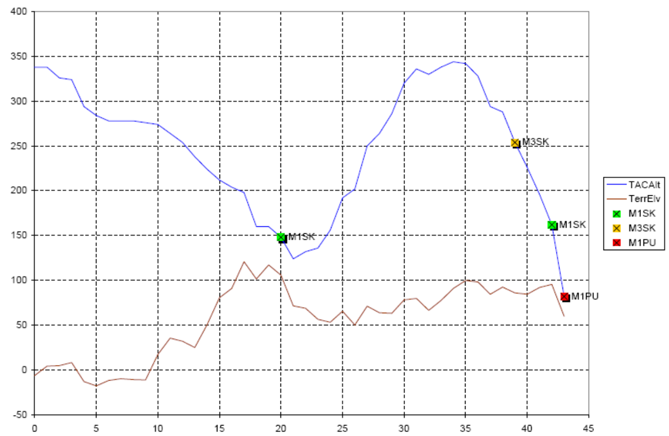
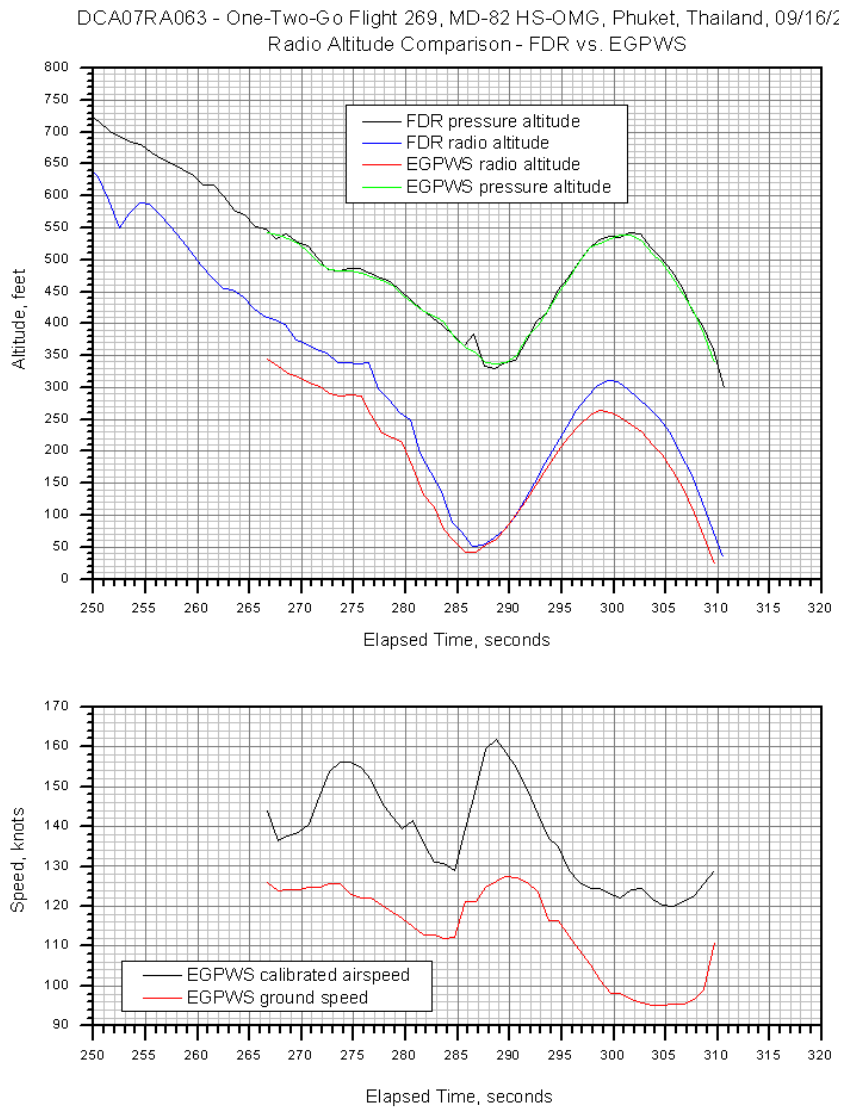


**Figure 3 Comparison of EGPWS and FDR data**




## C.4.3. Windshear Alerting and Guidance System

### General

At the time of the accident, airplane HS-OMG was equipped with a Honeywell 'Legacy' reactive windshear warning system. An assessment of the FDR data indicates that the only windshear warning issued during the accident flight occurred at about 08:40:09 (approximately 1 second before the end of FDR data).

Trans World Airlines originally installed this windshear warning system by installing one additional line replaceable unit (LRU), a Honeywell Wind Shear

Computer (WSC) part number 4059845-902, into the airplane per Douglas Service Bulletin 34-226. In 1998, Trans World Airlines replaced the originally installed computer with a computer, P/N 4059845-911. This computer met the requirements of Airworthiness Directive AD 96-02-06[12].

**Description of the windshear alerting and guidance system (WAGS)**

The windshear alerting and guidance system (WAGS) provides detection, alerting, and guidance through hazardous windshear conditions. The system consists of a windshear computer (WSC), which receives attitude, acceleration, and other data from the digital flight guidance computer (DFGC). The WSC also receives air data from the central air data computer (CADC) and stick shaker margin from the stall warning computers (SWC). The WSC uses the data from the DFGC, CADC and SWC to provide windshear and guidance during a windshear encounter. Upon detection of a windshear condition, the WSC provides both aural and visual cockpit annunciations.

The WSC detects two types of windshear: increasing performance (increasing headwind or updraft) and decreasing energy shears (increasing tail wind or downdraft). An increasing performance windshear (increasing head wind or up draft) results in an amber caution to be annunciated. A decreasing performance windshear (decreasing tail wind or down draft) causes a red warning to be annunciated on the glare shield and on the Primary Flight Display (PFD).

The WSC also enables the Central Aural Warning System (CAWS) to generate a warning tone. The actual voices that the CAWS delivers are operator selected options and can be either the "head wind shear" or "tail wind shear" warnings or the more common "wind shear wind shear". The FMA will display appropriate windshear annunciations. The WSC provides pitch guidance commands for all windshear encounters during all takeoff (after rotation) and go-around operations.

During approach, when the WSC detects a windshear, "WND SHR" will flash five times and then go steady in the FMA throttle window. An aural warning will sound when a decreasing performance windshear is detected. If the A/T are engaged in the speed mode when the wind shear is detected, the WSC will provide an input to the DFGC that will cause the DFGC to automatically control the auto throttles to maintain at least 1.3Vs + 20 knots.

The CAWS monitors discrete signals from the WSC and will annunciate a windshear unique tone followed by three repetitions of "windshear" in response to

[12] AD 96-02-06 was mandated to prevent significant delays in the Honeywell Standard Windshear Detection Systems (WSS) detecting hazardous windshear, which could lead to the loss of flight path control. The AD requires upgrading a wind shear computer by incorporating new software that eliminates delays in the WSS detecting windshear when the flaps of the airplane are in transition.

the setting of these discretes. According to Honeywell, the operator can choose to inhibit certain aural warnings by enabling certain pins on the windshear computer; the pins are 8, 11, 14, and 23. The following provides a description of the program pins and if grounded, what they will inhibit:

1. Program pin 8: Takeoff Roll Increasing Shear Aural Annunciation Inhibit. A ground will inhibit the W/S aural annunciation during the Takeoff Roll mode in response to an increasing performance shear.
2. Program pin 11: Takeoff/Go-Around Increasing Shear Aural Annunciation Inhibit. A ground will inhibit the W/S aural annunciation during the Takeoff or Go-Around modes in response to an increasing performance shear.
3. Program pin 14: Approach Increasing Shear Aural Annunciation Inhibit. A ground will inhibit the W/S aural annunciation during the Approach mode in response to an increasing performance shear.
4. Program pin 23: Aural Warning - WINDSHEAR. A ground w1ll provide for the annunciation of WINDSHEAR for decreasing performance wind shears. (If this option is selected, options 8, 11, and 14 must also be selected.) An open will provide for independent discrete outputs to the CAWS for aural annunciation of TAILWIND SHEAR and HEADWIND SHEAR.

If the system is configured in such a way that none of these 4 pins are grounded, the system would allow the “increasing shear” aural on takeoff roll, takeoff/ go around, and approach. However, if pins 8, 11 & 14 were all grounded then the aural warnings for those functions would be inhibited. To understand how the accident airplane was configured, a review of the operator’s aircraft records for airplane HS-OMG could be examined.

**Windshear Alerting and Guidance System Evaluation**

The windshear computer P/N 4059845-911 contains non-volatile memory in which any detected system failure occurring on a previous flight is recorded within the computer. Because of the usefulness of the non-volatile memory in logging failures and detections, the investigation attempted to recover the windshear computer hardware (specifically the printed circuit board that contains the non-volatile memory chips). Five printed circuit boards were recovered from the accident site and shipped to the National Transportation Safety Board, located in Washington D.C. The printed circuit boards had assembly and serial numbers printed on them. The circuit boards were identified as indicated:

1. Circuit Board # 1: 58960 ASSY4053337-971 Rev G, Serial number G2025553 side B
2. Circuit Board # 2: 58960 ASSY4035022-902 Rev M, Serial number 7101468 side B
3. Circuit Board # 3: 58960 ASSY4058344-901 Rev G, Serial number G2035780 side B

4. Circuit Board # 4: ASSY 42-807??
5. Circuit Board # 5: ASSY 42-80719

A review was conducted to determine if any of the circuit boards contained the non-volatile memory chips from the windshear computer. This recovery effort was unsuccessful in recovering the card with the non-volatile memory. None of the recovered hardware was helpful in this analysis. The number “58960” is the Honeywell Phoenix identification “cage” code. These circuit boards most likely originated from the Digital Flight Guidance Computer. However, this computer does not contain any Non-volatile memory. The circuit boards having “ASSY 42-“ could not be identified.

To evaluate the expected response of the windshear alerting and guidance system to the winds encountered by the accident aircraft, Honeywell constructed a windshear simulation model. Their simulation indicated that the legacy Honeywell windshear detection system would have been expected to produce an alert approximately 0.3 seconds before the end-of-data. The FDR data shows that the system on the accident airplane issued a windshear warning approximately 1 second before end-of-data. Details of Honeywell’s model and the results obtained from it are indicated in Appendix B.

**D. <u>OPERATIONAL AND HUMAN PERFORMANCE</u>**:

The systems investigation revealed that all airplane systems functioned as designed and that the airplane remained controllable during the approach and intended go-around. Because the pilots did not properly perform the go-around procedure or identify that the power was reduced during the go-around, the decisions and actions of the pilots should be further addressed by the AAIC. It is understood that during the accident sequence, the pilots were potentially distracted by the weather conditions; however, that distraction should not cause a loss of control of the airplane. Substantial investigative effort should be devoted to understanding the pilots’ actions as the scenario unfolded.

Additional investigative effort should also be devoted to understanding why the first officer transferred control of the airplane to the captain at low altitude, during a go-around. The pilots were faced with challenges during the approach and go-around, exacerbated by the transfer of control at low altitude. This created a situation in which critical checklist items were missed, and the airplane was allowed to descend into the terrain.

Investigation of these issues will require the collection of adequate human factors and operational data, which should be just as methodical and complete as the collection and analysis of information pertaining to the aircraft and its systems. Some general guidelines for the investigation of human factors in aircraft accidents can be founds in ICAO Circular 240, *Human Factors Digest No. 7, Investigation of Human Factors in Accidents and Incidents.*

In order to thoroughly investigate this subject, data should be collected (and substantiated) in reference to: pilots' experience, rest periods, and 72-hour personal histories. Additionally, company procedures and training should also be collected and evaluated.

Data pertaining to the individual pilots routinely includes the following focus areas:

- 72-hour history
- Fatigue
- Stress
- Recent health
- Medications
- Experience
- Training
- Proficiency
- Personality/cockpit behavior

This data can be obtained, for example, by examining pilot records, interviewing other pilots who may have flown with the accident crew, the pilots' families, the pilots' physicians, instructors who trained the pilots, and any pilot examiners who may have evaluated them. A detailed list of example questions is attached to this report as Appendix C.

Fatigue has proven to be a considerable detriment to pilot performance and the potential for its appearance in this accident should be investigated. A family member of one of the passengers killed in the One-Two-Go accident provided documents to the NTSB, which reference pilots exceeding flight time limitations as well as other safety issues at the airline. While the validity of these documents cannot be substantiated, extensive investigative effort should be focused in examining these issues[13].

Significant investigative effort should also be placed on examining the procedures, training, and corporate culture at the accident airline. During the accident sequence, the autothrottle system design function, RETARD, moved the throttles to idle as the aircraft descended through approximately 50 feet AGL. Because the pilots omitted a critical step in the go-around procedure; *i.e.,* activation of the TO/GA switch, the autothrottle system remained in the designed RETARD mode, and as the airplane transitioned to a climb the airspeed rapidly decayed. Had the crew followed the prescribed go-around procedures, activation of the TO/GA switch would have allowed the autothrottle system to advance to go-around thrust.

[13] These documents are attached as Appendix D.

Examination of an excerpt from the Orient Thai MD-82 Manual, revealed an “SOP Profile” for a “Missed Approach/Rejected Landing.” The procedure states that the maneuver should be performed as follows:

“1. AUTOPILOT OFF:

PF pushes TO/GA button, advances power and calls “max power, flaps 15” (flaps 11 if landing flaps 28), PNF will repeat flaps 15 (11) and selects flaps 15 (11), verifies throttle FMA reads EPR GA and roll and pitch FMA’s read GO RND. Rotate to arrest sink while advancing the throttles to go-around thrust setting. PNF confirms that thrust is set for go around.

On a rejected landing, touchdown may occur but is not desired. Rotate to 20 degrees maximum while climbing at no less than go around speed. When a positive rate climb is assured, the PNF calls “positive rate,” the PF commands “gear up; bug up.” The PNF retracts the gear on command and sets 200, 250 or clean maneuvering speed, as appropriate, in speed select window. Continue with normal missed approach procedure. Disarm spoilers when time permits.

2. AUTOPILOT ON/AUTOTHROTTLE ON

PF pushes TO/GA button, advances throttles and calls “max power, flaps 15” (flaps 11 if landing flaps 28). PNF will repeat “flaps 15 (11)” and selects flaps 15 (11), verifies throttle FMA reads EPR GA, roll and pitch FMA’s read GO RND, and throttles are set for go around. When a positive rate of climb is assured, the PNF calls “positive rate,” the PF commands “gear up, bug up.” The PNF retracts the gear on command and sets 200, 250 or clean maneuvering speed, as appropriate, in speed select window. Continue with normal missed approach procedure. Disarm spoilers when time permits.”

This accident bears a resemblance to similar accidents that involve automation and a loss of aircraft control. As an example, a McDonnell Douglas MD-83 aircraft veered off the runway during landing at the Kajaani Airport, Finland, on November 3, 1994. During the ILS approach, the autopilot was disconnected, at an altitude of approximately 490 feet. However, the autothrottle remained engaged and the first officer continued to fly the approach manually.

At an altitude of 150 feet, the captain took control of the airplane, as he believed the airplane was slightly above the glide slope. At an altitude of 120 feet, the autothrottle thrust mode changed to go-around mode, since the speed was selected at 141 knots, and the system required 1.25-1.30 EPR to maintain the selected speed. The captain continued to retard the throttles against the autothrottle movement. Three seconds before touchdown, the autothrottle was disengaged and the airplane touched down 600 meters from the normal touchdown point, 26 knots over touchdown speed. As a result, a runway excursion occurred.

Both the One-Two-Go accident and the Finland accident display the importance of pilots understanding aircraft automation and how to operate it properly. Substantial investigative efforts should be concentrated in this area, to address the failures of the flight crew.  Numerous publications are available in reference to flightdeck automation. One comprehensive, detailed publication can be found in *The Interfaces Between Flightcrews and Modern Flight Deck Systems,* published in 2004, by the Federal Aviation Administration, in Washington D.C.

# APPENDIX A

# HONEYWELL EGPWS REPORT

**Report to National Transportation Safety Board**
**September 16, 2007 One-Two-Go Airlines MD83 Accident**

| | |
|---|---|
| **Prepared By:** | **Paul Gipson, Honeywell Product Integrity** |
| **Prepared For:** | **Mike Hauf, NTSB** |
| **Date:** | **April 29, 2008** |

**Unit Data:**
Honeywell Enhanced Ground Proximity Warning System computer
Part Number 965-0976-003-216(Mod 2)-216(Mod 1), Serial Number 18254;

Honeywell was requested by the US National Transportation Safety Board and the Government of Thailand to assist in the investigation of the September 2007 One-Two-Go MD83 accident. Specifically, Honeywell was asked to retrieve and analyze any flight history data that might have been recorded in the Honeywell Enhanced Ground Proximity Warning System (EGPWS) computer that was installed in the subject aircraft.

The computer is designed to store certain flight history data surrounding EGPWS caution, warning, or fault events. Fault data is recorded as it is recognized by either the unit self tests or the continuous monitor. If the EGPWS detects a condition that warrants a “Caution” or “Warning” message, the flight history data, consisting of several different parameters is recorded. This data is recorded at one second intervals, for the period 20 seconds before until 10 seconds after the event. Any data recorded is stored to a Non Volatile Memory (NVM) and retained, even if power is lost to the unit. This Flight History data was retrieved and analyzed for this report.

This report describes the investigation, analysis and findings as performed by Honeywell. The report is outlined as follows:

- Participants
- Findings
- Mode Descriptions
- Data Plot
- Flight History Parameters
- Unit Photographs

**Participants:**

The unit was received into Honeywell's Redmond Washington facility on January 31, 2008. The initial examination of the unit was conducted in the presence of Joe Sedor of the US National Transportation Safety Board and Eric West of the US Federal Aviation Administration. After the initial evaluation the unit was secured pending a more thorough technical evaluation.

The technical evaluation of the unit was reconvened on February 28, 2008, at Honeywell's Redmond, Washington facility. Present for the subsequent evaluation were:

- Pete Brown — Quality Engineer, Honeywell
- Kevin Allen — EGPWS Technical Manager, Honeywell
- Wally Ward — EGPWS Hardware Engineer, Honeywell
- Wes Goo — EGPWS Systems Engineer, Honeywell
- Jim Mulkins — EGPWS Systems Engineer, Honeywell
- Kevin Conner — EGPWS Research and Development Engineer, Honeywell
- Yasuo Ishihara — EGPWS Research and Development Engineer, Honeywell
- Bill Pickens — EGPWS Technician, Honeywell
- Steven Johnson — EGPWS Technician, Honeywell

**Findings**:

The EGPWS unit as received had been severely damaged in the accident. Honeywell removed the appropriate memory chip and reinstalled this onto an exemplar card. The flight history data from the chip was then downloaded and analyzed.

During the last flight leg there were 4 alerts recorded in the data over an approximate 43 second span. These alerts are depicted in the chart, attachment 3. The EGPWS began recording data when the first alert was provided. The unit recorded the prior 20 and next 10 seconds of data. A list of data items recorded is in attachment 5.

The first alert was a Mode 1 sink rate alert. The next alert, 19 seconds later, was a Mode 3 sink rate alert. 3 seconds later there was another Mode 1 sink rate alert. A final Mode 1 warning (this time a PULL UP) was given 1 second later. At this point data recording ended, presumably at the same time as aircraft impact.

Mode 1 Alert -- Mode 1 alerts are provided when the EGPWS senses an excessive descent rate close to the terrain. The warnings are both altitude and descent rate sensitive. Mode 1 is active in all aircraft configurations. If the aircraft penetrates the outer alert boundary, the voice aural "**SINKRATE, SINKRATE**" is generated, and the caution lights illuminate. If the aircraft penetrates the inner alert boundary, the voice aural "**PULL UP**!" is generated and the warning lights illuminate.

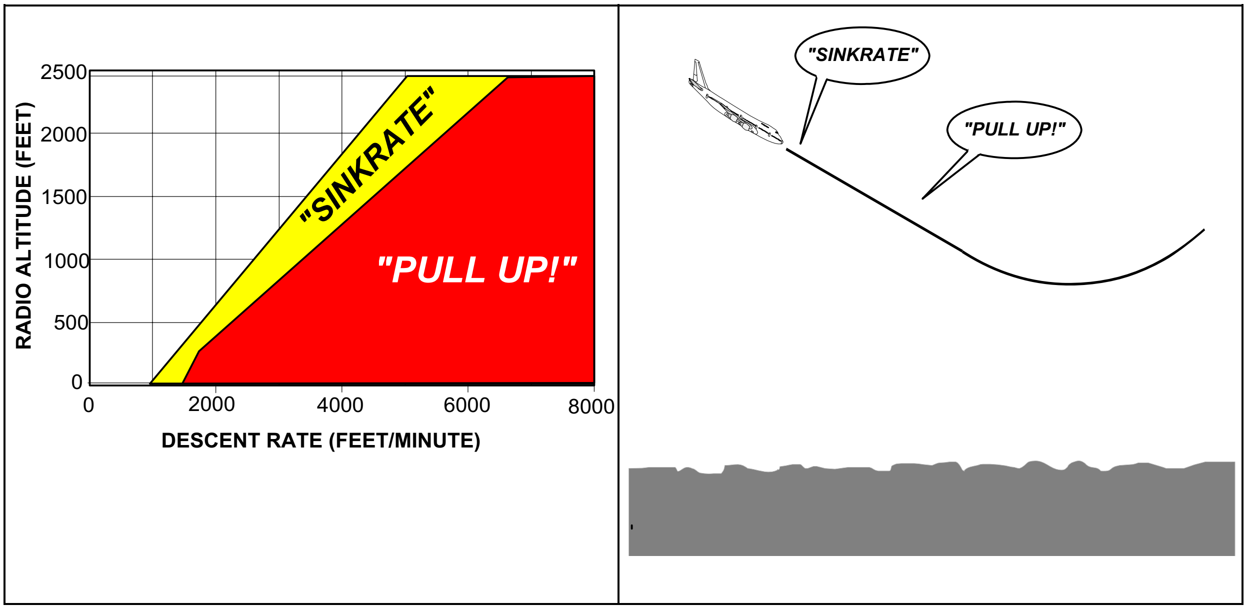
Mode 3 Alert -- Mode 3 alerts are provided when the EGPWS senses a significant altitude loss during takeoff or during a missed approach. This alert is given if the gear or flaps are not in the landing configuration. The aural alert is "**DON'T SINK, DON'T SINK**" and the caution lights are illuminated.

The plot of the downloaded data is Attachment 3 of this report. The raw data (in excel format) used to compile the chart was provided to the NTSB.

# Attachment 1

## Mode 1 - Excessive Descent Rate

Mode 1 provides alerts when the aircraft has excessive descent rate close to the terrain (see figure 2).




**MODE 1 - EXCESSIVE DESCENT RATE**

If the aircraft penetrates the outer alert boundary, the voice aural *"Sinkrate"* is generated, and alert discretes are output by the computer for driving visual annunciators. If the aircraft penetrates the inner alert boundary, the voice aural *"Pull Up!"* is generated and visual alert discretes are also output. The alert boundaries are defined in terms of aircraft vertical speed (barometric vertical speed supplemented by inertial vertical speed when available) and radio altitude.

## Mode 3 - Altitude Loss After Takeoff

Mode 3 provides alerts when the aircraft loses a significant amount of altitude immediately after takeoff or during a missed approach, as shown in Figure 1

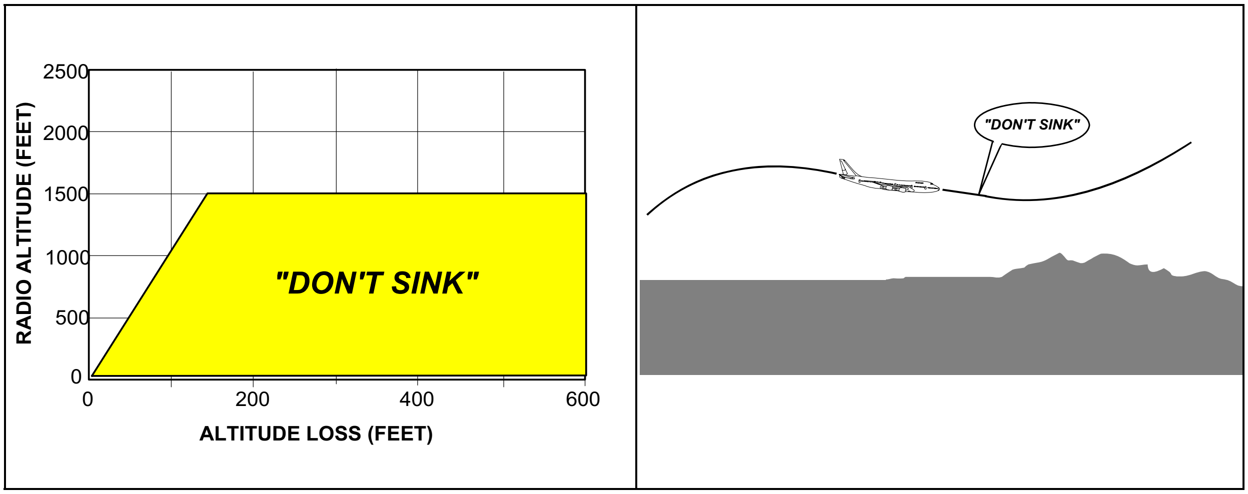
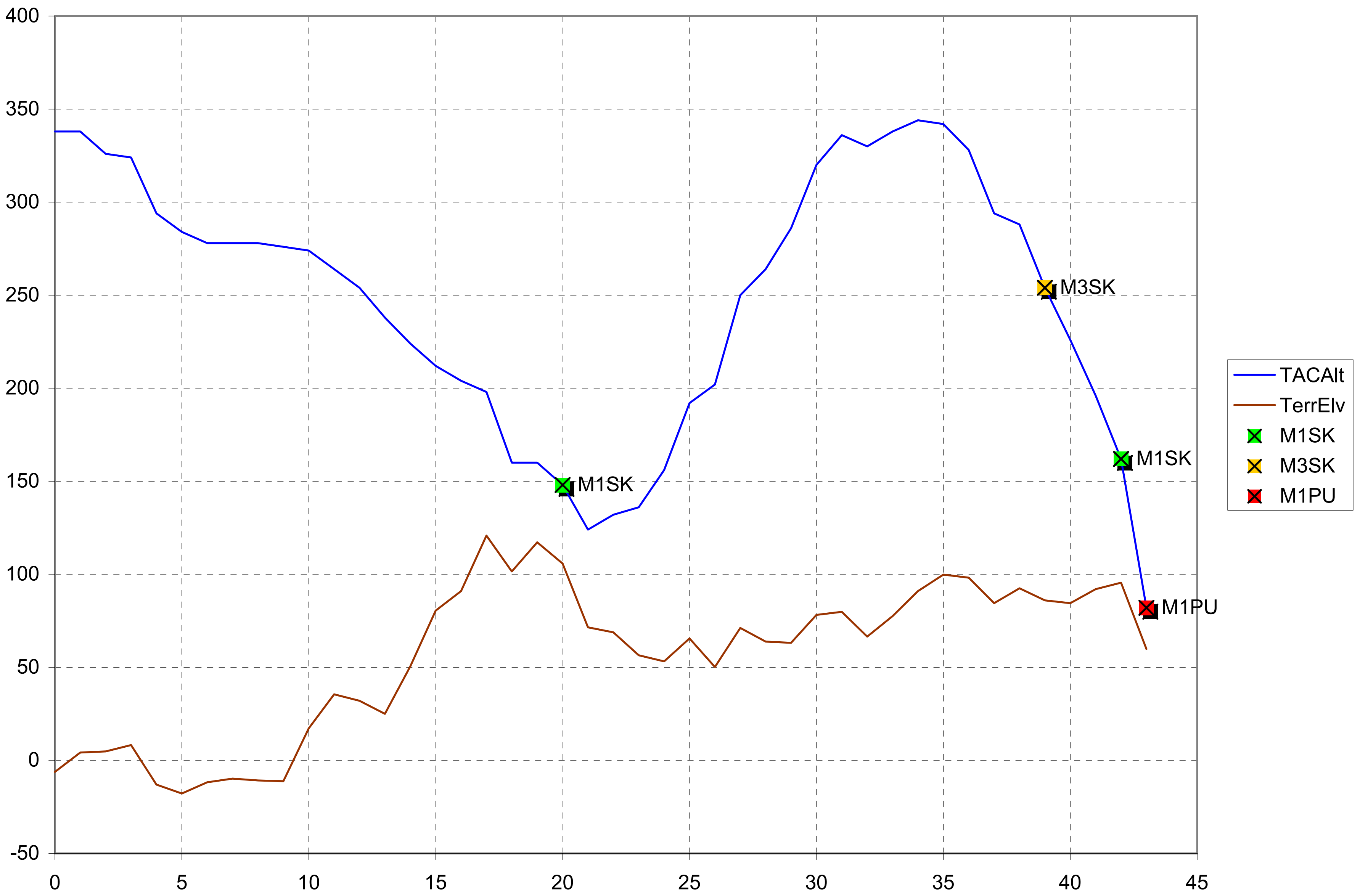



FIGURE 1 MODE 3 - ALTITUDE LOSS AFTER TAKEOFF

The altitude loss variable is based on the altitude (MSL) value from the time of the beginning of the inadvertent descent. The amount of altitude loss, which is permitted before an alert is given, is a function of the height of the aircraft above the terrain, as shown in Figure 1. Mode 3 is enabled after takeoff or go around when landing gear or flaps are not in landing configuration, and stays enabled until the EGPWS computer detects that the aircraft has gained sufficient altitude that it is no longer in the takeoff phase of flight.

If the aircraft penetrates the mode 3 boundary, the voice aural *"Don't Sink"* is generated, and alert discretes are provided for activation of visual annunciators. The visual annunciators remain active until a positive rate of climb is re-established.

## Attachment 3



# Attachment 4

# EGPWS Flight History Parameter List

System Operation Time
Latitude
Longitude
Position Uncertainty (HFOM)
VFOM
CAS
Ground Speed
GPS Altitude
Uncorrected Baro Altitude
Geometric Altitude
Radio Altitude
Terrain Database Elevation
Altitude Rate (Vertical Speed)
Magnetic Track
True Track
True Heading
Pitch
Roll
Glideslope Deviation
Loc Deviation
Position Source
TERR Display Range 1
TERR Display Range 2
Landing Gear Discrete
Landing Flaps Discrete
TERR Inhibit (Override)
TERR Display 1 Selected
TERR Display 2 Selected

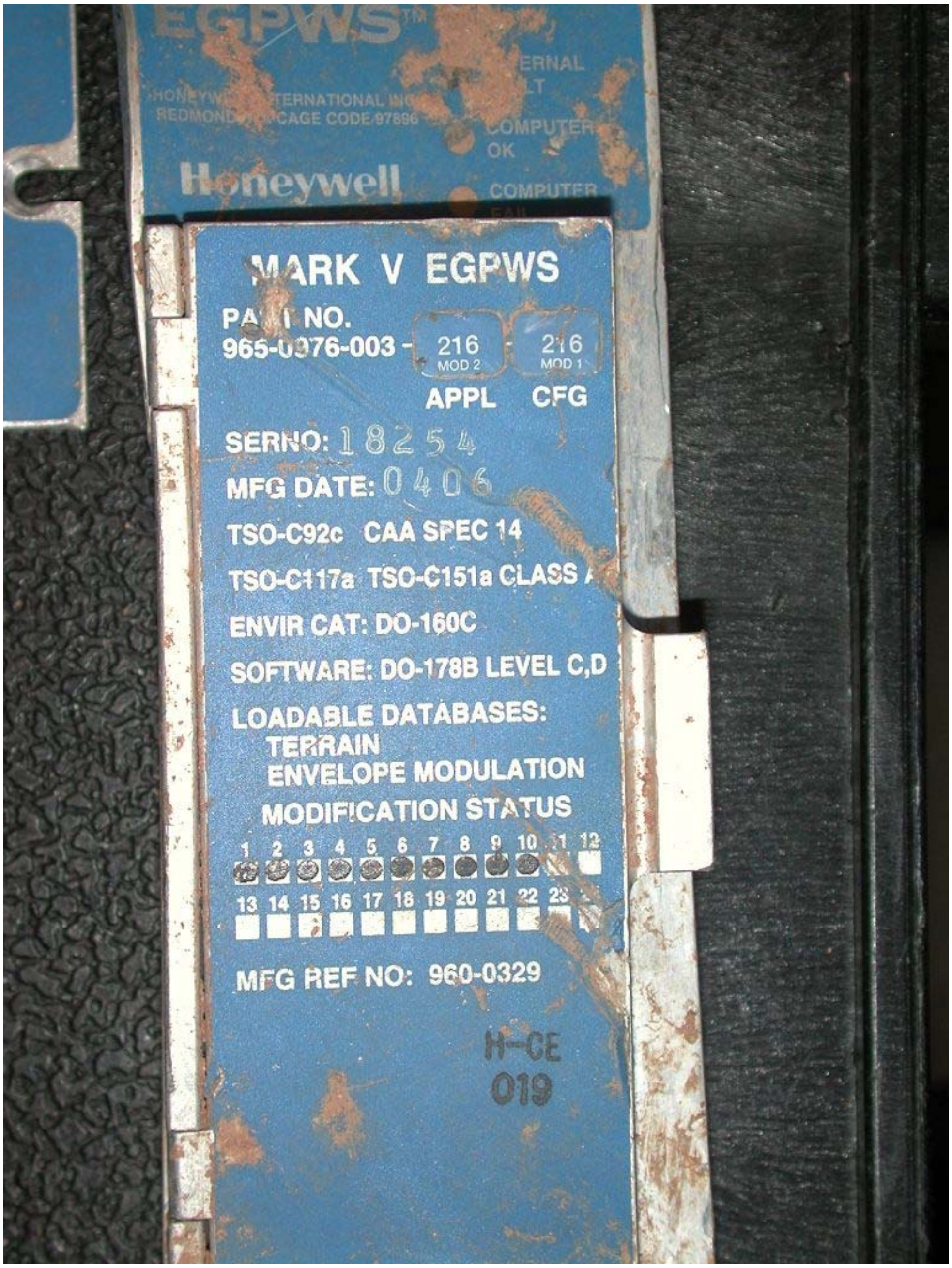
**PHOTO 1**


Unit as received at Honeywell Redmond facility

# PHOTO 2

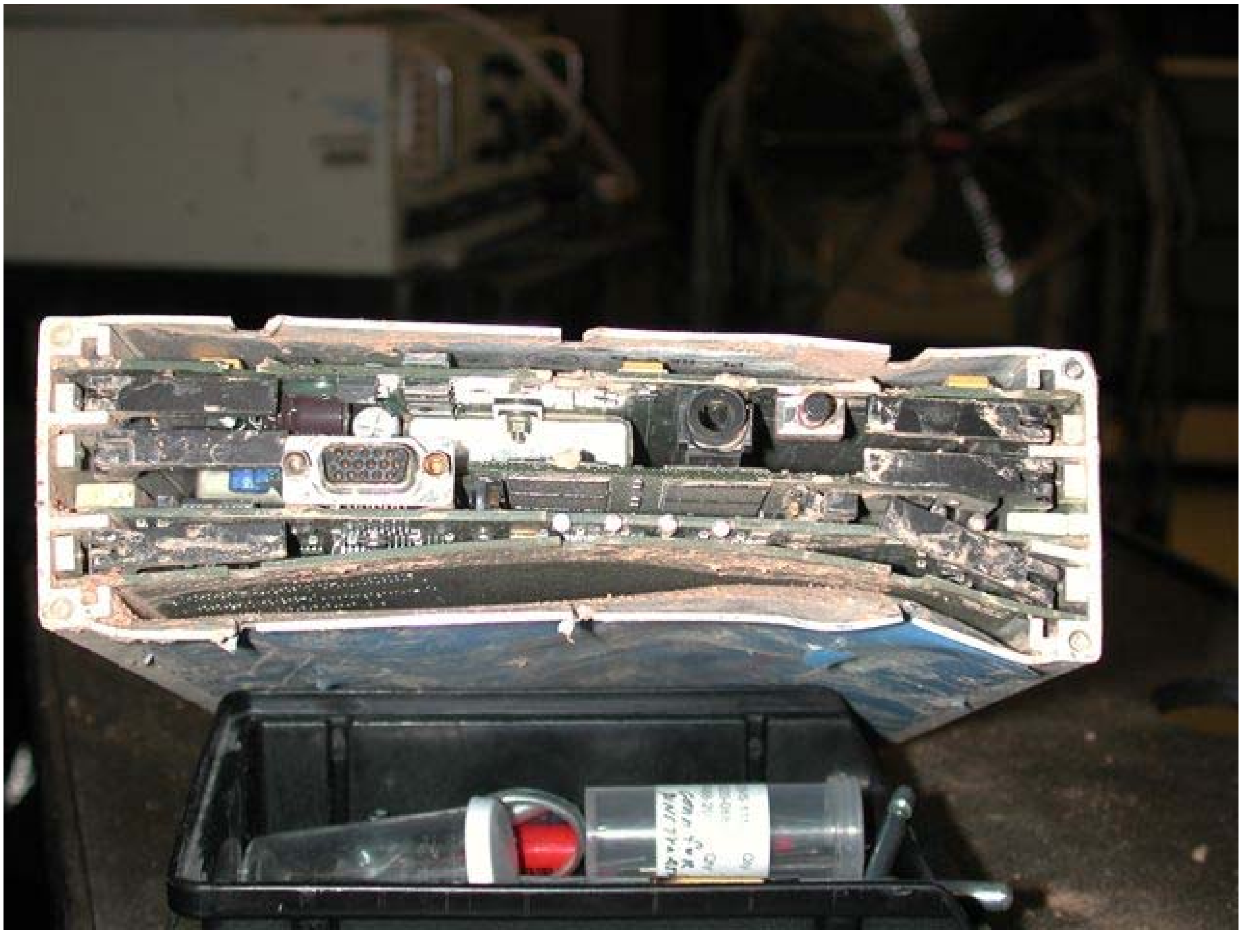

Unit removed from aircraft rack

# PHOTO 3




Unit Data Plate

**PHOTO 4**



Unit with front end cap removed

# APPENDIX B

# HONEYWELL WINDSHEAR REPORT

## Simulation of Honeywell Legacy Reactive Windshear Algorithm

J. Howard Glover, Honeywell Advanced Technology
30 November 2007

### References

1. Honeywell Document 5141-01298, Rev A, February 2002, "Detection Algorithms in Honeywell (Legacy) Reactive Windshear Systems – Description of the MD-80/90 System and Comparison to other Honeywell (Legacy) Windshear Systems".
2. FAA Technical Standard Order TSO-C117, "Airborne Windshear Warning and Escape Guidance Systems for Transport Aircraft".
3. NTSB spreadsheet data from flight data recorder of accident to MD-82, HS-OMG, Phuket, 9/16/2007.

### Background

The MD-82 aircraft HS-OMG involved in an accident at Phuket on 9 September, 2007 was equipped with a Honeywell 'legacy' reactive windshear warning system. In order to investigate the expected response of this warning system to the winds encountered by the accident aircraft, a simple simulation model was constructed. The model and the results obtained from it are described below.

### Simulation

Using the algorithm descriptions and diagrams contained in the Honeywell legacy windshear warning system description document (Reference 1), a Matlab® *Simulink* model of the algorithms was constructed. The *Simulink* model includes a simulation of the dynamics of a jet transport airplane. The model has some limitations:

- Detailed aerodynamic data for the MD-82 was not readily available, and data for a typical transport airplane of the size and performance of the MD-80 series was used,
- Some of the alerting and mode switching logic of the windshear detection algorithm was simplified. However the simplifications are not expected to have a significant effect on the results from the simulation.

The wind, aircraft flight path and airspeed data from the Phuket accident (Reference 3) were imported into the model, and the responses of the simulated windshear detection system were recorded.

For comparison purposes, a second Honeywell reactive windshear algorithm (the "legacy Sundstrand" algorithm was also included in the simulation, and subjected to the accident wind data. This algorithm was originally certified to the FAA TSO-C117 performance standard, and its behavior was used as a baseline for intended functioning of a reactive windshear detection system.

## Results

For the following time history charts, the time scale is referenced from an ‘end-of-data’ zero time corresponding to a GMT time of 31210.875 seconds in the original recorded data set in the spreadsheet provided by the NTSB.

The simulation indicated that the legacy Honeywell windshear detection system would have been expected to produce an alert approximately 0.3 seconds before end-of-data. The flight data recorder data shows that the system on the accident airplane issued a windshear warning approximately 1.1 seconds before end-of-data.

The simulation of the legacy Sundstrand windshear detection system provided a windshear warning at 0.6 seconds before end-of-data.

These results are compatible with each other, and well within the tolerance expected from the simulation.

The wind data provided by the NTSB (Reference 3) shows that there was a relatively insignificant vertical component of wind during the landing approach (Figure 1), and it is not expected that a windshear alert should have been issued based on the vertical shear. The variable within the legacy Honeywell algorithm which is most responsive to vertical shear is the variable TVERT, and the response of this variable is shown in Figure 3.

The horizontal wind component (Figure 2) shows a general increase from a headwind of 3 knots to a headwind of 47 knots during the majority of the approach, and then a rapid decrease to 10 knots at the end-of-data time. During the ‘increasing’ phase the wind speed oscillated considerably. These oscillations were attenuated by the gust filters of the windshear algorithm, as intended.

Towards the end of the approach, the headwind component (Figure 2) decreases, and the negative shear value eventually reaches a magnitude sufficient to cause the system to issue a warning alert (Figure 5).

The variables within the legacy Honeywell algorithm which are most responsive to horizontal shear are the variables TAIR1, TWIND1 and the ‘wind vector rotation’ variable TVIV. Plots of these variables against time from the simulation are shown in Figure 4. It is the variable TAIR1 which finally exceeds the threshold and causes an alert, as shown in Figure 5.

From the simulation data and accident data, the preliminary conclusion is that the legacy windshear detection system performed its function as intended, and that the performance was compatible with the requirements of FAA TSO-C117.

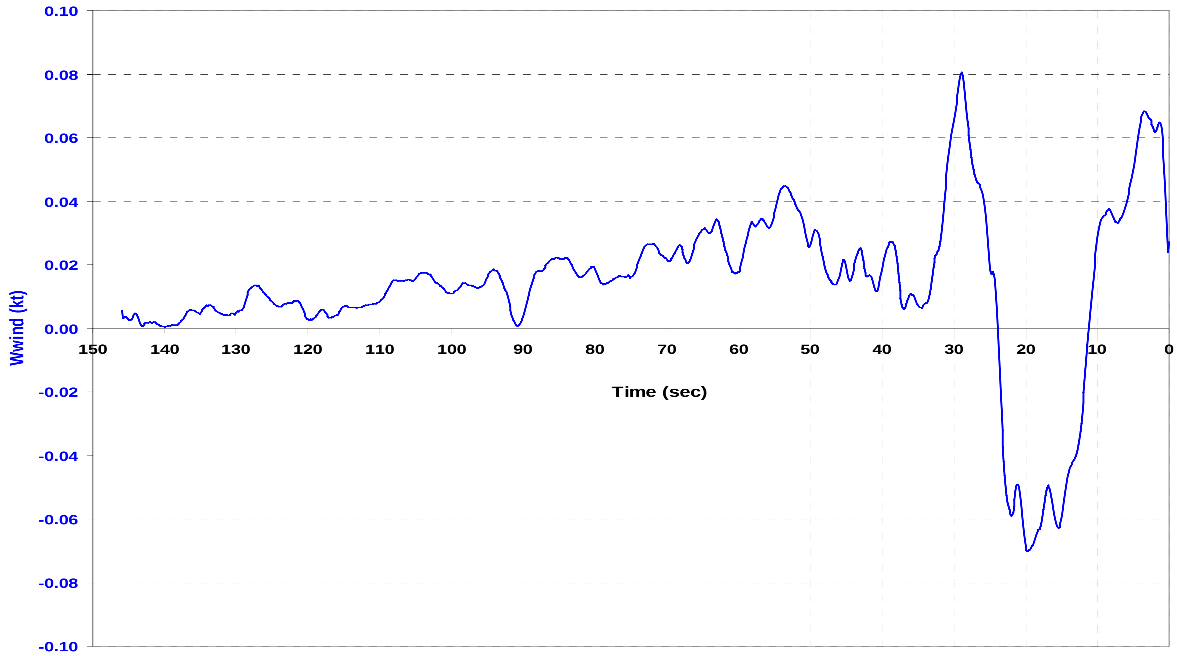



Figure 1. Vertical Wind

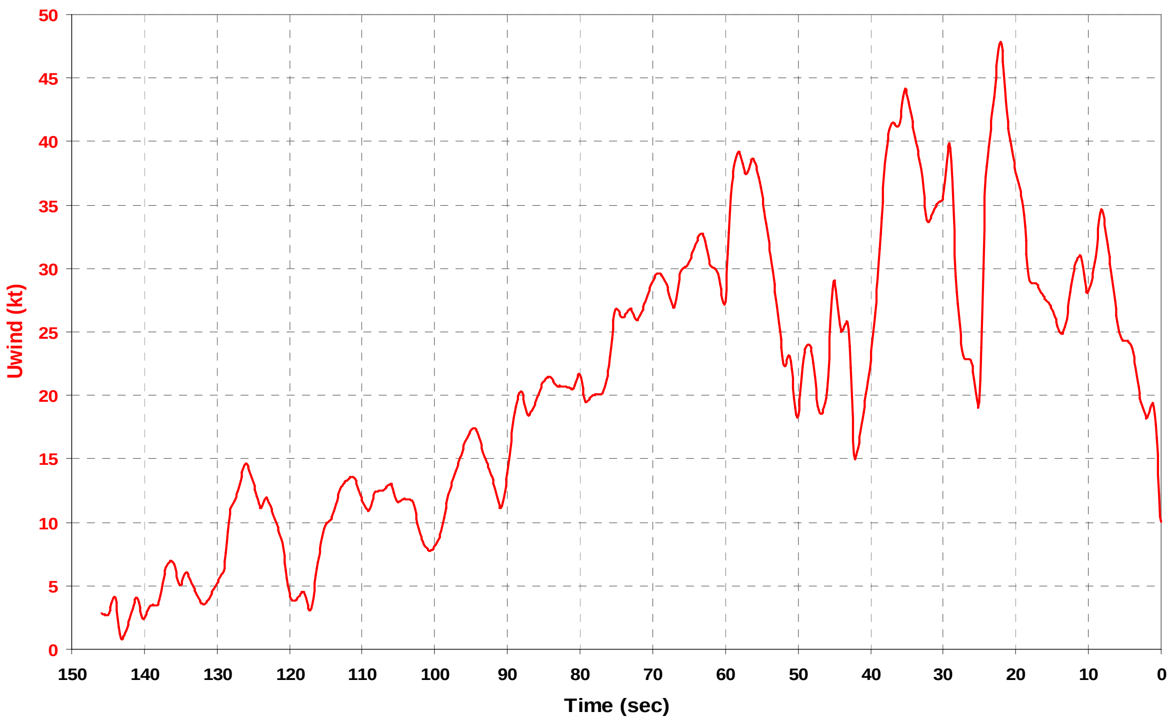



Figure 2. Horizontal Wind

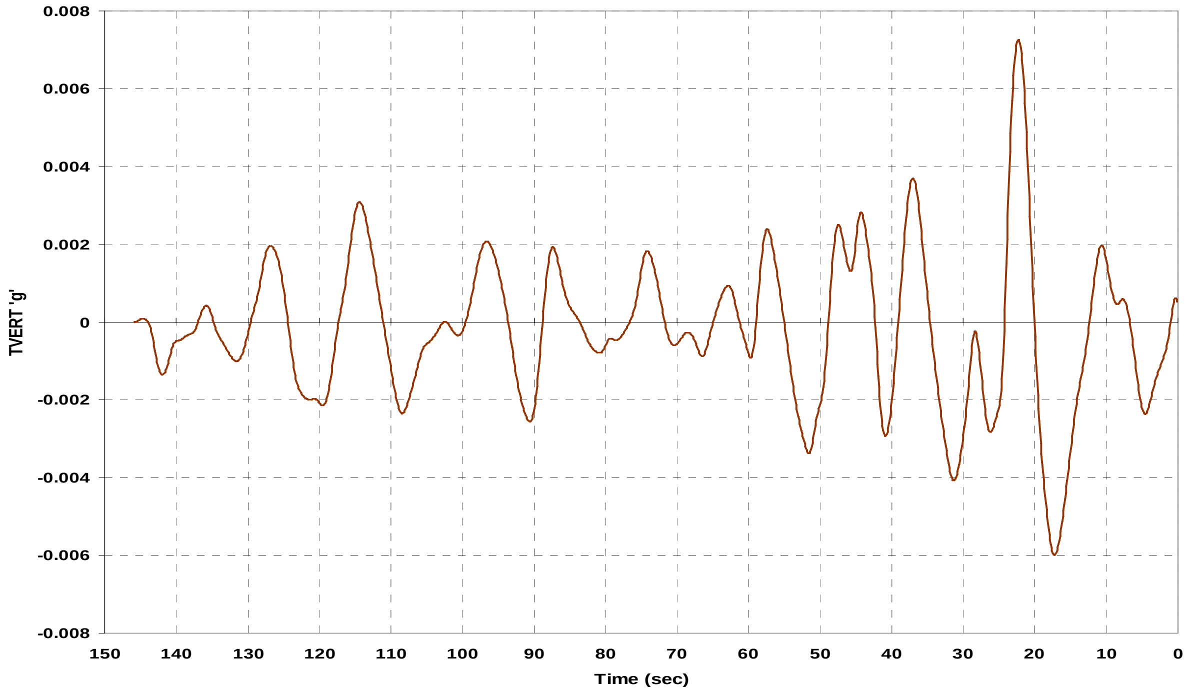



Figure 3. Simulation Time History of Windshear Algorithm Variable TVERT

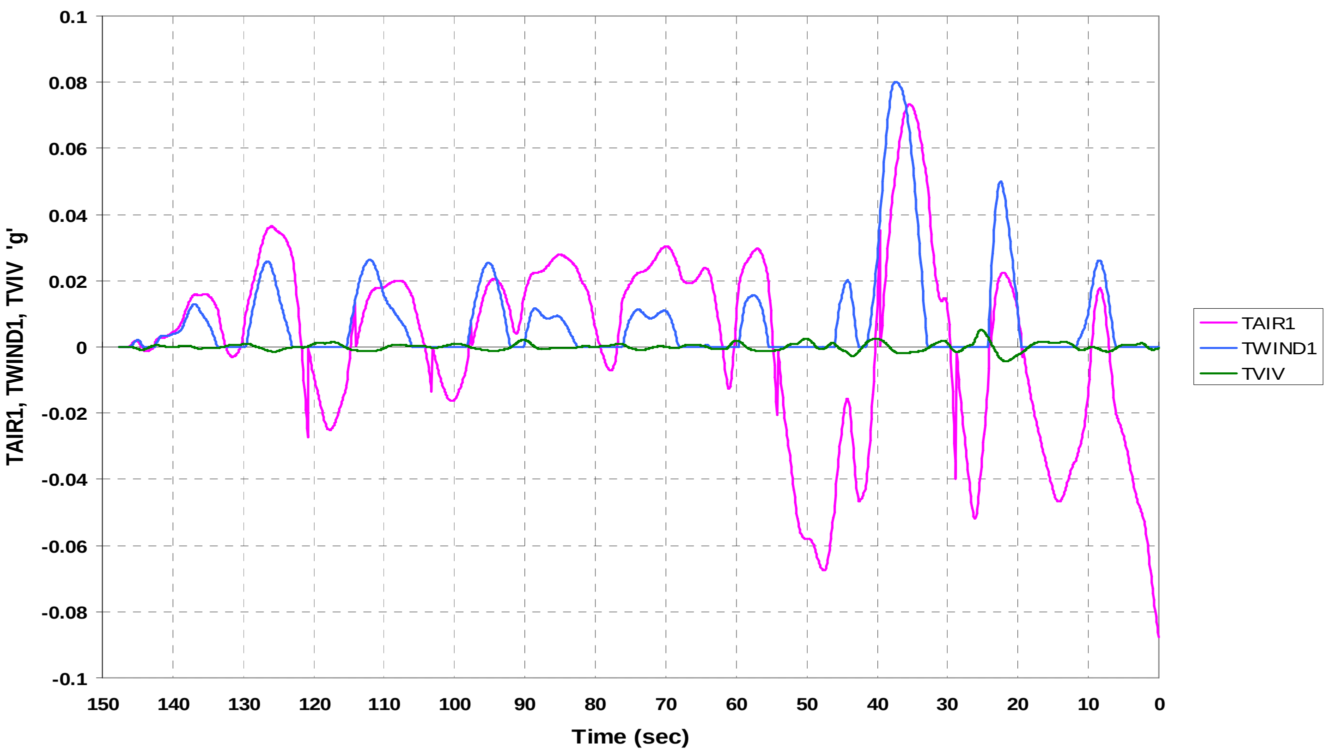



Figure 4. Simulation Time Histories of Windshear Algorithm Variables TAIR1, TWIND1 and TVIV

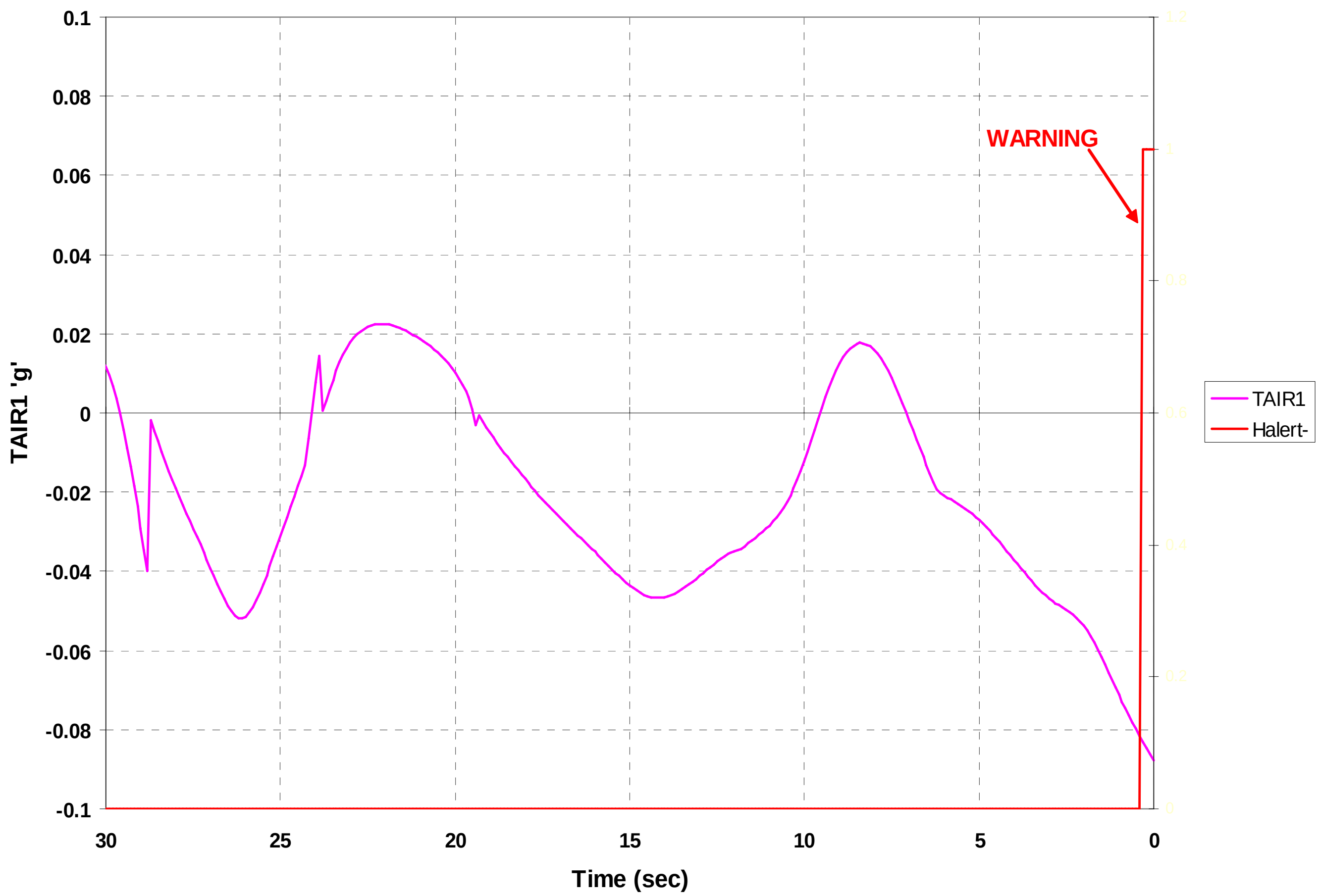



Figure 5. Simulation Time Histories of Windshear Algorithm Variables TAIR1 & Horizontal Negative Shear Warning (Expanded Time Scale)

# APPENDIX C

# HUMAN PERFORMANCE QUESTIONS

## APPENDIX C

## HUMAN PERFORMANCE/OPERATIONAL QUESTIONS

### A. PILOT PERCEPTION AND EVALUATION OF THE WEATHER CONDITIONS

Evaluate whether the pilots of One-Two-Go Airlines flight #269 failed to identify and respond to the weather conditions in a timely manner; evaluate whether the pilots failed to appreciate the severity of the conditions.

1. The crew that preceded the accident flight to the airport, reported weather information that they encountered during their approach. This information included an airspeed gain and loss of 15 knots during the final portion of the approach. From CVR information, document and evaluate the accident crews' response to this information. Determine whether the accident crew should have continued the approach at that time or whether the approach should have been abandoned or delayed.

2. Evaluate One-Two-Go Airlines severe weather recognition and avoidance training and their Windshear recognition and avoidance training.

3. Document One-Two-Go Airlines definition of windshear conditions. Document One-Two-Go Airlines procedures for operating in an area of windshear. Document One-Two-Go Airlines procedures for a Windshear Escape Maneuver. Determine and document whether the accident pilots should have considered the weather for the approach to be windshear conditions.

4. Document Boeing definition of windshear conditions. Document Boeing procedures for operating in an area of windshear. Document Boeing procedures for a Windshear Escape Maneuver.

### B. APPROACH PROCEDURES & TRANSFER OF CONTROL PROCEDURES

Document One-Two-Go Airlines procedures or guidance for additional speed additives to be used during approaches into areas of high winds and/or into areas where known loss and gain of airspeed has been reported. Determine whether the accident crew followed company procedures for airspeed additives during these conditions.

1. Document Boeing procedures or guidance for additional speed additives to be used during approaches into areas of high winds and/or into areas where known loss and gain of airspeeds has been reported.

2. Document One-Two-Go Airlines guidance and procedures for a first officer operating as the flying pilot during approaches into areas of high winds and/or into areas where known loss and gain of airspeeds have been reported. Determine and document any One-Two-Go Airlines limitations on the first officer operating as the flying pilot.

3. Document One-Two-Go Airlines guidance and procedures for transfer of controls and determine whether these procedures were followed. As the transfer of controls occurred at a critical point in the go-around, document and determine whether this transfer of control resulted in errors during the missed approach/go-around procedure.

## C. GO-AROUND AND WINDSHEAR ESCAPE PROCEDURES

Based on One-Two-Go Airlines procedures and training, evaluate and document whether the accident pilots should have recognized a windshear condition and performed a Windshear Escape Maneuver rather than a missed approach/go-around maneuver.

1. Document One-Two-Go Airlines and Boeing procedures for a missed approach/go-around.

2. Document One-Two-Go Airlines and Boeing Windshear Escape Maneuver procedures.

3. Document the specific duties, call-outs, and challenges of both the pilot flying and the pilot monitoring during Go-Around, Missed-Approach, and Windshear Escape Maneuvers.

4. Document whether the use of the autothrottles without use of the autopilot is consistent with One-Two-Go airlines guidance and procedures, including during Go-Around and Windshear Escape Maneuvers.

5. Document that One-Two-Go Airlines and Boeing procedures called for the flying pilot to push the TO/GA button, advance the power, and call for max power during a missed approach/go-around. Document that the TO/GA button was not pushed and that this allowed the throttles to retard to idle during the missed approach/go-around.

6. From the FDR information, document that the throttles retarded to idle and remained at idle thrust for approximately 14 seconds. Document that the throttles retarded to idle because the pilots failed to push the TO/GA button during the missed approach/go-around.

7. From FDR and CVR information, determine and document why the pilots failed to monitor the engine power setting and allowed the engine power to remain at idle power for about 14 seconds during a critical point in the missed approach/go-around.

8. Determine and document whether One-Two-Go Airlines training and guidance provides sufficient information to pilots concerning the effects of a failure to push the TO/GA button during a missed approach/go-around.

9. Determine and document whether One-Two-Go Airlines training provides sufficient guidance to pilots concerning the need to apply, monitor, and maintain sufficient power during a missed approach/go-around.

10. Document that weather conditions were not the cause of this accident, but may have been a contributing factor.

# APPENDIX D

# OPERATIONAL DOCUMENTS PROVIDED TO THE NTSB

**Demko (Andrews) Jill**

**From:** [redacted]
**Sent:** Thursday, May 29, 2008 10:02 AM
**To:** Demko (Andrews) Jill
**Subject:** Fwd: Thailand IASA - 1st email for Jill - resending 1C

Date: Tue, 20 May 2008 09:48:44 -0400
To: D[redacted]@faa.gov
From: [redacted]
Subject: Thailand IASA
Cc: [redacted]

Danuta,

Attached is:

1) Orient-Thai 11.jpg: The image of a document, written by Ron Allendorfer (but not signed), explaining the other images. What it says (in a nutshell) is: A Capt. Latief signed and approved PPC checks for 4 crew members in December, 2007 while he was on leave from Orient Thai. Since the signatures and comments differ in ink and handwriting style, Ron speculates that Capt. Latief signed the documents before going on Hajj. Ron recommends a complete and thorough IOSA Audit by an independent firm, specifically not one from Thailand.

2) Orient-Thai 12.jpg: An image of Capt. Latief's leave application, on Orient Thai stationary, signed by Capt. Latief and other writing presumably in his hand.

3) Orient-Thai 13-16.jpg: 4 images of the signed check rides on Orient Thai stationary. Even in black and white the different ink and handwriting are obvious.

4) Orient-Thai 2.jpg: An image of the MD-80 roster for the month of Dec, 2007 showing Latief to be "LV" during the dates of the check rides.

These images came from Ron Allendorfer through X X to me, with the intention of having them go public. In the email, Mr. Allendorfer says: "I sent an email to the DCA as a courtesy and to give them a heads up that others are aware of the condition of the carriers and it will be very embarrassing if the alleged fraudulent check rides and other things get out without them investigating. I feel nothing will be done, there's got to be some strong political connection for this to continue. "

warmly,
[redacted]

Reviewing the training records of December 2007, I found records that could possibly be fraudulent. On 1 November 2007, Capt. Latief, an instructor, requested and received approval from the DFO for leave from 1 December 2007 to 15 January 2008 to do the Hajj Pilgrimage. The official company crew schedule for December 2007 indicates that Capt. Latief was on leave for the entire month.

After reviewing the company Pilot Proficiency forms for the month of December 2007, Capt. Latief signed/approved PPC checks for the following crewmembers:

1. 17-12-07 PPC Simulator Capt. Anwar Haryanto
2. 05-12-07 PPC Simulator Capt. Nasrun Natsir
3. 10-12-07 PPC Simulator Capt. Harry Purwanto
4. 12-12-07 PPC Simulator Capt. Hendrarto

The question is: If Capt. Latief was on the Hajj Pilgrimage during December, how could he have conducted the Pilot Proficiency Checks?

I spoke with the Chief Pilot in regards to this and he explained that Capt. Latief was present during all the checks in question. He also relayed to me that Capt. Latief was on the Hajj from 20 December 2007. If that was the case and he did do the checks before he left for the Hajj, did the company pay him for those checks? If he did the checks, why did the official crew list for December not reflect that he was working? Does his logbook reflect that he conducted these checks? Does the Flight Simulator Log reflect that he was present?

I recommend that the aforementioned questions be investigated. It is my opinion that the forms were signed by Capt. Latief prior to his departure to the Hajj Pilgrimage. This is suspected because his signature is a different color of ink from the General Assessment, and the General Assessment printing appears to be done by another person. The Simulator Instructor ink and printing appears to be the same as what's written in the General Assessments.

Besides these possible irregularities, I would recommend that all of the training records and flight and duty time records be investigated for irregularities.

Based on the observations and information I provided on the state of Orient-Thai/One-Two-Go Airlines, I highly recommend that Orient-Thai/One-Two-Go be directed to undergo a complete and thorough IOSA Audit by an independent firm (not one from Thailand) beginning no later than 30 days from notification.

Depending on the results of the IOSA, reasonable and strict dates should be established to comply with any and all major findings.

## PILOT PROFICIENCY CHECK / INSTRUMENT RATING

### DEPARTMENT OF CIVIL AVIATION - ORIENT THAI AIRLINES CO., LTD.

| | | | | |
|---|---|---|---|---|
| O PILOT PROFICIENCY REPORT | O INITIAL | ☑ RECURRENT | O UPGRADE | FILE |
| INSTRUMENT FLIGHT REPORT | O INITIAL | O RENEWAL | O UPGRADE | NAME NASRUN NATSIR. |

| | | | | | |
|---|---|---|---|---|---|
| MEDICAL VALID 31-01-2008. | | LICENCE NUMBER [redacted] | | CREW STATUS CAPTAIN. | EMP # [redacted] |
| CANDIDATE BASE BANGKOK. | | EMPLOYER ORIENT THAI | | CHECK No. | PLACE OF CHECK |
| DATE 05.12.07 | SIM TYPE MD-82 | | FLT. TIME 04.00 | CCP | EXAMINER |
| DATE | AC TYPE | REG | FLT. TIME | CCP | EXAMINER |
| MARKING GUIDE | | | R NT | GENERAL ASSESMENT | |

# APPLICATION FOR LEAVE

(Technical Crew)

Name: RACHMAN LATIEF

Staff No.: [redacted] Title: CAPT.

Division/Dept.: OPS

Period of Leave: From 1 DEC 2007 To 15 JAN 2008

Type of Leave 90 DAYS ☑ Annual ☐ Medical ☐ Duty ☑ Without Pay

Reason: (Only in the case of Duty or Without Pay)

HAJ PILGRIMS.

Employee's Signature [redacted] Date 01 NOV 2007

(RACHMAN LATIEF)

## For Office Use Only

Leave Balance as at Date of Application: ______ Annual ______ Medical ______ Other

Comments ________________________________

Crew Scheduling Officer's Signature ____________________ Date ____________

( _________________________ )

ORIENT THAI

# PILOT PROFICIENCY CHECK / INSTRUMENT RATING

## DEPARTMENT OF CIVIL AVIATION - ORIENT THAI AIRLINES CO., LTD.

| | | | | |
|---|---|---|---|---|
| O PILOT PROFICIENCY REPORT | O INITIAL | ☑ RECURRENT | O UPGRADE | FILE |
| INSTRUMENT FLIGHT REPORT | O INITIAL | O RENEWAL | O UPGRADE | NAME NASRUN NATSIR. |

| | | | | | |
|---|---|---|---|---|---|
| MEDICAL VALID 31-01-2008. | LICENCE NUMBER [redacted] | | CREW STATUS CAPTAIN | EMP # [redacted] | |
| CANDIDATE BASE BANGKOK. | EMPLOYER ORIENT THAI | | CHECK No. | PLACE OF CHECK | |
| DATE 05-12-07 | SIM TYPE MD-82 | FLT. TIME 04:00 | CCP | EXAMINER | |
| DATE | AC TYPE REG | FLT. TIME | CCP | EXAMINER | |

MARKING GUIDE

S SATISFACTORY

SB SATISFACTORY WITH BRIEFING

U UNSATISFACTORY

| | | | SIMULATOR | AIRCRAFT | INSTRUMENT CLASS |
|---|---|---|---|---|---|
| 1 PRE FLIGHT PREPARATION | A) Cockpit | | S | | |
| | B) Engine Start and checks | | S | | |
| | C) Taxing | | S | | |
| | D) Checks | | S | | |
| 2 DEPARTURE AND ENROUTE PROCEDURES | A) Normal Takeoff - 700 RVR | | S | | |
| | B) Rejected Takeoff | | S | | |
| | C) Crosswind Takeoff | | S | | |
| | D) Simulated Power Loss | | S | | |
| | E) Area Departure | | S | | |
| 3 AIRWORK | A) Holding | | S | | |
| | B) Steep Turns | | N/A | | |
| | C) Approach to Stall | | N/A | | |
| 4 TERMINAL PROCEDURES | A) Transition to Approach Facility | | S | | |
| | B) Approach Facility Used | 1 LOC | S | | |
| | | 2 ILS. | S | | |
| | | 3 | | | |
| | | 4 | | | |
| | | 5 | | | |
| | | 6 | | | |
| | | 7 | | | |
| | | 8 | | | |
| | C) Missed Approach | 1 LOC | S | | |
| | D) Circling Approach | 2 VISUAL | S | | |
| 5 LANDINGS | A) Crosswind / Wind shear | | S | | |
| | B) Simulated Power Loss | | S | | |
| | C) From Circling Approach | | | | |
| | D) Flapless | | | | |
| | E) From ILS | | S | | |
| 6 ALTERNATE ABNORMAL AND EMERGENCY PROCEDURES | A) L. HYD LEAK FAST. | | S | | |
| | B) L GEN LT ON. | | S | | |
| | C) APU FIRE | | S | | |
| | D) PAX EVAC | | SB | | |
| | E) | | | | |
| | F) | | | | |
| | G) | | | | |
| | H) | | | | |

GENERAL ASSESMENT

CAPT. NASRUN HAS SUCCESSFULLY COMPLETED THE CHECKRIDE ON THE RIGHT HAND SEAT IN THE MD82 SIMULATOR AT JAKARTA

NOTE: HAS ACCOMPLISHED RECURRENT TRAINING ON KTM AIRFIELD BOTH THE NORMAL AND SINGLE ENGINE PROCEDURES

[redacted]

TRAINEE SIGNATURE NASRUN NATSIR

| | | |
|---|---|---|
| PPC SIMULATOR | ☑ PASSED | O FAILED |
| | [redacted] RACHMAN LATIEF [redacted] | |
| | SIGNATURE AND LICENCE OF CHECK PILOT | |
| SIM INSTR PPC AIRCRAFT | ☑ PASSED | O FAILED |
| | [redacted] | |
| | SIGNATURE AND LICENCE OF CHECK PILOT | |

| | | | |
|---|---|---|---|
| INSTRUMENT FLIGHT RATING | O PASSED | | O FAILED |
| | RATING RECOMMENDED | | CLASS GROUP |
| | LICENCE ENDORSED | O YES | O NO |
| | VALID TO | | |
| | SIGNATURE & LICENCE NO. OF CHECK PILOT | | |

# PILOT PROFICIENCY CHECK / INSTRUMENT RATING

## DEPARTMENT OF CIVIL AVIATION - ORIENT THAI AIRLINES CO., LTD.

| | | | | |
|---|---|---|---|---|
| O PILOT PROFICIENCY REPORT | O INITIAL | ☑ RECURRENT | O UPGRADE | FILE *PPC* |
| O INSTRUMENT FLIGHT REPORT | O INITIAL | O RENEWAL | O UPGRADE | NAME *HARRY PURWANTO* |
| MEDICAL VALID *31.01.2008* | LICENCE NUMBER [redacted] | | CREW STATUS *CAPTAIN* | EMP # [redacted] |
| CANDIDATE BASE *BANGKOK* | EMPLOYER *ORIENTHAI AIRLINES* | | CHECK No. | PLACE OF CHECK *JAKARTA* |
| DATE *10.12.07* | SIM TYPE *MD-82* | FLT. TIME *04:00* | CCP | EXAMINER *RACHMAN LATIEF* |
| DATE | AC TYPE / REG | FLT. TIME | CCP | EXAMINER |

MARKING GUIDE
S SATISFACTORY
SB SATISFACTORY WITH BRIEFING
U UNSATISFACTORY

| | | | SIMULATOR | AIRCRAFT | INSTRUMENT CLASS |
|---|---|---|---|---|---|
| 1 PRE FLIGHT PREPARATION | A) Cockpit | | S | | |
| | B) Engine Start and checks | | S | | |
| | C) Taxing | | S | | |
| | D) Checks | | S | | |
| 2 DEPARTURE AND ENROUTE PROCEDURES | A) Normal Takeoff - 700 RVR | | S | | |
| | B) Rejected Takeoff | | S | | |
| | C) Crosswind Takeoff | | S | | |
| | D) Simulated Power Loss | | S | | |
| | E) Area Departure | | S | | |
| 3 AIRWORK | A) Holding | | S | | |
| | B) Steep Turns | | N/A | | |
| | C) Approach to Stall | | N/A | | |
| 4 TERMINAL PROCEDURES | A) Transition to Approach Facility | | S | | |
| | B) Approach Facility Used | 1 *VOR* | S | | |
| | | 2 *ILS* | S | | |
| | | 3 | | | |
| | | 4 | | | |
| | | 5 | | | |
| | | 6 | | | |
| | | 7 | | | |
| | | 8 | | | |
| | C) Missed Approach | 1 *ILS* | S | | |
| | D) Circling Approach | 2 | | | |
| 5 LANDINGS | A) Crosswind / Wind shear | | S | | |
| | B) Simulated Power Loss | | S | | |
| | C) From Circling Approach | | | | |
| | D) Flapless | | S | | |
| | E) From ILS | | S | | |
| 6 ALTERNATE ABNORMAL AND EMERGENCY PROCEDURES | A) *L. GEN LIGHT ON* | | S | | |
| | B) *APU GEN LIGHT ON* | | S | | |
| | C) *FUEL FILTER PRESS DROP* | | S | | |
| | D) *PAX EVACUATION* | | S | | |
| | E) | | | | |
| | F) | | | | |
| | G) | | | | |
| | H) | | | | |

GENERAL ASSESMENT

*Captain Harry Purwanto has successfully completed the checkride on the MD-82 simulator at Jakarta on the 10th December 2007.*

*NOTE: has completed the recurrent training at KIM addressed both the normal and single engine operations.*

TRAINEE SIGNATURE [redacted] *HARRY .P* [redacted]

PPC SIMULATOR
O PASSED O FAILED
[redacted] *RACHMAN LATIEF*
SIGNATURE [redacted] OF CHECK PILOT

PPC AIRCRAFT
O PASSED O FAILED
SIGNATURE AND LICENCE OF CHECK PILOT

INSTRUMENT FLIGHT RATING
O PASSED O FAILED
RATING RECOMMENDED | CLASS GROUP
LICENCE ENDORSED O YES O NO
VALID TO
SIGNATURE & LICENCE NO. OF CHECK PILOT

# PILOT PROFICIENCY CHECK / INSTRUMENT RATING

## DEPARTMENT OF CIVIL AVIATION - ORIENT THAI AIRLINES CO., LTD.

| | | | | |
|---|---|---|---|---|
| O PILOT PROFICIENCY REPORT | O INITIAL | ☑ RECURRENT | O UPGRADE | FILE *PPC* |
| O INSTRUMENT FLIGHT REPORT | O INITIAL | O RENEWAL | O UPGRADE | NAME *HENDRARTO* |

| | | | |
|---|---|---|---|
| MEDICAL VALID *31-01-2008* | LICENCE NUMBER [redacted] | CREW STATUS *CAPTAIN* | EMP # [redacted] |
| CANDIDATE BASE *BANGKOK* | EMPLOYER *ORIENT THAI AIRLINES* | CHECK No. | PLACE OF CHECK *JAKARTA* |
| DATE *12-12-07* / SIM TYPE *MD-82* | FLT. TIME *0400* | CCP | EXAMINER *RACHMAN LATIEF* |
| DATE / AC TYPE / REG | FLT. TIME | CCP | EXAMINER |

MARKING GUIDE
S SATISFACTORY
SB SATISFACTORY WITH BRIEFING
U UNSATISFACTORY

| | | SIMULATOR | AIRCRAFT | INSTRUMENT CLASS |
|---|---|---|---|---|
| 1 PRE FLIGHT PREPARATION | A) Cockpit | S | | |
| | B) Engine Start and checks | S | | |
| | C) Taxing | S | | |
| | D) Checks | S | | |
| 2 DEPARTURE AND ENROUTE PROCEDURES | A) Normal Takeoff - 700 RVR | SB | | |
| | B) Rejected Takeoff | S | | |
| | C) Crosswind Takeoff | S | | |
| | D) Simulated Power Loss | S | | |
| | E) Area Departure | S | | |
| 3 AIRWORK | A) Holding | S | | |
| | B) Steep Turns | N/A | | |
| | C) Approach to Stall | N/A | | |
| 4 TERMINAL PROCEDURES | A) Transition to Approach Facility | S | | |
| | B) Approach Facility Used 1 *VOR* | S | | |
| | 2 *ILS* | S | | |
| | 3 | | | |
| | 4 | | | |
| | 5 | | | |
| | 6 | | | |
| | 7 | | | |
| | 8 | | | |
| | C) Missed Approach 1 *VOR* | S | | |
| | D) Circling Approach 2 | N/A | | |
| 5 LANDINGS | A) Crosswind / Wind shear | S | | |
| | B) Simulated Power Loss | S | | |
| | C) From Circling Approach | N/A | | |
| | D) Flapless | | | |
| | E) From ILS | S | | |
| 6 ALTERNATE ABNORMAL AND EMERGENCY PROCEDURES | A) *Alternate Trim Runaway* | S | | |
| | B) *L. Hyd. Drain And Elty. Cont* | S | | |
| | C) *PAX EVACUATION* | S | | |
| | D) | | | |
| | E) | | | |
| | F) | | | |
| | G) | | | |
| | H) | | | |

GENERAL ASSESMENT

*- Successfully completed the Check Ride on the MD-82 Simulator at Jakarta on 12 December 2007*

*NOTE: Completed the Training on KTM Airfield both the Normal and Single Engine Operations procedures.*

TRAINEE SIGNATURE [redacted]

| | | |
|---|---|---|
| PPC SIMULATOR | ☑ PASSED | O FAILED |
| | [redacted] *RACHMAN LATIEF -* [redacted] SIGNATURE AND LICENCE OF CHECK PILOT | |
| *SIM INSTRUCTOR* ~~PPC AIRCRAFT~~ | ☑ PASSED | O FAILED |
| | [redacted] SIGNATURE AND LICENCE OF CHECK PILOT | |

| | | |
|---|---|---|
| INSTRUMENT FLIGHT RATING | O PASSED | O FAILED |
| | RATING RECOMMENDED | CLASS GROUP |
| | LICENCE ENDORSED | O YES O NO |
| | VALID TO | |
| | SIGNATURE & LICENCE NO. OF CHECK PILOT | |

ORIENT THAI AIRLINES

# PILOT PROFICIENCY CHECK / INSTRUMENT RATING

## DEPARTMENT OF CIVIL AVIATION - ORIENT THAI AIRLINES CO., LTD.

| | | | | |
|---|---|---|---|---|
| O PILOT PROFICIENCY REPORT | O INITIAL | Ø RECURRENT | O UPGRADE | FILE PPC |
| O INSTRUMENT FLIGHT REPORT | O INITIAL | O RENEWAL | O UPGRADE | NAME ANWAR HARYANTO |

| | | | |
|---|---|---|---|
| MEDICAL VALID 31-01-2008 | LICENCE NUMBER [redacted] | CREW STATUS CAPTAIN | EMP # [redacted] |
| CANDIDATE BASE BANGKOK | EMPLOYER ORIENT-THAI | CHECK No. | PLACE OF CHECK JAKARTA |
| DATE 17-12-07 / SIM TYPE MD-82 | FLT. TIME 0400 | CCP | EXAMINER RACHMAN LATIEF |
| DATE / AC TYPE / REG | FLT. TIME | CCP | EXAMINER |

MARKING GUIDE
S SATISFACTORY
SB SATISFACTORY WITH BRIEFING
U UNSATISFACTORY

| | | SIMULATOR | AIRCRAFT | INSTRUMENT CLASS |
|---|---|---|---|---|
| 1 PRE FLIGHT PREPARATION | A) Cockpit | SB | | |
| | B) Engine Start and checks | SB | | |
| | C) Taxing | S | | |
| | D) Checks | S | | |
| 2 DEPARTURE AND ENROUTE PROCEDURES | A) Normal Takeoff - 700 RVR | SB | | |
| | B) Rejected Takeoff | S | | |
| | C) Crosswind Takeoff | S | | |
| | D) Simulated Power Loss | S | | |
| | E) Area Departure | SB | | |
| 3 AIRWORK | A) Holding | S | | |
| | B) Steep Turns | N/A | | |
| | C) Approach to Stall | N/A | | |
| 4 TERMINAL PROCEDURES | A) Transition to Approach Facility | S | | |
| | B) Approach Facility Used 1 VOR | S | | |
| | 2 ILS | S | | |
| | 3 | | | |
| | 4 | | | |
| | 5 | | | |
| | 6 | | | |
| | 7 | | | |
| | 8 | | | |
| | C) Missed Approach 1 VOR | S | | |
| | D) Circling Approach 2 | | | |
| 5 LANDINGS | A) Crosswind / Wind shear | S | | |
| | B) Simulated Power Loss | S | | |
| | C) From Circling Approach | | | |
| | D) Flapless | S | | |
| | E) From ILS | S | | |
| 6 ALTERNATE ABNORMAL AND EMERGENCY PROCEDURES | A) ALTERNATE TRIM RUNAWAY | SB | | |
| | B) FLAPS 0/SLATS EXTENDED LDG | S | | |
| | C) APU FIRE | S | | |
| | D) PAX EVACUATION | SB | | |
| | E) | | | |
| | F) | | | |
| | G) | | | |
| | H) | | | |

GENERAL ASSESMENT

- Successfully completed the Check-Ride on the MD-82 Simulator at Jakarta on 17 December 2007.
- Completed a Right Hand Seat takeoff with engine failure after V1 Single Engine Approach and go-around and single engine landing to the required standards.

NOTE: Completed trainings on KTM airfield both the normal and single engine operations and procedures.

TRAINEE SIGNATURE [redacted]

| | |
|---|---|
| PPC SIMULATOR | O PASSED O FAILED<br>[redacted] RACHMAN LATIEF [redacted]<br>SIGNATURE AND LICENCE OF CHECK PILOT |
| PPC AIRCRAFT | O PASSED O FAILED<br>SIGNATURE AND LICENCE OF CHECK PILOT |
| INSTRUMENT FLIGHT RATING | O PASSED O FAILED<br>RATING RECOMMENDED / CLASS GROUP<br>LICENCE ENDORSED O YES O NO<br>VALID TO<br>SIGNATURE & LICENCE NO. OF CHECK PILOT |

ORIGINAL(01DEC) ... DECEMBER 2001

| Captains | 1 SAT | 2 SUN | 3 MON | 4 TUE | 5 WED | 6 THU | 7 FRI | 8 SAT | 9 SUN | 10 MON | 11 TUE | 12 WED | 13 THU | 14 FRI | 15 SAT | 16 SUN |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| MADHU | X | X | 8003 8104/8105 1550/0020+1 HKG | MEETING | 8142/8143 8134/8135 8136 0700/1450 CNX | 8131/ 0530/0740 | 8501/8502 8903/8902 0710/1405 | 8501/8502 8205/8204 0710/1400 | X | X | PM | 8207/218 1505/2120 HKG | 219/8209 0825/1250 HKG | 8209/8208 1620/2130 | X | 8501/8502 8134/8135 0710/1340 |
| [illegible] | FERRY | X | 8203/8202 8903/8902 0705/1405 | MEETING | 8501/8502 8903/8902 0710/1405 | 8102/8103 8104/8105 0700/1310 | 8233/8232 8235/8234 0705/1400 | X | 8104/8105 8106/8107 1020/1630 | 8604/8605 8209/8208 1435/2130 | 8604/8605 8122/8123 1435/2130 | PM | X | D/H 8105 1340/1450 CNX | 8101 8134/8135 0700/1130 | AM |
| LATIEF | LV | LV | LV | SIM | SIM | SIM | LV | LV | LV | LV | LV | LV | LV | LV | LV | LV |
| MASRUH | X | 8124/8125 8126 1200/1630 CNX | 8101 8114/8115 8134/8135 0700/1456 | SIM | SIM | SIM | X | X | 8207/218 1505/2120 HKG | 219/8209 0825/1250 HKG | 8703/8702 8215/8216 1320/1930 | X | 8903/8902 8604/8605 1050/1735 | 8703/8702 8215/8216 8126 1320/2130 CNX | D/H 8105 1200/1310 | 8209/8208 1620/2120 |
| CARLOS | 219/8206 0610/1250 HKG | X | 8102/8103 8104/8105 8106 0700/1450 CNX | 8101/8114 8115 0700/1130 | PM | 8203/8202 8235/8234 0705/1400 | 8114/8115 8124/8125 0840/1450 | 8001/200 1630/2145 HKG | 203/8002 0815/1120 HKG | X | 8207/218 1505/2120 HKG | 219/8206 0825/1250 HKG | 8501/8502 8205/8204 0710/1400 | X | 8209/8208 1620/2130 | PM |
| ROBERT | X | 8207/218 1505/2120 HKG | 219/8203 0825/1250 HKG | 8207/218 1505/2123 HKG | 219/8208 0825/1250 HKG | X | 8106/8107 8108/8109 8126 1340/2130 CNX | 8125 8114/8115 0700/1130 | PM | 8207/218 1505/2120 HKG | 219/8206 0825/1250 HKG | X | X | PM | 8001/200 1630/2145 HKG | 203/8002 0815/1100 HKG |
| ANWAR | X | 8106/8107 8108/8109 8128 1430/2130 CNX | 8107/8108 8109/8128 1520/2130 CNX | 8127/8122/8 123 1700/2130 | 8207/218 1505/2120 HKG | 219/8206 0825/1250 HKG | X | D/H 8106 1340/1450 CNX | 8101 8114/8115 0700/1130 | 8106/8107 8108/8109 8120 1340/2130 CNX | D/H 8103 0840/0950 | X | PM | 8106/8107 8122/8123 1340/2130 | XX | SIM |
| NURHAIM | X | 8102/8103 8104/8105 0700/1310 | 8501/8502 8205/8204 0710/1400 | 8203/8202/8 903/8902 0705/1405 | 8001/200 1630/2145 HKG | 203/8002 0815/1120 HKG | X | 8233/8232 0705/1015 | 8501/8502 8205/8204 0710/1400 | 8203/8202 8903/8902 0705/1405 | X | 8102/8103 8104/8105 0700/1310 | 8106/8107 8122/8123 1340/2130 | 8207/216 1505/2120 HKG | 219/8206 0825/1250 HKG | X |
| WIDMAN | 8233/8238 1620/2100 | XX | MED LICENSE | MED LICENSE | MED LICENSE | MED LICENSE | MED LICENSE | MED LICENSE | XX | X | 8209/8208 1620/2130 | 8106/8107 8108/8109 1340/2130 | 8207/218 1505/2120 HKG | 219/8206 0825/1250 HKG | X | X |
| SUPRIYONO | 8107/8126 1520/2130 CNX | 8127/8122 8123 1700/2130 | X | 8102/8103 8104/8105 0700/1310 | KTM | KTM | KTM | 8602/8603 8903/8902 0745/1405 | 8203/8202 8903/8902 0705/1405 | 8501/8502 8205/8204 0710/1400 | 8501/8502 8205/8204 0710/1400 | REPORT | 8909/ 1700/2000 INT | SIM | SIM | SIM |
| HENDRARTO | AM | 8903/8902 8604/8605 1050/1735 | XX | MEETING | 8604/8605 8209/8208 1435/2130 | 8604/8605 8209/8208 1435/2131 | 8126/8127 8122/8123 1520/2130 | 8604/8605 8209/8208 1435/2131 | X | X | SIM | SIM | SIM | XX | PM | 8207/216 1505/2120 HKG |
| YORDI | 8126/8127 8122/8123 1520/2130 | 8209/8208 1620/2130 | X | 8501/8502/8 205/8204 0710/1400 | 8233/8232 8235/8234 0705/1400 | 8106/8107 8108/8109 8128 1340/2130 CNX | D/H 8105 1200/1310 | 8703/8702 8215/8216 1320/1930 | X | PM | 8203/8202 8903/8902 0705/1405 | 8903/8902 8604/8605 1050/1735 | 8209/8208 1620/2130 | AM | X | 8703/8702 8235/8236 1320/1930 |
| SENTANU | 8001/200 1630/2145 HKG | 200/8002 0815/1120 HKG | 8703/8702 8233/8232 1320/1930 | 8703/8702 8215/8216 1320/1930 | X | 8601/8602 8903/8902 0710/1405 | 8207/218 1505/2120 HKG | 219/8206 0825/1250 HKG | 8604/8605 8209/8208 1435/2130 | X | PM | 8703/8702 8215/8216 1320/1930 | 8703/8702 8215/8216 1320/1930 | X | 8207/218 1505/2120 HKG | 219/8206 0825/1250 HKG |
| PORRAS | X | 0235/8234 1050/1400 | 8604/8605 8209/8208 1435/2130 | 8604/8605/8 209/8208 1435/2130 | 8703/8702 1320/1605 | X | 8102/8103 8104/8105 0700/1310 | 8102/8103 8104/8105 0700/1310 | 8126/8127 8122 1520/1950 CNX | 8101 8114/8115 0700/1130 | X | AM | 8128/8101 0840/1130 | X | X | LV |
| DAVID | X | X | X | X | X | X | X | X | X | X | X | X | X | SIM | SIM | SIM |
| EKO | 8102/8103 8104/8105/8 106 0700/1450 CNX | 8101 8114/8115 0700/1130 | 8001/200 1630/2145 HKG | 203/8002 0815/1120 HKG | X | 8207/218 1505/2120 HKG | 219/8206 0825/1250 HKG | 8106/8107 8108/8109 8124 1340/2130 CNX | 8123/ 2020/2130 | XX | SIM | SIM | SIM | RENEW LICENSE INDO | RENEW LICENSE INDO | XX |
| HARRY | 8101 8114/8115 8124/8125 0700/1450 | X | MEETING | KTM | KTM | KTM | KTM | X | SIM | SIM | SIM | RENEW MED LINEC | X | 8903/8902 8604/8605 1050/1735 | 8102/8103 8104/8105 0700/1310 | 8235/8234 8136/8137 1050/1710 |
| BAMBANG | 8903/8902 8604/8606 1050/1735 | 8703/8702 8233/8232 1320/1930 | BKK/JKT | JKT | JKT | SIM | SIM | SIM | 8703/8702 8215/8216 1320/1930 | 8703/8702 8215/8216 1320/1931 | 8106/8107 8108/8109 1340/2130 | X | AM | 8102/8103 8104/8105 0700/1310 | 8501/8502 8205/8204 0710/1400 | X |
| JAIRO PORRAS | 8206/8204 8207 1050/1625 HKT | 8206/ 1130/1250 | X | 8106/8107 8108/8109 8128 CNX | 8137 8132/8133 8128 1520/2130 CNX | 8133/ 2020/2130 | 8604/8605 8209/8208 1435/2130 | PM | X | 8124/8125 8128 1200/1630 CNX | 8101/ 0700/0810 | 8207/218 1505/2120 HKG | 219/8206 0825/1250 HKG | X | 8703/8702 8225/8220 1320/1635 | 8138/8139 1740/2040 |
| SAGATRA | PM | X | 8136/8137 8132/8133 1520/2130 | 8124/8125/8 126 1200/1630 CNX | 8123/ 2020/2130 | X | X | X | X | 8102/8103 8104/8105 0700/1310 | 8102/8103 8104/8105 0700/1311 | 8209/8208 1620/2130 | X | X | 8106/8107 8122/8123 1340/2130 | 8126/8127 8122/8123 1520/2130 |
| IRAWAN | X | X | 8003 8104/8106 1550/0020+1 HKG | MEETING | X | 8703/8702 8215/8216 1320/1930 | 8703/8702 8215/8216 1320/1930 | XX | 8106/8109 8128 1700/2130 CNX | 8127 8122/8123 1700/2130 | X | 8501/8502 8205/8204 0710/1400 | 8102/8103 8104/8105 0700/1310 | 8601/8602 0205/8204 0710/1400 | 8903/8902 8604/8605 1050/1735 | 8903/8902 8604/8605 1050/1735 |

| Captains | 17 MON | 18 TUE | 19 WED | 20 THU | 21 FRI | 22 SAT | 23 SUN | 24 MON | 25 TUE | 26 WED | 27 THU | 28 FRI | 29 SAT | 30 SUN | 31 MON |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| MADHU | 8102/8103 8104/8105 0700/1310 | 8132/8133 8902/8902 0700/1405 | X | 8102/8103 8104/8105 0700/1310 | 8102/8103 8903/8902 0700/1405 | 8102/8103 8903/8902 0700/1405 | 8702/8702 1340/1630 | AM | X | 8207/218 1505/2120 HKG | 219/8206 0825/1250 HKG | 8205/8204 8126/8127 1145/1810 | 8703/8702 8501/8502 1340/1635 | X | 8102/8103 8104 0700/1130 CNX |
| [illegible] | X | 8604/8605 8123 1700/2140 CNX | 8237 8209/8238 1700/2150 | MEETING | 8703/8702 1340/1630 | AM | 8102/8103 8903/8902 0700/1405 | 8124/8125 8126 1220/1650 CNX | 8101 8104/8105 0720/1310 | 8903/8902 1050/1405 | X | 8106/8107 8108/8109 1340/1950 | D/H 8120 8122/8123 1555/2140 | 8207/216 8219 1445/0010+1 HKG | X |
| LATIEF | LV | LV | LV | LV | LV | LV | LV | LV | LV | LV | LV | LV | LV | LV | LV |
| MASRUH | XX | XX | 8207/218 1505/2120 HKG | 219/8206 0825/1250 HKG | 8207/216 1505/2120 HKG | 219/8209 0825/1250 HKG | X | 8102/8103 8903/8902 0700/1405 | XX | XX | 8205/8204 8120 1145/1635 CNX | 8101 8104/8105 0720/1310 | 8124/8125 8116/8117 8126 1320/2140 CNX | 8127 8209/8208 1700/2150 | 8209/8208 1640/2150 |
| CARLOS | LV | LV | LV | LV | LV | LV | LV | LV | LV | LV | LV | LV | LV | LV | LV |
| ROBERT | 8207/216 8219 1505/0050+1 HKG | X | AM | LV | LV | LV | LV | LV | LV | LV | LV | LV | LV | LV | LV |
| ANWAR | SIM | SIM | XX | 8207/218 1505/2120 HKG | 219/8206 0825/1250 HKG | 8124/8125 8501/8502 1220/1820 | 8122/8123 1900/2145 | X | 8207/216 1505/2120 HKG | 219/8206 0825/1250 HKG | 8124/8125 1220/1610 | 8207/218 1505/2120 HKG | 219/8206 0825/1250 HKG | X | 8903/8902 1050/1405 |
| NURHAIM | 8501/8502 8205/8204 0710/1400 | 8207/218 1505/2120 HKG | 219/8206 0825/1250 HKG | PM | X | 8205/8204 8120 1145/1635 CNX | 8101 8104/8105 0720/1310 | 8215/8216 8217/8218 1330/2020 | 8604/8605 1700/2000 | 8209/8208 1640/2150 | X | X | 8703/8702 8104/8105 0705/1335 | SICK | SICK |
| WIDMAN | 8001/200 1630/2145 HKG | 203/8002 0815/1100 HKG | 8102/8103 8903/8902 0700/1405 | 8124/8125 1220/1510 | 8122/8123 1900/2145 | PM | X | 8207/218 1505/2120 HKG | 219/8206 0825/1250 HKG | D/H 8120 1525/1635 CNX | 8127 8209/8208 1700/2150 | 8128/8129 2030/2020 | X | X | 8122/8123 1900/2145 |
| SUPRIYONO | 8209/8208 1620/2130 | 8122/8123 1900/2145 | 8127/ 2030/2140 CNX | 8127 8209/8208 1700/2150 | X | MEETING | 8207/216 1505/2120 HKG | 219/8206 0825/1250 HKG | 8703/8702 1340/1630 | 8703/8702 8604/8605 1340/2000 | 8501/8502 8122/8123 1540/2145 | X | 500/501 0900/1515 KTM | 8215/8216 8217/8218 1330/2020 | 8604/8605 8126 1700/2140 CNX |
| HENDRARTO | 219/8200 0825/1250 HKG | 8134/8135 8703/8702 1020/1630 | 8215/8216 8217/8218 1710/2020 | AM | PAX BKK/JKT | 8908/ 1110/1420 | 8124/8125 8126 1220/1650 CNX | 8101 8104/8105 0720/1310 | 8102/8103 8903/8902 0700/1405 | AM | X | X | 2316/2317 0530/1140 HKG | 8203/8202 8104/8105 0705/1310 | 8207/219 1505/2120 HKG |
| YORDI | 8703/8702 8215/8216 1320/1930 | 8235/8236 8237/8238 1330/2020 | 8703/8702 8604/8605 1840/2000 | X | 8215/8216 8217/8218 1330/2020 | 8122/8123 1900/2145 | 8604/8605 8128 1700/2140 CNX | 8127 8209/8208 1720/2210 | X | X | 8604/8605 8128 1710/2140 CNX | D/H 8127 8209/8208 1700/2150 | 8001 8604/8605 1555/2110 | 8122/8123 1900/2145 | 8124/8125 8501/8502 1220/1820 |
| SENTANU | XX | LV | LV | LV | LV | LV | LV | LV | XX | 8124/8125 8501/8502 1220/1820 | 8207/218 1505/2120 HKG | 219/8200 0825/1250 HKG | 8102/8103 8114/8115 0700/1310 | 8124/8125 8501/8502 1220/1820 | X |
| PORRAS | LV | LV | PM | 8215/8216 8217/8218 1330/2020 | 8604/8605 8128 1700/2140 CNX | 8127 8209/8208 1700/2150 | X | 8205/8204 1145/1455 | 8215/8216 8217/8218 1330/2020 | 8215/8216 8217/8218 1330/2020 | 8215/8216 1330/1040 | 8122/8123 1900/2145 | X | 8102/8103 8903/8902 0700/1405 | X |
| DAVID | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X |
| EKO | XX | XX | X | 8604/8605 8128 1700/2140 CNX | 8127 8200/8208 1700/2150 | 8207/218 1506/2120 HKG | 219/8206 0825/1250 HKG | X | 8124/8125 8501/8502 1220/1820 | X | 8903/8902 1050/1405 | 8102/8103 8903/8902 0700/1405 | 8602/8603 8903/8902 0745/1430 | 8602/8603 0745/1045 | D/H 8104 8703/8702 1020/1630 |
| HARRY | 8903/8902 8604/8605 1050/1735 | 8124/8125 8501/8502 1220/1820 | X | MEETING | 8205/8204 8126 1145/1635 CNX | 8101 8104/8105 0720/1310 | 8215/8216 8217/8218 1330/2020 | 8604/8605 8128 1700/2210 CNX | D/H 8127 8209/8208 1700/2150 | X | X | AM | 500/501 0900/1615 KTM | 8205/8204 D/H 8127 1145/1810 | 8213/8216 8217/8218 1330/2020 |
| BAMBANG | 8134/8136 8136/8137 0640/1630 | 8205/8204 8126/8127 1146/1610 | 8124/8125 1220/1610 | 8703/8702 1340/1630 | X | 8604/8605 8128 1700/2140 CNX | 8127 8209/8208 1720/2210 | 8501/8502 8122/8123 1640/2146 | PM | 8122/8123 1900/2145 | X | 8703/8702 8604/8605 1340/2000 | 8206/8204 8126 1215/1705 CNX | 8001 8114/8115 0720/1100 | X |
| JAIRO PORRAS | PM | D/H 8124 1220/1330 CNX | 8101 8104/8105 0720/1310 | 8205/8204 8126 1145/1635 CNX | 8101 8104/8105 0720/1310 | X | X | 8703/8702 1340/1630 | 8122/8123 1900/2145 | LV | LV | LV | LV | LV | X |
| SAGATRA | 8136/8139 1700/1950 | 8209/8208 1640/2150 | 8501/8502 8122/8123 1540/2145 | 8501/8502 8122/8123 1540/2145 | X | 8703/8702 1340/1630 | 8205/8204 8501/8502 1145/1820 | X | X | 8102/8103 8104/8105 0700/1310 | 8102/8103 8104/8105 0700/1310 | 8124/8126 8501/8502 1220/1820 | 8106/8107 8208/8208 1405/2150 | 8703/8702 8604/8605 1340/2000 | X |
| IRAWAN | X | PM | 8235/8234 8236 1145/1635 CNX | 8101 8903/8902 0720/1405 | 8124/8125 8501/8502 1220/1820 | 8215/8216 8217/8218 1330/2020 | PM | X | 8205/8204 8126/8127 1145/1810 | 8205/8204 8126/8127 1145/1810 | 8703/8702 8108/8109 1340/1950 | 8215/8216 8217/8218 1330/2020 | 8207/218 1505/2120 HKG | 219/8206 0825/1250 HKG | 8205/8204 8210/8217 1145/1810 |

# Daily Flight Roster

Aircraft: MD-82

Date SUNDAY, 16 SEPTEMBER

Issue: REV.3

| Flight No. | Acft. Reg. | Sector | Dep./Arr. | Captain Name | First Officer Name | Remarks |
|---|---|---|---|---|---|---|
| | | OFF | | MORBIT/HANANTO | | |
| | | STBYAM | | | | |
| | | STBY PM | | | | |
| 267/266/269/268/128/129 | OMA G | DMK/HKT/DMK/HKT/DMK/CNX/DMK | 1040/2130 | ARIEF | MONTRI | |
| OX821 | OMB | CTU/BKK | 0045/0245 | NURHADI | DANIEL | |
| 160/161/297/296 | OMC | DMK/CEI/DMK/KBV/DMK | 0700/1340 | HENDRARTO/NASRUN (R/H) | | |
| 124/125/263/262 | OME | DMK/CNX/DMK/HKT/DMK | 1410/2130 | CARLOS | PHAISIT/PHRUT (OBS) | |
| 219/2070 | OMD | HKG/HKT/BKK | 0830/1310 | ROBERT | FREDERICK | |
| 2071/218 | OMD | BKK/HKT/HKG | 1400/2110 | YORDI | RODRIGO | |
| 265/264/283/282 | OME | DMK/HKT/DMK/HDY/DMK | 0700/1410 | ANWAR | ANAWAT | |
| 253/252/255/256 | OME | DMK/NST/DMK/NST/DMK | 1525/2210 | SENTANU | APRIAS/SORAWIT (OBS) | |
| 251/252/166/165 | OMF A | DMK/NST/DMK/CEI/DMK | 0630/1255 | PORRAS | KITTISAK | |
| 261/260/162/163 | OMG A | DMK/HKT/DMK/CEI/DMK | 1320/2000 | EKO | ARTHIT/TEERAWAT (OBS) | |
| 134/135/126/127 | OMH | DMK/CNX/DMK/CNX/DMK | 0650/1310 | SUPRIYONO | NOPPANAI | |
| 291/292/285/284 | OMH | DMK/URT/DMK/HDY/DMK | 1330/2110 | DAVID | WURTZ/TAWAN (OBS) | |
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# Daily Flight Roster

Aircraft: MD-82

Date SATURDAY, 15 SEPTEMBER

Issue: REV.1

| Flight No. | Acft. Reg. | Sector | Dep./Arr. | Captain | First Officer | Remarks |
|---|---|---|---|---|---|---|
| | | | | Name | Name | |
| | | OFF | | YORDI | KITTISAK | |
| | | STBYAM | | | | |
| | | STBY PM | | | | |
| 267/266/269/268/128/129 | OMA | DMK/HKT/DMK/HKT/DMK/CNX/DMK | 1040/2130 | SENTANU | APRIAS | |
| OX820 | OMB | BKK/CTU | 1945/2345 | NURHADI | DANIEL | |
| 160/161/297/296 | OMC | DMK/CEI/DMK/KBV/DMK | 0700/1340 | SUPRIYONO | PRAPHON | |
| 124/125/263/262 | OMC | DMK/CNX/DMK/HKT/DMK | 1410/2130 | CARLOS | RODRIGO/SKOLPONG(OBS) | |
| 219/2070 | OMD | HKG/HKT/BKK | 0830/1310 | NASRUN | MONTRI | |
| 2071/218 | OMD | BKK/HKT/HKG | 1400/2110 | ROBERT | FREDERICK | |
| 265/264/283/282 | OME | DMK/HKT/DMK/HDY/DMK | 0700/1410 | PORRAS | ARTHIT | |
| 253/252/255/256 | OME | DMK/NST/DMK/NST/DMK | 1525/2210 | HANANTO | WURTZ/AKARACHAI(OBS) | |
| 251/250/166/165 | OMG | DMK/NST/DMK/CEI/DMK | 0630/1255 | EKO/ANWAR(R/H) | | |
| 261/260/162/163 | OMG | DMK/HKT/DMK/CEI/DMK | 1320/2000 | ARIEF/HENDRARTO(R/H) | TAW-YOD(OBS) | |
| 134/135/126/127 | OMH | DMK/CNX/DMK/CNX/DMK | 0650/1310 | MORBIT | ANAWAT | |
| 291/292/285/284 | OMH | DMK/URT/DMK/HDY/DMK | 1330/2110 | DAVID | PHAISIT/RERK(OBS) | |
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# Daily Flight Roster

Aircraft: MD-82

Date FRIDAY, 14 SEPTEMBER

Issue: REV#2

| Flight No. | Acft. Reg. | Sector | Dep./Arr. | Captain | First Officer | Remarks |
|---|---|---|---|---|---|---|
| | | | | Name | Name | |
| | | OFF | | | | |
| | | STBYAM | | | | |
| | | STBY PM | | | | |
| 269/268/128/129 | OMA | DMK/HKT/DMK/CNX/DMK | 1430/2130 | DAVID | RODRIGO | |
| 203 | OMB | HKG/BKK | 0815/0955 | ROBERT | FREDERICK | |
| 851P/8512 | OMB | BKK/SIN/KPS/BKK | 1150/1930 | NURHADI | APRIAS | |
| 2307/830P | OMC | HKG/BKK/DMK | 0820/1045 | ARIEF/HENDRARTO(R/H) | | |
| 297/296/253/252/255/256 | OMC | DMK/KBV/DMK/NST/DMK/NST/DMK | 1115/2210 | CARLOS | PHAISIT | |
| 219/2070 | OMD | HKG/HKT/BKK | 0830/1050 | NASRUN | MONTRI | |
| 2071/218 | OMD | BKK/HKT/HKG | 1400/2110 | NASRUN | MONTRI | |
| 265/264/283/282 | OME | DMK/HKT/DMK/HDY/DMK | 0700/1410 | SENTANU | ARTHIT | |
| 124/125/263/262 | OME | DMK/CNX/DMK/HKT/DMK | 1440/2130 | HANANTO | DANIEL/KRIT(OBS) | |
| 134/135/166/165 | OMG | DMK/CNX/DMK/CEI/DMK | 0650/1255 | MORBIT | ANAWAT | |
| 261/260/162/163 | OMG | DMK/HKT/DMK/CEI/DMK | 1320/2000 | PORRAS | KITTISAK/NOPPANON(OBS) | |
| 251/250/126/127 | OMH | DMK/NST/DMK/CNX/DMK | 0630/1310 | EKO/ANWAR(R/H) | | |
| 291/292/285/284 | OMH | DMK/URT/DMK/HDY/DMK | 1330/2110 | YORDI | WURTZ/KITTIPOL(OBS) | |
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# Daily Flight Roster

Aircraft: MD-82

Date THURSDAY, 13 SEPTEMBER

Issue: REV.3

| Flight No. | Acft. Reg. | Sector | Dep./Arr. | Captain Name | First Officer Name | Remarks |
|---|---|---|---|---|---|---|
| | | OFF | | | KITTISAK | |
| | | STBY AM | | | | |
| | | STBY PM | | | | |
| 166/165/261/260/162/163 | OMH | DMK/CEI/DMK/HKT/DMK/CEI/DMK | 1000/2000 | HANANTO | DANIEL | |
| 160/161/297/296 | OMC | DMK/CEI/DMK/KBV/DMK | 0700/1340 | YORDI | WURTZ | |
| 291/292/OX8412/OX2306 | OMC | DMK/URT/DMK/BKK/HKG | 1330/2150 | ARIEF/HENDRARTO | YOTSAPOL(OBS) | |
| 219/2070 | OMD | HKG/HKT/BKK | 0830/1310 | MORBIT | APRIAS | |
| 2071/218 | OMD | BKK/HKT/HKG | 1400/2110 | NASRUN | MONTRI | |
| 265/264/283/282 | OME | DMK/HKT/DMK/HDY/DMK | 0700/1410 | EKO/ANWAR(R/H) | | |
| 269/268/128/129 | OME | DMK/HKT/DMK/CNX/DMK | 1430/2130 | PORRAS/NURHADI(R/H) | PROMPAN(OBS) | |
| 251/250/126/127 | OMG | DMK/NST/DMK/CNX/DMK | 0630/1310 | SENTANU | ARTHIT | |
| 253/252/263/262 | OMG | DMK/NST/DMK/HKT/DMK | 1525/2130 | DAVID | RODRIGO/WANTHIT(OBS) | |
| 134/135/267/266 | OMB | DMK/CNX/DMK/HKT/DMK | 0650/1350 | CARLOS | RURI | |
| 124/125/OX8410/OX200 | OMB | DMK/CNX/DMK/BKK/HKG | 1410/2140 | ROBERT | FREDERICK/THANA(OBS) | |
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# Daily Flight Roster

Aircraft: MD-82

Date WEDNESDAY, 12 SEPTEMBER

Issue: REV.1

| Flight No. | Acft. Reg. | Sector | Dep./Arr. | Captain | First Officer | Remarks |
|---|---|---|---|---|---|---|
| | | | | Name | Name | |
| | | OFF | | EKO/SENTANU | | |
| | | STBY AM | | | | |
| | | STBY PM | | | | |
| 160/161/267/ 266 | OMB | DMK/CEI/DMK/HKT/DMK | 0700/1350 | ARIEF/ANWAR(R/H) | | |
| 269/268/128/129 | OMB | DMK/HKT/DMK/CNX/DMK | 1430/2130 | ROBERT | FREDERICK | |
| 166/165/261/260/285/284 | OMC | DMK/CEI/DMK/HKT/DMK/HDY/DMK | 1000/2110 | PORRAS | RODRIGO | |
| 219/2070 | OMD | HKG/HKT/BKK | 0830/1310 | YORDI | WURTZ | |
| 2071/218 | OMD | BKK/HKT/HKG | 1400/2110 | MORBIT | APRIAS | |
| 265/264/283/282 | OME | DMK/HKT/DMK/HDY/DMK | 0700/1410 | CARLOS | RURI | |
| 253/252/255/256 | OME | DMK/NST/DMK/NST/DMK | 1525/2210 | NASRUN | MONTRI/TEERAWAT(OBS) | |
| 251/250/126/127 | OMG | DMK/NST/DMK/CNX/DMK | 0630/1310 | HANANTO | ARTHIT | |
| 291/292/162/163 | OMG | DMK/URT/DMK/CEI/DMK | 1330/2000 | DAVID | KITTISAK/AKARACHAI(OBS) | |
| 134/135/297/296 | OMH | DMK/CNX/DMK/KBV/DMK | 0650/1340 | NURHADI | CHOOLARP | |
| 124/125/263/262 | OMH | DMK/CNX/DMK/HKT/DMK | 1410/2130 | HENDRARTO | DANIEL/RERK(OBS) | |
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# Daily Flight Roster

Aircraft: MD-82
Date TUESDAY, 11 SEPTEMBER
Issue: REV.1

| Flight No. | Acft. Reg. | Sector | Dep./Arr. | Captain | First Officer | Remarks |
|---|---|---|---|---|---|---|
| | | | | Name | Name | |
| | | OFF | | EKO | | |
| | | STBY AM | | | | |
| | | STBY PM | | | | |
| 166/165/261/260/285/284 | OMA | DMK/CEI/DMK/HKT/DMK/HDY/DMK | 1000/2000 | HENDRARTO | CHOOLARP | |
| 160/161/267/ 266 | OMB | DMK/CEI/DMK/HKT/DMK | 0700/1350 | ARIEF | ARTHIT/WANTHIT(OBS) | |
| 269/268/128/129 | OMB | DMK/HKT/DMK/CNX/DMK | 1430/2130 | DAVID | MONTRI | |
| 291/292/162/163 | OMG | DMK/URT/DMK/CEI/DMK | 1330/2000 | SENTANU/NASRUN(R/H) | THANA(OBS) | |
| 219/2070 | OMD | HKG/HKT/BKK | 0830/1310 | NURHADI/ANWAR(R/H) | | |
| 2071/218 | OMD | BKK/HKT/HKG | 1400/2110 | YORDI | WURTZ | |
| 265/264/283/282 | OME | DMK/HKT/DMK/HDY/DMK | 0700/1410 | CARLOS | RURI | |
| 253/252/255/256 | OME | DMK/NST/DMK/NST/DMK | 1525/2210 | ROBERT | DANIEL/YOTSAPOL(OBS) | |
| 251/250/126/127 | OMG | DMK/NST/DMK/CNX/DMK | 0630/1310 | MORBIT | RODRIGO | |
| 134/135/297/296 | OMH | DMK/CNX/DMK/KBV/DMK | 0650/1340 | HANANTO | KITTISAK | |
| 124/125/263/262 | OMH | DMK/CNX/DMK/HKT/DMK | 1410/2130 | PORRAS | FREDERICK/PROMPAN(OBS) | |
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# Daily Flight Roster

Aircraft: MD-82

Date MONDAY, 10 SEPTEMBER

Issue: REVISION#2

| Flight No. | Acft. Reg. | Sector | Dep./Arr. | Captain Name | First Officer Name | Remarks |
|---|---|---|---|---|---|---|
| | | OFF | | MORBITT | RODRIGO/PHAISIT/WURTZ | |
| | | STBY AM | | | | |
| | | STBY PM | | | | |
| PAX TG 433 | TG | BKK/JKT | 0755/1130 | MADURO/LATIEF/ SUPRIYONO | | |
| | | | | | | |
| 166/165/261/260/162/163 | OMA | DMK/CEI/DMK/HKT/DMK/CEI/DMK | 1000/2000 | ROBERT | MONTRI | |
| 160/161/267/ 266 | OMB | DMK/CEI/DMK/HKT/DMK | 0700/1350 | CARLOS | APRIAS | |
| 269/268/128/129 | OMB | DMK/HKT/DMK/CNX/DMK | 1430/2130 | DAVID | KITTISAK/KRIT(OBS) | |
| 134/135/297/296 | OMC | DMK/CNX/DMK/KBV/DMK | 0650/1340 | HENDRARTO | ARTHIT | |
| 124/125/263/262 | OMC | DMK/CNX/DMK/HKT/DMK | 1410/2130 | PORRAS/NASRUN(R/H) | | |
| 219/2070 | OMD | HKG/HKT/BKK | 0830/1310 | HANANTO | RURI | |
| 2071/218 | OMD | BKK/HKT/HKG | 1400/2110 | NURHADI/ANWAR(R/H) | | |
| 265/264/283/282 | OME | DMK/HKT/DMK/HDY/DMK | 0700/1410 | EKO | BIMO | |
| 253/252/255/256 | OME | DMK/NST/DMK/NST/DMK | 1525/2210 | SENTANU | FREDERICK/PHRUT(OBS) | |
| 251/250/126/127 | OMG | DMK/NST/DMK/CNX/DMK | 0630/1310 | ARIEF | CHOOLARP | |
| 291/292/285/284 | OMG | DMK/URT/DMK/HDY/DMK | 1330/2110 | YORDI | DANIEL | |
| | | | | | | |
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# Daily Flight Roster

Aircraft: MD-82

Date SUNDAY, 9 SEPTEMBER

Issue: REV.2

| Flight No. | Acft. Reg. | Sector | Dep./Arr. | Captain | First Officer | Remarks |
|---|---|---|---|---|---|---|
| | | | | Name | Name | |
| | | OFF | | MADURO/MORBIT/CARLOS/EKO | APRIAS/DANIEL/ NOPPANAI/ APICHART | |
| | | STBY AM | | | | |
| | | STBY PM | | | | |
| | | | | | | |
| 166/165/261/260 | OMA | DMK/CEI/DMK/HKT/DMK | 1000/1630 | SENTANU | WURTZ/TEERAWAT(OBS) | |
| 162/163 | OMA | DMK/CEI/DMK | 1700/2000 | YORDI | RODRIGO | |
| 160/161/267/ 266 | OMB | DMK/CEI/DMK/HKT/DMK | 0700/1350 | SUPRIYONO | NOPPADON | |
| 269/268/128/129 | OMB | DMK/HKT/DMK/CNX/DMK | 1430/2130 | ROBERT | MONTRI | |
| 134/135/297/296 | OMC | DMK/CNX/DMK/KBV/DMK | 0650/1340 | LATIEF | WINYAWAT | |
| 124/125/263/262 | OMC | DMK/CNX/DMK/HKT/DMK | 1410/2130 | DAVID | FREDERICK/KITTIPOL(OBS) | |
| 219/2070 | OMD | HKG/HKT/BKK | 0830/1310 | ARIEF | ARTHIT | |
| 2071/218 | OMD | BKK/HKT/HKG | 1400/2110 | HANANTO | RURI | |
| 265/264/283/282 | OME | DMK/HKT/DMK/HDY/DMK | 0700/1410 | HENDRARTO | PHAISIT | |
| 253/252/255/256 | OME | DMK/NST/DMK/NST/DMK | 1525/2210 | PORRAS | KITTISAK/NOPPANON(OBS) | |
| 251/250/126/127 | OMG | DMK/NST/DMK/CNX/DMK | 0630/1310 | NURHADI | CHOOLARP | |
| 291/292/285/284 | OMG | DMK/URT/DMK/HDY/DMK | 1330/2110 | ANWAR | BIMO/TAW-YOD(OBS) | |
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# Daily Flight Roster

Aircraft: MD-82

Date SATURDAY, 8 SEPTEMBER

Issue: ORIGINAL

| Flight No. | Acft. Reg. | Sector | Dep./Arr. | Captain | First Officer | Remarks |
|---|---|---|---|---|---|---|
| | | | | Name | Name | |
| | | C/F | | ROBERT/ANWAR/ HENDRARTO/ NURHADI | MONTRI/PHAISIT | |
| | | STBY AM | | | | |
| | | STBY PM | | | | |
| | | | | | | |
| 166/165/261/260 | OMA | DMK/CEI/DMK/HKT/DMK | 1000/1630 | DAVID | KITTISAK | |
| 162/163 | OMA | DMK/CEI/DMK | 1700/2000 | EKO | BIMO | |
| 219/2070 | OMD | HKG/HKT/BKK | 0830/1310 | SENTANU | WURTZ | |
| 2071/218 | OMD | BKK/HKT/HKG | 1400/2110 | ARIEF | ARTHIT | |
| 134/135/297/296 | OMC | DMK/CNX/DMK/KBV/DMK | ✓ 0650/1340 | LATIEF | WINYAWAT/ APRIAS(SAFETY F/O) | |
| 124/125/263/262 | OMC | DMK/CNX/DMK/HKT/DMK | 1410/2130 | HANANTO | DANIEL/YOTSAPOL(OBS) | |
| 160/161/267/ 266 | OMD B | DMK/CEI/DMK/HKT/DMK | ✓ 0700/1350 | SUPRIYONO | NOPPADON | |
| 269/268/128/129 | OMD B | DMK/HKT/DMK/CNX/DMK | 1430/2130 | YORDI | FREDERICK/WANTHIT(OBS) | |
| 265/264/283/282 | OME | DMK/HKT/DMK/HDY/DMK | ✓ 0700/1410 | PORRAS | RODRIGO | |
| 253/252/255/256 | OME | DMK/NST/DMK/NST/DMK | 1525/2210 | CARLOS | RURI/THANA(OBS) | |
| 251/250/126/127 | OMG | DMK/NST/DMK/CNX/DMK | ✓ 0630/1310 | MADURO | APICHART | |
| 291/292/285/284 | OMG | DMK/URT/DMK/HDY/DMK | 1330/2110 | MORBIT | CHOOLARP/PHOMPAN(OBS) | |
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# Daily Flight Roster

Aircraft: MD-82

Date FRIDAY, 7 SEPTEMBER

Issue: REV.1

| Flight No. | Acft. Reg. | Sector | Dep./Arr. | Captain | First Officer | Remarks |
|---|---|---|---|---|---|---|
| | | | | Name | Name | |
| | | OFF | | HANANTO/PORRAS/EKO | ANAWAT/MONTRI/RURI/ NOPPANAI | |
| | | STBY AM | | | | |
| | | STBY PM | | | | |
| | | | | | | |
| 134/135/297/296 | OMA | DMK/CNX/DMK/KBV/DMK | 0650/1340 | CARLOS/HENDRARTO(R/H) | | |
| 124/125/263/262 | OMA | DMK/CNX/DMK/HKT/DMK | 1410/2130 | DAVID | KITTISAK | |
| 219/2070 | OMB | HKG/HKT/BKK | 0830/1310 | ANWAR | APRIAS | |
| 2071/218 | OMB | BKK/HKT/HKG | 1400/2110 | SENTANU | WURTZ | |
| 166/165/261/260 | OMC | DMK/CEI/DMK/HKT/DMK | 1000/1630 | YORDI | RODRIGO | |
| 162/163 | OMC | DMK/CEI/DMK | 1700/2000 | ROBERT | FREDERICK | |
| 160/161/267/ 266 | OMD | DMK/CEI/DMK/HKT/DMK | 0700/1350 | LATIEF | WINYAWAT/ ARTHIT(SAFETY F/O) | |
| 269/268/128/129 | OMD | DMK/HKT/DMK/CNX/DMK | 1430/2130 | ARIEF | CHOOLARP | |
| 265/264/283/282 | OME | DMK/HKT/DMK/HDY/DMK | 0700/1410 | MADURO | APICHART | |
| 253/252/255/256 | OME | DMK/NST/DMK/NST/DMK | 1525/2210 | NURHADI | DANIEL | |
| 251/250/126/127 | OMG | DMK/NST/DMK/CNX/DMK | 0630/1310 | SUPRIYONO | NOPPADON | |
| 291/292/285/284 | OMG | DMK/URT/DMK/HDY/DMK | 1330/2110 | MORBIT | PHAISIT | |
| | | | | | | |
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# Daily Flight Roster

Aircraft: MD-82
Date THURSDAY, 6 SEPTEMBER
Issue: REV.1

| Flight No. | Acft. Reg. | Sector | Dep./Arr. | Captain Name | First Officer Name | Remarks |
|---|---|---|---|---|---|---|
| | | OFF | | HANANTO/YORDI/ NURHADI/DAVID | MONTRI/ARTHIT/ FREDERICK/RURI | |
| | | STBY AM | | | | |
| | | STBY PM | | | | |
| | | | | | | |
| 166/165/261/260 | OMA | DMK/CEI/DMK/HKT/DMK | 1000/1630 | EKO | WURTZ | |
| 162/163 | OMA | DMK/CEI/DMK | 1700/2000 | SENTANU/HENDRARTO(R/H) | | |
| 219/2070 | OMB | HKG/HKT/BKK | 0830/1310 | NASRUN | RODRIGO | |
| 2071/218 | OMB | BKK/HKT/HKG | 1400/2110 | ANWAR | APRIAS | |
| 134/135/297/296 | OMC | DMK/CNX/DMK/KBV/DMK | 0650/1340 | LATIEF | APICHART | |
| 124/125/263/262 | OMC | DMK/CNX/DMK/HKT/DMK | 1410/2130 | ROBERT | CHOOLARP | |
| 160/161/267/ 266 | OMD | DMK/CEI/DMK/HKT/DMK | 0700/1350 | MORBIT | ~~ANAWAT~~ MONTRI | |
| 269/268/128/129 | OMD | DMK/HKT/DMK/CNX/DMK | 1430/2130 | CARLOS | DANIEL | |
| 265/264/283/282 | OME | DMK/HKT/DMK/HDY/DMK | 0700/1410 | SUPRIYONO | NOPPADON | |
| 253/252/255/256 | OME | DMK/NST/DMK/NST/DMK | 1525/2210 | PORRAS | PHAISIT | |
| 251/250/126/127 | OMG | DMK/NST/DMK/CNX/DMK | 0630/1310 | MADURO | NOPPANAI | |
| 291/292/285/284 | OMG | DMK/URT/DMK/HDY/DMK | 1330/2110 | ARIEF | KITTISAK | |
| DH 200 (b-747) | UTQ | BKK/HKG | 1810/2140 | NASRUN | BIMO | FOR VISA PURPOSE |
| | | | | | | |

# Daily Flight Roster

Aircraft: MD-82

Date WEDNESDAY, 5 SEPTEMBER

Issue: ORIGINAL

| Flight No. | Acft. Reg. | Sector | Dep./Arr. | Captain Name | First Officer Name | Remarks |
|---|---|---|---|---|---|---|
| | | OFF | | ANWAR/ARIEF/ SUPRIYONO/SENTANU | KITTISAK/CHOOLARP/ FREDERICK/NOPPANAI | |
| | | STBY AM | | | | |
| | | STBY PM | | | | |
| | | | | | | |
| 166/165/261/260 | OMA | DMK/CEI/DMK/HKT/DMK | 1000/1630 | CARLOS | MONTRI | |
| 162/163 | OMA | DMK/CEI/DMK | 1700/2000 | NURHADI/HENDRARTO(R/H) | | |
| 219/2070 | OMB | ----HKG/HKT/BKK | 0830/1310 | YORDI | DANIEL | |
| 2071/218 | OMB | BKK/HKT/HKG | 1400/2110 | NASRUN | RODRIGO | |
| 134/135/297/296 | OMC | DMK/CNX/DMK/KBV/DMK | 0650/1340 | MADURO | NOPPADON | |
| 124/125/263/262 | OMC | DMK/CNX/DMK/HKT/DMK | 1410/2130 | HANANTO | ARTHIT | |
| 160/161/267/ 266 | OMD | DMK/CEI/DMK/HKT/DMK | 0700/1350 | LATIEF | APICHART/ ANAWAT(SAFETY F/O) | |
| 269/268/128/129 | OMD | DMK/HKT/DMK/CNX/DMK | 1430/2130 | DAVID | BIMO | |
| 265/264/283/282 | OME | DMK/HKT/DMK/HDY/DMK | 0700/1410 | MORBIT | APRIAS | |
| 253/252/255/256 | OME | DMK/NST/DMK/NST/DMK | 1525/2210 | ROBERT | RURI | |
| 251/250/126/127 | OMG | DMK/NST/DMK/CNX/DMK | 0630/1310 | EKO | WURTZ | |
| 291/292/285/284 | OMG | DMK/URT/DMK/HDY/DMK | 1330/2110 | PORRAS | PHAISIT | |
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# Daily Flight Roster

Aircraft: MD-82

DATE TUESDAY, 4 SEPTEMBER

Issue: REV.1

| Flight No. | Acft. Reg. | Sector | Dep./Arr. | Captain Name | First Officer Name | Remarks |
|---|---|---|---|---|---|---|
| | | OFF | | SUPRIYONO/SENTANU/ HENDRARTO/ARIEF | KITTISAK/PHAISIT/ CHOOLARP/NOPPADON | |
| | | STBY AM | | | | |
| | | STBY PM | | | | |
| | | | | | | |
| 166/165/261/260 | OMA | DMK/CEI/DMK/HKT/DMK | 1000/1630 | MORBIT | WURTZ | |
| 162/163 | OMA | DMK/CEI/DMK | 1700/2000 | ROBERT | RODRIGO | |
| 219/2070 | OMB | HKG/HKT/BKK | 0830/1310 | CARLOS | ANAWAT | |
| 2071/218 | OMB | BKK/HKT/HKG | 1400/2110 | YORDI | DANIEL | |
| 134/135/297/296 | OMC | DMK/CNX/DMK/KBV/DMK | 0650/1340 | LATIEF | RURI(SAFETY F/O)/ APICHART | |
| 124/125/263/262 | OMC | DMK/CNX/DMK/HKT/DMK | 1410/2130 | NURHADI/ANWAR(R/H) | | |
| 160/161/267/ 266 | OMD | DMK/CEI/DMK/HKT/DMK | 0700/1350 | EKO | FREDERICK | |
| 269/268/128/129 | OMD | DMK/HKT/DMK/CNX/DMK | 1430/2130 | HANANTO | BIMO | |
| 265/264/283/282 | OME | DMK/HKT/DMK/HDY/DMK | 0700/1410 | PORRAS | APRIAS | |
| 253/252/255/256 | OME | DMK/NST/DMK/NST/DMK | 1525/2210 | DAVID | ARTHIT | |
| 251/250/126/127 | OMG | DMK/NST/DMK/CNX/DMK | 0630/1310 | MADURO | NOPPANAI | |
| 291/292/285/284 | OMG | DMK/URT/DMK/HDY/DMK | 1330/2110 | NASRUN | MONTRI | |
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# Daily Flight Roster

Aircraft: MD-82

DATE MONDAY, 3 SEPTEMBER

Issue: ORIGINAL

| Flight No. | Acft. Reg. | Sector | Dep./Arr. | Captain | First Officer | Remarks |
|---|---|---|---|---|---|---|
| | | | | Name | Name | |
| | | OFF | | LATIEF/MADURO/MORBIT/ EKO | WURTZ/PHAISIT/RODRIGO/ NOPPADON | |
| | | STBY AM | | | | |
| | | STBY PM | | | | |
| | | | | | | |
| 166/165/261/260 | OMA | DMK/CEI/DMK/HKT/DMK | 1000/1630 | SUPRIYONO | NOPPANAI | |
| 162/163 | OMA | DMK/CEI/DMK | 1700/2000 | ARIEF | MONTRI | |
| 2071/218 | OMB | BKK/HKT/HKG | 1100/2110 | CARLOS | ANAWAT | |
| 219/2070 | OMB | HKG/HKT/BKK | 0830/1240 | ROBERT | KITTISAK | |
| 134/135/297/296 | OMC | DMK/CNX/DMK/KBV/DMK | 0650/1340 | HENDRARTO | APRIAS | |
| 124/125/263/262 | OMC | DMK/CNX/DMK/HKT/DMK | 1410/2130 | NASRUN | BIMO | |
| 160/161/267/ 266 | OMD | DMK/CEI/DMK/HKT/DMK | 0700/1350 | NURHADI | CHOOLARP | |
| 269/268/128/129 | OMD | DMK/HKT/DMK/CNX/DMK | 1430/2130 | DAVID | DANIEL | |
| 265/264/283/282 | OME | DMK/HKT/DMK/HDY/DMK | 0700/1410 | YORDI | RURI | |
| 253/252/255/256 | OME | DMK/NST/DMK/NST/DMK | 1525/2210 | SENTANU | FREDERICK | |
| 251/250/126/127 | OMG | DMK/NST/DMK/CNX/DMK | 0630/1310 | PORRAS | ARTHIT | |
| 291/292/285/284 | OMG | DMK/URT/DMK/HDY/DMK | 1330/2110 | HANANTO/ANWAR(R/H) | | |
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# Daily Flight Roster

Aircraft: MD-82

DATE SUNDAY, 2 SEPTEMBER

Issue: REV.1

| Flight No. | Acft. Reg. | Sector | Dep./Arr. | Captain Name | First Officer Name | Remarks |
|---|---|---|---|---|---|---|
| | | OFF | | MADURO/MORBIT/CARLOS/ HENDRARTO/YORDI/PORRAS | APRIAS/ANAWAT/ DANIEL/WURTZ | |
| | | STBY AM | | | | |
| | | STB[illegible] | | | | |
| | | | | | | |
| 166/165/261/260 | OMA | DMK/CEI/DMK/HKT/DMK | 1000/1630 | NURHADI | ARTHIT | |
| 162/163 | OMA | DMK/CEI/DMK | 1700/2000 | DAVID | PHAISIT | |
| 2071/218 | OMB | BKK/HKT/HKG | 1100/2110 | ROBERT | KITTISAK | OPRT. 219/2070, HKG/HKT/BKK ON 03SEP. D.0830 AM. |
| 134/135/297/296 | OMC | DMK/CNX/DMK/KBV/DMK | 0650/1340 | ARIEF | BIMO | |
| 124/125/263/262 | OMC | DMK/CNX/DMK/HKT/DMK | 1410/2130 | HANANTO | RODRIGO | |
| 160/161/267/ 266 | OMD | DMK/CEI/DMK/HKT/DMK | 0700/1350 | LATIEF | NOPPADON | |
| 269/268/128/129 | OMD | DMK/HKT/DMK/CNX/DMK | 1430/2130 | SENTANU | FREDERICK | |
| 265/264/283/282 | OME | DMK/HKT/DMK/HDY/DMK | 0700/1410 | ANWAR | RURI | |
| 253/252/255/256 | OME | DMK/NST/DMK/NST/DMK | 1525/2210 | NASRUN | CHOOLARP | |
| 251/250/126/127 | OMG | DMK/NST/DMK/CNX/DMK | 0630/1310 | SUPRIYONO | PRAPHON | |
| 291/292/285/284 | OMG | DMK/URT/DMK/HDY/DMK | 1330/2110 | EKO | MONTRI | |
| | | | | | | |
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# Daily Flight Roster

Aircraft: MD-82
DATE SATURDAY, 1 SEPTEMBER
Issue: ORIGINAL

| Flight No. | Acft. Reg. | Sector | Dep./Arr. | Captain Name | First Officer Name | Remark |
|---|---|---|---|---|---|---|
| | | OFF | | ARIEF/NASRUN/ROBERT/ NURHADI/YORDI/ PORRAS/DAVID | WURTZ/ANAWAT/DANIEL/ RURI/BIMO | |
| | | STBY AM | | | | |
| | | STBY PM | | | | |
| | | | | | | |
| 166/165/261/260/162/163 | OMG | DMK/CEI/DMK/HKT/DMK/CEI/DMK | 1000/2000 | CARLOS | FREDERICK | |
| 2071/2070 | OMB | BKK/HKT/BKK | 1100/1410 | MORBIT | PHAISIT | |
| 251/250/126/127 | OMC | DMK/NST/DMK/CNX/DMK | 0630/1310 | MADURO | NOPPANAI | |
| 291/292/285/284 | OMC | DMK/URT/DMK/HDY/DMK | 1330/2110 | HANANTO | CHOOLARP | |
| 160/161/267/ 266 | OMD | DMK/CEI/DMK/HKT/DMK | 0700/1350 | SUPRIYONO | PRAPHON | |
| 269/268/128/129 | OMD | DMK/HKT/DMK/CNX/DMK | 1430/2130 | SENTANU | RODRIGO. | |
| 265/264/283/282 | OME | DMK/HKT/DMK/HDY/DMK | 0700/1410 | ANWAR | ARTHIT | |
| 253/252/255/256 | OME | DMK/NST/DMK/NST/DMK | 1525/2210 | EKO | MONTRI | |
| 134/135/297/296 | OMA | DMK/CNX/DMK/KBV/DMK | 0650/1340 | LATEIF | NOPPADON/ APRIAS(SAFETY F/O) | |
| 124/125/263/262 | OMA | DMK/CNX/DMK/HKT/DMK | 1410/2130 | HENDRARTO | KITTISAK | |
| | | | | | | |
| | | | | | | |