FINAL

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NATIONAL TRANSPORTATION SAFETY COMMITTEE

Aircraft Serious Incident Investigation Report

PT. Sriwijaya Air
PK – CJC
Boeing Company 737-300
Depati Amir Airport, Pangkal Pinang
Republic of Indonesia

18 April 2008

NATIONAL TRANSPORTATION SAFETY COMMITTEE
MINISTRY OF TRANSPORTATION
REPUBLIC OF INDONESIA
2010

This Report was produced by the National Transportation Safety Committee (NTSC), Karya Building 7th Floor Ministry of Transportation, Jalan Medan Merdeka Barat No. 8 JKT 10110, Indonesia.

The report is based upon the investigation carried out by the NTSC in accordance with Annex 13 to the Convention on International Civil Aviation, Aviation Act (UU No.1/2009), and Government Regulation (PP No. 3/2001).

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GLOSSARY OF ABBREVIATIONS

AD	Airworthiness Directive
AFM	Airplane Flight Manual
AGL	Above Ground Level
ALAR	Approach-and-landing Accident Reduction
AMSL	Above Mean Sea Level
AOC	Air Operator Certificate
ATC	Air Traffic Control
ATPL	Air Transport Pilot License
ATS	Air Traffic Service
ATSB	Australian Transport Safety Bureau
Avsec	Aviation Security
BMG	Badan Meterologi dan Geofisika
BOM	Basic Operation Manual
°C	Degrees Celsius
CAMP	Continuous Airworthiness Maintenance Program
CASO	Civil Aviation Safety Officer
CASR	Civil Aviation Safety Regulation
CPL	Commercial Pilot License
COM	Company Operation Manual
CRM	Cockpit Recourses Management
CSN	Cycles Since New
CVR	Cockpit Voice Recorder
DFDAU	Digital Flight Data Acquisition Unit
DGCA	Directorate General of Civil Aviation
DME	Distance Measuring Equipment
EEPROM	Electrically Erasable Programmable Read Only Memory
EFIS	Electronic Flight Instrument System
EGT	Exhaust Gas Temperature
EIS	Engine Indicating System
FL	Flight Level
F/O	First officer or Copilot
FDR	Flight Data Recorder
FOQA	Flight Operation Quality Assurance
GPWS	Ground Proximity Warning System
hPa	Hectopascals
ICAO	International Civil Aviation Organization
IFR	Instrument Flight Rules

IIC	Investigator in Charge
ILS	Instrument Landing System
Kg	Kilogram(s)
Km	Kilometer(s)
Kt	Knots (NM/hour)
Mm	Millimeter(s)
MTOW	Maximum Take-off Weight
NM	Nautical mile(s)
KNKT /	Komite Nasional Keselamatan Transportasi /
NTSC	National Transportation Safety Committee
PIC	Pilot in Command
QFE	Height above aerodrome elevation (or runway threshold elevation) based on local station pressure
QNH	Altitude above mean sea level based on local station pressure
RESA	Runway End Safety Area
RPM	Revolution Per Minute
SCT	Scattered
S/N	Serial Number
SSCVR	Solid State Cockpit Voice Recorder
SSFDR	Solid State Flight Data Recorder
TS/RA	Thunderstorm and rain
TAF	Terminal Aerodrome Forecast
TSN	Time Since New
TT/TD	Ambient Temperature/Dew Point
TTIS	Total Time in Service
UTC	Coordinated Universal Time
VFR	Visual Flight Rules
VMC	Visual Meteorological Conditions

SYNOPSIS

On 18 April 2008, at 1115 UTC, a Boeing B737-300 aircraft, registered PK-CJC operated by PT. Sriwijaya Air, was being flown on a scheduled flight from Jakarta to Pangkal Pinang. During the landing at Pangkal Pinang, the aircraft overran the end of the runway. The aircraft stopped 50 meters beyond the end of the runway, but within the stop-way.

There were 150 people on board; two pilots, four flight attendants, and 144 passengers. The aircraft's occupants were not injured, and disembarked normally using air stairs one hour after the aircraft stopped. Based upon crew interviewed, airport fire and rescue personnel arrived at the aircraft approximately 10 minutes after it stopped. During that 10 minute period, the flight crew were not aware of the extent of the damage to the aircraft and if a fire may have started.

The PIC became distracted by a cabin issue during the approach, and did not appropriately monitor the aircraft's approach profile. The investigation found that the aircraft was high and fast on the approach, but the pilot in command allowed the co pilot to continue the approach and landing.

The investigation determined that the approach was un-stabilized, and the flight crew's compliance with procedures, including crew resource management, was not at a level to ensure the safe operation of the aircraft.

The National Transportation Safety Committee issued several recommendations to the aircraft operator and the Directorate General of Civil Aviation with the final report. These included: a review of airline procedures and flight crew training with respect to the timeliness of evacuation of passengers and crew after an accident or serious incident, particularly when the extent of damage to the aircraft is not known; a review of training programs and procedures with respect to stabilized approaches; and the promulgation of procedures requiring flight crew and maintenance personnel to deactivate the power source to flight recorders as soon as practicable after an accident or serious incident. The NTSC also urged the DGCA to ensure that Indonesian operators have flight recorder deactivation procedures and they are implemented.

The NTSC also reiterated its recommendations that were previously issued to the Directorate General of Civil Aviation with Report KNKT.07.11.27.04 stressing similar safety concerns.

1 FACTUAL DATA

1.1 HISTORY OF THE FLIGHT

On 18 April 2008, at 1115 UTC[1], a Boeing B737-300 aircraft, registered PK-CJC, operated by PT. Sriwijaya Air was being flown on a scheduled passenger flight from Jakarta to Pangkal Pinang.

There were 150 persons on board; two pilots, four cabin crew, and 144 passengers. The Pilot in Command (PIC) was the support/monitoring pilot and the copilot was the handling pilot.

The aircraft touched down about 750 meters from the landing threshold end of the runway, with about 1,250 meters remaining. During the landing roll the aircraft overran the end of the runway, and stopped 50 meters beyond the end of the runway, within the stop-way.

None of the aircraft's occupants were injured and they disembarked normally using airstairs.

Figure 1: Final position of the aircraft on the stopway

[1] The 24-hour clock used in this report to describe the time of day as specific events occurred is in Coordinated Universal Time (UTC). Local time, Western Indonesian Standard Time (WIB) is UTC+ 7 hours.

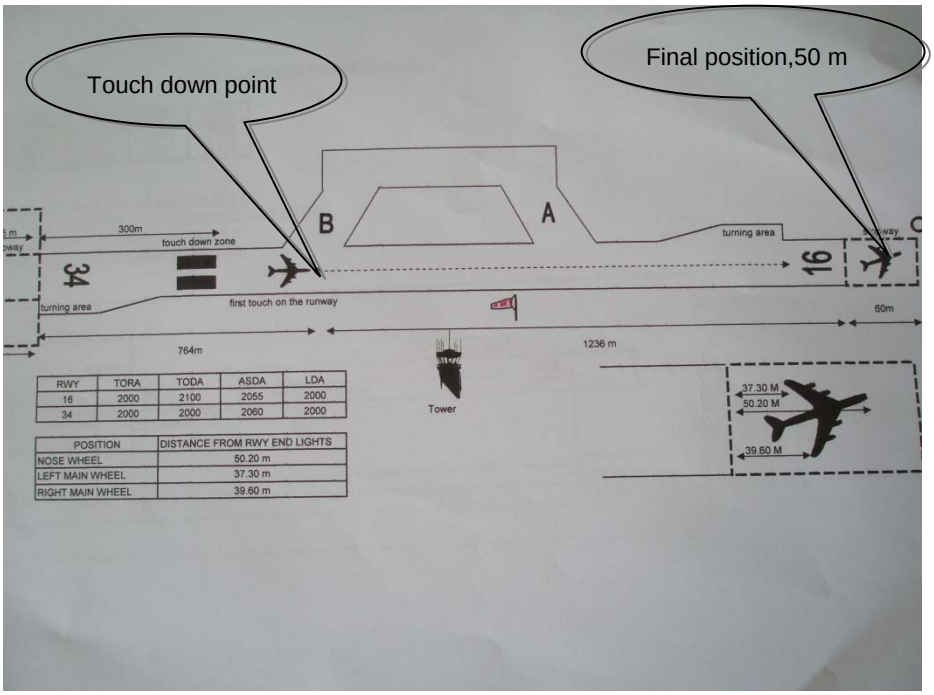

Figure 2: Diagram of the runway, showing touchdown point, and final position of the aircraft

Figure 3: Tire marks on departure end of the runway

1.2 INJURIES TO PERSONS

There were no injuries to persons as a result of this serious incident.

Table 1: Injuries to persons

Injuries	Flight crew	Passengers	Total in Aircraft	Others
Fatal	-	-	-	-
Serious	-	-	-	-
Minor	-	-	-	Not applicable
Nil Injuries	6	144	150	Not applicable
TOTAL	6	144	150	-

1.3 DAMAGE TO AIRCRAFT

The inboard main landing gear tires (number two and number three)[2] were substantially damaged. Both engines' fan blades were substantially damaged (gouged), and the number-two engine air intake screen was dented.

1.4 OTHER DAMAGE

There was no other damage to property and/or the environment.

1.5 PERSONNEL INFORMATION

1.5.1 Pilot in Command (Pilot Monitoring)

Gender	: Male
Date of birth	: 4 Jan 1956
License	: ATPL
Valid to	: 30 September 2008
Aircraft ratings	: B737-300/400
Medical certificate valid to	: 26 September 2008
Last Proficiency Check	: 27 November 2007
Last Line Check	: 6 March 2008

[2] Main landing gear wheels are numbered one to four, with wheel number one the left outboard, and wheel number four the right outboard.

Flying experience

Total all types	: 15,230 hours
Total on type	: 10,376 hours 30 minutes
Total on type last 90 days	: 154 hours 27 minutes
Total on type last 7 days	: 13 hours 15 minutes
Total on type last 24 hours	: 54 minutes
Last proficiency check	: 27 November 2007
Medical class	: Class I
Valid to	: 26 September 2008
Medical limitation	: Nil

There was no evidence that the PIC was not fit for duty.

1.5.2 Copilot (Pilot Flying)

Gender	: Male
Date of birth	: 6 April 1974
License	: ATPL
Valid to	: Requested, but not provided by the operator
Aircraft ratings	: B737-300/400/500
Instrument rating	: Valid
Last medical check valid to	: 21 May 2008
Last proficiency check	: 21 February 2008
Last line check	: 28 July 2007
Flying experience	
Total all types	: 5,254 hours
Total on type	: 1,069 hours
Total on type last 90 days	: 50 hours 27 minutes
Total on type last 24 hours	: 54 minutes
Last proficiency check	: 21 February 2008
Medical class	: Class I
Valid to	: 21 May 2008
Medical limitation	: Nil

There was no evidence that the copilot was not fit for duty.

The copilot was a Directorate General of Civil Aviation Flight Operations Inspector.

1.6 AIRCRAFT INFORMATION

1.6.1 General

Registration	:	PK–CJC
Manufacturer	:	Boeing Company
Country of Manufacturer	:	United States of America
Date of Manufacture	:	1988
Type Model	:	B737-33A
Serial Number	:	24025
Certificate of Airworthiness	:	2393
Issued	:	27 July 2007
Valid to	:	26 July 2008
Certificate of Registration	:	2393
Issued	:	6 July 2007
Validity	:	5 July 2008
Category	:	Scheduled passenger flight

The aircraft was certified as being airworthy when it was dispatched from Jakarta for the flight. It was being operated within the approved weight and balance limitations.

1.6.2 Engine Data

Engine Type	:	Turbo-fan
Manufacturer	:	GE/SNECMA
Model	:	CFM 56 -3B1

There was no evidence of a defect with the aircraft's engines.

1.7 METEOROLOGICAL INFORMATION

The weather information for the landing at Pangkal Pinang, reported on 18 April 2008 at 0900 was:

Surface wind	: Calm
Visibility	: 9 km
Present weather	: Nil significant
Cloud	: Broken 1,600 feet
Temperature / DP	: 23 C
Dew Point	: 25 C

1.8 AIDS TO NAVIGATION

The airport was equipped with a serviceable VOR/DME navigation system. The aircraft was also equipped with appropriate navigation systems. The airport and the aircraft systems were in serviceable condition. The pilots were rated to perform the instrument approach. However, during this flight the pilots elected to conduct a straight-in visual approach.

1.9 COMMUNICATIONS

Communication between Air Traffic Services and the crew was normal.

1.10 AERODROME INFORMATION

Aerodrome Code	:	PGK / WIPK
Airport Name	:	DEPATI AMIR
Airport Address	:	Jl. Soekarno Hatta / Jl. Koba Km.7 Pangkalan Baru - Pangkal Pinang
Airport Class	:	II
Airport Authority	:	Directorate General of Civil Aviation
Airport Service	:	Domestic
Coordinates	:	02° 09′ 45″ S, 106° 08′ 17″ E
Elevation	:	109 feet
Runway Length	:	2,000 meters
Runway Width	:	30 meters
Azimuth	:	16 – 34

1.11 FLIGHT RECORDERS

The Cockpit Voice Recorder and Flight Data Recorder were secured and placed in the custody of the National Transportation Safety Committee (NTSC). The recorders were analyzed at the flight recorder laboratory of the Air Accident Investigation Bureau of Singapore.

1.11.1 Flight Data Recorder

Manufacturer	: Sundstrand
Type/Model	: Digital Flight Data Recorder
Part Number	: 980-4100-DXUS

The data from the flight data recorder showed that at 1,000 feet on the approach, the aircraft was configured with the landing gear extended, wing flaps 30 degrees, and speed of 171 knots (185 knots groundspeed).

At 500 feet on the approach, the aircraft was configured with the landing gear extended, wing flaps 30 degrees, and speed of 162.5 knots (176 knots groundspeed).

The crew informed the investigators that the approach and landing were planned to be flown with the wing flaps at the 30 degree setting, and V_{REF}[3] of 130 knots at the aircraft's calculated landing weight of 51,439 kg.

The flight recorded data showed that the approach from 1,000 feet was not stabilized

The aircraft flew above the landing threshold at a speed of 170 knots (180 knots groundspeed), and 211 feet above ground level. The aircraft touched down at about 750 meters from the landing threshold, at a speed of 158.5 knots (166 knots groundspeed).

Three seconds after touchdown, at a speed of 145 knots, the crew selected the wing flaps to the 40 degree setting. The flaps took five seconds to reach the 40 degree position.

1.11.2 Cockpit Voice Recorder

Manufacturer : Sundstrand

Type/Model : AV557C

Part Number : 93-A100-80

Serial Number : 54197

No useful information about the approach and landing was obtained from the cockpit voice recorder. The recorded data for the approach and landing was overwritten during the post-incident ground handling period, because electrical power was still applied to the recorder. The recorded data commenced at a time after the aircraft came to a stop. The investigation was unable to determine if the crew completed the landing checklist, and what emergency procedures were discussed with respect to passenger and crew evacuation.

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[3] V_{REF} is approach speed at 1.35 the stalling speed, with the flaps at the landing setting and engines idling.

1.12 WRECKAGE AND IMPACT INFORMATION

1.12.1 Number-three main wheel tire

Figure 4: Tire number three was substantially damaged

Figure 5: Damaged tire number two

1.12.2 Engines

Both engines' fan blades were substantially damaged (gouged), and the number-two engine air intake screen was dented.

Figure 6: Damaged engine fan blades

Figure 7: Damaged number-two engine air intake screen

Figure 8: Tire marks at the end of the runway, and onto the stopway

1.13 MEDICAL AND PATHOLOGICAL INFORMATION

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

1.14 FIRE

There was no evidence of fire in flight or after the aircraft landed.

1.15 SURVIVAL ASPECTS

None of the occupants were injured, and they vacated the aircraft unaided via airstairs.

1.16 TESTS AND RESEARCH

No tests or research were required to be conducted as a result of this serious incident.

1.17 ORGANIZATIONAL AND MANAGEMENT INFORMATION

Aircraft Operator : PT. Sriwijaya Air

Address : Jalan Pangeran Jayakarta No.68 Block C 15-16

Jakarta Pusat – Indonesia

Air Operator Certificate: AOC/121/35

1.18 ADDITIONAL INFORMATION

1.18.1 Pilot and flight attendant report

The PIC reported the following information to investigators, and subsequently confirmed the details during the investigation interview. He reported that during the approach, Flight Attendant One (FA1) went to the cockpit and reported that during the flight she was disturbed by one of the passengers who was sitting in seat number 1D. The PIC requested that FA1 leave the cockpit and send Flight Attendant Two (FA2) to the cockpit to confirm the report of the disturbance by the passenger. The PIC subsequently called FA1, and said to her, “That disturbance will be solved after landing”.

1.18.2 Approach profile

The PIC reported that shortly after the discussion with the flight attendants, while continuing descent on the approach, he observed that the aircraft was too high and too fast on the approach. The approach from 1,000 feet was not stabilized, however, the PIC decided not bring his concern to the attention of the copilot, and did not take remedial action.

1.18.3 Use of thrust reverser

The air traffic controller reported that as the aircraft left the runway and entered the stopway, there was a lot of dust. The investigation found that the stopway had loose stones and sand, which damaged both engines' fan blades and engines' air intake. This evidence confirmed the flight recorded data that the full reverse was still being used at the end of the landing roll.

1.18.4 The Rescue and Fire Fighting

Following the occurrence, no immediate actions were initiated by the airport rescue fire fighting service (RFFS) personnel. The RFFS personnel and equipment arrived at the aircraft about 10 minutes after the aircraft stopped. During that 10-minute period, the pilots did not know the full extent of the damage, and the risk of fire or explosion.

However, a flight attendant reported that she informed the PIC that the cabin was "ok" and that there was no fire, so the PIC elected not to conduct an emergency evacuation, and kept the passengers on the aircraft for about 1 hour until airstairs arrived.

1.18.5 The Directorate General of Civil Aviation

The investigation did not find evidence of DGCA oversight of the operator with respect to ensuring the operator had procedures, and flight crews and maintenance personnel had been trained, to deactivate the power source from the flight recorders as soon as practicable after an accident or serious incident.

1.19 USEFUL OR EFFECTIVE INVESTIGATION TECHNIQUES

The investigation was conducted in accordance with NTSC approved policies and procedures, and in accordance with the standards and recommended practices of Annex 13 to the Chicago Convention.

2 ANALYSIS

During the period from top of descent, the pilot in command (PIC) became distracted, discussing a cabin safety matter with two of the flight attendants. On final approach he realised that the aircraft was above the appropriate approach profile, and that the speed was high, but he decided to allow the co-pilot to continue flying the aircraft and land the aircraft from the approach.

The aircraft touched down with a runway distance remaining of 1,250 meters, and was stopped using full reverse thrust and heavy braking. The aircraft came to a stop within the stop-way, with the nose wheel 50 meters into the stop-way.

The Flight Data Recorder (FDR) data showed that the aircraft crossed the threshold, 211 feet above the runway, at airspeed of 170 knots, 40 knots faster than the required landing speed for 30 degrees flaps setting. It touched down at 158.5 knots, 28.5 knots faster than the required landing speed for 30 degrees flaps, at the aircraft's landing weight of 51,439 kg.

During the landing roll, three seconds after touchdown, at a speed of 145 knots, the crew selected the wing flaps to the 40 degree setting. The investigation was unable to know the reason of this selection.

No useful information about the approach and landing was obtained from the cockpit voice recorder. The recorded data for the approach and landing was overwritten during the post-incident ground handling period, because electrical power was still applied to the recorder. There were no procedures to require flight crew or maintenance personnel to deactivate the power source to the CVR following an accident or serious incident.

The dust reported by the air traffic controller came from the runway end that was covered with loose stones and sand, which caused the damage to the engines' fan blades and the engines' air intakes. This indicated that high thrust reverse was still being applied to both engines at the end of the landing roll. It was also confirmed by the FDR data. The marks on the runway also showed evidence of heavy brake application as the aircraft entered the stopway.

The PIC became distracted by a passenger cabin issue during the approach, and did not appropriately monitor the aircraft's approach profile. The approach was being flown by the copilot, and the aircraft was high and fast and not on the correct approach profile. The investigation determined that the approach from 1,000 feet was not stabilized, and did not conform to the operator's standard operating procedures. Appropriate crew resource management procedures were not utilised. The PIC decided

not to bring his concerns about the high and fast approach to the attention of the copilot. He also elected not to order a go around, or take over control from the copilot and initiate a go around, when it became clear to him that the aircraft was too high and fast on short final approach.

The investigation determined that the flight crew's compliance with procedures, including crew resource management, was not at a level to ensure the safe operation of the aircraft.

The copilot was a Directorate General of Civil Aviation (DGCA) Flight Operations Inspector. The investigation was unable to determine why the PIC did not order a missed approach, or take over flying the aircraft from the copilot. However, it is possible that the PIC sensed a heightened level of cockpit authority gradient due to the copilot being a DGCA inspector.

The investigation determined that ground-based navigation aids, onboard navigation aids, and aerodrome visual ground aids were not a factor in this occurrence.

The investigation was unable to determine why the airport rescue and fire fighting personnel and equipment took approximately 10 minutes to arrive at the aircraft. During that period, the pilots did not know the extent of the damage and the risk of fire or explosion. The investigation determined that, in the absence of evidence regarding the extent of the damage to the aircraft, the PIC should have ordered an evacuation of the passengers from the aircraft.

3 CONCLUSIONS

3.1 FINDINGS

- The aircraft was certified, equipped and maintained in accordance with existing regulations and approved procedures.
- The aircraft was certified as being airworthy when dispatched for the flight.
- There was no evidence of any defect or malfunction in the aircraft that could have contributed to the serious incident.
- The aircraft was loaded within the prescribed weight and balance limitations.
- The pilots were licensed and qualified for the flight in accordance with existing regulations.
- The pilot in command (PIC) was the support/monitoring pilot and the copilot was the handling pilot.
- The PIC became distracted by a cabin issue during the approach and did not appropriately monitor the aircraft's approach profile.
- The aircraft was high and fast on the approach, but the pilot in command allowed the copilot to continue the approach and landing.
- The approach was not stabilized, and did not conform to the operator's standard operating procedures.
- The aircraft touched down at speed 28.5 knots above V_{REF}, about 750 meters from the landing threshold, with 1,250 meters remaining.
- Three seconds after touchdown, at a speed about 145 knots, the crew selected the wing flaps to the 40 degree setting.
- The aircraft overran the end of the runway and stopped within the stopway.
- The flight crew's compliance with procedures, including crew resource management, was not at a level to ensure the safe operation of the aircraft.
- The cockpit voice recorded data for the approach and landing was overwritten during the post-incident ground handling period, because the power source was not deactivated after the serious incident.

- There was no company procedure to require flight crews to deactivate the power source to the CVR as soon as practicable after the aircraft has stopped, following an accident or serious incident.
- The airport rescue and fire fighting services (RFFS) took approximately 10 minutes to arrive at the aircraft.
- The flight crew were not aware of the extent of damage to the aircraft.
- The PIC did not order an evacuation of the aircraft during the period before the RFFS arrived.

3.2 CAUSES

- The approach was not stabilised, and did not conform to the operator's standard operating procedures.
- The aircraft was high and fast on the approach, but the pilot in command allowed the copilot to continue the approach and landing.
- The flight crew's compliance with procedures was not at a level to ensure the safe operation of the aircraft.

4 SAFETY RECOMMENDATIONS

As a result of the investigation into this serious incident, the National Transportation Safety Committee made the following recommendations.

4.1 RECOMMENDATION TO PT. SRIWIJAYA AIR

The National Transportation Safety Committee recommends that PT. Sriwijaya Air review their procedures and flight crew training with respect to the timeliness of evacuation of passengers and crew after an accident or serious incident, particularly when the extent of damage to the aircraft is not known.

4.2 RECOMMENDATION TO PT. SRIWIJAYA AIR

The National Transportation Safety Committee recommends that PT. Sriwijaya Air should ensure that its documented flight crew training procedures include information about stabilized approaches, particularly, that all flights must be stabilized by 1,000 feet above airport elevation in instrument meteorological conditions (IMC) and by 500 feet above airport elevation in visual meteorological conditions (VMC).

4.3 RECOMMENDATION TO PT. SRIWIJAYA AIR

The National Transportation Safety Committee recommends that PT. Sriwijaya Air should also ensure that its documented flight crew training procedures include information about stabilized approach criteria, and that an approach is stabilized when all of the following criteria are met:

a. The aircraft is on the correct flight path;

b. Only small changes in heading/pitch are required to maintain the correct flight path;

c. The aircraft speed is not more than VREF + 20 knots indicated airspeed and not less than VREF;

d. The aircraft is in the correct landing configuration;

e. Sink rate is no greater than 1,000 feet per minute; if an approach requires a sink rate greater than 1,000 feet per minute, a special briefing should be conducted;

f. Power setting is appropriate for the aircraft configuration and is not below the minimum power for approach as defined by the aircraft operating manual;

g. All briefings and checklists have been conducted;

h. Specific types of approaches are stabilized if they also fulfil the following: instrument landing system (ILS) approaches must be flown within one dot of the glide slope an localizer; a Category II or Category III ILS approach must be flown within the expanded localizer band; during a circling approach, wings should be level on final when the aircraft reaches 300 feet above airport elevation; and,

i. Unique approach procedures or abnormal conditions requiring a deviation from the above elements of a stabilized approach require a special briefing.

4.4 RECOMMENDATION TO DIRECTORATE GENERAL OF CIVIL AVIATION

The National Transportation Safety Committee recommends that the Directorate General of Civil Aviation urgently require all Indonesian airlines to review their procedures with respect to the timeliness of evacuation of passengers and crew after an accident or serious incident, particularly when the extent of damage to the aircraft is not known.

4.5 RECOMMENDATION TO PT. SRIWIJAYA AIR

The National Transportation Safety Committee recommends that PT. Sriwijaya Air promulgate a procedure, and instruct all flight crew and maintenance personnel, to deactivate the power source to the Cockpit Voice Recorder, following an accident or serious incident. The deactivation should be accomplished as soon as practicable after the aircraft has stopped.

4.6 RECOMMENDATION TO DIRECTORATE GENERAL OF CIVIL AVIATION

The National Transportation Safety Committee recommends that the Directorate General of Civil Aviation, as a matter of urgency, ensure that all Indonesian operators of aircraft equipped with a Cockpit Voice Recorder (CVR) have a procedure, and have instructed all flight crew and maintenance personnel, to deactivate the power source to the CVR, following an accident or serious incident. The deactivation should be accomplished as soon as practicable after the aircraft has stopped.

The NTSC reiterates its recommendations that were previously issued to the Directorate General of Civil Aviation with Report KNKT.07.11.27.04 as follows:

Directorate General of Civil Aviation
KNKT.07.11.27.04 Paragraph 4.2.6

The National Transportation Safety Committee recommends that the Directorate General of Civil Aviation (DGCA) ensure that PT. Mandala Airlines and other Indonesian Part 121 and 135 operators have documented flight crew training procedures that include information about stabilized approaches. In particular the procedures should ensure that all flights must be stabilized by 1,000 feet above airport elevation in instrument meteorological conditions (IMC) and by 500 feet above airport elevation in visual meteorological conditions (VMC).

Directorate General of Civil Aviation
KNKT.07.11.27.04 Paragraph 4.2.7

The National Transportation Safety Committee recommends that the Directorate General of Civil Aviation (DGCA) ensure that PT. Mandala Airlines and other Indonesian Part 121 and 135 operators have documented flight crew training procedures that include information about stabilized approach criteria, and that an approach is stabilized when all of the following criteria are met:

a. The aircraft is on the correct flight path;

b. Only small changes in heading/pitch are required to maintain the correct flight path;

c. The aircraft speed is not more than VREF + 20 knots indicated airspeed and not less than VREF;

d. The aircraft is in the correct landing configuration;

e. Sink rate is no greater than 1,000 feet per minute; if an approach requires a sink rate greater than 1,000 feet per minute, a special briefing should be conducted;

f. Power setting is appropriate for the aircraft configuration and is not below the minimum power for approach as defined by the aircraft operating manual;

g. All briefings and checklists have been conducted;

h. Specific types of approaches are stabilized if they also fulfil the following: instrument landing system (ILS) approaches must be flown within one dot of the glideslope an localizer; a Category II or Category III ILS approach must be flown within the expanded localizer band; during a circling approach, wings should be level on final when the aircraft reaches 300 feet above airport elevation; and,

i. Unique approach procedures or abnormal conditions requiring a deviation from the above elements of a stabilized approach require a special briefing.

Directorate General of Civil Aviation
KNKT.07.11.27.04 Paragraph 4.2.8

The National Transportation Safety Committee recommends that the Directorate General of Civil Aviation (DGCA) ensure that PT. Mandala Airline and other Indonesian Part 121 and 135 operators have documented flight crew procedures that include information that an approach that becomes unstabilized below 1,000 feet above airport elevation in IMC or below 500 feet above airport elevation in VMC requires an immediate go-around.