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**NATIONAL
TRANSPORTATION
SAFETY
COMMITTEE**

Aircraft Accident Investigation Report

BEEHCRAFT SUNDOWNER (C23)

PK-ANW

TENJO VILAGE, PARUNG PANJANG,

BOGOR, WEST JAVA

REPUBLIC OF INDONESIA

30 APRIL 2009



**NATIONAL TRANSPORTATION SAFETY COMMITTEE
MINISTRY OF TRANSPORTATION
REPUBLIC OF INDONESIA
2009**

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, Indonesian Law (UU No.15/1992), 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 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

Hrs	:	Hours
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/hours)
Mm	:	Millimeter(s)
MTOW	:	Maximum Take-off Weight
NM	:	Nautical mile(s)
NTSB	:	National Transportation Safety Board (USA)
KNKT/NTSC	:	Komite Nasional Keselamatan Transportasi / National Transportation Safety Committee
PIC	:	Pilot in Command
QFE	:	Height above airport 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
ROV	:	Remotely Operated Vehicle
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
TPL	:	Towed Pinger Locator
TSN	:	Time Since New
TT/TD	:	Ambient Temperature/Dew Point
TTIS	:	Total Time in Service
UTC	:	Universal Time Coordinate
VFR	:	Visual Flight Rules
VMC	:	Visual Meteorological Conditions

INTRODUCTION

SYNOPSIS

On the afternoon of 30 April 2009, a Beechcraft Sundowner C23 aircraft, registered PK-ANW, operated by Sekolah Tinggi Penerbangan Indonesia (STPI), on a local training flight from Budiarto Airport (Curug), Tangerang, Banten, Indonesia, impacted terrain about 13 km southwest of the aerodrome. Thunderstorms, strong wind, and heavy rain were in the area at the time.

There were three persons on board the aircraft; one flight instructor and two student pilots. The instructor was fatally injured, and the two student pilots were seriously injured.

The aircraft was airworthy during when it departed from Curug. It was destroyed by the impact forces, and the damage to the aircraft was consistent with it being in an aerodynamically stalled condition at the time of impact.

During the investigation it was concluded that there was a lack of supervision and instruction from STPI regarding the aircraft's continued operation in adverse weather condition. Those requirements were documented in the STPI operating handbooks.

It was also concluded that the injuries sustained by two of the occupants during the impact were the result of them not having properly worn their safety harnesses.

Other safety issues were identified during the investigation. They included ground-based very high frequency radio communication equipment and ground-based wind direction indication equipment. Those issues did not contribute to the accident, but were identified as safety deficiencies.

The National Transportation Safety Committee's report includes recommendations to STPI, Budiarto Airport Operator, and Directorate General of Civil Aviation to address safety deficiencies, both with the aircraft operation and the aerodrome equipment.

1 FACTUAL INFORMATION

1.1 HISTORY OF THE FLIGHT

On the afternoon of 30 April 2009, a Beechcraft Sundowner C23 aircraft, registered PK-ANW, was on a local training flight from Budiarto Airport (Curug), Tangerang, Banten, Indonesia.

There were three persons on board the aircraft; one flight instructor and two student pilots. One student pilot occupied the command (left front) seat. The other student occupied a rear passenger seat.

The training was being conducted in the Curug flying training area between 1,000 feet and 3,000 feet above mean sea level (MSL).

The pilots requested a taxi clearance at 1316 local time (0616 Coordinated Universal Time (UTC))¹. Twelve minutes later, at 0628, the takeoff was commenced. At 0634 the pilots reported reaching the south training area.

At 0641 the Curug aerodrome controller (the controller) advised the pilots that there was heavy rain in the vicinity of aerodrome. The controller instructed the pilots to return to Curug for a landing.

Six minutes later, at 0647, the pilots reported leaving the south area, and requested landing instructions, the controller instructed the pilots to join the aerodrome circuit on downwind for runway 30, via overhead the aerodrome at 1,500 feet.

Five minutes later, at 0652, the pilots reported that they were remaining in the training area. At 0713, they reported to the controller that they were returning to aerodrome.

At 0733, the controller requested the pilots to report their position, but received no reply.

A short time later, the aircraft was reported to have impacted the ground at Tenjo Village, about 13 km southwest of Budiarto. The aircraft was substantially damaged.

The student seated in the rear of the aircraft subsequently reported that as the aircraft approached the aerodrome, it encountered heavy rain. The

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.

student also reported that the aircraft was in a downdraft, and hearing the aural stall warning sounding² and increasing engine RPM.

Witnesses on the ground near the impact site reported seeing the aircraft passing overhead at a low height 'turning to the left' shortly before it impacted the ground. They reported that it was raining heavily at the time, accompanied by strong wind.

The flying instructor was fatally injured, and the two student pilots were injured.

1.2 INJURIES TO PERSONS

Injuries	Flight crew	Passengers	Total in Aircraft	Others
Fatal	1	-	1	-
Serious	2	-	2	-
Minor	-	-	-	-
Nil Injuries	-	-	-	-
TOTAL	3	-	3	-

All the aircraft occupants were Indonesian citizens.

1.3 DAMAGE TO AIRCRAFT

The aircraft was substantially damaged.

1.4 OTHER DAMAGE

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

1.5 PERSONNEL INFORMATION

Details of the flight instructor's flight hours were requested from the operator, but at the time of finalizing the draft report the details had not been supplied to the investigation.

² Aural stall warning sounds when the aircraft is entering an aerodynamic stall.

1.5.1 The Flight Instructor

Age	: 23 years (date of birth 16 June 1985)
Gender	: Male
Type of licence	: Commercial Pilot Licence (CPL)
Valid to	: 30 June 2009
Rating	: Beechcraft C23
Total flying time	: Not provided
Total on this type	: 670 hours
Total last 90 days	: Not provided
Total on type last 90 days	: Not provided
Total on type last 7 days	: Not provided
Total on the type last 24 hours	: Not provided
Last proficiency check	: Not provided
Medical class and last examination	: Not provided
Medical limitation	: Not provided

1.5.2 The student pilot 1 (left seat)

Age	: 20 years (date of birth 25 November 1988)
Gender	: Female
Type of licence	: Student Pilot Licence
Valid to	: 14 August, 2009
Total flying time	: 21 hours 40 minutes
Medical class and last examination	: First Class, 14 August, 2008
Medical limitation	: Nil

1.5.3 The student pilot two (rear seat)

The student pilot two on rear seat as observer.

1.6 AIRCRAFT INFORMATION

1.6.1 General

Aircraft manufacturer	: Beech Aircraft Corporation
Model	: C23 Sundowner
Serial number	: M-1699
Year of manufacture	: 1975
Nationality and registration mark	: Indonesia, PK-ANW

Validity of Certificate of Airworthiness : Valid until 20 April 2010
Validity of Certificate of Registration : Valid until 23 January 2009
Total flying hours since manufacture : 10,971 hours
Total flying hours since last inspection : 21 hours 44 minutes

Engine and propeller details are not relevant in this occurrence.

The aircraft engine used 100/130 grade aviation gasoline (AVGAS). There was no evidence of an engine malfunction that would have required fuel testing as part of the investigation.

The investigation determined that the aircraft had no recorded defects before the accident.

The investigation determined from the aircraft flight manual that the maximum take-off weight for the aircraft was 2,450 lbs. The investigation also determined that the actual take-off weight for the flight was 2,210 lbs.

1.7 METEOROLOGICAL INFORMATION

The controller was providing weather information to the pilots who were on a local flight being conducted under visual flight rules.

The reported weather information for Curug between 0600 and 0700, as documented by the controller, included information that there were thunderstorms and heavy rain in the area.

The Curug Meteorology Station routinely recorded weather conditions at Curug. The weather observation at 0600 included information that the surface wind was from 300 degrees at 3 knots, and the temperature was 33°C. The 0600 observation also included information that there were thunderstorms in the area.

The 0700 observation included information that the surface wind was from 080 degrees at 16 knots, and the temperature was 25°C. The 0700 observation also included information that there were thunderstorms in the area, with heavy rain.

Witnesses reported that during the thunderstorm, high wind blew part of the roof off Tenjo railway station, which was located about 700 meters from the impact site (see Figure 1).



Figure 1: Partially damaged roof at Tenjo railway station

1.8 AIDS TO NAVIGATION

Ground-based navigation aids, onboard navigation aids, aerodrome visual ground aids, and their serviceability, were not factors in this occurrence.

1.9 COMMUNICATIONS

The aircraft was equipped with one serviceable very high frequency (VHF) radio communication system which the pilots used to communicate with the aerodrome controller.

Technical staff at Curug aerodrome reported that no VHF communications between the controller and the crew were recorded by ground based automatic voice recording equipment during the flight.

During the investigation, it was determined that the VHF transceiver at Curug aerodrome was unserviceable, and that a low-powered portable VHF transceiver was being used by the controllers to communicate with aircraft at Curug. It was also determined that the main VHF communication recorder was unserviceable at the time of the accident.

The unserviceability of the main VHF transceiver and communication recorder at Curug had apparently remained unresolved for more than one year.

The controller subsequently provided the investigation with a documented record of his recollection of the communications with the aircraft during the flight, as follows:

Time (UTC)	Reported conversation as subsequently documented by the controller
0616	The pilots requested a taxi clearance for the training flight.
0628	Aircraft departed Curug.
0634	The pilots reported reaching southern training area, and requested a clearance to operate between altitude 1,000 feet to 3,000 feet.
Between 0634 - 0641	The controller informed the pilots of the weather conditions at Curug.
0641	The controller again informed the pilots of the weather at Curug, and asked if they wanted to return to Curug for landing.
0647	The pilots reported leaving southern training area, and requested landing instructions. The controller instructed the pilots to join the downwind leg for runway 30 at Curug, after overflying the aerodrome at 1,500 feet.
0649	The pilot reported that the aerodrome was not in sight, and requested a clearance to proceed to the south-west training area at 1,500 feet, due to the weather deteriorating.
0652	The pilots reported reaching the south-west training area, and that they were maintaining 2,000 feet. They requested a clearance to operate between 1,000 feet to 3,000 feet altitude. The controller approved that request, and instructed the pilots to report when leaving the training area.
0703	The pilots reported leaving the training area and requested a clearance to operate at 1,500 feet in the Rangkasbitung training area. The controller approved the request, and instructed the pilots to report when reaching the area.
0705	The pilots reported reaching the Rangkasbitung training area.
0713	The pilots requested clearance to return to Curug. The controller instructed the pilots to depart the training area, descend to 1,000 feet, to report over reporting point 'Charlie', and to join down wind runway for runway 30. The pilots read back the clearance.
0719	The pilots reported overhead 'Charlie' at 1,500 feet. The controller instructed the pilots to join downwind for runway 30, and to descend to 1,000 feet. The pilots read back the clearance.
0733	The controller requested the pilots to report their position, but there was no response.

1.10 AERODROME INFORMATION

The air traffic control tower at Curug was not equipped with wind direction and speed indicator displays. The investigation determined that at the time of the accident, that deficiency had remained unresolved for more than one year.

1.11 FLIGHT RECORDERS

The aircraft was not fitted with a flight data recorder or cockpit voice recorder. Neither recorder was required by current Indonesian regulations.

1.12 WRECKAGE AND IMPACT INFORMATION

The wreckage was located among trees and bamboo near houses located 13.4 km south west of Curug aerodrome.

Distribution of the wreckage indicated low forward speed of the aircraft at the time of impact, and that its descent had been arrested by impact with the bamboo trees.

The alignment of wreckage indicated that the aircraft was in a left turn, and heading away from the aerodrome at the time of impact.

There was no evidence of in-flight break-up. There was also no evidence of pre- or post-impact fire.

1.13 MEDICAL INFORMATION

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

There was no evidence that physiological factors or incapacitation of the pilots affected their performance.

The survivors received medical treatment for their injuries.

1.14 FIRE

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

1.15 SURVIVAL ASPECTS

After ensuring there was no fire, witnesses from the nearby houses went to the aircraft within minutes of the impact. The local residents assisted the injured occupants from the aircraft and took them to the village football field. A helicopter subsequently flew the survivors to a hospital about 10 km from the accident site.

The instructor, who was seated in the right front seat, was not wearing the over shoulder sash part of the safety harness assembly fitted to that seat. He sustained severe head and chest injuries during the impact.

The student pilot, who was seated in the left front seat, was wearing the full safety harness. However, she received lacerations to both arms when the aircraft windshield fragmented during the impact sequence. She also received a broken collar bone.

The student pilot passenger, who was seated in the in the rear seat during the flight, received facial lacerations, a dislocated jaw, and blunt trauma injuries to the upper abdomen, including a ruptured liver.

1.16 TESTS AND RESEARCH

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

1.17 ORGANISATIONAL AND MANAGEMENT INFORMATION

Aircraft Owner : Curug Civil Aviation Institute (STPI³)

Aircraft Operator : Sekolah Tinggi Penerbangan Indonesia (STPI)
Budiato Airport Curug, Tangerang
Republic of Indonesia.

The operator was an approved flying training organisation under CASR Part 141, and the holder of Certificate Number 141/001.

The STPI Curug Pilot Training Division HANDBOOK, General Section, 1.43 described the procedures for Restriction or Suspension of Operations. Section 1.44 stated:

The most likely circumstances requiring a recall or diversion will be weather deterioration or airworthiness considerations ...

3 Sekolah Tinggi Penerbangan Indonesia

Section 1.45 required that when a hazardous condition was recognized, an order to return to base, divert, or hold would be relayed to the aircraft by the controller. The decision was to be made by the Chief Flying Instructor, senior flying instructor, duty instructor, or duty operations staff.

The STPI Curug Pilot Training Division Handbook – Standard Operating procedure Manual, Section 1.121 stated:

If the pilot encounters deteriorating weather in flight below the approved limits, the pilot must return to the departure airport or land at the nearest suitable airport...

There was no evidence that instructions in accordance with the approved manuals were given to the pilots. The controller asked the pilots if they wanted to return to Curug, but did not order them to do so. Additionally, no instruction was given by the flying school.

Civil Aviation Safety Regulation (CASR) 91, subpart 91.107 included the requirements for the use of Seats, Safety Belts, Shoulder Harnesses, and Child Restraint Systems, as follows:

(a) Unless otherwise authorized by the Director the following rules apply to all Indonesian-registered civil aircraft except a free balloon that incorporates a basket or gondola, or an airship.

(1) No pilot may takeoff an aircraft unless the pilot in command of that aircraft ensures that each person on board is briefed on how to fasten and unfasten that person's safety belt and, if installed, that person's shoulder harness.

(2) No pilot may cause to be moved on the surface, takeoff, or land an aircraft unless the pilot in command of that aircraft ensures that each person on board has been notified to fasten his or her safety belt and, if installed, his or her shoulder harness.

(3) Except as provided in this paragraph, each person on board an aircraft must occupy an approved seat or berth with a safety belt and, if installed, shoulder harness, properly secured about him or her during movement on the surface, for takeoff, and for landing.

1.18 ADDITIONAL INFORMATION

There was no other factual information that was relevant to the circumstances leading up to the occurrence.

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

The training flight was being conducted during a period of thunderstorm activity in the area of the flight.

The investigation determined that there was strong wind and heavy rain at the time the aircraft was returning to Curug for a landing.

The investigation assessed the weather conditions based on evidence from the Curug Meteorology Station, the Curug Air Traffic Controller, the student pilot passenger on board the aircraft, and witnesses near the impact site.

The information provided was consistent with the aircraft having encountered a strong convective downdraft, strong wind, and heavy rain from one of the thunderstorms in the area at the time of the occurrence. The aircraft was turning away from the area of the thunderstorms when it impacted the ground. It is likely that the pilot was turning to avoid the area of heavy rain. It is also likely that the strong wind from the thunderstorm damaged the roof of Tenjo Railway Station, about 700 meters from the impact site.

The student passenger in the rear seat subsequently reported that the aural ‘stall warning’ sounded shortly before the impact, feeling a ‘strong downdraft’, and hearing the application of increased engine power. Those were all indicative of the aircraft encountering a convective downdraft, and the instructor’s attempted recovery action.

At 0641 the controller informed the pilots that the weather in the area was deteriorating, and asked if they wanted to return to Curug. However, the pilots reported that they could not see the aerodrome. Therefore, they elected to continue the training operation and requested, and subsequently obtained, a clearance to continue the training in the Rangkasbitung Training area. The reason the flying school did not order the pilots to return to Curug, or divert to an alternate aerodrome, or hold clear of the weather could not be determined.

The instructor was not wearing the shoulder section of the safety harness. This resulted in him receiving fatal injuries during the impact. The student pilot in the left front seat was wearing the full safety harness. She received lacerations to both arms when the aircraft windshield fragmented during the impact sequence, which suggested she had raised both arms to protect her face during the impact. The student pilot’s injuries were less severe than those sustained by the instructor. It is possible that had the instructor had been wearing the full safety harness, his head and chest injuries may

not have been so severe, and that he may have survived the accident. The injuries sustained by the student pilot passenger seated in the rear of the aircraft were serious. It is likely that those injuries resulted from him not having his seat belt correctly fastened at the time of impact.

There was no evidence to suggest that the aircraft was not airworthy at the time of the flight.

3 CONCLUSIONS

3.1 FINDINGS

3.1.1 Aircraft

- The aircraft had no recorded defects before the accident.
- The aircraft was operated within the approved weight limits.
- The damage to the aircraft was consistent with it being in an aerodynamically stalled condition at the time of impact.
- The aircraft was turning away from the area of thunderstorms when it impacted the ground.

3.1.2 The pilots

- The instructor was appropriately licensed to conduct the flight.
- The student pilot occupying the left front command seat was appropriately licensed to conduct the flight.
- The pilots were provided with information by the Curug Air Traffic Controller that the weather conditions at the aerodrome were deteriorating.
- Due to reduced visibility in the vicinity of the aerodrome, the pilots elected to remain in the training area.
- When the pilots decided to return to the aerodrome, they encountered heavy rain, strong wind and downdraft conditions about 13 km south-west of the aerodrome.
- After encountering the deteriorating weather conditions, the pilots turned the aircraft to avoid those conditions.
- It could not be positively determined who was the handling pilot at the time the aircraft encountered the deteriorating weather conditions. However, due to the laceration injuries to the student pilot's arms, it was considered likely the instructor was the handling pilot at the time of impact.
- The serious injuries sustained by the student pilot passenger seated in the rear of the aircraft were likely to have resulted from him not having his seat belt correctly fastened at the time of impact.
- The fatal injuries sustained by the instructor probably resulted from him not using his full safety harness.

3.1.3 Communications

- The controller provided appropriate advice to the pilots about the deteriorating weather conditions at Curug.
- The pilots acknowledged the advice provided to them by the controller about the deteriorating weather conditions at Curug.
- When the hazardous weather conditions at Curug were recognized, the Curug (STPI) Pilot Training Division did not order the recall of the pilots to Curug, or alternatively, order them to divert or hold.
- There was no evidence that instructions in accordance with the approved Curug Pilot Training Division manuals were given to the pilots when the hazardous weather conditions became apparent at Curug.
- Communications between the controller and the aircraft were accomplished by the controller using a low-powered portable very high frequency (VHF) transceiver due to the long-term unserviceability of the main VHF transceiver at Curug.
- The long-term unserviceability of the main VHF transceiver was not a factor in the occurrence.
- The long-term unserviceability of VHF communications recorder at Curug was also not a factor in the occurrence.

3.1.4 The weather

- There were thunderstorms and heavy rain in the vicinity of Curug at the time of the accident.
- High wind associated with the thunderstorm at the time of accident damaged the roof of Tenjo Railway Station, about 700 meters from the accident site.
- The reduction in temperature from 33 degrees Celcius at 0600, to 25 degrees Celcius at 0700, was consistent with cooling resulting from convective downdrafts associated with thunderstorms.
- The air traffic control tower at Curug was not equipped with wind direction and speed indicator displays.

3.2 CAUSES

The lack of instruction from STPI to recall the aircraft to Curug, and the flight instructor's decision to operate the aircraft in close proximity to a thunderstorm, together contributed to this accident.

The improper use of the aircraft's seat belts by two of the occupants contributed to the severity of their injuries at the time of the impact.

4 SAFETY ACTIONS AND RECOMMENDATIONS

4.1 SAFETY ACTIONS

At the time of writing the Final Report, the National Transportation Safety Committee had not been informed of any safety actions resulting from this accident.

4.2 RECOMMENDATIONS

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

4.2.1 STPI

1. The National Transportation Safety Committee recommends that the Sekolah Tinggi Penerbangan Indonesia (STPI) should review its implementation of documented procedures; specifically the requirement to order the recall, diversion, or holding of STPI training aircraft during hazardous weather conditions.
2. The National Transportation Safety Committee recommends that the Sekolah Tinggi Penerbangan Indonesia should document within its Training Division Handbook, the requirements of Civil Aviation Safety Regulation Part 91, subpart 91.107 with respect to the appropriate use of safety harnesses.

4.2.2 Budiarto Airport Operator

1. The National Transportation Safety Committee recommends that the Budiarto Airport Operator should ensure that the air traffic control tower is equipped with wind velocity instrumentation.
2. The National Transportation Safety Committee recommends that the Budiarto Airport Operator should ensure that the air traffic control tower is equipped with mains powered VHF ground to air communication and recording system.

4.2.3 DGCA

1. The National Transportation Safety Committee recommends that the Directorate General of Civil Aviation (DGCA) ensure that the Budiarto Airport Operator and the Sekolah Tinggi Penerbangan Indonesia comply with all parts of the Civil Aviation Safety Regulations and DGCA approved documentation relevant to their operations.
2. The National Transportation Safety Committee recommends that the Directorate General of Civil Aviation ensure that the Budiarto Airport Operator's air traffic control tower is equipped with wind velocity instrumentation.
3. The National Transportation Safety Committee recommends that the Directorate General of Civil Aviation ensures that the Budiarto Airport Operator's air traffic control tower is equipped with a mains powered VHF ground to air communication and recording system.