

Occurrence Report

BN-2

State reporting	Taiwan Island	Date entered	2012/10/5
Reporting org.	Taiwan (ASC)	Report last modified	2014/7/9 PM 05:00:03
State file number	ASC-AOR-13-09-002	Report status	Data

Headline ROC Aviation Company BN-2, B-68801, crashed into mountainous area while carrying out an aerial photography mission

Occurrence class	Accident	Occurrence category	CFIT: Controlled flight into or toward terrain
Local date	2012/8/30 AM 09:43:00	UTC date	2012/8/30 AM 01:43:00
State/area of occurrence	Taiwan Island	Latitude of occ	23:20 North
Location of occ	Mountain area in Hualien	Longitude of occ	121:02 East

Aircraft Involved

Manufacturer/model	BRITTEN-NORMAN - BN-2A ISLANDER	Aircraft registration	B-68801
Call sign	BRAVO 68801	Operator	Taiwan - ROC Aviation Company - (to be coded)
Flight phase	Manoeuvring		

TAIWAN ISLAND, ASC-AOR-13-09-002**Filing information**

Headline	ROC Aviation Company BN-2, B-68801, crashed into mountainous area while carrying out an aerial photography mission		
State reporting	Taiwan Island	Date entered	2012/10/5
State file number	ASC-AOR-13-09-002	Reporting org.	Taiwan (ASC)

When

Local date	2012/8/30 AM 09:43:00	UTC date	2012/8/30 AM 01:43:00
-------------------	-----------------------	-----------------	-----------------------

Where

State/area of occurrence	Taiwan Island	Latitude of occ	23:20 North
Location of occ	Mountain area in Hualien	Longitude of occ	121:02 East

Classification

Occurrence class	Accident	Occurrence category	CFIT: Controlled flight into or toward terrain
-------------------------	----------	----------------------------	--

Severity

Damage aircraft	Destroyed	Damage aerodrome	None
Third party damage	No	Injury level	Fatal

Injury totals

	Fatal	Serious	Minor	None	Unknown	Total
Total on ground	0	0	0	0	0	0
Total on aircraft	3	0	0	0	0	3
Grand total	3	0	0	0	0	3

ATM relation

ATM contribution	None	Effect on ATM service	No effect
-------------------------	------	------------------------------	-----------

NARRATIVE (ENGLISH)

On August 30, 2012, a RAC's BN-2B-26 aircraft, registration number B-68801, contracted by Real World Engineering Consultants Inc. (Real World) to perform an aerial photogrammetry mission with a captain, a first officer and an aerial photographer on board. The flight plan was to take off from Songshan Airport, requested for instrument departure and visual flight rules to conduct aerial photogrammetry mission in Hualien and Taitung area, the aircraft planned to land at Taitung Airport after the mission accomplished. The aircraft took off at 0726, approximately 18 minutes after took off, the flight crew changed flight mode from instrument flight rules to visual flight rules. At 0827, the aircraft entered Hualien County Fenglin, Guangfu, Wanrong aerial photograph area, maintain 8,300 feet to 8,500 feet altitude and continued climbing to Jhuosi, Hualien County photo area at 0919. From 0837 to 0843, Taipei Approach informed the flight crew 'Radar can't cover you.....make sure maintain visual flight'. There were about 7 times

NARRATIVE (ENGLISH)

communication blockage between the aircraft and Taipei Approach during 0755 to 0913 period. The Kaohsiung Approach Control contacted the aircraft at 0913:39 and lost contact with the aircraft at 0914:20 after the last communication. At 0920:55, the aircraft was at 260 degrees, 31.5 km mountain area

from Yuli, Taitung and began to turn right heading 280 degrees. The last recorded Light Detection and Ranging (LIDAR) device data was 262 degrees, 35.9 km west of Yuli's mountain area with coordinates of 23 ° 20 '25.01 " latitude and 121 ° 01' 50.03" longitude. At the time of the last recording, the aircraft was at 9,572 feet with about 69 knots ground speed, 250 degrees heading, the climb rate was 874 ft / min and the pitch was 23.5 degrees. At 0940, Taipei Mission Control Center (MCC) received ELT (Emergency Locator Transmitter) signals, about the same time, Japan Coast Guard informed Rescue Command Center, Executive Yuan (RCC) of the same ELT signals. After verification with Civil Aeronautics Administration, Ministry of Transportation and Communications (CAA), RCC confirmed that the aircraft had lost contact. At 0955 on September 1, 2012, the search and rescue aircraft discovered the aircraft crashed at altitude about 9,568 feet of the original forest, about 20 kilometers southwest of Jhuosi, Hualien County. Three

crew members on board were killed, and the aircraft was destroyed. Findings related to probable causes: After completing the aerial photogrammetry of Morakot No.16 measuring line, the aircraft turned 280 degrees to the right and attempted to climb to get out of the valley area. During climbing, the pitch of the aircraft was remained more than 20 degrees for a few seconds, the aircraft might nearly close to stall and activated stall warning. The aircraft performance might not be able to fly over the obstacles ahead under this condition, the aircraft flew into trees and crashed. When completing the

aerial photography of Morakot No.16 measuring line from the north to the south, the aircraft could not be able to fly over mountains ahead between the directions of 9 to 3 o'clock with the aircraft best climb performance. Despite the available climbing distance was longer when flight crew chose to turn to the right, the area geography was not favorable for circling climb or turn around to escape the mountain area safely. The on board personnel choose to

perform an aerial photogrammetry at Morakot when weather condition was permitted after completing the aerial photography at Wanrong Woods without

any advance planning due to the Morakot aerial photography had been behind schedule. Findings related to risks: 1.The two paper copies provided by Real World of the measuring lines chart and the contour lines map of Morakot aerial photography area could not directly overlaid, the copy was unfavorable for pilots and the photographer to evaluate the distance between the measuring lines and surrounding ground obstacles. The names of the mountains surrounding measuring lines and altitude markings in the measuring lines chart were not complete. 2.The operator did not to integrate Morakot

aerial photography area relevant charts information provided by Real World and therefore when planning for the flight course, the operator missed the opportunity to access the following risks: after completing the aerial photography of the no.16 measuring line from the north to the south, the elevation of

the surrounding mountains within the 180 degrees range in front was all higher than the 2,500 meter measuring line elevation and the geography of that area was not favorable for the aircraft to perform circling climb nor turn around. 3.The preparation regulation of the operator' aerial photography mission did not consider specifically the timing and participants for preparing the flight plan, aircraft performance limitation and single-engine malfunction

NARRATIVE (ENGLISH)

condition. The regulation did not have an evaluation mechanism to examine surrounding ground obstacles within aerial photography area at a safe altitude, chart information required for flight course planning and the concrete items and records of the flight course planning. 4.The captain and the first officer's route check was performed by the Instructor Pilot instead of the Check Pilot or CAA Designated Examiner, which was not in accordance with the Flight Crew Training Manual. 5.The operator did not establish particular and appropriate flight routes training and check items base on the characteristics of aerial photography mission. 6.The operator did not follow the Flight Crew Training Manual to properly record and manage pilots' flight hours, training and check record. 7.The operator did not follow the Flight Crew Training Manual to provide aerial photographer with Crew Resource Management trainings, aeronautical meteorology and aircraft performance training. 8.Due to weight and balance, aircraft performance, and the limited space in the aircraft, CAA did not perform cockpit flight route check during any of the aerial photography missions. 9.CAA had issued inspection recommendations regarding to the pilot training record management to RAC prior to the occurrence and the RAC responded that the improvement was accomplished. However, many defects were still found in training record during the investigation. The Aviation Safety Council issued a total of 16 safety recommendations. Safety Recommendations To Roc Aviation Company: 1.A complete flight course planning was needed prior to perform an aerial photography mission; No mission shall be carried out if it is not adequately planned. 2.Implement relevant regulations and actual performance preparation prior to aerial photography mission, including: verify the approval of the aerial photography plan, timing and flight course planning participants, safety precautions of flight course planning, aircraft performance and safety consideration of single-engine malfunction, evaluate the necessity of examining surrounding ground obstacles within aerial photography area at safety altitude, required chart information, weather information and concrete items and recording methods of flight course planning. 3.Implement integration and application of relevant aerial photography area chart information to assist pilots and aerial photographers to acknowledge the information of geography, ground obstacles altitude, distance between measuring lines and ground obstacles. 4.Implement internal control to ensure that all pilot trainings are planned according to the Flight Crew Training Manual. 5.Implement pilots' flight route training and check to meet flight route and aerial photography missions requirement. 6.Examine the qualification of route check examiner and ensure the qualification is in accordance with the regulations. 7.Implement internal control mechanism regarding to pilots' flight hours, training and inspection of relevant record management to improve the integrity and accuracy of records. 8.Implement aerial photographers training regulations and establish training items specific to their responsibilities and keep training records. 9.Ensured aircraft maintenance record filled and kept in accordance with the regulations. To Aerospace Industrial Development Corporation: Ensured maintenance personnel perform aircraft maintenance according to the operation standard, reinforce Quality Check personnel's inspection to ensure aircraft maintenance quality. To CAA: 1.Supervised the operator and other general aviation operators' preparation of aerial photography missions, personnel's training, and pilots' records management. 2.Re-examine the feasibility of performing general aviation operator flight route check when performing an aerial photography mission. 3.Re-examine

NARRATIVE (ENGLISH)

the feasibility for general aviation operators to implement Annex 6 of Aircraft Flight Operation Regulations. 4. Produce visual flight chart in accordance with ICAO standard to assist the operator to produce visual flight plans and visual flight operation. 5. Study the feasibility of installing simple flight recorder system to facilitate monitoring of flight missions and occurrence investigation of national general aviation industry. To Office of Disaster Management, Executive Yuan: Re-examine and coordinate the amendments of the emergency procedures in 'Operation Plan of Air Disaster Management', especially the related organization' authorization and responsibilities of searching operation.

EVENTS**Flight preparation related event , during Standing. {Occurrence}**

Aircraft dispatch procedure : Incomplete; Insufficient details

Operator., Human interface-company procedures : Unclear

Flight planning staff, Inadequate or inaccurate knowledge

Maps : Lack (of)

Operator., Maps or charts or use of maps/charts : Lack (of)

Government - Civil Aviation Authority/Administration, Maps or charts or use of maps/charts : Lack (of)

Aeroplane - deviation from intended flight path/attitude (fixed wing aircraft) , during Manoeuvring. {Occurrence}

Flight crew's decisions : Improper

Flight crew., Pressure to achieve

Aircraft collision with high terrain, a hill or a mountain , during Manoeuvring. {Occurrence}

Mountain/hill surface : High

Altitude : Too low; Too close

Flight planning staff, Psychological action-pre-flight planning : Improper

Flight crew's separation judgement : Insufficient

WEATHER**General weather conditions**

Weather conditions	VMC	Light conditions	Daylight
Weather relevant	No	Wind speed	
Speed measured at		Visibility	10000 m

Clouds

Cloud amount	Scattered (3/8 to 4/8)	Height of cloud base	11000 ft
---------------------	------------------------	-----------------------------	----------

Temperature

Air temperature	10 C	Dew point	
------------------------	------	------------------	--

Precipitation and other weather phenomena

	Precipitation intensity	Precipitation type	Characteristics
	None		

BRITTEN-NORMAN - BN-2A ISLANDER, B-68801**Aircraft identification**

Manufacturer/model	BRITTEN-NORMAN - BN-2A ISLANDER	State of registry	Taiwan Island
Year built	1992	Aircraft registration	B-68801
Aircraft serial number	2255	Call sign	BRAVO 68801
		Flight number	

Aircraft Operation

Operator	Taiwan - ROC Aviation Company - (to be coded)	Operation type	Aerial Work - Commercial - Photography
Operator type	Private owner	ICAO information	

Aircraft description

Aircraft category	Fixed wing	Wake turb. category	Light
Propulsion type	Reciprocating	Mass group	2 251 to 5 700 Kg
Number of engines	2	Maximum take-off mass	2993.71 kg
Landing gear type	Tricycle, fixed	GNSS installed	
EFIS	No		

Aircraft status

Total cycles a/c	2426	Maintenance docs.	Current
Aircraft total time	4909 Hour(s)	Airworthiness cert.	Valid

Fuel

Fuel type used	Reciprocating engine fuel - Grade 100 LL	Recommended fuel type	
Fuel quantity on board			

HISTORY OF FLIGHT**Itinerary**

Last departure point	Taiwan - RCSS (TSA): Taipei/Songshan Airport - (to be coded)	Flight phase	Manoeuvring
Planned destination	Taiwan - RCFN (TTT): Taitung/Fongnian Airport - (to be coded)	Duration of flight	138 Minute(s)
		Occ. on ground	No

Head-up display

HUD installed	No	HUD used	
----------------------	----	-----------------	--

Person at controls

Person at controls	Unknown
---------------------------	---------

INJURIES**Injuries**

	Fatal	Serious	Minor	None	Unknown	Total
Pilot	1	0	0	0	0	1
Co-pilot	1	0	0	0	0	1
Cabin crew	0	0	0	0	0	0
Other flight crew	0	0	0	0	0	0
Crew Total	2	0	0	0	0	2
Passengers	0	0	0	0	0	0
Other on Aircraft	1	0	0	0	0	1
Unknown	0	0	0	0	0	0
Total	3	0	0	0	0	3

Injury types

	Fatal injuries	Non-fatal injuries	Unknown
Burns	0	0	0
Drowning	0		0
Fumes/gases	0	0	0
Impact	3	0	0
Shock exposure	0	0	0
Other reasons	0	0	0
Unknown	0	0	0

Incapacitation

Person incapacitated	Severity of incapacity	Reason for incapacity
None		

Autopsy

Persons autopsied	Flight crew
-------------------	-------------

AIRCRAFT RECORDINGS**Cockpit voice recorder**

CVR location	CVR recovery
CVR Recording medium	Underwater locator (CVR)
Number of channels	CVR Reason for data loss
CVR Recording duration	CVR Recording quality
Hot microphone	None/not applicable

MANAGEMENT**Occurrence report**

Report identification	BN-2	Report last modified	2014/7/9 PM 05:00:03
Report moderator		Report status	Data
Report source	Accident/Incident investigation	Reporting form type	ICAO - Final Report
Date report created	2012/10/5 PM 12:37:47		