



**Aviation Safety Council
Taipei, Taiwan**

**National Airborne Service Corps. UH-1H,
NA-508, engine over speed governor
system malfunction during initial climb,
forced landing at Lu-ya river bed,
Taitung, Taiwan on January 19, 2008**

Executive Summary

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On January 19, 2008, a UH-1H helicopter, NA-508, operated by National Airborne Service Corps., Ministry of the Interior, performed a logistic supporting for a search and rescue (SAR) team. About 0916(Taipei local time) the helicopter took off from Taitung (Fong-nien) Airport to transport a SAR team to the Yan-ping mountain area. Totally 8 people were on board including pilot, co-pilot, flight mechanic and 5 SAR team members. About 0940 the helicopter arrived target area. By SAR team request, the helicopter also performed an aerial survey about 4 miles/030 from the target area. It took about 10 minutes aerial survey and then landed safely at a river bed. Three SAR team members left the helicopter and continued on surface search of assigned SAR mission.

About 0956, the helicopter took off and headed Fong-nien Airport. The helicopter carried pilot, co-pilot, flight mechanic and 2 SAR team members. Before take-off checks, the engine speeds and power were normal, fuel quantity about 550 lbs, torque about 38 psi. The helicopter flew normally after taking off. About 1000, the helicopter left the target area about 1 mile, about 18 miles/315 to Fong-nien airport, heading about 320, AGL about 300 ft, airspeed about 60 kts, the master warning light illuminated and engine low rpm aural warning was on. The pilot felt engine power anomaly. Pilot said that the helicopter yaw to left, he corrected the heading with right rudder and decided to perform a forced landing. The helicopter made a left U turn and landed on a Rocky River bed. The rotor blades hit river bed during forced landing and it caused helicopter substantial damaged. All the people on board were no

injured.

Findings as the result of the investigation

1. Wrong installation of a pin occurred during engine repair or overhaul, which then could not secure the N2 spur gear assembly onto the carrier housing under normal vibration environment. It resulted in disconnection of the N2 spur gear assembly from the N2 train and caused malfunction to the over speed governor system.
2. Pilot failed to identify the emergency situation caused by N2 disconnect, and due to low AGL he performed emergency landing procedure instead of performing the Engine over speed procedure.
3. Under this circumstance, the UH-1H Operator's Manual used by NASC could not provide enough information to identify N2 disconnect situation, which may result in Engine Over speed.
4. Neither of the pilots had received the Operating Information Letter, OI53-01R1, nor similar training.
5. In the confined mountain valley, the single engine UH1H suffering from engine malfunction was in very serious emergency situation, especially when helicopter just took off with only AGL 300 ft and airspeed 60 kts. To find a suitable landing area was difficult when flying over a river bed with rocks and stones. Even when the pilots had selected a more even area for emergency landing, still the helicopter hit the raised riverbed and caused substantial damage to the helicopter.

Findings Related to the Risks

1. The Operating Information Letter, OI53-01R1, did not exist in either NASC or Air Asia received technical document. The subject information should be included in the “all technical document”, according the to 2005 contract between NASC and Air Asia.
2. NASC UH-1H Operator’s Manual (TM 55-1520-210-10) was not updated with the Operating Information Letter, OI53-01R1.
3. The emergency procedure of “Over speed Governor Malfunction” on NASC UH-1H Helicopter Inspection Manual conflicts with the emergency procedure of “Engine Over speeds” which may be harmful to emergency operation.
4. The NASC uses the translated version (Chinese version) from R.O.C. military which format of the “Immediate Action Emergency Steps” would not fully comply with the purpose of US UH-1H Operator’s manual.
5. The NASC UH-1H fleet has both military and civil maintenance systems.
6. The pilots lacked situational awareness, but it did not directly affect this occurrence.

Other Findings

1. No evidences indicated that this occurrence is related to pilots’ physiology, psychology, drug and alcohol.
2. The helicopter weight and balance was within limits.
3. When the occurrence occurred the over speed governor

system malfunctioned and fuel shut off valve might have failed, but the valve had no relation to the malfunction of over speed governor system. All other helicopter systems were normal.

4. Maintenance records indicated that Air Asia did not overhaul the subject engine and did not repair the sleeve of N2 spur gear assembly.
5. The military said early maintenance records including overhaul records of the subject engine were destroyed due to preservation time limit. The military may not be excluded from the repair work with the wrong installation pin.
6. Air Asia had recommended to NASC to extend the T53 engine TBO to 2,400 hours, which did not conflict with the manufacturer's service bulletin and did not cause harmful result.
7. The pilot manpower and job assignments are issues in National Airborne Service Corps.

Interim Flight Safety Bulletin

1. Enhance pilot training of "engine over speed governor system malfunction" and associated emergency procedure ¹ .
(ASC-IFSB-08- 02-001)
2. Immediately evaluate the engine condition² of UH-1H fleet and

¹ Refer to engine manufacturer Operating Information Letter, OI53-01R1, which would provide information which will aid operator in identification of and mitigating action for an N2 drive train disconnect.

² Investigation found a wrong installation pin of N2 spur gear assemblies which may result in N2 disconnect.

take feasible counter measurements³ to prevent similar occurrence from happening. (ASC-IFSB-08-02-001)

Safety Recommendations

To National Airborne Service Corps., Ministry of the Interior

1. Maintain or contract maintenance of the UH-1H technical document to provide up-to-date information for pilot. (ASC-ASR-09-02-01)
2. Control and update UH-1H helicopter inspection manual used and referred by online pilots, and confirm its correctness, abolish it if unable to make sure the correctness. (ASC-ASR-09-02-02)
3. Review and correct the translation/format of relevant manual related to emergency procedure. (ASC-ASR-09-02-03)
4. Review the co-existing military/civil maintenance system for UH-1H fleet and make counter measurement. (ASC-ASR-09-02-04)
5. Refer to the service bulletin no. T53-L-13B-0001 of the engine manufacturer, and review the engine overhaul time limit according to the actual operation environment. (ASC-ASR-09-02-05)
6. Enhance the situation awareness and professional training of pilots to identify emergency situations and decision making. (ASC-ASR-09-02-06)

³ Refer to engine manufacturer Service Bulletin, SB-T5313B/17-0110 ◦

7. Review the manpower and job assignment for pilots to enhance the mission, training and flight safety management.
(ASC-ASR-09-02-07)

To AIR ASIA COMPANY LTD.

1. Review and provide all technical documents to National Airborne Service Corps according to the contract.
(ASC-ASR-09-02-08)
2. Review the appropriateness of current UH-1H military/civil co-existed maintenance systems and make countermeasures
(ASC-ASR-09-02-09)

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