

NATIONAL TRANSPORTATION SAFETY BOARD
Southwest Regional Office
Gardena, CA

February 20, 2007

Airworthiness Factual Report

A. ACCIDENT

Location: Phoenix, AZ

Date: July 27, 2007

Time: 1246 Mountain Standard Time

Aircraft: N613TV (Ch 3), Eurocopter AS350B2
N215TV (Ch 15), Eurocopter AS350B2

Operator: N613TV, KTVK TV
N215TV, US Helicopters, Inc.

NTSB Number: LAX07MA231A/B

B. Airworthiness Participants

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B. SUMMARY

On July 27, 2007, about 1246 mountain standard time¹, KTVK-TV Channel 3 (Ch 3) and KNXS-TV Channel 15 (Ch 15) news helicopters, N613TV and N215TV, respectively, collided in mid air while maneuvering in Phoenix, Arizona. Each helicopter was a Eurocopter AS350B2. KTVK-TV² and US Helicopters, Inc., were operating the helicopters under the provisions of 14 *Code of Federal Regulations* (CFR) Part 91. The commercial pilots of both helicopters and one photographer in each helicopter were killed. The helicopters were destroyed. Ch 15 departed Scottsdale, Arizona, at 1222, and Ch 3 departed Scottsdale at 1232, as local electronic news gathering (ENG) flights. Visual meteorological conditions prevailed, and no flight plans had been filed.

C. DETAILS OF THE INVESTIGATION

1.0 HISTORY OF FLIGHT

¹ All times in this report are mountain standard time based on a 24-hour clock.

² See Attachment A-email from Belo Corporation attorney

The ENG helicopters were covering a police pursuit on local streets. The suspect's vehicle had been moving; he then stopped, abandoned it, and acquired another vehicle. The collision occurred during this ground action sequence. The main wreckage of both helicopters came to rest approximately 160 feet apart in Steele Indian School Park.

2.0 AIRCRAFT INFORMATION

2.1 N613TV



Figure 1. Ch 3

The helicopter, N613TV, was a Eurocopter model AS350B2, serial number 2883. The engine was a Turbomeca Arriel 1D1, serial number 9212. Ch 3 contracted their maintenance to Westcor Aviation. A review of the helicopter's logbooks³ revealed that it had a total airframe time of 11,817.7 hours. The logbooks contained an entry for F and S inspections dated July 24, 2007, which noted total times of 11,810.1 for the airframe and 8,946.3 for the engine. The records indicated completion of 10, 25, 30, 50, 100, 200, 250, 300, 400, 500, 550, and T-inspections on June 29, 2007. The helicopter logged about 168 hours in the previous 90 days.

2.2 N215TV

³ See Attachment B-logbook excerpts for N613TV



Figure 2. Ch 15

The helicopter, N215TV, was a Eurocopter model AS350B2, serial number 3167. It was imported from the Philippines in 2003. Ch 15 contracted their maintenance to Mustang Helicopter Services. The engine was a Turbomeca Arriel 1D1, serial number 9610. A review of the helicopter's logbooks⁴ indicated that airframe and engine total times were not consistent. An entry on June 5, 2007, noted a total airframe time of 5,041.0 hours and engine time of 4,804.0 hours. The next entry on June 10, 2007, noted an airframe time of 4,978 hours and an engine time of 4,741.4 hours. The last inspection recorded was a 100/30-hour inspection on July 15, 2007, at a total airframe time of 5,094.1 hours and total engine time of 4,857.4 hours. The last entry in the logbook on July 26, 2007, indicated a total airframe time of 5,124.6 hours and total engine time of 4,877.9 hours. The helicopter logged about 269 hours in the previous 90 days.

⁴ See Attachment C-logbook excerpts for N215TV

3.0 WRECKAGE AND IMPACT INFORMATION

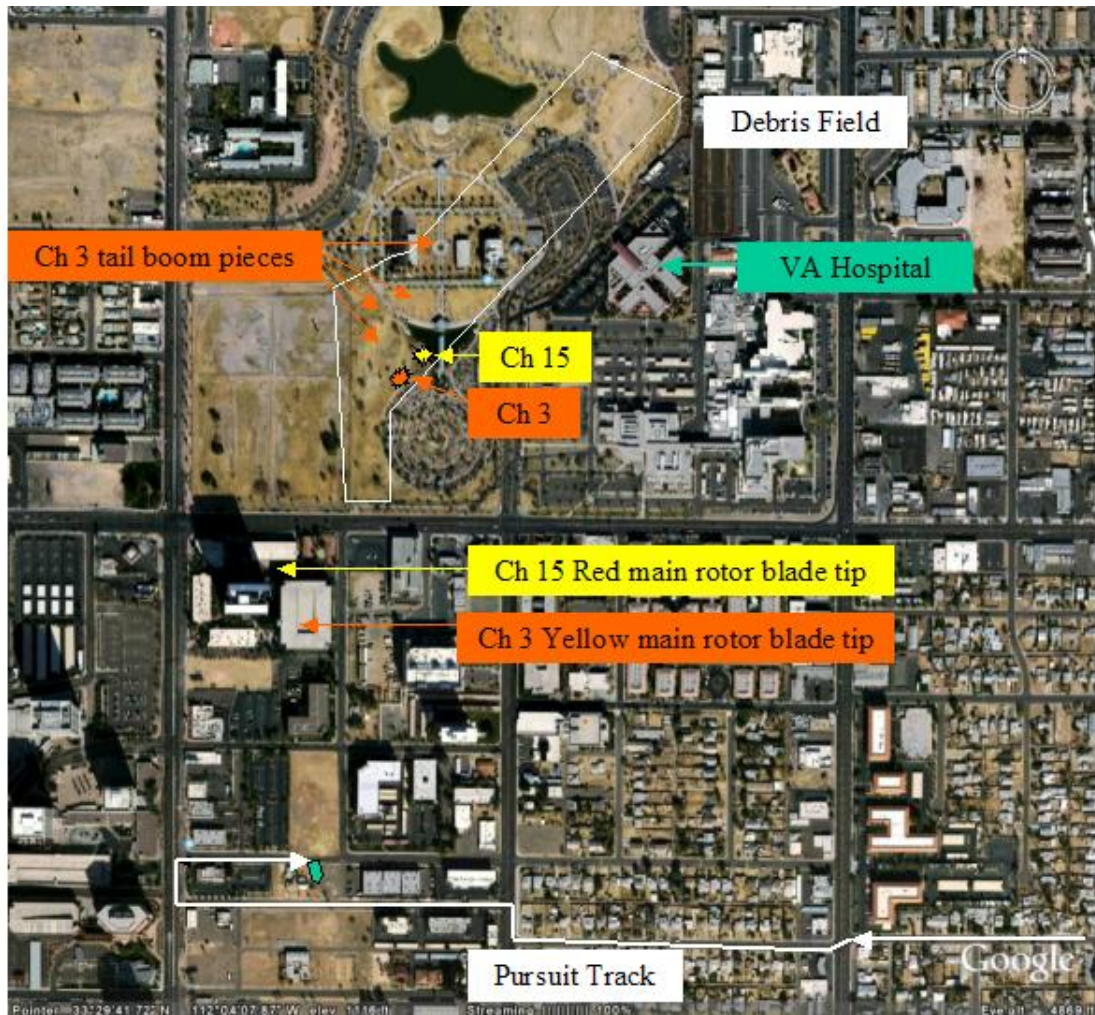


Figure 3. Overhead view of accident site



Figure 4. Aerial view from south



Figure 5. Aerial View of Park

3.1 Investigators from the Safety Board, the FAA, American Eurocopter, and Turbomeca examined the wreckage at the accident scene. The main wreckage for each helicopter was in Steele Indian School Park, and they were about 160 feet apart⁵. Debris dented the roof of a nearby covered walkway. The main debris field, which encompassed components from both helicopters, was about 2,160 feet long and 560 feet wide, and north of Indian School Road. The only pieces of debris south of Indian School Road were an outboard segment of the yellow main rotor blade from the Ch 3 helicopter and an outboard segment of the red main rotor blade from the Ch 15 helicopter.

3.2 Ch 3

⁵ See Attachment D-Police map of debris field



Figure 6. Ch 3 main wreckage

The helicopter was fragmented, and the airframe and engine sustained severe mechanical and thermal damage. The main wreckage consisted of the cabin, engine, mast, and inboard sections of the rotor blades. The cabin was inverted with the mast imbedded several feet into the ground.

The tail boom separated into several major pieces: (1) the forward tail boom, (2) an accordianed piece that was the aft portion of the left horizontal stabilizer, (3) aft tail boom with the tail rotor section attached, and (4) the tail cone. The forward tail boom section was about 170 feet west northwest of the main wreckage. The aft tail boom section with the tail rotor attached was about 260 feet northwest of the main wreckage. The accordianed piece and the tail cone were about 320 feet north of the Ch 3 main wreckage; the tail cone was about 50 feet east of the accordianed piece.

3.3 Ch 15



Figure 7. Ch 15 main wreckage

The cabin, the top of the tail boom, and the top portion of the vertical stabilizer were dark blue. The bottom of the tail boom, the horizontal stabilizers, and the bottom portion of the vertical stabilizer were yellow.

The helicopter sustained severe mechanical and thermal damage. All main airframe components were within the main wreckage debris field. The engine was with the main wreckage. It sustained substantial mechanical and thermal damage.

4.0 TESTS AND RESEARCH

Investigators examined the wreckage at Air Transport, Phoenix, Arizona, on July 29, 2007.

There are three main rotor blades on each helicopter, and they are color coded yellow, blue, and red on the blade

root. The blades rotate clockwise; the sequence of rotation is yellow, blue, and red. The blades on the left side are moving forward (toward the nose of the helicopter), and are called the advancing blades. The blades on the right side are moving backward (away from the nose of the helicopter), and are called the retreating blades. Each main rotor blade is 15.3443016 feet (15 feet 4 1/10 inches) or 4,677 millimeters long⁶; this is the length from the center of the pin retention holes in the blade root to the outboard tip. The rotor disc diameter is 35.00 feet (10.69 meters). The main rotor blades' exterior paint is blue-gray. The light alloy components of the airframe, which includes the tail boom, have a zinc-chromate primer applied under the final color coat.

4.1 Ch 3 N613TV

Engine



Figure 8. Turbomeca on site picture of engine

⁶ See Attachment E-Eurocopter training manual excerpts



Figure 8. Turbomeca picture of axial compressor - axial rotor and nose bullet



Figure 9. Turbomeca picture of free turbine blades - broken trailing edge tips



Figure 10. Turbomeca picture of triangular flange at rear of turbine reduction gear



Figure 11. Turbomeca picture of short shaft - rotational scarring

Post accident examination of the Ch 3 engine revealed substantial mechanical and post-impact fire damage. The axial compressor separated from the gas generator at the interface of the intermediate casing and the turbine casing assembly of the gas generator. The axial rotor appeared solidly packed with mud and debris. The axial compressor's

blades exhibited mechanical damage in the form of gouges and scratches. The nose bullet was in place, and appeared undamaged. The linking tube appeared flattened. The short shaft separated from the triangular flange at the rear of the turbine reduction gear flange with the ears of the triangular flange bent backward. The flexible coupling separated with its plates twisted and splayed apart. The coupling's plates exhibited fracture surfaces that were irregularly shaped. The short shaft exhibited rotational scarring aft of the forward attach flange. The free turbine blades were in place, and the tips of the trailing edges appeared chipped and broken.

Main Rotor Blades



Figure 12. Eurocopter photo of Ch 3 main rotor blades

Red Blade

Charring encompassed the area 4 to 5 feet from the blade root. The blade portion aft of the spar from approximately 11 feet outboard from the root was missing. The blade

sustained mechanical damage to the leading edge about 14 feet from the blade root, and separated into several pieces outboard of this point. Investigators observed blue-gray and orange paint transfer marks on the leading edge from about 12 feet from the root to the separation point. The end plate and weights separated; investigators recovered them several hundred feet north-northwest of the main wreckage.

Blue Blade

Investigators observed significant mechanical damage 5 feet and 11 feet from the blade root, and the blade separated at these points. The leading edge stainless steel strip was missing from 9 to 11 feet from the root. The blade sustained thermal damage from the root out to 11 feet. The outboard separated section of the blade contained blue-gray paint. The end plate was in place.

Yellow Blade

The blade portion aft of the spar was missing from 4 feet 4 inches and outboard from the root. Investigators observed mechanical damage to the leading edge 5 feet from the blade root, and the blade separated at this point. The blade exhibited leading edge mechanical damage 13 to 14 feet from the root. The 9 to 13-foot area sustained thermal damage. The outer 1 1/2 feet of the blade, with the end plate attached, separated; this piece was about 1,050 feet southwest of the Ch 3 main wreckage site. The inboard stainless steel leading edge of this piece exhibited in excess of 90° forward bending mechanical damage. The yellow Starflex blade sleeve exhibited the most severe damage of the three sleeves; it exhibited severe broomstraw damage.

Airframe

The Ch 3 helicopter's cabin was primarily white. The forward half of the tail boom was red. Going aft, the tail boom paint scheme transitioned to dark orange; this section included the horizontal stabilizers. Aft of the horizontal stabilizers, it transitioned to light orange; the tail rotor was attached to this section. The aft portion of the tail boom consisted of the vertical stabilizer and tail cone, which were yellow.



Figure 13. Ch 3-Forward tail boom section



Figure 14. Ch 3-accordion left horizontal stabilizer piece



Figure 15. Ch 3-aft tail boom with tail rotor attached



Figure 16. Ch 3-left side of tail cone

The main rotor blades for the AS350B2 rotate clockwise. The right side of the forward tail boom piece exhibited a

zinc chromate transfer mark and crush damage that was similar to the dimensions of a main rotor blade⁷.

The outboard section of the right horizontal stabilizer had a camera attached. This piece separated in an outward and aft direction. The aft section of the left horizontal stabilizer separated, and came to rest north of the main wreckage. It exhibited accordion crush damage in the direction of main rotor blade rotation. There was a clockwise zinc chromate primer transfer mark smeared on the upper center section of the tail boom, but over the horizontal stabilizer. The tail rotor drive shaft cover for this area separated, and was north of the main wreckage.

The left side of the tail cone exhibited a witness mark and zinc chromate primer transfer mark that was upward and to the right at an approximate 70-degree angle. The right side of the upper vertical stabilizer contained punctures and leftward impact damage about 1 foot from the top. The forward end of this piece exhibited a clockwise twist, and it also had blue-gray paint and zinc chromate primer transfer marks.

One tail rotor blade exhibited chordwise scoring with orange paint transfer marks on the leading edge, and a flattened strike tab. A twisted skin piece on the right side of the tail boom had a tear mark similar in dimension to the strike tab. The other blade fractured at the cuff, and the strike tab was undamaged. The trailing edge of both blades exhibited witness marks just inboard of the trailing edge tabs. The tail rotor shaft had blue witness marks in the vicinity of the boss weights. The tail rotor drive shaft separated at the front of this section; it exhibited torsional twist in the direction of rotation and an angular fracture surface. The tail rotor pitch change rod separated forward of the tail rotor bell crank input; the rod appeared crushed, and the fracture surface appeared angular and irregular.

4.2 Ch 15 N215TV

Engine

⁷ See N613TV red blade write up regarding orange paint transfer marks



Figure 17. Turbomeca picture of axial compressor, coupling tube, and transmission shaft



Figure 18. Turbomeca picture of axial rotor and nose bullet detailing bending and smearing opposite to the direction of rotation



Figure 19. Turbomeca picture of coupling tube and transmission shaft - showing torsional twist



Figure 20. Turbomeca picture of flange at the rear of the turbine reduction gear and short shaft



Figure 20. Turbomeca picture of linking tube - torsional twist

Post accident examination of the Ch 15 engine revealed substantial mechanical and post-crash fire damage. The axial rotor blades appeared bent opposite the direction of rotation. The nose bullet appeared flattened and smeared in a direction opposite that of rotation. The coupling tube between the engine and main rotor transmission separated and was twisted and buckled with irregular fracture surfaces. The linking tube exhibited torsional twist and buckling. The transmission shaft was torsionally twisted; it buckled, and had an irregular fracture surface. The short shaft separated from the triangular flange at the rear of the turbine reduction gear, and was twisted and deformed. However, it remained connected to the triangular flange by a portion of the flexible coupling. The free turbine blades were in place, and appeared undamaged.

Ch 15 Main Rotor Blades

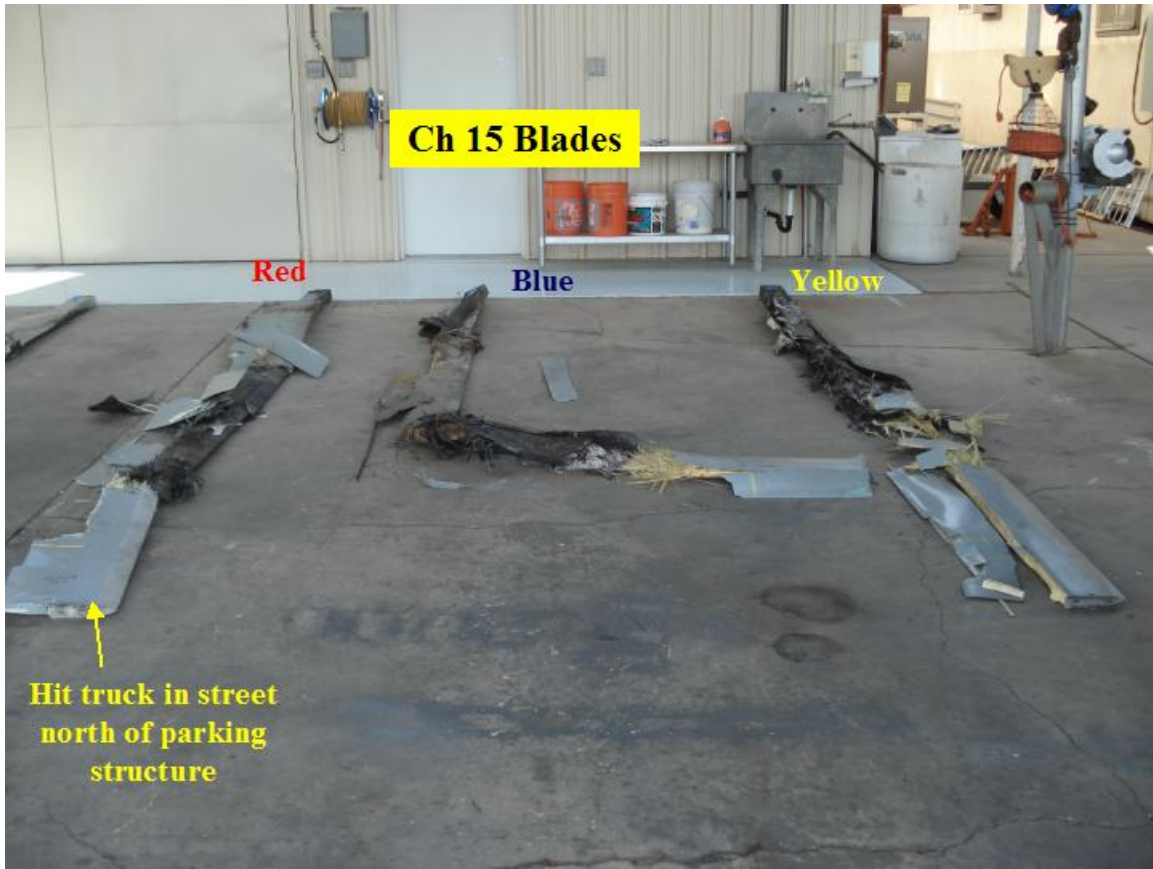


Figure 21. Eurocopter picture of Ch 15 main rotor blades

Red Blade

The leading edge sustained severe mechanical damage 6 1/2 feet from the root, and the blade separated at this point. The blade section aft of the spar was missing from the separation point to 12 feet 8 inches from the root. The leading edge stainless steel strip was also missing from this area. The outboard 2 feet 8 inches of the blade separated, and hit a delivery truck parked at 4041 North Central Avenue. This was 1,040 feet southwest of the Ch 15 main wreckage, and about 180 feet from the separated yellow blade piece from the Ch 3 helicopter. It damaged the hood of the truck, and came to rest about 10 feet away. The end plate was in place.

Blue Blade

The leading edge sustained mechanical damage and separated 4 feet 8 inches from the root. The inboard sections of the blade sustained thermal damage. Large sections of blade

skin and foam core were missing. Investigators observed leading edge mechanical damage and forward bending from 9 feet 7 inches to 12 feet 10 inches. The blade piece outboard of this area separated; it was within the park boundaries about 560 feet south of the main wreckage. The end plate separated, and investigators found it in brush several feet away from the blade tip.

Yellow Blade

The blade sustained thermal damage from the root out to 8 feet 9 inches. Investigators observed severe mechanical damage and separation from 8 feet 9 inches to 11 feet 9 inches. A section of the leading edge stainless steel strip from this area exhibited blue-gray paint transfer marks. The blade section outboard of 11 feet 9 inches separated. This piece was within the park boundaries, and about 520 feet south of the main wreckage. It did not exhibit any thermal damage; the end plate was in place.

Airframe

The cabin, the top of the tail boom, and the top portion of the vertical stabilizer were dark blue. The bottom of the tail boom, the horizontal stabilizers, and the bottom portion of the vertical stabilizer were yellow.

D. EXHIBITS

The following documents are contained with this report as the following Attachments:

- A. Email from Belo Corporation (Ch 3)
- B. Copies of N613TV logbook excerpts
- C. Copies of N215TV logbooks excerpts
- D. Police map of debris field
- E. Eurocopter training manual excerpts

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