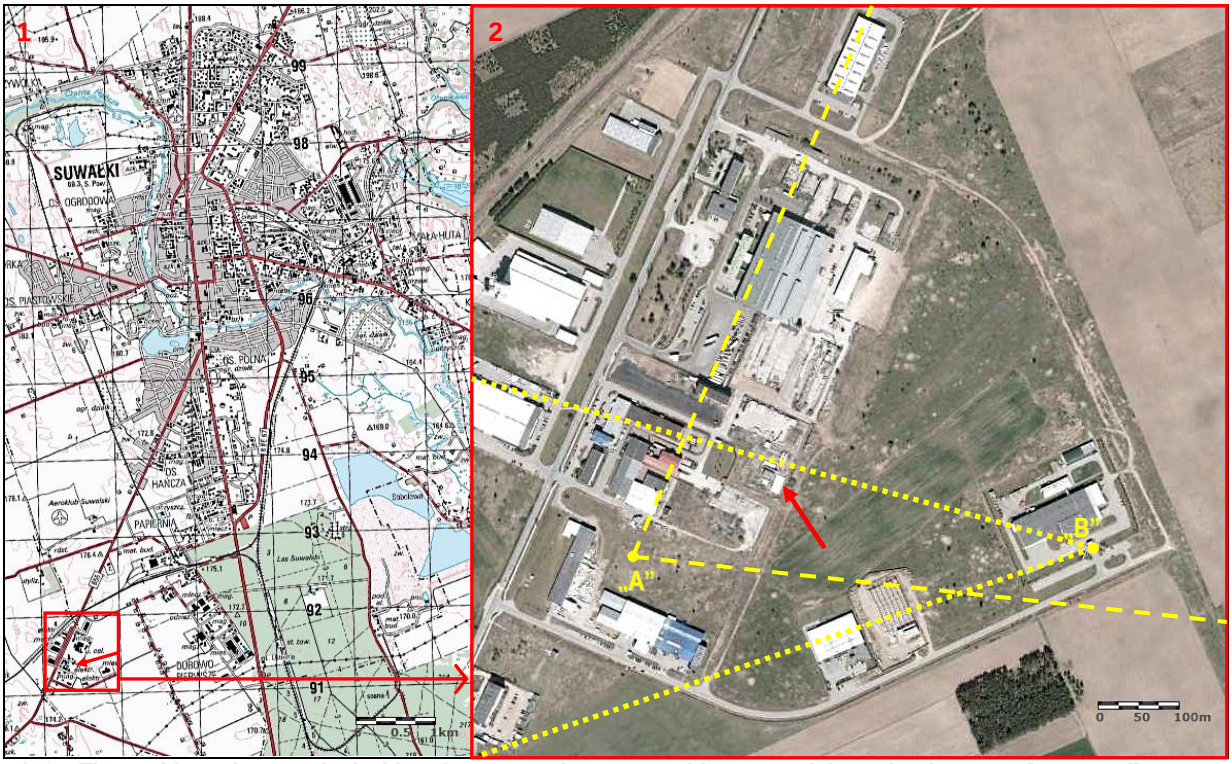
ALBUM OF ILLUSTRATIONS

Accident to
McDonnell-Douglas MD-500E helicopter
(Hughes Model 369E)
N60EP
7 April 2016, Suwałki



1, 2 – The accident place marked with red arrow on the topographic map and the orthophotomap [geoportal]. The illustration on the right side shows the position of surveillance cameras "A" and "B" and the limits of their angular observation range (camera "A" is also shown in figure [6]).

ΔH – loss of height for one complete revolution

LS – helicopter length (LS ≈7,2 m)

ΔH/LS ≈ 12/5 = 2,4 → ΔH ≈ 17 m

ΔT – time of a complete revolution (ΔT = 1,4652 s)

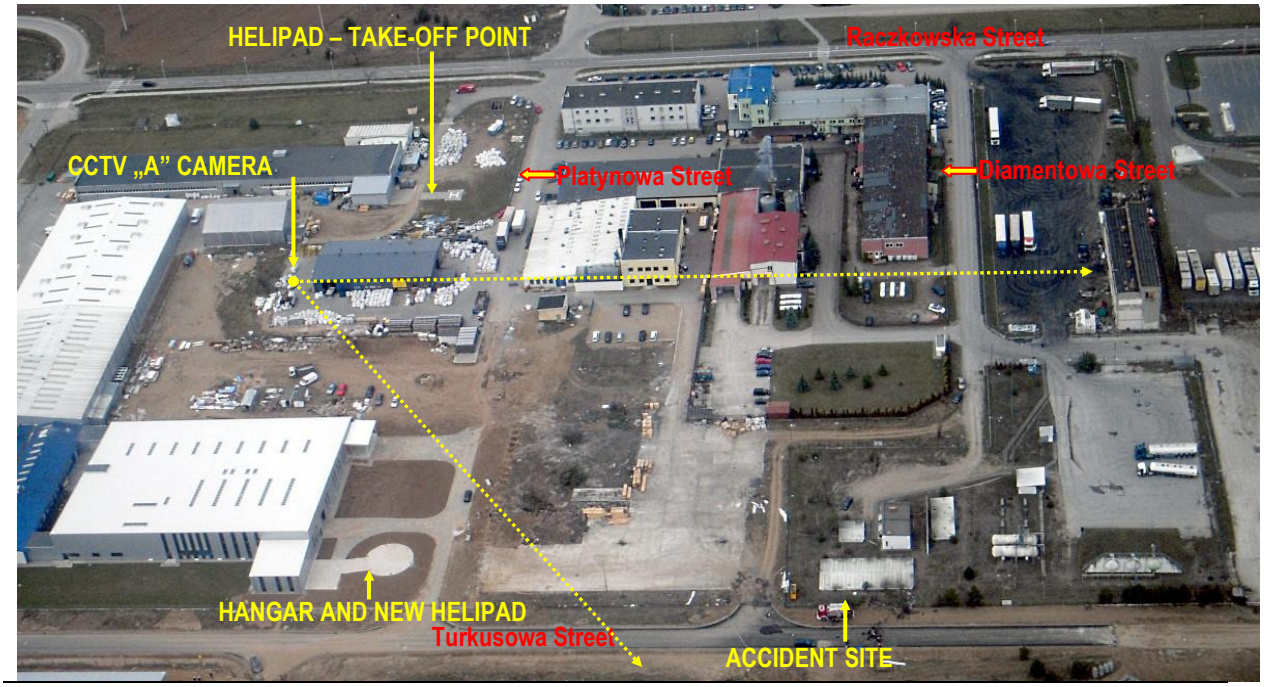
W – descent rate

W = ΔH/ΔT

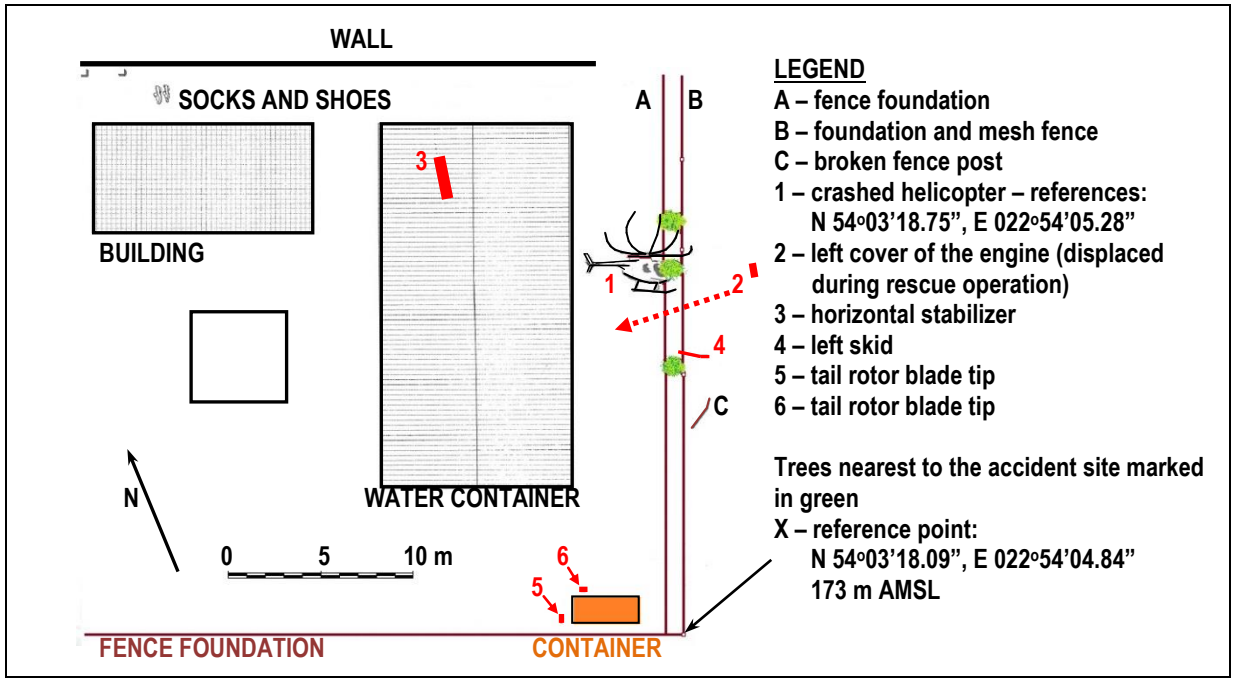
W ≈ 11,6 m/s

3 – Images of the successive phases of the helicopter's movement during the descent (based on analysis of the recording from "A" camera).

4 - Salag Sp. z o.o. premises - aerial photo from north-west direction. [photo I.Przybyła, Suwalska Szkoła Lotnicza].



5 - Salag Sp. z o.o. premises – aerial photo from south east direction. [photo I.Przybyła, Suwalska Szkoła Lotnicza].



4 – Sketch of the accident site [based on materials from Suwałki police station].

7 - Immediate vicinity of the accident site along Turkusowa Street, reference point X is marked with the red arrow.

8 - Immediate vicinity of the accident site along Turkusowa Street, continued to the north. The arrow shows a collapsed, damaged portion of the fence [photo KMP Suwałki].

9 – Crashed helicopter, bottom view. In the foreground, the engine cover [2], moved after the accident to the place shown in the photo.

10 – Damage to the lower skin of the fuselage.

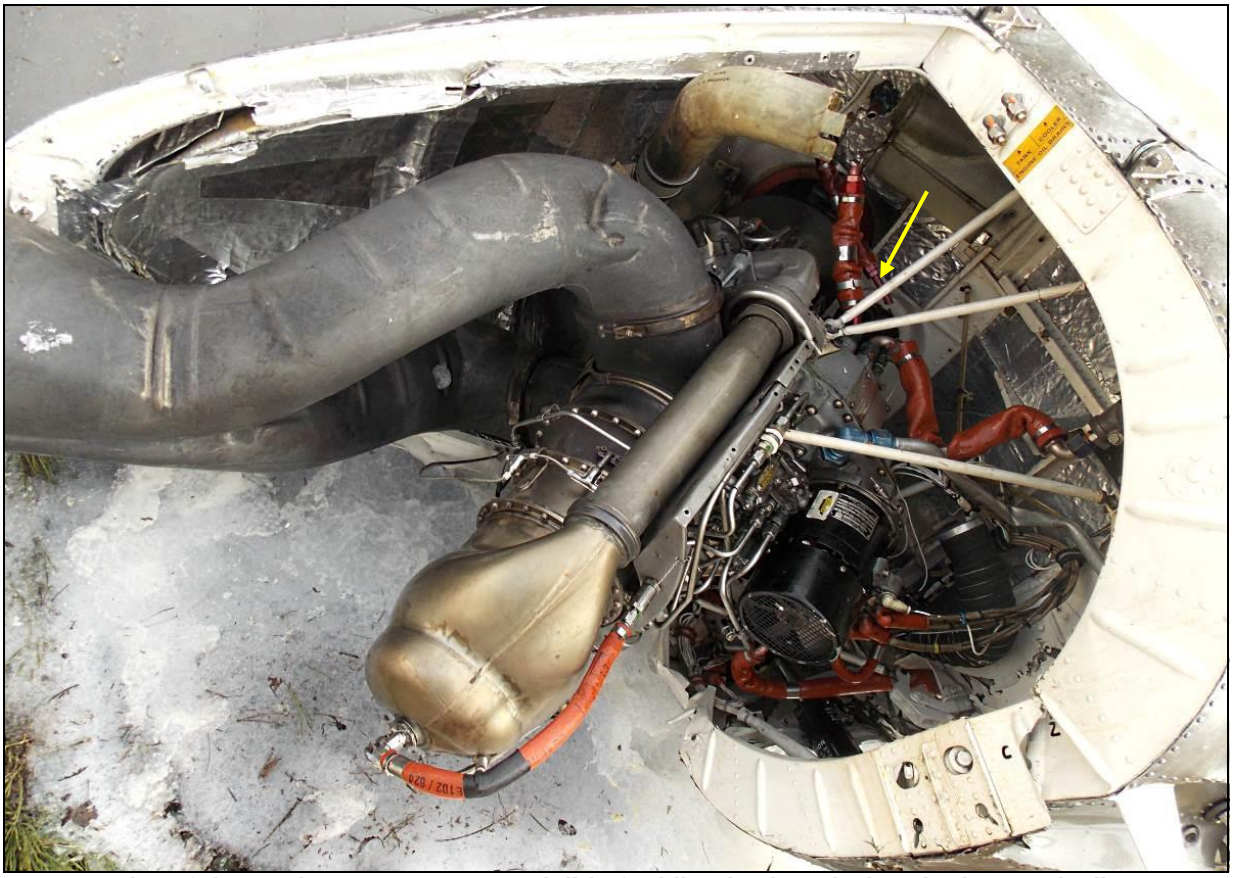
11 – The crashed helicopter, front view. Characteristic damage to the main rotor blades.

12 - Damaged main rotor blades, characteristically bent into a “tulip" shape.

13 - Crashed helicopter, view from the top of the fuselage.

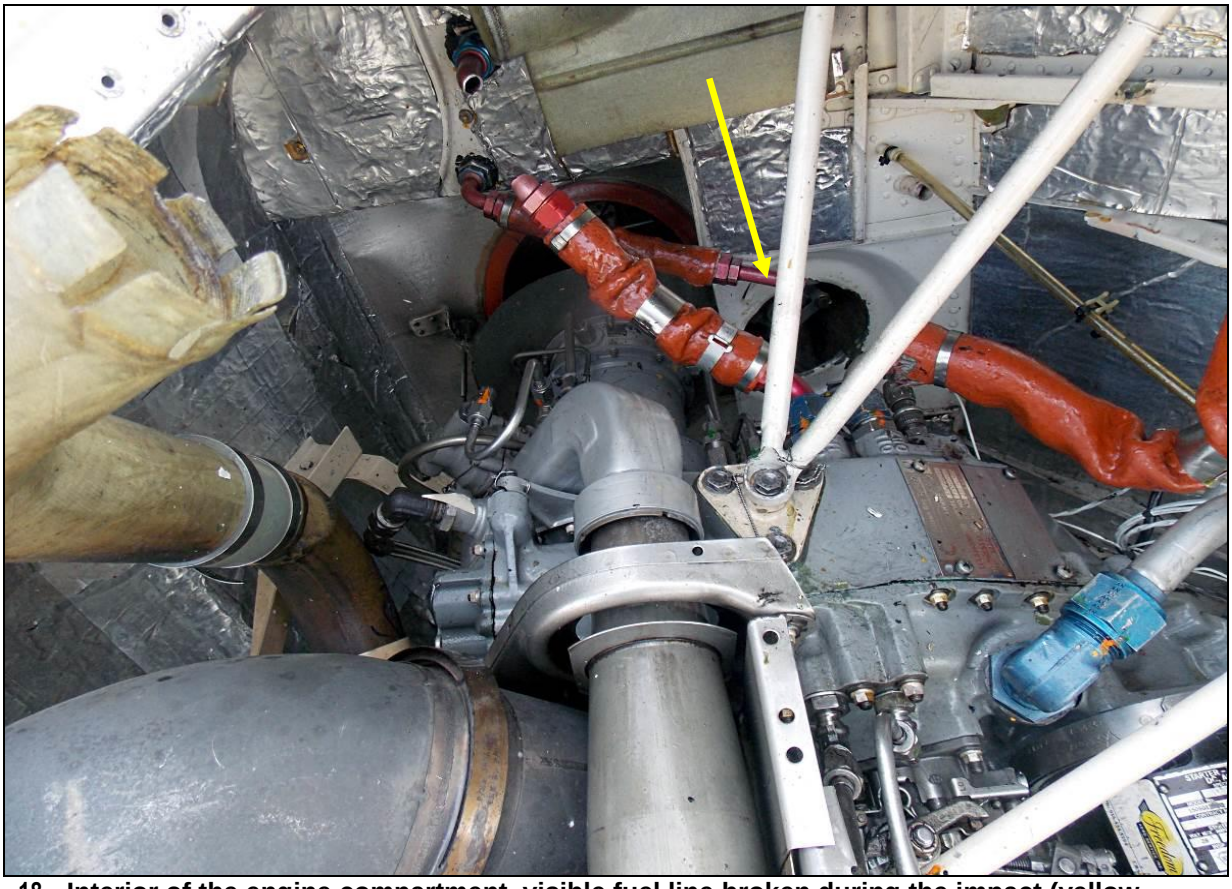
14 - Crashed helicopter, view from the bottom of the fuselage.

15 - Engine and broken tailboom with vertical tail and tail rotor.



16 - Interior of the engine compartment, visible fuel line broken during the impact (yellow arrow).

17 – Interior of the engine compartment.



18 – Interior of the engine compartment, visible fuel line broken during the impact (yellow arrow).

19 - Engine exhaust pipes. Significant soot deposit visible.

20 - Rear part of the fuselage from the bottom, general view.

21 – Portion of the tailboom with vertical tail and tail rotor with blades broken off.

22 - Tailboom breakthrough. The yellow arrow marks the bent tail rotor control pusher, the orange arrow – the broken shaft of the tail rotor.

23 - Tailboom breakthrough. Red arrow shows dents caused by impact of the main rotor blade.

24 - Tail boom breakthrough close-up. The yellow arrow marks the bent and broken tail rotor control pusher, the orange arrow - the broken shaft of the tail rotor.

25 - Cabin and rear part of the fuselage from the top.

26 - Cabin part of the fuselage from the top.

27 - Main rotor head from the front.

28 - Right side of the main rotor head.

29 - Main rotor head front and top.

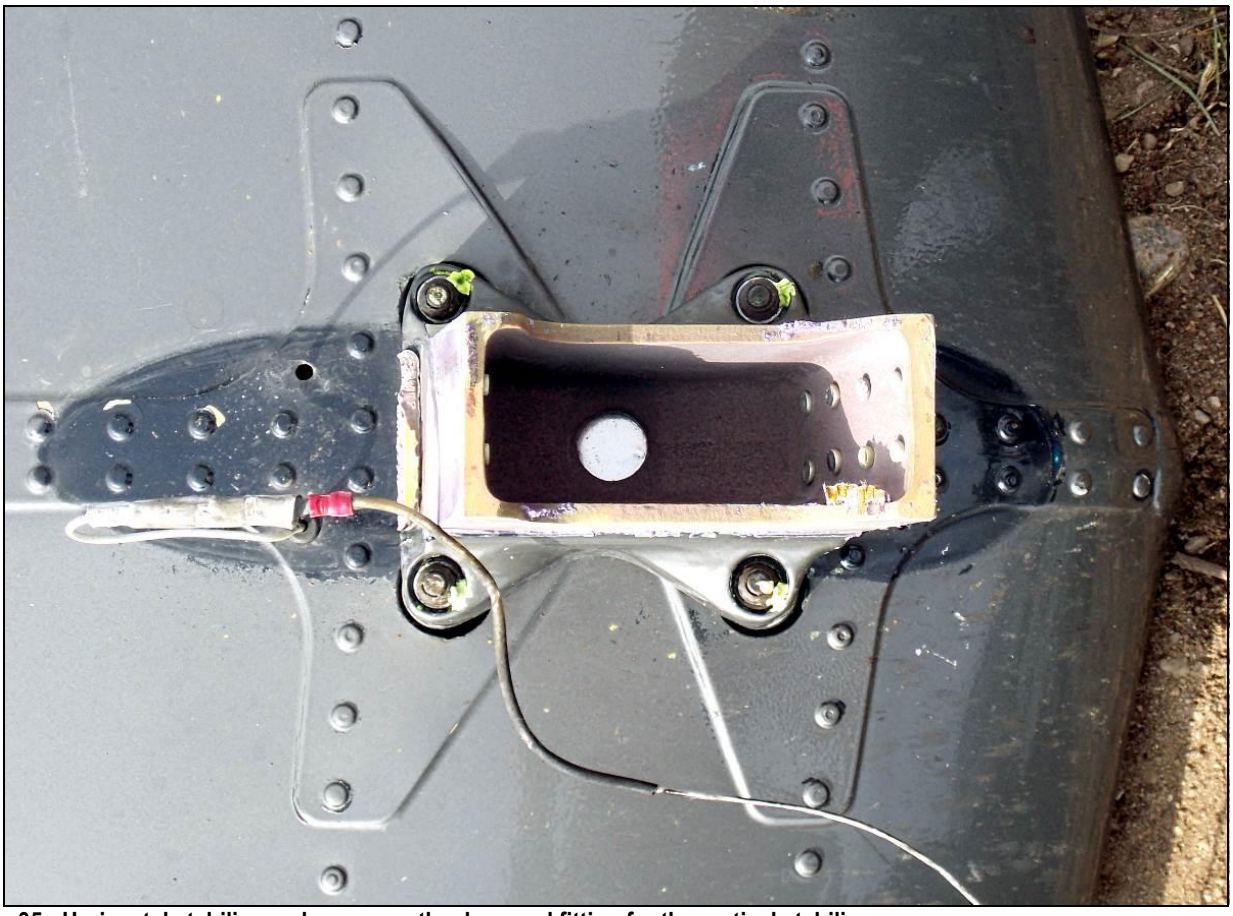
30 – Top of the main rotor head.

31 - Engine air filter.

32 - Horizontal stabilizer on the roof of the water tank.

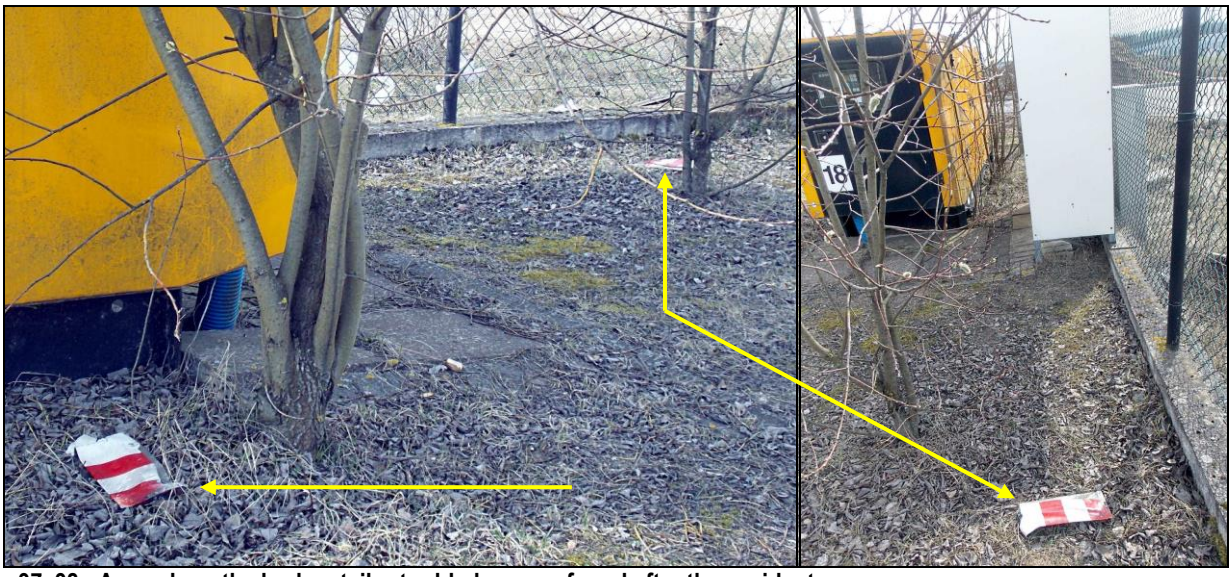
33 - Horizontal stabilizer - top view. A visible patch on the left part of the leading edge.

34 – Horizontal stabilizer - bottom view. A visible patch on the left part of the leading edge.



35 - Horizontal stabilizer - close-up on the damaged fitting for the vertical stabilizer.

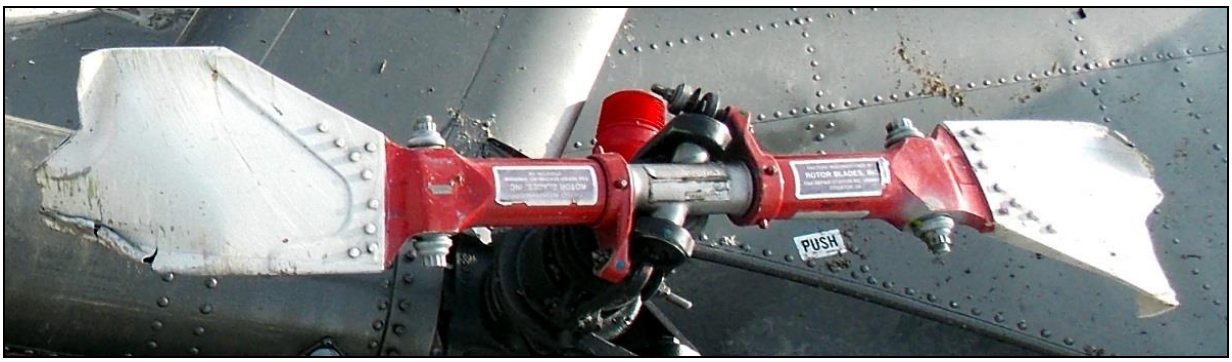
36 - Horizontal stabilizer – front view. A visible patch on the left part of the leading edge.



37, 38 - Area where the broken tail rotor blades were found after the accident.

39, 40 - Broken tail rotor blade shown from both sides.

41, 42 – Broken tail rotor blade shown from both sides.



43 - A tail rotor with the outer parts of the blades broken off.

44, 45 – Tail rotor head and propeller blades broken off.

46, 47 - Right side of the fuselage, cabin door closed.

48, 49 - Right side of fuselage, cabin door open.

50 - Damage to the right side of the fuselage – close up.

51 – Left skid.

52 – Helicopter wreck lifted by a crane, visible damage to the left side of the fuselage.

53 – Helicopter wreck lifted by a crane, visible damage to the left side of the fuselage.

54 – Helicopter wreck lifted by a crane, visible damage to the left side of the fuselage and the main rotor.

55 – Helicopter wreck lifted by a crane, visible damage to the left side of the fuselage and the main rotor.

56 – Right skid before cutting.

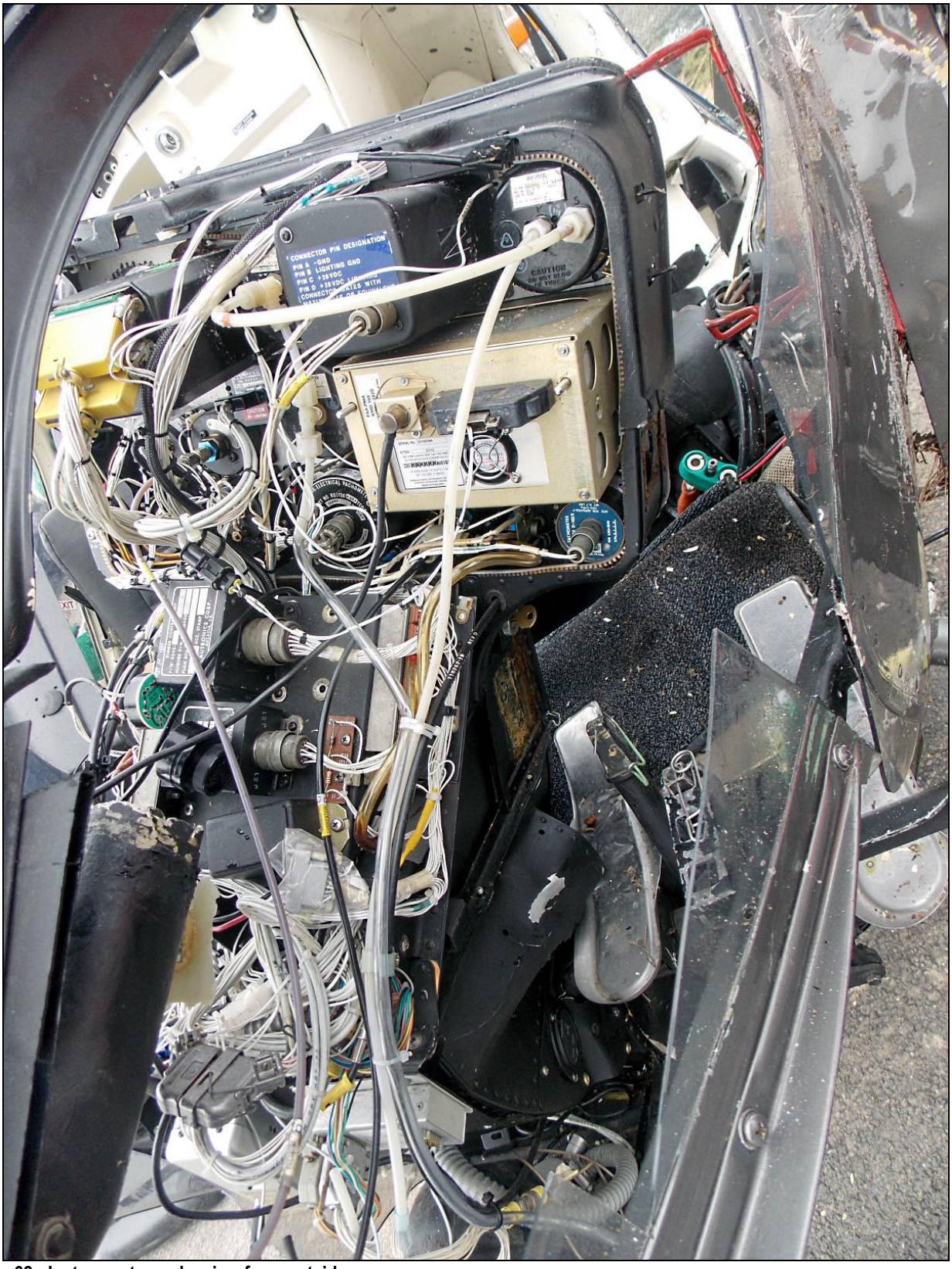
57 - Right skid and the front of the fuselage resting on the left side.

58 - Close-up of the front part of the fuselage .

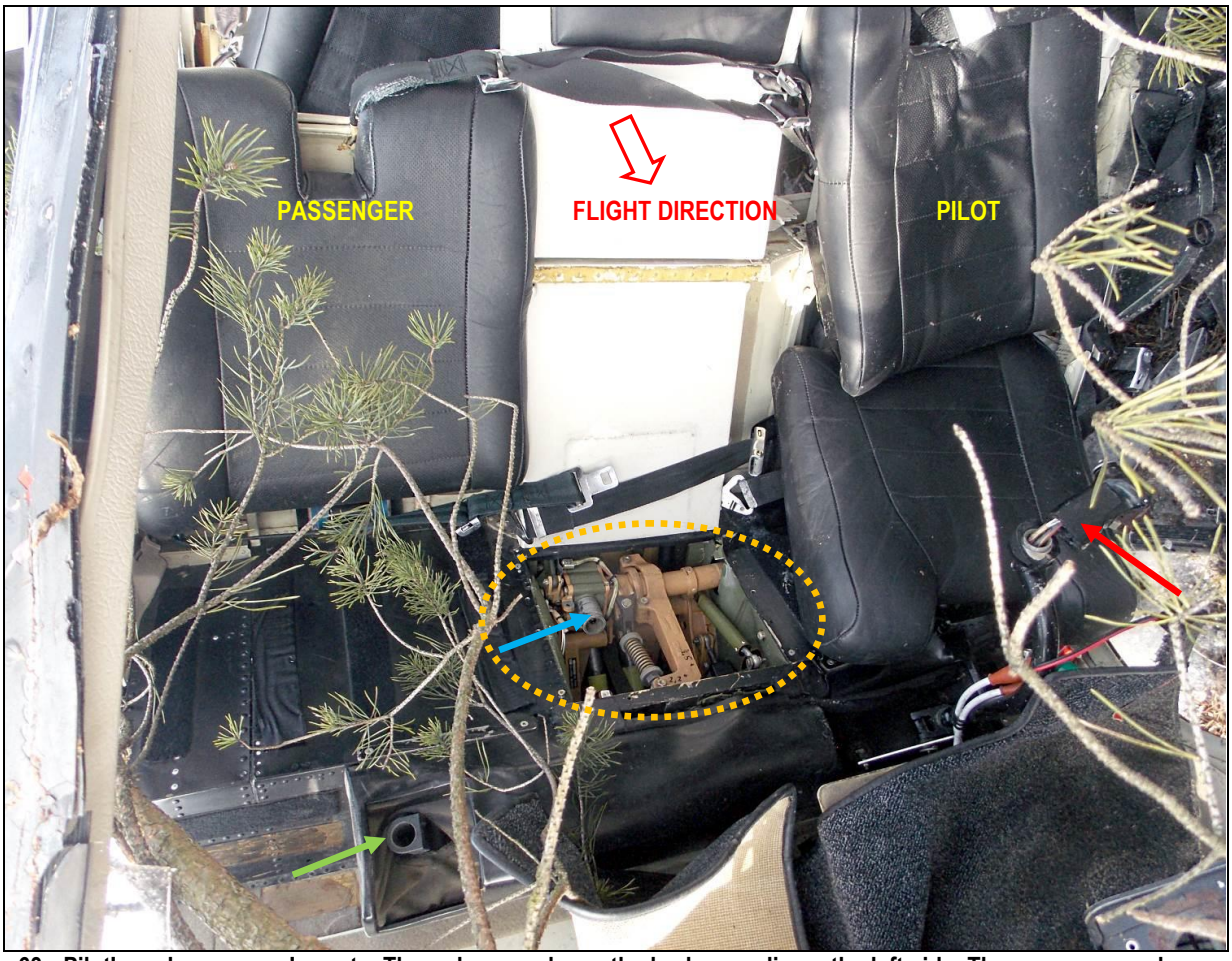
59 - Helicopter data plate.

60 - Left side view of the pilot's seat. Yellow arrow shows the collective setting and red arrow shows the broken cyclic.

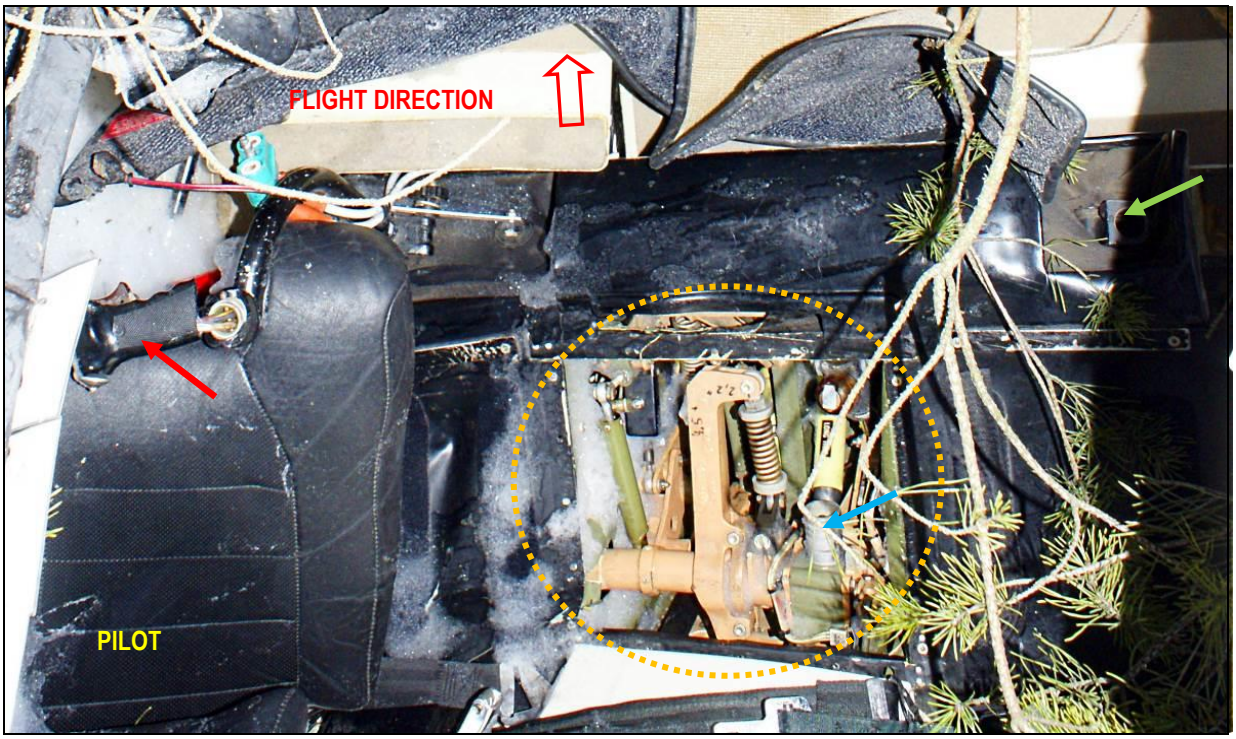
61 – Instrument panel, radio station panel and multifunction display.



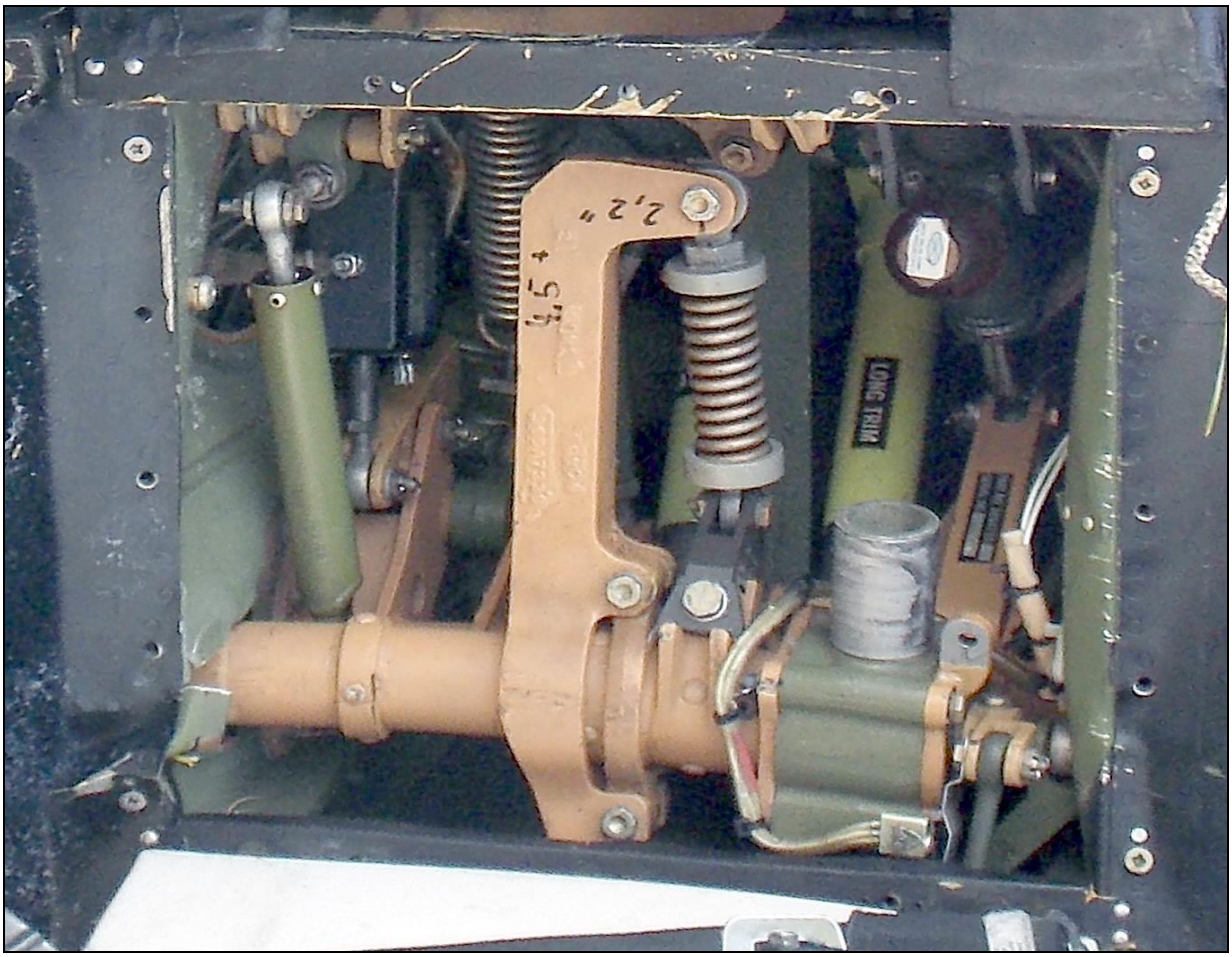
62 - Instrument panel – view from outside.



63 - Pilot's and passenger's seats. The red arrow shows the broken cyclic on the left side. The green arrow shows the mount of removed cyclic. The blue arrow shows the mount of removed collective. A portion of the flight control system in the cabin is visible because an unsecured center seat cushion has fallen off.



64 - A portion of the flight control system in the cabin after falling off the unsecured center seat (marked with arrows as above) [photo: Suwałkl police].



65 – Uncovered part of the flight control system in the cabin, visible holes for screws designed for securing the missing cover.

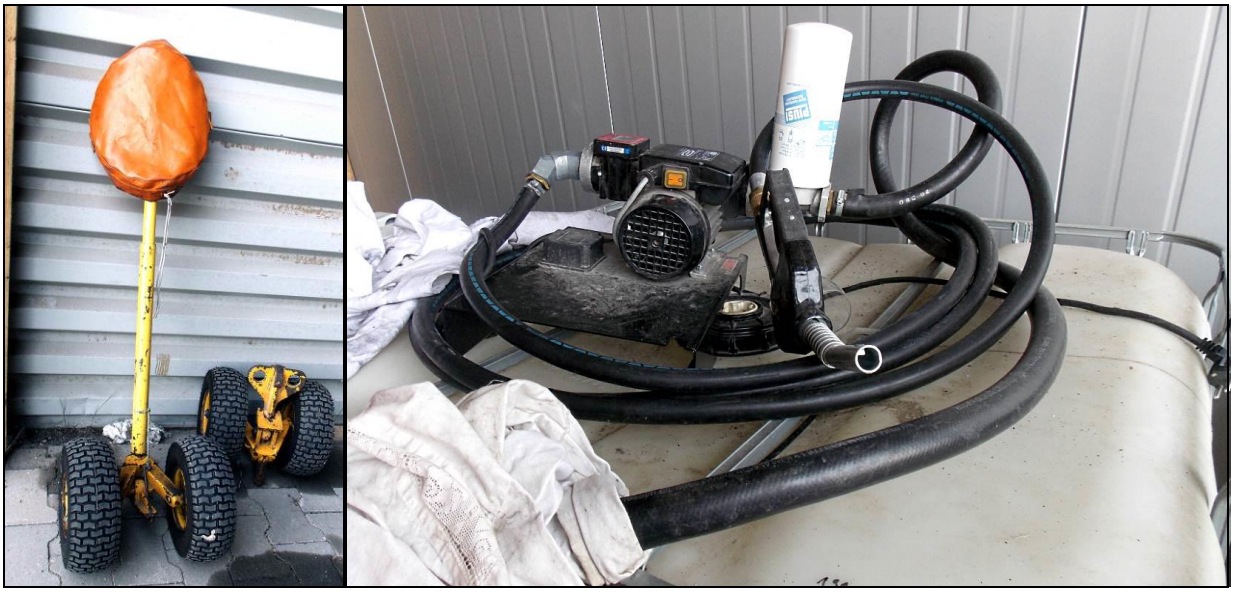
66 - Right seat cushion found outside the cabin.

67 – collective shown from inside the cabin. Its setting is clearly visible.

68 - Engine data plate.

69 - Helipad and hangar (on the right) used for the helicopter operation.

70 - The interior of the hangar, fuel tanks on the right.



71, 72 – Ground handling wheels and fuel tank with refueling device.

Photos - PKBWL (unless otherwise stated)

END