

National Transportation Safety Board

Office of Aviation Safety

Washington, DC 20594



WPR23FA122

ONSCENE AND WRECKAGE EXAMINATION

March 9, 2023

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A. ACCIDENT

Location: Willows, California
Date: March 7, 2023
Time: 1400 PST
0000 UTC
Airplane: Rockwell S2R (N8424V)

B. ONSCENE AND WRECKAGE EXAMINATION

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C. SUMMARY

On March 7, 2023, about 1600 Pacific standard time, a Rockwell International S-2R, N8424V, was substantially damaged when it was involved in an accident near Willows California. The pilot was fatally injured. The airplane was operated as a Title 14 *Code of Federal Regulations* Part 137 aerial application flight.

According to the operator, the pilot was scheduled to spray fungicide over several almond orchards. Preliminary data retrieved from an onboard global positioning system aerial application guidance system showed that the airplane departed Willows/Glenn County Airport, Willows, California about 1354 towards the south and turned right to a westerly heading. The airplane then flew a racetrack pattern in a north/south direction over the field located immediately west of a bank of powerlines. The flight track ceased at 1611 about 0.6 nm southwest of the accident site. A witness located about 0.5 nm northwest of the accident site reported that he observed the airplane make several passes in a racetrack pattern on a north/south heading directly

over him at 1545 as it sprayed the field. The airplane left the area and then returned several minutes later and made additional passes about 1610. He heard a loud noise about 2 minutes after the last pass and no further passes were made. The operator reported that the pilot had been flying for about 8 hours when the accident occurred.

The airplane came to rest inverted in an almond orchard about 500 ft northeast of a powerline tower and was oriented on a heading of 038° magnetic. All of the major structures of the airplane were accounted for at the accident site. The debris field was marked by several broken tree branches about 50 ft southeast of the accident site. A ground scar about 5 ft in diameter was collocated with the main wreckage. Both ailerons and flaps remained attached to their respective wings, which were both attached to the fuselage. The right wing displayed a depression about 3 ft in diameter with accordion style deformation and tree remnants several feet outboard of the wing root. The left wing leading edge exhibited a depression about 10 ft from the wing root. A conductor (powerline) about 2 inches in diameter that was wrapped around the propeller hub was traced through the left wing depression to the trees southeast of the accident site. Both elevators remained connected at their respective horizontal stabilizers and the rudder remained attached to the vertical stabilizer, which were both bent about midspan. The elevator trim tabs were attached to their respective elevators; the left elevator trim tab was deflected downward and the right elevator trim tab exhibited an upward deflection. Photographs and overhead footage furnished by law enforcement showed that the airplane impacted the inside (west) conductor on the east tower of powerlines near the midspan point between two towers.

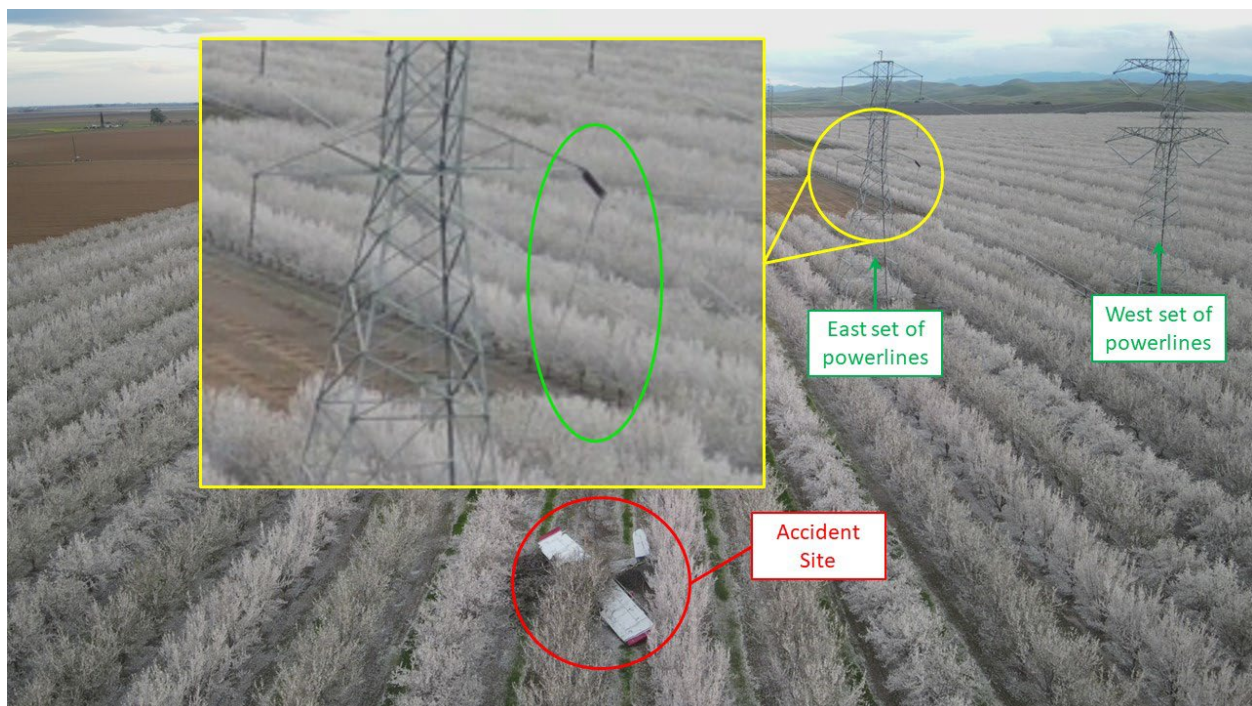


Figure 1: Powerlines and accident site



Photograph 1: Broken trees and ground scar

D. DETAILS OF THE INVESTIGATION

1.0 Accident Site



Photograph 2: Airplane at accident site

The airplane came to rest inverted in an almond orchard about 500 ft northeast of a powerline tower and was oriented on a heading of 038° magnetic. All of the major structures of the airplane were accounted for at the accident site. A ground scar about 5 ft in diameter was collocated with the main wreckage. An odor consistent with JET A fuel was noted beneath the right and left wings and fuselage at the accident site.

Both ailerons and flaps remained attached to their respective wings, which were both attached to the fuselage. The right wing displayed a depression about 3 ft in diameter with accordion style deformation several feet outboard of the wing root and bending at the wingtip. The left wing leading edge exhibited a depression about 3.5 ft in diameter 10 ft from the wing root. A conductor (powerline) about 2 inches in diameter ran from the propeller hub through the left wing depression to the trees southeast of the accident site. Both elevators remained connected at their respective horizontal stabilizers and the rudder remained attached to the vertical stabilizer, which were both bent about midspan. The elevator trim tabs could not be actuated by hand. The left elevator trim tab was deflected downward and the right elevator trim tab exhibited an upward deflection.



Photograph 3: Accordion style deformation at right wing



Photograph 4: Midspan damage at left wing with conductor

The empennage was canted, but otherwise intact. The right horizontal stabilizer was bent about midspan and the bottom surface was partially colored in soot. Both trim tabs remained attached to their respective elevators. The right elevator trim tab was deflected upward and the left trim tab was deflected downward. There was tearing and a puncture in the cloth on the left horizontal stabilizer. The rudder was bent about midspan.

The fuselage was mostly deformed and the canopy was destroyed.

A two-inch thick conductor (powerline) was wrapped around the propeller that was traced through the depression in the left wing and terminated at the trees located about 50 ft from the main wreckage. A green colored residue was observed along the leading edges of both wings. Brown transfer marks and tree debris were observed within the according style deformation at the depression in the right wing. A flat impact mark was located on outboard leading edge of the left wing that extended about 16 inches in length. The left-wing tip was separated from the outboard leading edge. Both main landing gear and the tailwheel remained attached.

The engine firewall and mount separated from the fuselage and were canted about 30° degrees relative to the fuselage. The engine was intact with no evidence of catastrophic engine failure.

The four bladed propeller remained attached to the engine at the propeller flange. One blade was in contact with the ground and exhibited a bend towards the blade face near the blade root. Another blade was straight and displayed a large gouge on the leading edge outboard and minor bending along the trailing edge about midspan. Another blade exhibited a large gouge about midspan on the leading edge and the last propeller blade was unremarkable.



Photograph 5: Propeller from front of airplane

2.0 Airframe Examination

The airplane was recovered to Plain Parts in Pleasant Grove, California and a wreckage examination was performed on March 10, 2023.

2.1 Fuselage



Photograph 6: Wings and fuselage prior to examination

The lower bay of the fuselage was comprised of the flap motor and actuator, the airframe fuel pump (see Fuel System section), the header tank, fuel lines, and intermediate flight control linkages (see Empennage and Wing sections).

The flap shaft assembly was intact and attached to the flap actuator assembly, which displayed no threads.

No fuel residue or evidence of leakage was observed in the fuselage lower bay. All the fuel system hardware appeared intact and secured.

2.2 Empennage

The right and left elevators were separated by recovery personnel at the elevator torque tube. Elevator control continuity was traced from the control stick to the torque tube through a separation of the elevator push tube at the fuselage. The elevator trim system was continuous from the trim lever in the cockpit to the trim bellcrank assembly in the empennage through the push rod assembly, which was cut by recovery personnel at the fuselage. The left elevator trim push rod was attached at the trim tab, but was separated from the trim bell crank assembly by recovery

personnel. The right elevator trim push rod was attached to the right trim tab and the opposing rod end of that push rod was attached to a bracket that had been attached to the top of the empennage beneath the vertical stabilizer, before it was separated by recovery personnel during the retrieval process.

Rudder control was continuous from the pedal assembly in the cockpit to the rudder horn at the empennage. Both rudder cables were separated by recovery personnel at the fuselage.

2.3 Wings

Continuity of the right and left aileron flight controls were traced from the control stick to their respective flight control surfaces through the left and right bellcranks, which were both intact and attached at their mounts at each wing.

Both flap linkage assemblies remained attached to their respective flaps and the flap shaft assembly.

2.4 Cockpit

The instrument panel was partially separated from the cockpit. The throttle quadrant, located on the left side of the cockpit, was intact and mounted to the fuselage structure. Both the mixture and throttle levers were in the full aft position. Both rudder pedals remained attached to their hangar assemblies and were attached through the rudder interconnect cable. The control stick assembly was intact and the dust cover was present. The fuel selector was in the ON position and the elevator trim tab lever was intact and mounted on the left side of the cockpit aft of the throttle quadrant. The engine controls and elevator trim controls operated normally when the levers were actuated by hand.

The throttle and mixture controls were continuous from the throttle quadrant to the engine compartment where the cables had been separated by recovery personnel.

2.5 Fuel/Fuel System

The fuel lines were continuous from the right and left wings to an airframe fuel pump through a header tank. The airframe fuel pump was attached in the lower bay directly below the cockpit on the left side of the fuselage. The pump motor produced an audible sound when it was connected to a 24v battery. During the fuel pump test, a clear liquid that exhibited an odor consistent with JET A fuel was expelled from a hose connected to the airframe fuel filter. The fuel filter was disassembled and void of any contaminants.

Submitted by:

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Aviation Accident Investigator