Aviation Investigation Final Report

Location:	Fairbanks, Alaska	**Accident Number:**	ANC12LA017
Date & Time:	January 15, 2012, 14:23 Local	**Registration:**	SP-SSW
Aircraft:	PZL-SWIDNIK SW-4	**Aircraft Damage:**	Substantial
Defining Event:	Loss of control in flight	**Injuries:**	3 None
Flight Conducted Under:	Part 91: General aviation - Flight test		

Analysis

During a hover test above the departure end of the runway, the flight test technician turned the hydraulics system off to simulate an in-flight hydraulic failure. During a series of prearranged hover maneuvers, the pilot began to hover the helicopter to the left, at which time, the cyclic and collective became very "stiff and ratchety," which was followed by a forward and left movement of the cyclic that the pilot was unable to physically overcome. The helicopter subsequently descended, the left skid struck the runway, and the helicopter rolled onto its left side, which resulted in substantial damage to the fuselage, tail boom, and main rotor drive system. A postaccident examination revealed no evidence of any preimpact mechanical anomalies that would have precluded normal operation.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be:

A loss of control during a simulated hydraulic emergency, which resulted in an inadvertent dynamic rollover from the which the pilot could not recover.

Findings

Not determined	(general) - Unknown/Not determined
Personnel issues	(general) - Pilot
Aircraft	Hydraulic, main system - Simulated malf/failure

Factual Information

History of Flight

Maneuvering-hover	Loss of control in flight (Defining event)
Maneuvering-hover	Collision with terr/obj (non-CFIT)
Maneuvering-hover	Dynamic rollover

On January 15, 2012, about 1423 Alaska standard time (AST), a Polish registered PZL Swidnik SW-4 helicopter, SP-SSW, sustained substantial damage when it collided with terrain, following a loss of control while maneuvering at the Fairbanks International Airport, Fairbanks, Alaska. The Polish production test pilot and two flight test technicians on board were not injured. The helicopter was operated by PZL Swidnik S.A., Swidnik, Poland, as a 14 CFR Part 91 visual flight rules (VFR) test flight when the accident occurred. Visual meteorological conditions (VMC) prevailed at the Fairbanks Airport. The local area flight originated at the Fairbanks International Airport about 1315, and company flight following procedures were in effect.

During a telephone interview with the National Transportation Safety Board (NTSB) investigator-in-charge (IIC) on January 19, the on-site flight test manager for PZL Swidnik reported that the accident helicopter was undergoing cold weather flight testing at the time of the accident. He said that after the helicopter departed from the Fairbanks International Airport, the flight test crew flew a series of preplanned flight test maneuvers to the southeast of the airport. After completing the one hour flight, the crew returned to the Fairbanks International Airport to begin a series of hover tests, with the helicopter's hydraulic systems disabled, to simulate an in-flight hydraulics failure.

The flight test manager said that as the pilot hovered the helicopter above the departure end of Runway 2L, the flight test technician turned the hydraulics system off to begin the simulation. As part of the prearranged flight test plan, the pilot hovered the helicopter sideways, first to the right and then to the left. He said that as the pilot began to hover the helicopter to the left, the cyclic and collective became very stiff and ratchety, followed by a forward and left movement of the cyclic, which the pilot was unable to physically overcome. The helicopter subsequently descended, the left skid struck the runway, and the helicopter rolled to the left, with the main rotor blades striking the runway. As the main rotor blades struck the runway, the helicopter continued to roll onto its left side, sustaining substantial damage to the fuselage, tail boom and main rotor drive system.

The closest weather reporting facility was the Fairbanks International Airport, Fairbanks. At 1432, an Aviation Routine Weather Report (METAR) was reporting, in part: Wind, calm; visibility, 6 statute miles with ice fog; clouds and sky condition, 500 feet few, 1,100 feet broken, 2,500 feet broken; temperature, minus 36 degrees F; dew point, missing; altimeter, 31.05 inHg.

After the accident, the helicopter was returned to the manufacturer's production facility in Poland. According to the production flight test manager's written statement included in the Pilot/Operator Aircraft Accident Report (NTSB Form 6120.1) submitted by the manufacturer, there were no

mechanical anomalies discovered during the postaccident examination of the helicopter that would have precluded normal operation.

Pilot Information

Certificate:	Airline transport; Flight instructor; Foreign	**Age:**	56
Airplane Rating(s):	Single-engine land	**Seat Occupied:**	Left
Other Aircraft Rating(s):	Glider; Helicopter	**Restraint Used:**	4-point
Instrument Rating(s):	Airplane; Helicopter	**Second Pilot Present:**	No
Instructor Rating(s):	Airplane single-engine	**Toxicology Performed:**	No
Medical Certification:	Class 1 With waivers/limitations	**Last FAA Medical Exam:**	March 25, 2011
Occupational Pilot:	Yes	**Last Flight Review or Equivalent:**	December 7, 2011
Flight Time:	14625 hours (Total, all aircraft), 1600 hours (Total, this make and model), 19190 hours (Pilot In Command, all aircraft), 202 hours (Last 90 days, all aircraft), 52 hours (Last 30 days, all aircraft), 5 hours (Last 24 hours, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	PZL-SWIDNIK	**Registration:**	SP-SSW
Model/Series:	SW-4	**Aircraft Category:**	Helicopter
Year of Manufacture:		**Amateur Built:**	
Airworthiness Certificate:	Special flight (Special)	**Serial Number:**	600401
Landing Gear Type:	High skid; Skid	**Seats:**	
Date/Type of Last Inspection:	November 25, 2011 Continuous airworthiness	**Certified Max Gross Wt.:**	3968 lbs
Time Since Last Inspection:	28 Hrs	**Engines:**	1 Turbo shaft
Airframe Total Time:	242 Hrs at time of accident	**Engine Manufacturer:**	Rolls-Royce
ELT:	C126 installed, not activated	**Engine Model/Series:**	250 C20R
Registered Owner:	PZL, Swidnik S.A.	**Rated Power:**	450
Operator:	PZL, Swidnik S.A.	**Operating Certificate(s) Held:**	None

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	**Condition of Light:**	Day
Observation Facility, Elevation:	PAFA,439 ft msl	**Distance from Accident Site:**	
Observation Time:	14:32 Local	**Direction from Accident Site:**	
Lowest Cloud Condition:	Few / 500 ft AGL	**Visibility**	6 miles
Lowest Ceiling:	Broken / 1100 ft AGL	**Visibility (RVR):**	
Wind Speed/Gusts:	/	**Turbulence Type Forecast/Actual:**	/
Wind Direction:		**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:	31.04 inches Hg	**Temperature/Dew Point:**	-38°C
Precipitation and Obscuration:	Light - None - Fog		
Departure Point:	Fairbanks, AK (FAI)	**Type of Flight Plan Filed:**	Company VFR
Destination:	Fairbanks, AK (FAI)	**Type of Clearance:**	VFR
Departure Time:	13:15 Local	**Type of Airspace:**	

Airport Information

Airport:	Fairbanks Internation FAI	**Runway Surface Type:**	Asphalt
Airport Elevation:	439 ft msl	**Runway Surface Condition:**	Dry;Snow
Runway Used:	02L	**IFR Approach:**	None
Runway Length/Width:	11800 ft / 150 ft	**VFR Approach/Landing:**	Straight-in

Wreckage and Impact Information

Crew Injuries:	3 None	**Aircraft Damage:**	Substantial
Passenger Injuries:		**Aircraft Fire:**	None
Ground Injuries:	N/A	**Aircraft Explosion:**	None
Total Injuries:	3 None	**Latitude, Longitude:**	64.800003,-147.850006(est)

Administrative Information

Investigator In Charge (IIC):	Johnson, Clinton
Additional Participating Persons:	Christopher Farnell ; Federal Aviation Administration; Anchorage , AK
Original Publish Date:	January 30, 2014
Last Revision Date:	
Investigation Class:	Class
Note:	
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=82701