National Transportation Safety Board
Aviation Accident Factual Report

Location:	Gig Harbor, WA	**Accident Number:**	SEA04LA048
Date & Time:	03/02/2004, 2013 PST	**Registration:**	N75844
Aircraft:	Cessna 172N	**Aircraft Damage:**	Substantial
Defining Event:		**Injuries:**	2 None
Flight Conducted Under:	Part 91: General Aviation - Personal		

On March 2, 2004, at 2013 Pacific standard time, a Cessna 172N, N75844, registered to and flown by the pilot as a 14 CFR Part 91 personal flight, collided with a tree while on an Instrument Landing System (ILS) approach to runway 17 at Tacoma Narrows Airport, Gig Harbor, Washington. Night visual meteorological conditions prevailed at the time and no flight plan had been filed. The aircraft was substantially damaged and the commercial pilot and pilot rated passenger were not injured. The flight originated from Bremerton, Washington, at 1900.

During a telephone interview and subsequent written statement, the pilot reported that the purpose of the flight was to "practice (hood) night VFR ILS approaches at Tacoma Narrows Airport." The pilot was accompanied by a non-instrument rated private pilot acting as a safety pilot.

The pilot stated that he contacted Seattle approach and was cleared for the approaches followed by contact with Tacoma Tower. Two practice ILS approaches to runway 17 had been accomplished, descending down to about 700 feet mean sea level before executing the missed approach. After announcing the second missed approach to Tacoma tower, the tower controller advised to Tacoma traffic that the tower was now closed. The pilot then contacted Seattle Approach for vectors to the ILS for the third approach.

During the third approach, the pilot stated that everything was normal and the localizer and glide slope needles were centered when at an elevation of approximately 600 feet, the aircraft struck an object. The pilot stated that he was unaware of what he hit and immediately initiated a climb. The pilot then made contact with Seattle Approach to report that he was finished with the approaches and requested flight following back to Bremerton, where a landing was made without further incident.

The safety pilot reported that during the third approach, he glanced over at the instruments and noted that the aircraft was aligned with the runway and on the proper glide path. He reported that he did not see any flags on the instrument. He also reported that he did not note the altitude at the time. During a telephone interview, the safety pilot reported that during the

third approach, he did not at any time see the runway nor was he aware of the immediate terrain as it was "very dark" and the terrain was not visible.

Inspection of the aircraft revealed a leading edge indentation on the left wing just outboard of the lift strut attach point. The leading edge was crushed aft to the wing spar. Fir needles were embedded within the metal folds. The rib above the lift strut attach point was deformed and torn. Impact damage was also noted to the right side main landing gear leg.

A FAA flight test of the approach equipment was accomplished the following day. The test revealed normal equipment operation.

A certificated airframe and powerplant mechanic tested the aircraft's #1 ILS system and found the glide slope to have "extremely low sensitivity." The glide slope receiver also could not pick up a signal. The localizer was within tolerance, but off by a "dot and a half." The #2 Nav system localizer was tested and found to work normally and within specifications.

The Tacoma Narrows ILS Runway 17 approach plate (see attached approach plate) indicated to cross the SCENN Final Approach Fix (FAF)/ outer marker at 2,000 feet. The FAF is located 4.6 nautical miles from the missed approach point, which is .4 nautical miles from the end of the runway. SCENN FAF is identified via the 227 degree radial from Seattle VOR. The minimum descent altitude is 492 feet.

Radar data was provided by Seattle Terminal Radar Approach Control (TRACON) and sent to the National Transportation Safety Board Research and Engineering Division for readout. Additionally, Seattle TRACON also provided the times in which the aircraft was cleared for the approach which were matched to the approximate radar data points. (See attached Radar Data Points)

At 1939, the flight was cleared for the ILS runway 17 approach by Seattle Approach Control and the pilot was instructed to maintain 2,000 feet until established (on the approach) and to contact Tacoma Tower. Radar data indicated that the flight was at 2,000 feet and about nine nautical miles northwest of Tacoma Narrows at the time. The aircraft tracking intercepted the localizer for runway 17 and began tracking inbound to the airport. The radar data indicated that the aircraft crossed SCENN FAF at 1,500 feet and continued on the localizer to descend to 500 feet within about one mile of the runway before a climb was initiated.

After the pilot announced the missed approach to Tacoma Tower, the aircraft continued a climbing right turn to 2,000 feet. At 1954, the flight was cleared by Approach Control for the second ILS approach and the pilot was again instructed to maintain 2,000 feet until established and to contact Tacoma Tower. The aircraft intercepted the localizer and began tracking inbound to the airport. The aircraft crossed SCENN FAF at 1,100 feet. The tracking continued on the localizer to descend to 700 feet before initiating a climb about one nautical mile from the end of the runway.

After the pilot announced the missed approach to Tacoma Tower at 1959, the control tower announced to Tacoma traffic that it was closed.

The aircraft continued a climbing right turn to 2,000 feet. At 2009, the flight was cleared for the third ILS approach by Approach Control about 11 nautical miles northwest of the airport and the pilot was again instructed to maintain 2,000 feet until established. Frequency change to UNICOM was approved. The aircraft intercepted the localizer shortly thereafter and began tracking inbound to the airport and descending from 1,800 feet. The aircraft continued on the localizer, descending down to 500 feet, about 7 nautical miles from the landing threshold of runway 17, and 1.7 nautical miles before SCENN FAF. The radar data indicated three data points at 500 feet in a 10 second time frame before a climb was initiated at 2013.

The terrain elevation in the area of the collision with the tree(s) was estimated to be approximately 350 feet mean sea level.

The radar data provided by Seattle TRACON also noted that Minimum Safe Altitude Warning (MSAW) alerts were recorded during the three approaches. During the first approach at 1943, and at an altitude of 1,400 feet, two brief alerts were noted, however, the altitude remained at 1,400 feet for a brief time before resuming the descent, and no other alerts were noted for the remainder of the approach.

During the second approach at 1957, and at an altitude of 1,100 feet, while on the Tacoma Tower frequency, MSAW alerts continued as the aircraft descended to 700 feet where the missed approach was initiated, followed by an increase in altitude at 1959. Tower control personnel reported that the aircraft was in sight at the time of the alerts and no warnings were transmitted to the aircraft.

During the third approach at 2009, and at an altitude of 1,900 feet, the pilot was cleared for the ILS approach by Approach Control, and frequency change to UNICOM was approved. At 2012, and at an altitude of 1,100 feet, MSAW alerts were recorded. The alerts continued as the aircraft descended to 500 feet and ended as the aircraft transitioned to a climb to 700 feet at 2013:37. At 2013:51, the pilot re-established contact with Seattle Approach Control at an altitude of 900 feet.

Pilot Information

Certificate:	Commercial	**Age:**	47, Male
Airplane Rating(s):	Single-engine Land	**Seat Occupied:**	Left
Other Aircraft Rating(s):	None	**Restraint Used:**	Seatbelt, Shoulder harness
Instrument Rating(s):	Airplane	**Second Pilot Present:**	Yes
Instructor Rating(s):	None	**Toxicology Performed:**	No
Medical Certification:	Class 2 Valid Medical--w/ waivers/lim.	**Last FAA Medical Exam:**	07/01/2002
Occupational Pilot:		**Last Flight Review or Equivalent:**	10/03/2002
Flight Time:	553 hours (Total, all aircraft), 312 hours (Total, this make and model), 453 hours (Pilot In Command, all aircraft), 9 hours (Last 90 days, all aircraft), 7 hours (Last 30 days, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	Cessna	**Registration:**	N75844
Model/Series:	172N	**Aircraft Category:**	Airplane
Year of Manufacture:		**Amateur Built:**	No
Airworthiness Certificate:	Normal	**Serial Number:**	17267998
Landing Gear Type:	Tricycle	**Seats:**	4
Date/Type of Last Inspection:	05/05/2003, Annual	**Certified Max Gross Wt.:**	2300 lbs
Time Since Last Inspection:	53 Hours	**Engines:**	1 Reciprocating
Airframe Total Time:	3170 Hours at time of accident	**Engine Manufacturer:**	Lycoming
ELT:	Installed, not activated	**Engine Model/Series:**	O-320-H2AD
Registered Owner:	Steven C. Townsend	**Rated Power:**	160 hp
Operator:	Steven C. Townsend	**Operating Certificate(s) Held:**	None

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual Conditions	**Condition of Light:**	Night/Dark
Observation Facility, Elevation:	TIW, 292 ft msl	**Distance from Accident Site:**	7 Nautical Miles
Observation Time:	1953 PST	**Direction from Accident Site:**	170°
Lowest Cloud Condition:		**Visibility**	10 Miles
Lowest Ceiling:	Broken / 7000 ft agl	**Visibility (RVR):**	
Wind Speed/Gusts:	4 knots /	**Turbulence Type Forecast/Actual:**	/
Wind Direction:	240°	**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:	30.18 inches Hg	**Temperature/Dew Point:**	6°C / 2°C
Precipitation and Obscuration:			
Departure Point:	Bremerton, WA (PWT)	**Type of Flight Plan Filed:**	None
Destination:		**Type of Clearance:**	IFR
Departure Time:	1900 PST	**Type of Airspace:**	Class D

Airport Information

Airport:	Tacoma Narrows (TIW)	**Runway Surface Type:**	Asphalt
Airport Elevation:	292 ft	**Runway Surface Condition:**	Dry
Runway Used:	17	**IFR Approach:**	ILS
Runway Length/Width:	5002 ft / 150 ft	**VFR Approach/Landing:**	None

Wreckage and Impact Information

Crew Injuries:	1 None	**Aircraft Damage:**	Substantial
Passenger Injuries:	1 None	**Aircraft Fire:**	None
Ground Injuries:	N/A	**Aircraft Explosion:**	None
Total Injuries:	2 None	**Latitude, Longitude:**	47.268889, -122.566667

Administrative Information

Investigator In Charge (IIC):	Debra J Eckrote
Additional Participating Persons:	Thomas W Normoyle; Seattle, Washington; Renton, WA
Investigation Docket:	NTSB accident and incident dockets serve as permanent archival information for the NTSB's investigations. Dockets released prior to June 1, 2009 are publicly available from the NTSB's Record Management Division at pubinq@ntsb.gov, or at 800-877-6799. Dockets released after this date are available at http://dms.ntsb.gov/pubdms/.