NATIONAL TRANSPORTATION SAFETY BOARD
Office of Research and Engineering
Materials Laboratory Division
Washington, D.C. 20594

August 28, 2009

MATERIALS LABORATORY FACTUAL REPORT Report No. 09-063

A. ACCIDENT

Place	:	Sanderson, FL
Date	:	07/08/2009
Vehicle	:	Noles Van's RV7
NTSB No.	:	ERA09LA392
Investigator	:	Corky Smith

B. COMPONENTS EXAMINED

Piece of tail section

C. DETAILS OF THE EXAMINATION

The piece tail section, as shown in Figure 1, was removed from the wreckage by a cutting saw. The horizontal stabilizers were also sawed from the piece of tail section. According to field investigators, the vertical stabilizer and rudder were not found at the wreckage site and have not been located. The purpose of this examination is to determine the mode of separation of the vertical stabilizer and rudder from the fuselage.

The vertical stabilizer is bolted to the tail of the fuselage at the forward spar and rear spar as depicted in Figure 2. Additionally, the rear spar is reinforced with a spar doubler which is riveted to the rear spar and bolted to the fuselage (also in Figure 2). As shown in Figure 3, the vertical stabilizer separated from the aircraft fuselage by fractures in the front spar and the rear spar/doubler assembly. The fracture surfaces on the front and rear spar pieces and the rear doubler piece exhibited slant-fracture features consistent with ductile overload. No evidence of preexisting damage such as fatigue or corrosion is noted.

Figure 4 shows macrographs of the lower rudder hinge bracket and rod end assembly. As noted in Figure 4a, the rudder hinge brackets are bent downward and the threaded portion of the rod end is also bent downward. Figure 4b indicates that the threaded portion of the rod end fractured by ductile mechanical overload.

Figure 5 and 6 show macrographs of the starboard and port rudder cable clevises with pieces of rudder control horn bolted in place. In both instances, the rudder control horn fractured from the rudder cable clevises by ductile overload of the aluminum horn.

Michael K. Budinski
Chief, Materials Laboratory Division

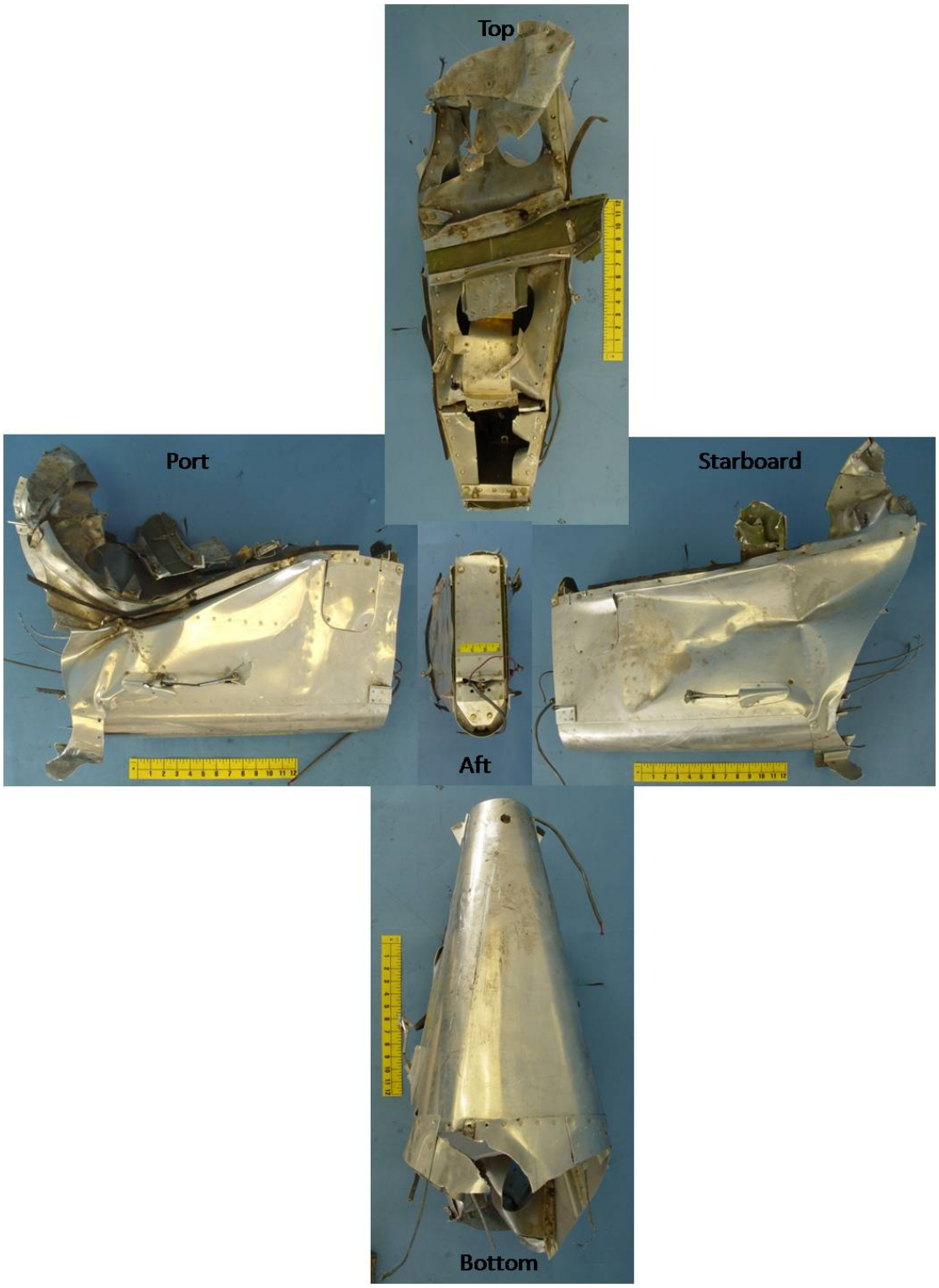

Figure 1 Projection montage of all sides of the piece of tail section.

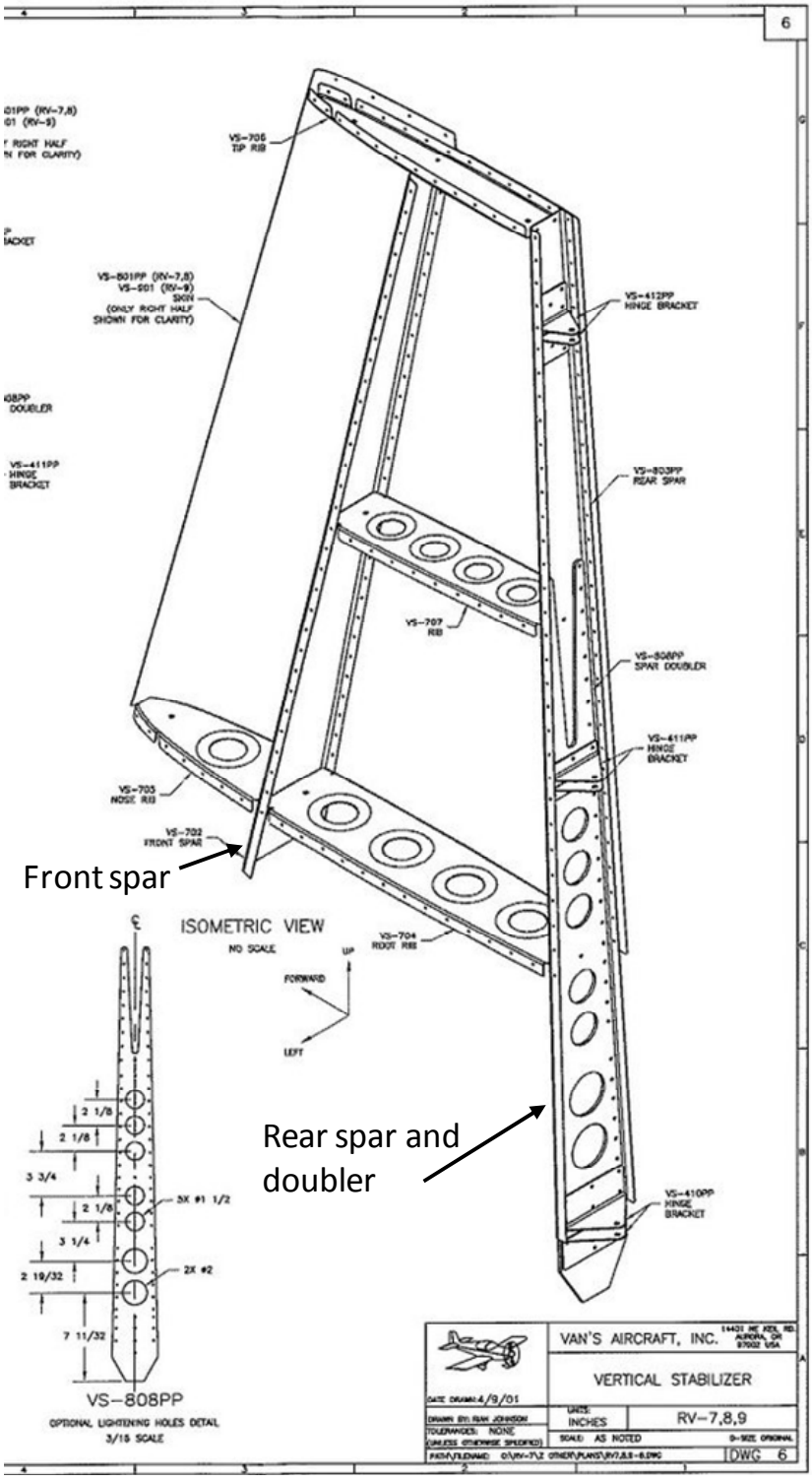

Figure 2 Portion of the assembly drawing for the vertical stabilizer showing the front and read spars and the rear doubler.

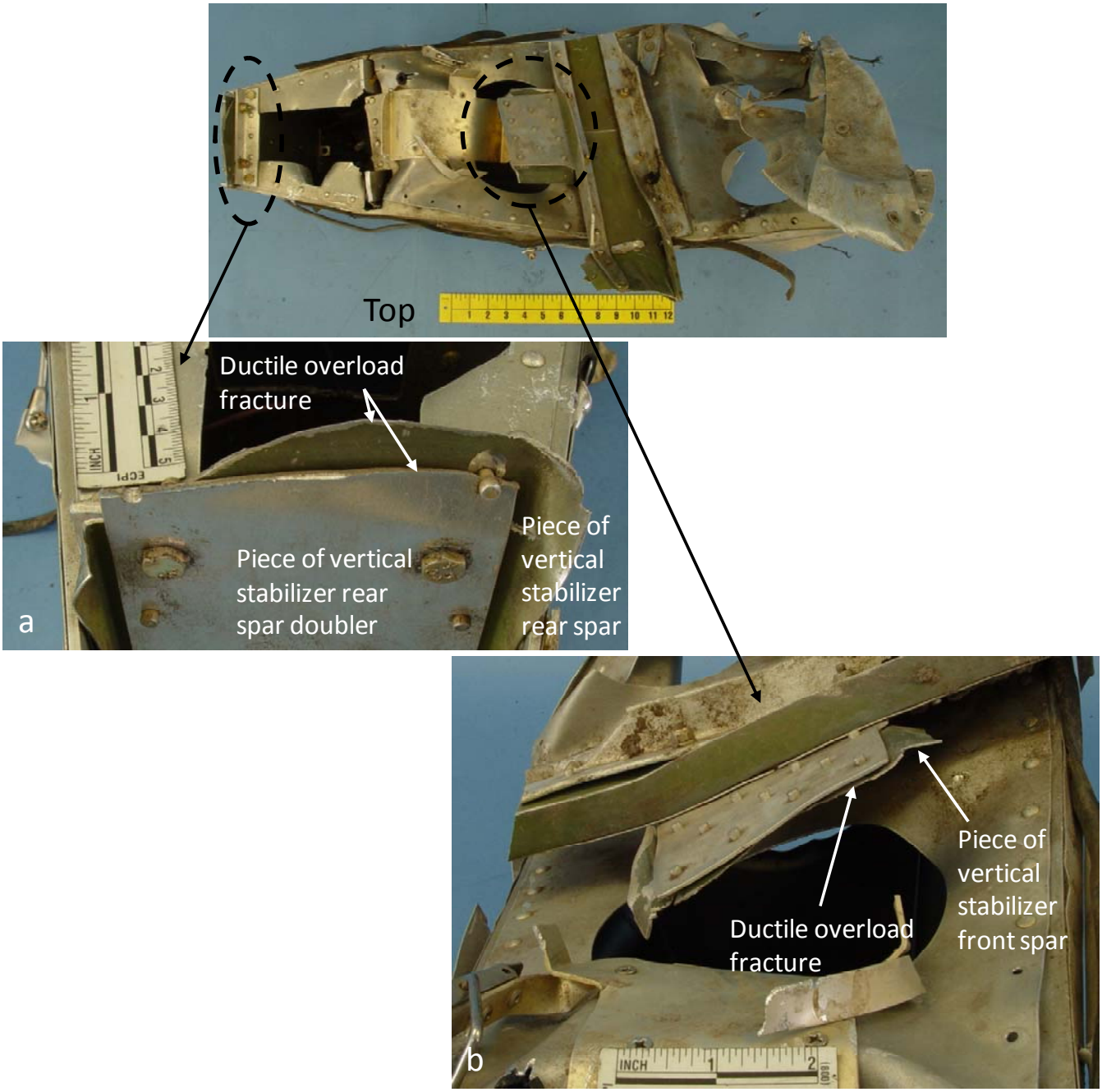

Figure 3 a) macrograph showing the ductile overload fracture surfaces of the rear spar and rear spar doubler for the vertical stabilizer. b) macrograph showing the ductile overload fracture surface of the front spar for the vertical stabilizer.

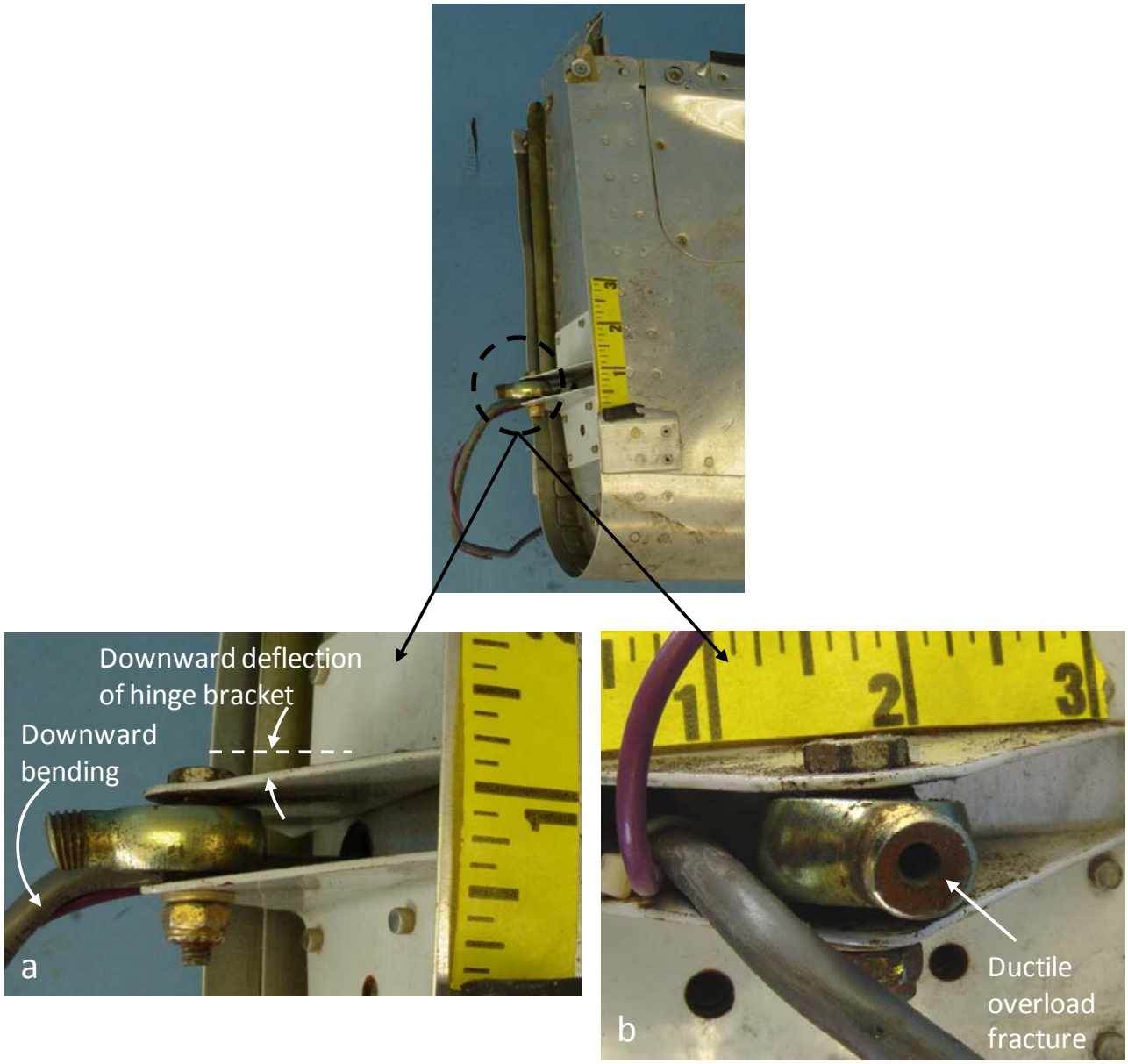

Figure 4 a) macrograph showing bent rudder hinge brackets and bent threads on a rod end. b) macrograph showing ductile overload fracture surface of the threaded section of the rod end.

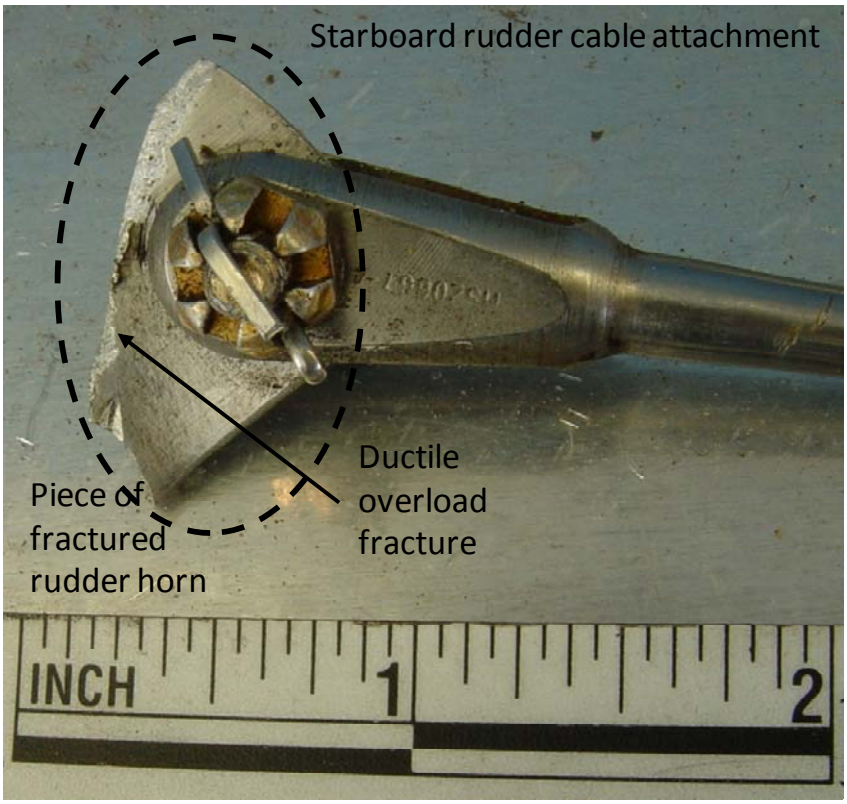

Figure 5 Macrograph showing a fractured piece of the starboard side rudder horn.

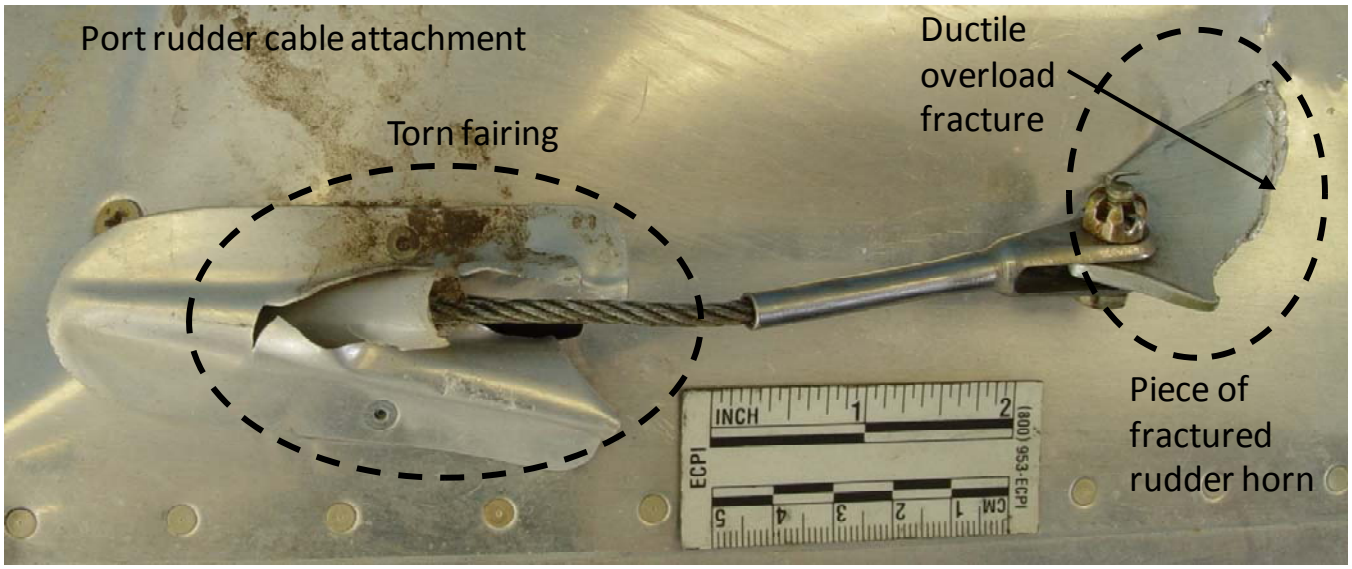

Figure 6 Macrograph showing a fractured piece of the port side rudder horn and torn fairing.