

**National Transportation Safety Board**  
Office of Research and Engineering  
Washington, D.C. 20594

**Airplane Performance Study**

**Specialist Report**  
**Timothy Burtch**

**A. ACCIDENT**

**Location:** Presque Isle, Maine  
**Date:** March 4, 2019  
**Time:** 1629 GMT (1129 EST)  
**Airplane:** EMB-145XR, N14171  
**NTSB Number:** DCA19FA089

**B. GROUP**

No vehicle performance group was formed.

**C. SUMMARY**

On March 4, 2019, about 11:29 eastern standard time (EST), CommutAir flight 4933, dba United Express, an EMB-145XR, registration N14171, landed at Presque Isle Airport (KPQI), Maine, to the right side of the runway 01, in light to moderate snow. On board were the captain, the first officer, one flight attendant, and 28 passengers. Two passengers and one crewmember received minor injuries, and the airplane received substantial damage. The regularly scheduled domestic passenger flight was operating under the provisions of 14 Code of Federal Regulations Part 121 from Newark International Airport (KEWR), Newark New Jersey.

The First Officer (FO) was the Pilot Flying and the Captain (CPT) was the Pilot Monitoring during the flight from KEWR. The crew opted to go around during their first approach to the instrument landing system (ILS) runway 01 at KPQI and touched down to the right side of the runway during the second approach.

Times in the study are quoted in EST. EST = Greenwich Mean Time (GMT) – 5 hr.

**D. THE AIRPLANE**

A picture of the accident airplane, an EMB-145XR, is shown in Figures 1 and 2.

**E. WEATHER SUMMARY**

Presque Isle Airport has an Automated Weather Observation system (AWOS) that is not augmented with human observers. The KPQI AWOS reported the following approximately 33 minutes before the accident.

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***METAR KPQI 041556Z AUTO 08006KT 1/2SM SN FZFG OVC013 M02/M04 A2970 RMK AO2 SLP103 P0001 T10221044 FZRANO RVRNO=***

The KPQI weather observation at 1056 EST, automated, wind from 080° at 6 knots, visibility 1/2 mile in moderate snow and freezing fog, ceiling overcast at 1,300 ft above ground level (agl), temperature -2°C, dew point temperature -4°C, altimeter 29.70 inches of mercury (Hg). Remarks: automated station, sea-level pressure 1010.3-hPa, hourly precipitation 0.01 inch.

**F. PERFORMANCE STUDY**

The airplane performance study is largely based on flight data recorder (FDR) information. However, position data shown in Figures 4, 5, and 6 are from recorded Automatic Dependent Surveillance-Broadcast (ADS-B) data.

The ADS-B data were provided by the Federal Aviation Administration (FAA). ADS-B is a primary technology supporting the FAA's Next Generation Air Traffic Control System, or NextGen, which is shifting airplane separation and air traffic control from ground-based radar to satellite-derived positions. Satellite-based Global Positioning System (GPS) data have an accuracy of approximately 20 meters (m) in both the horizontal and vertical dimensions. GPS augmented with the Wide Area Augmentation System (WAAS)<sup>1</sup> is accurate to approximately 1.5 – 2 meters.

Figure 3 is the approach plate for the ILS 01 at KPQI. Figure 4 is an overview of the airplane's ground track in the vicinity of Presque Isle Airport and captures the initial approach and second landing attempt on KPQI's runway 1. (Note the 17° magnetic variation between the approach course of 6° and the true course of 349° to runway 1 depicted in the figure.)

Figures 5 and 6 include insets outlined in Figure 4 for more detail. In addition, Figure 5 includes paraphrased cockpit voice recorder (CVR) comments from the final minute of flight. The ADS-B data show the airplane was aligned slightly right of runway 01 during both approaches.

Figure 7 shows the altitude and airspeed recorded on the FDR for the entire flight. While the first approach resulted in a missed approach, and the second approach resulted in the accident, altitude and airspeed for both approaches were similar<sup>2</sup>. The crew used 10° approach flaps followed by 45° landing flaps during both landing attempts.

Figure 8 focuses on the final 30 minutes of the flight for more detail.

The recorded airplane attitude for the final 30 minutes is shown in Figure 9, and the engine power settings are shown in Figure 10. Both the attitudes and engine data appear normal.

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<sup>1</sup> WAAS collects, processes, and corrects GPS information to ensure that the data the pilot receives can be trusted: [https://www.faa.gov/news/fact\\_sheets/news\\_story.cfm?newsId=14974&omniRss=fact\\_sheetsAoc&cid=103\\_F\\_S](https://www.faa.gov/news/fact_sheets/news_story.cfm?newsId=14974&omniRss=fact_sheetsAoc&cid=103_F_S)

<sup>2</sup> A momentary stick shaker was recorded at 11:10:5.1 EST following the Captain's call for a go-around. The First Officer input 16.7° of airplane-nose-up (ANU) elevator at 11:10:4.2 EST.

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**G. SUMMARY AND CONCLUSIONS**

While the ADS-B data show the airplane was offset to the right of the runway centerline for both landing attempts, recorded FDR data indicate that flight deck instruments were largely “centered” for both the localizer and glideslope with only small deviations consistent with normal pilotage. See Figure 11.

During the pre-departure briefing for the accident flight, the FO mentioned that his previous trip had been to KPQI and that runway 01’s localizer had been about one “dot”<sup>3</sup> off when the aircraft was aligned with the runway during the visual approach. In addition, a company flight crew reported that they had conducted a visual approach into KPQI two days prior to the accident and had reported the localizer anomaly to Boston Center. Despite the notification, there was no NOTAM<sup>4</sup> issued regarding the KPQI ILS RWY 01 approach.

In the days following the accident, an FAA Flight Check determined that the offset was the result of an erroneous signal from the localizer ground equipment. The ILS was immediately taken out of service and a NOTAM issued.

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<sup>3</sup> At the final approach fix, each dot is worth about 300 feet; a mile from touchdown, each dot counts for 100 feet. See Figure 12.

<sup>4</sup> A NOTAM is a “notice(s) to airmen” containing information essential to personnel concerned with flight operations but not known far enough in advance to be publicized by other means.

**H. FIGURES**

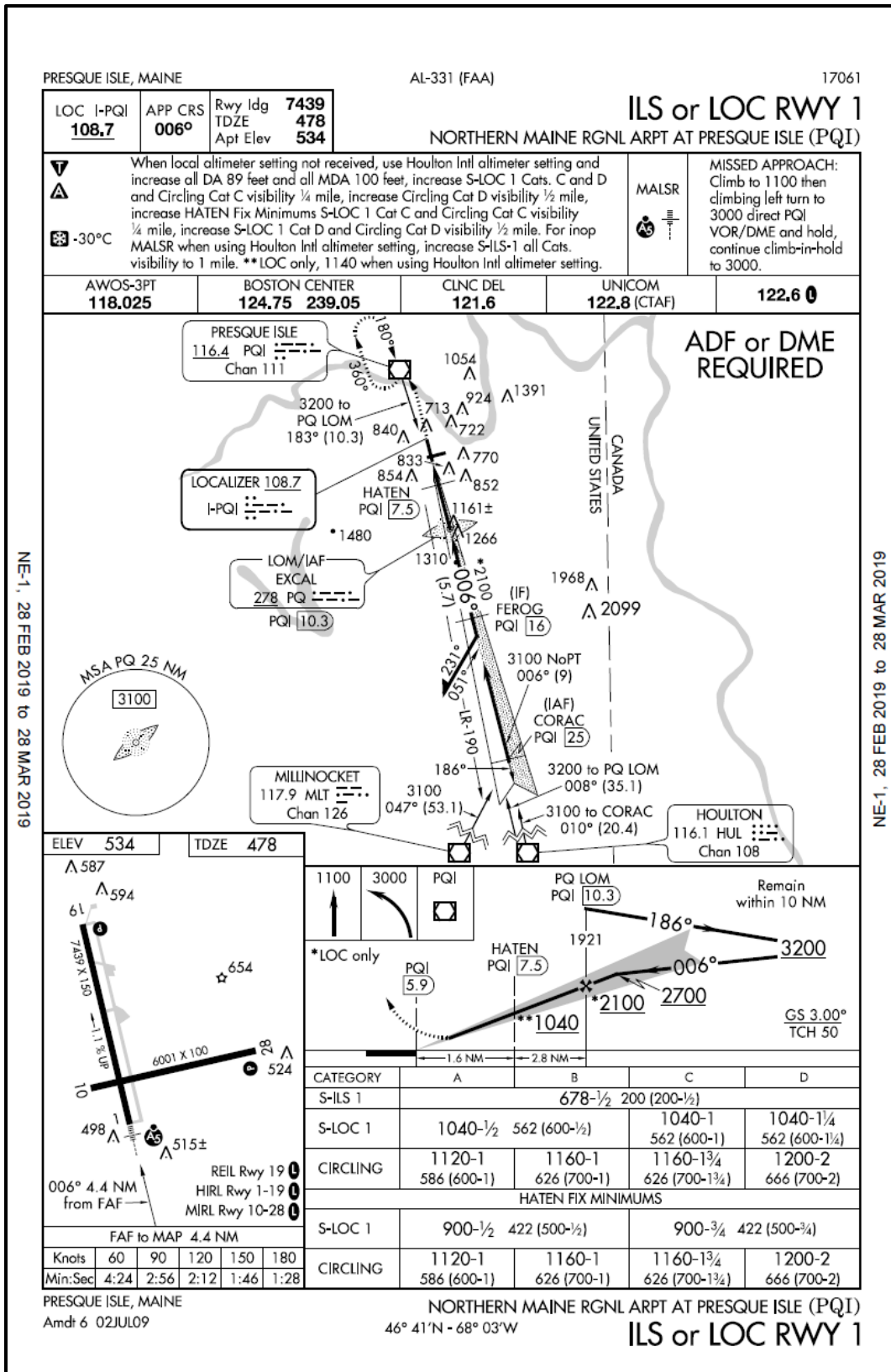


**Figure 1: Accident Airplane, N14171, an EMB-145XR, Before Accident**



**Figure 2: N14171 After the Accident**

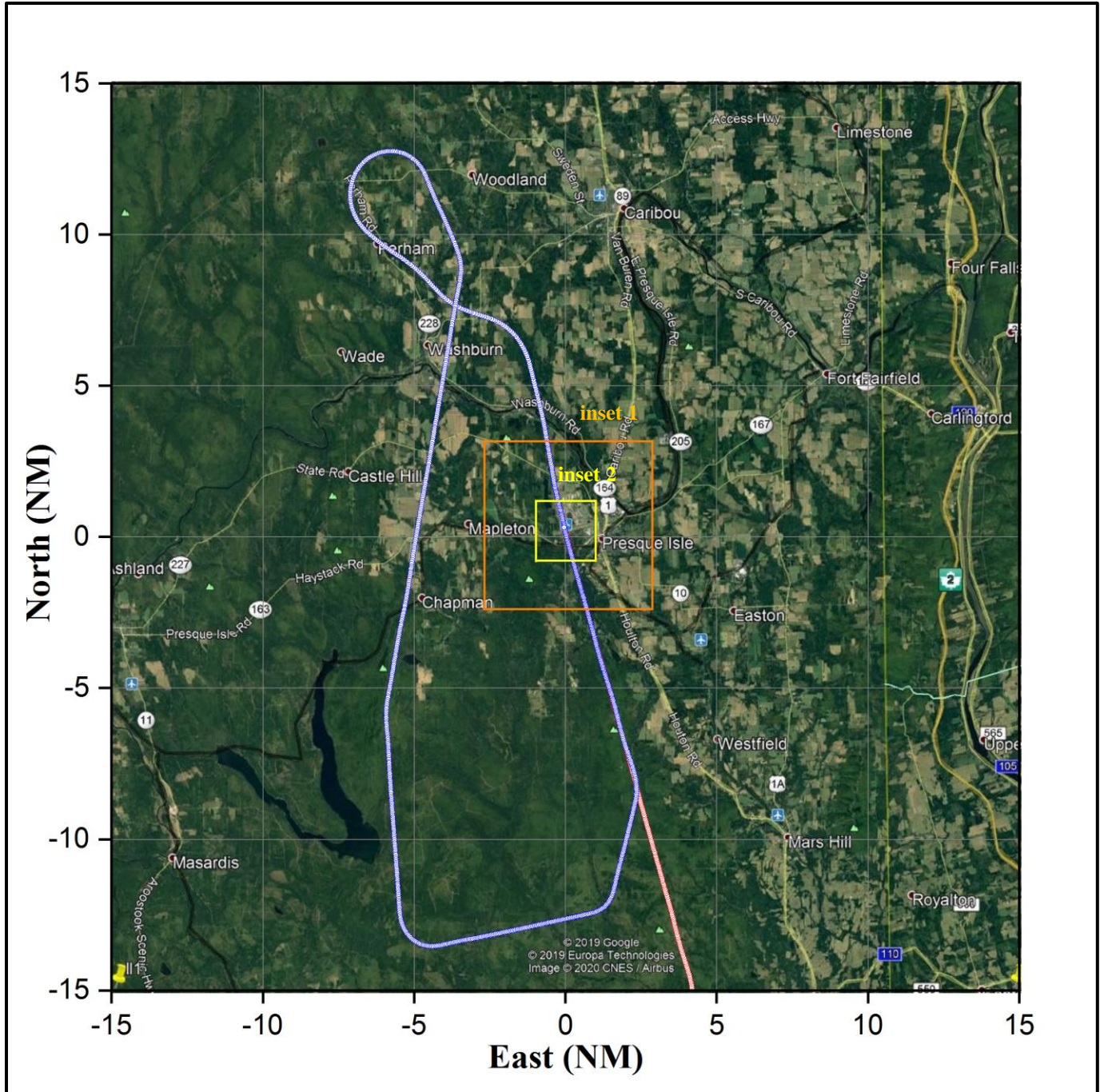
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**Figure 3: KPQI ILS Runway 01 Approach Plate**

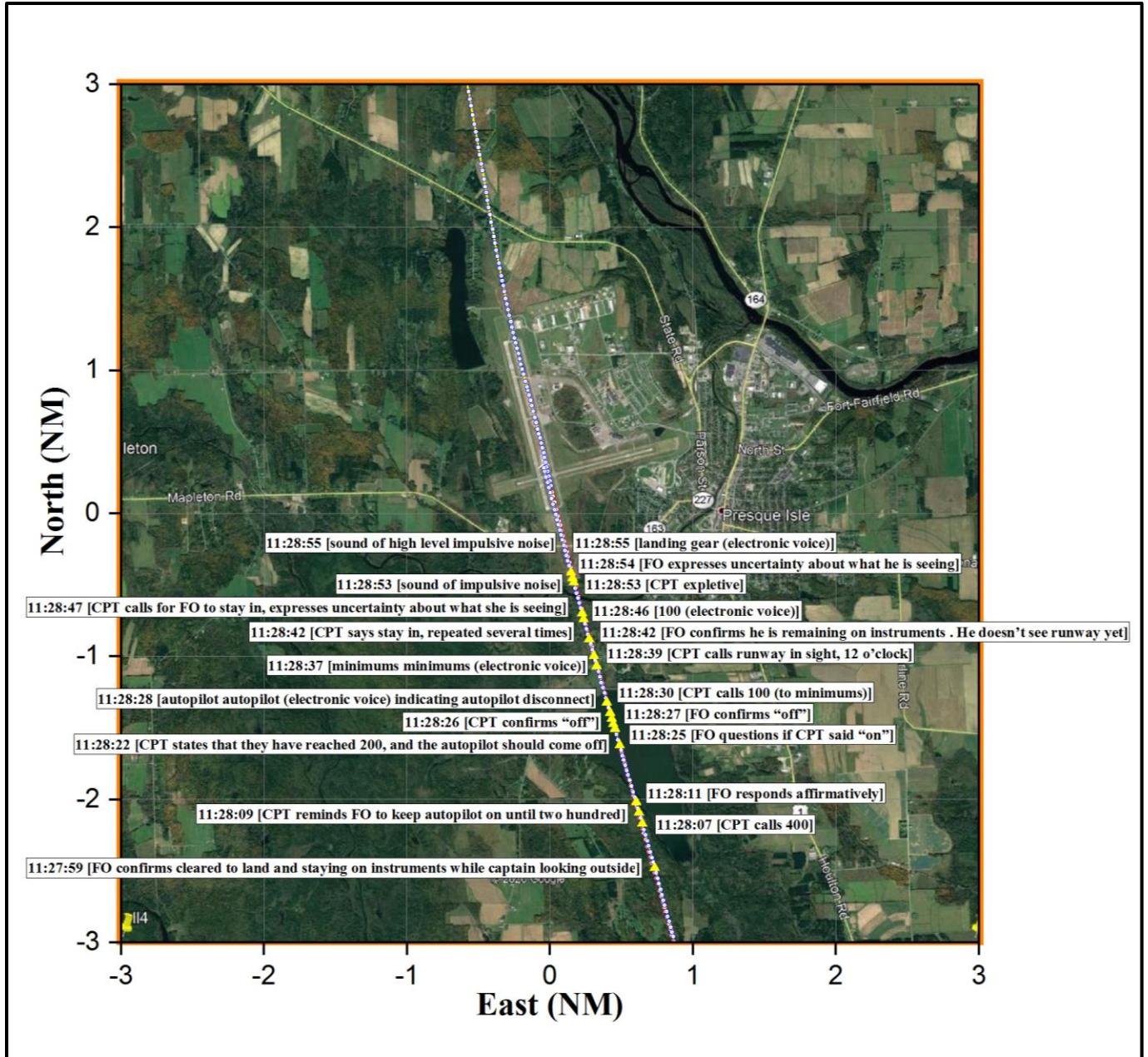


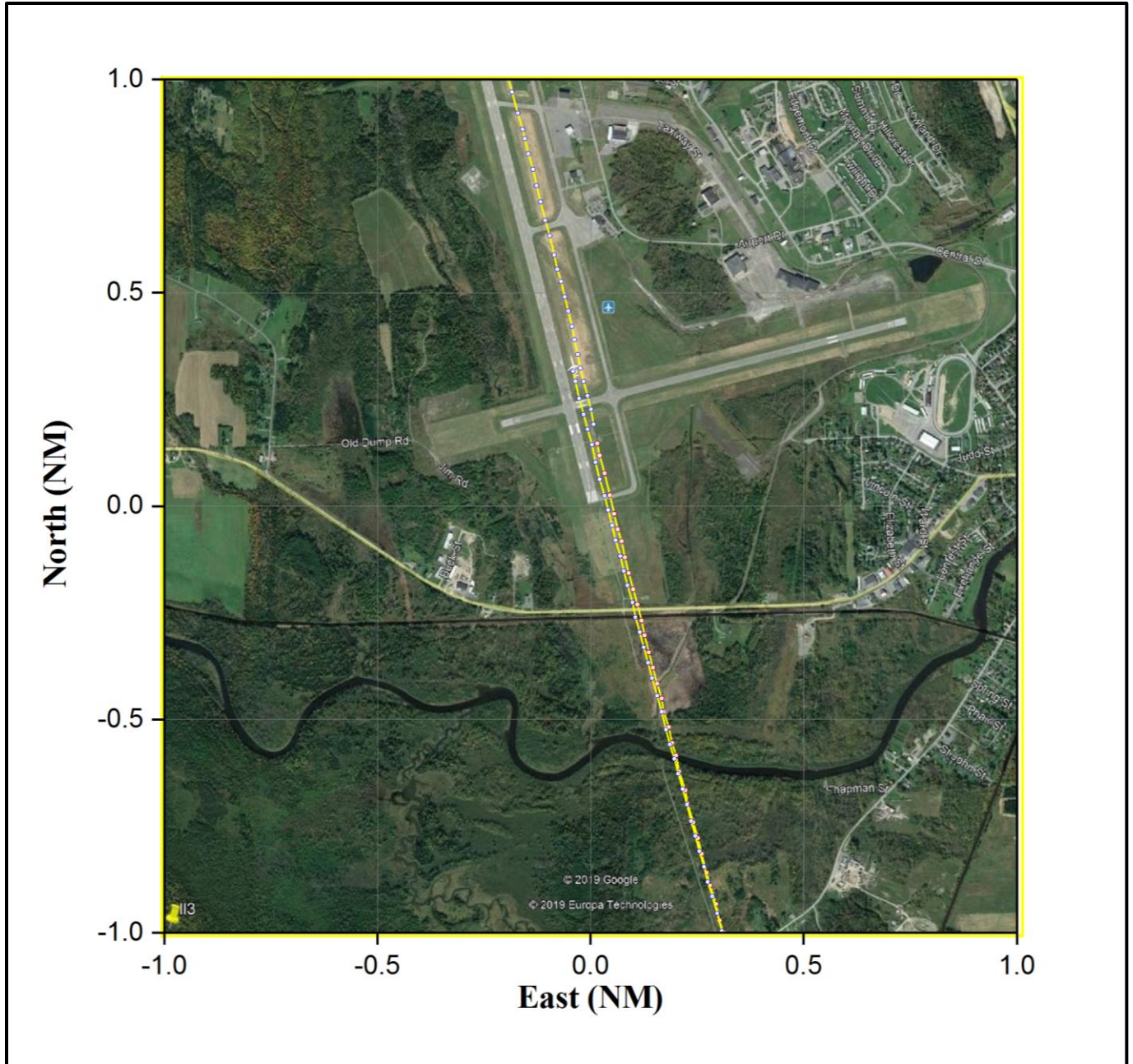
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**Figure 4: Initial Approach (red) and Missed Approach (blue) Ground Tracks from ADS-B**







**Figure 6: inset 2 - Initial Approach (red symbols), Missed Approach (blue symbols), and Landing (blue symbols) Ground Tracks from ADS-B (Airplane symbol shows the approximate location of the wreckage.)**



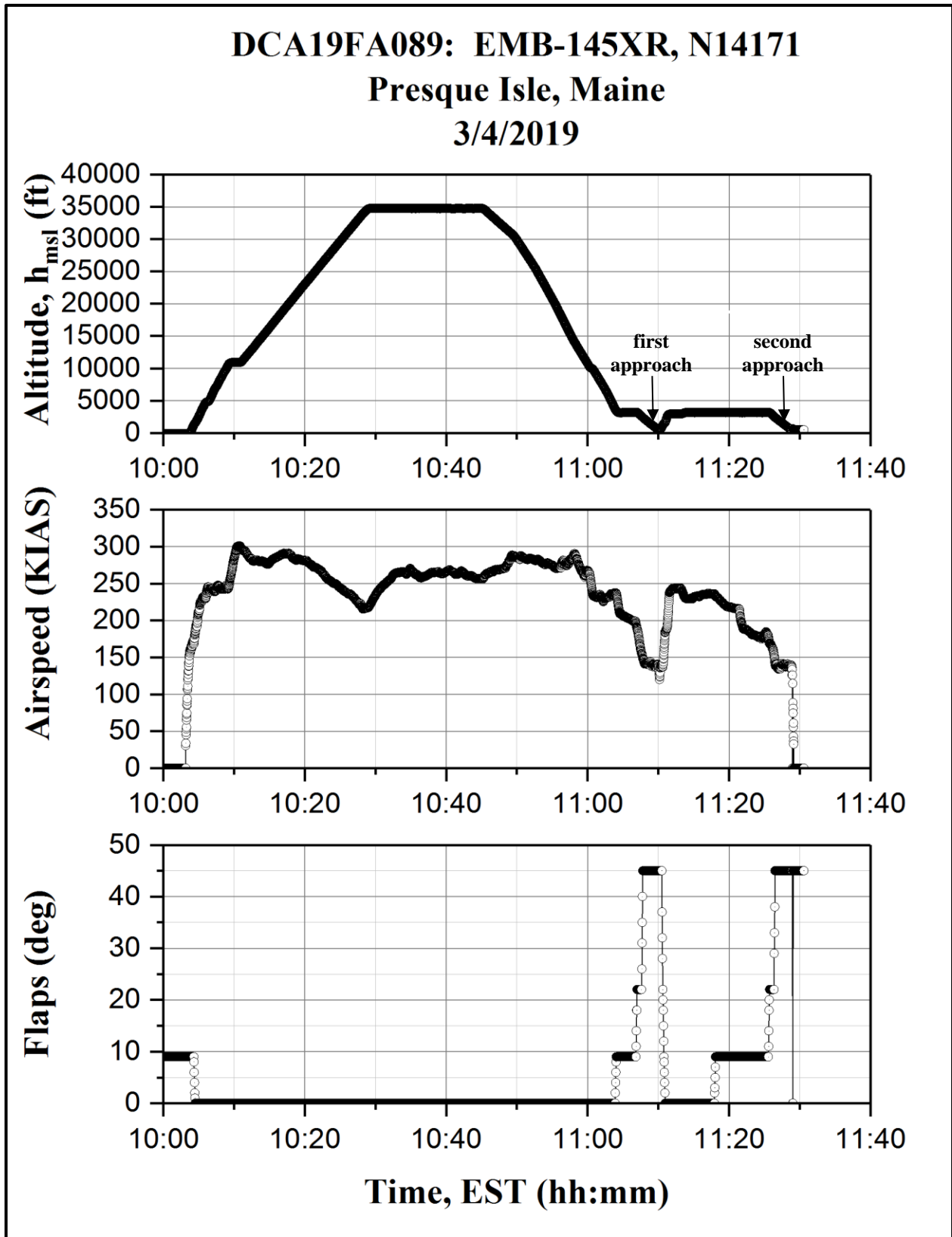


Figure 7: Altitude and Airspeed for Entire Flight Based on FDR Data

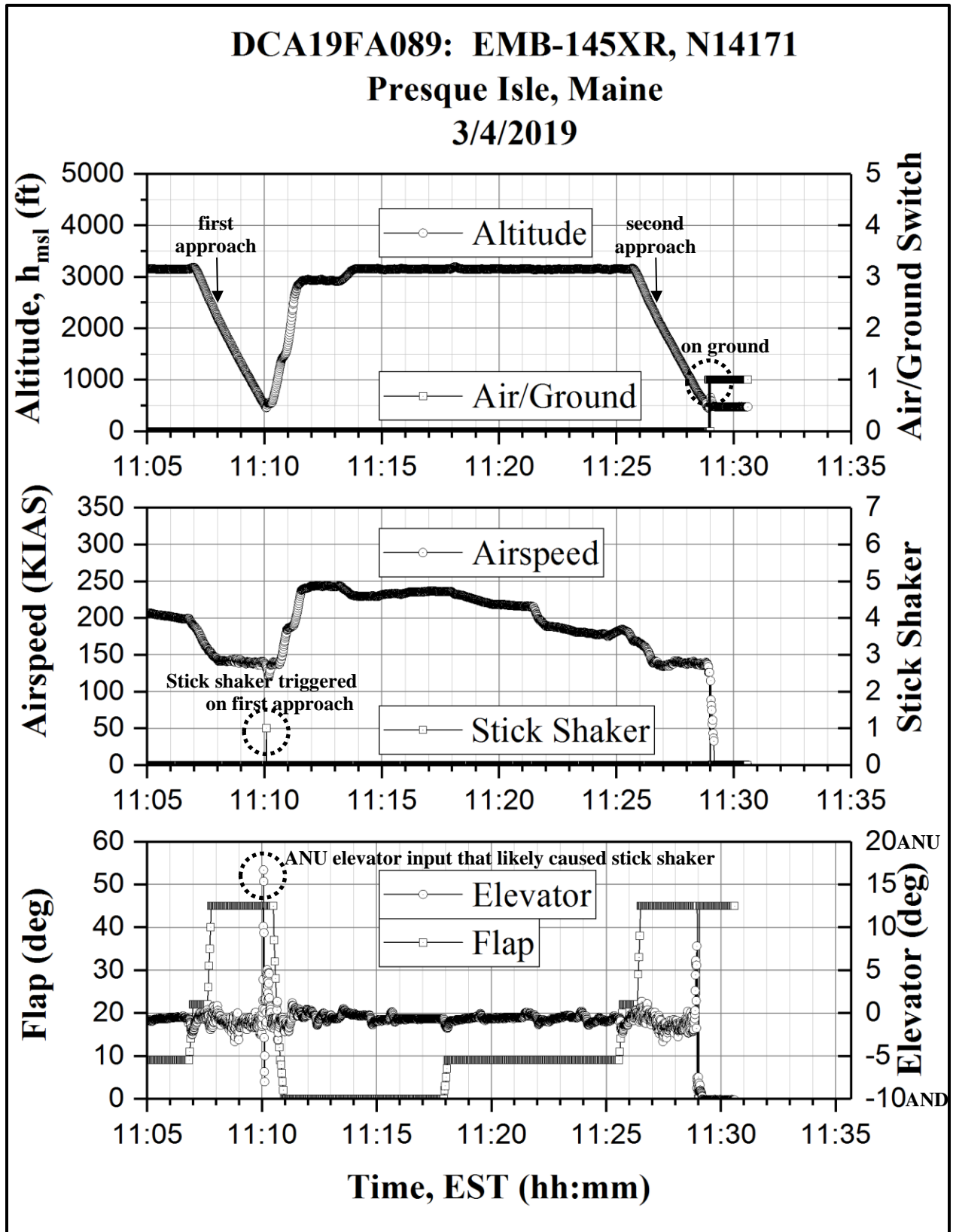


Figure 8: Altitude and Speed for Final 30 Minutes Based on FDR Data

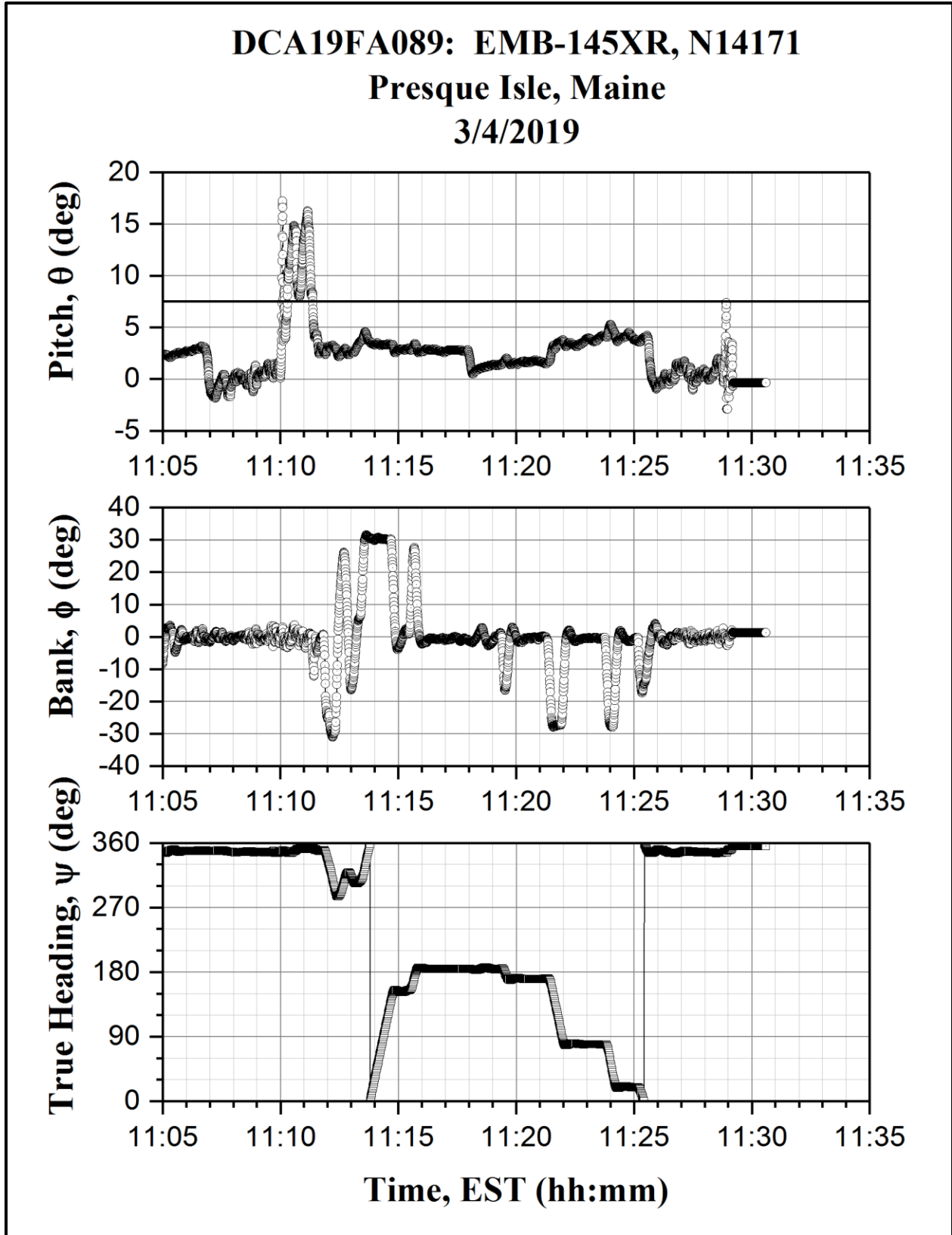


Figure 9: Pitch, Bank, and True Heading for Final 30 Minutes Based on FDR Data



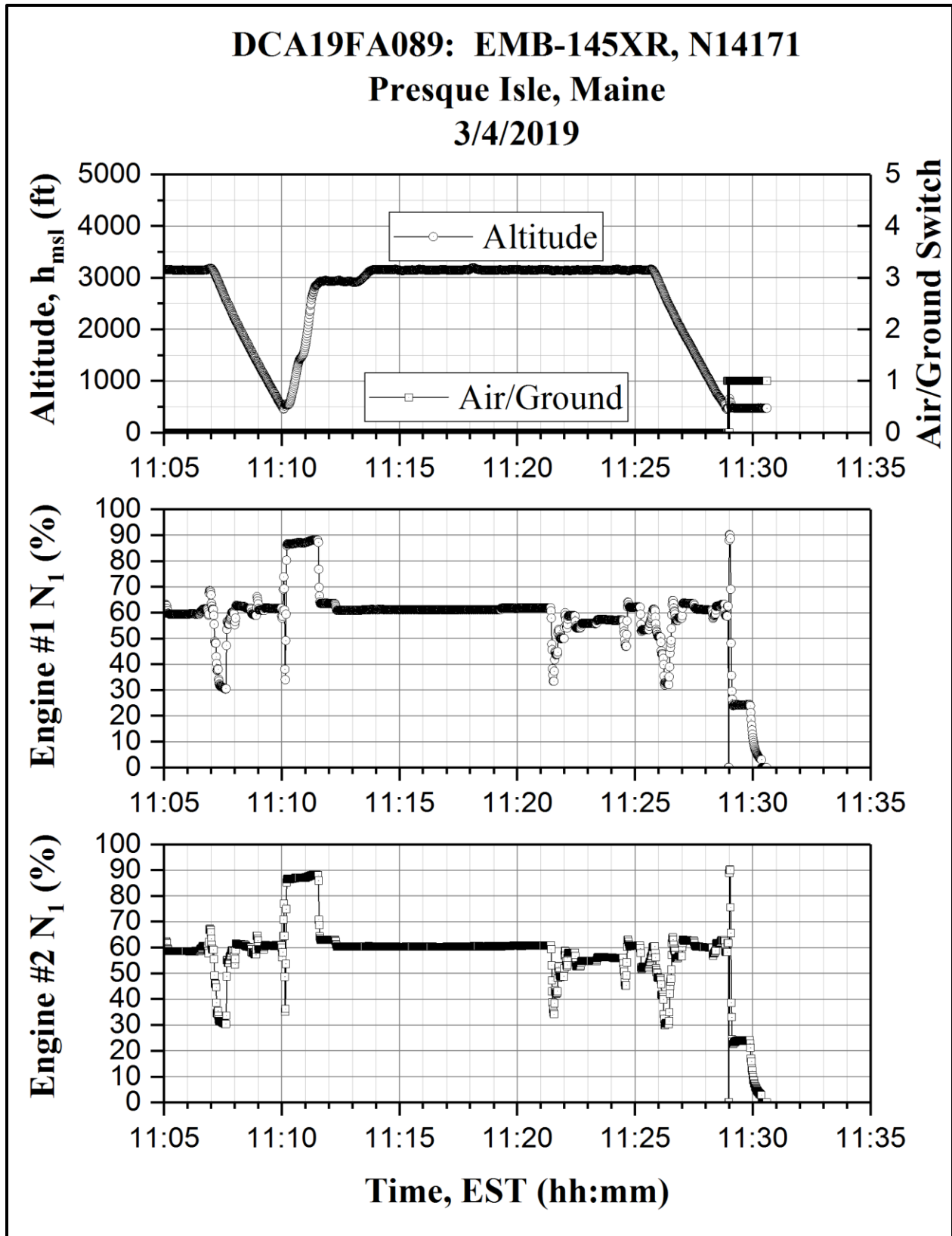


Figure 10: Engine Speed for Final 30 Minutes Based on FDR Data

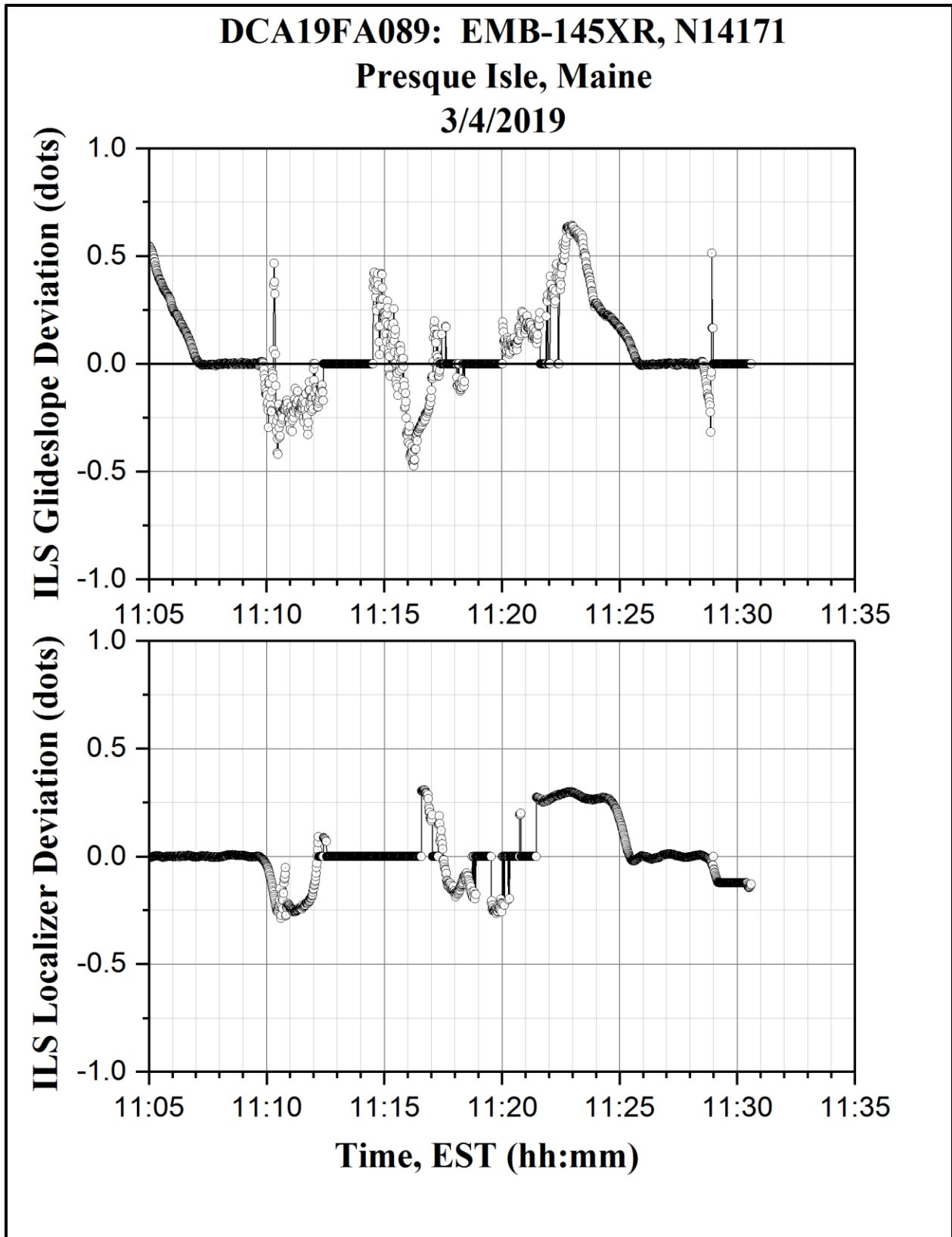
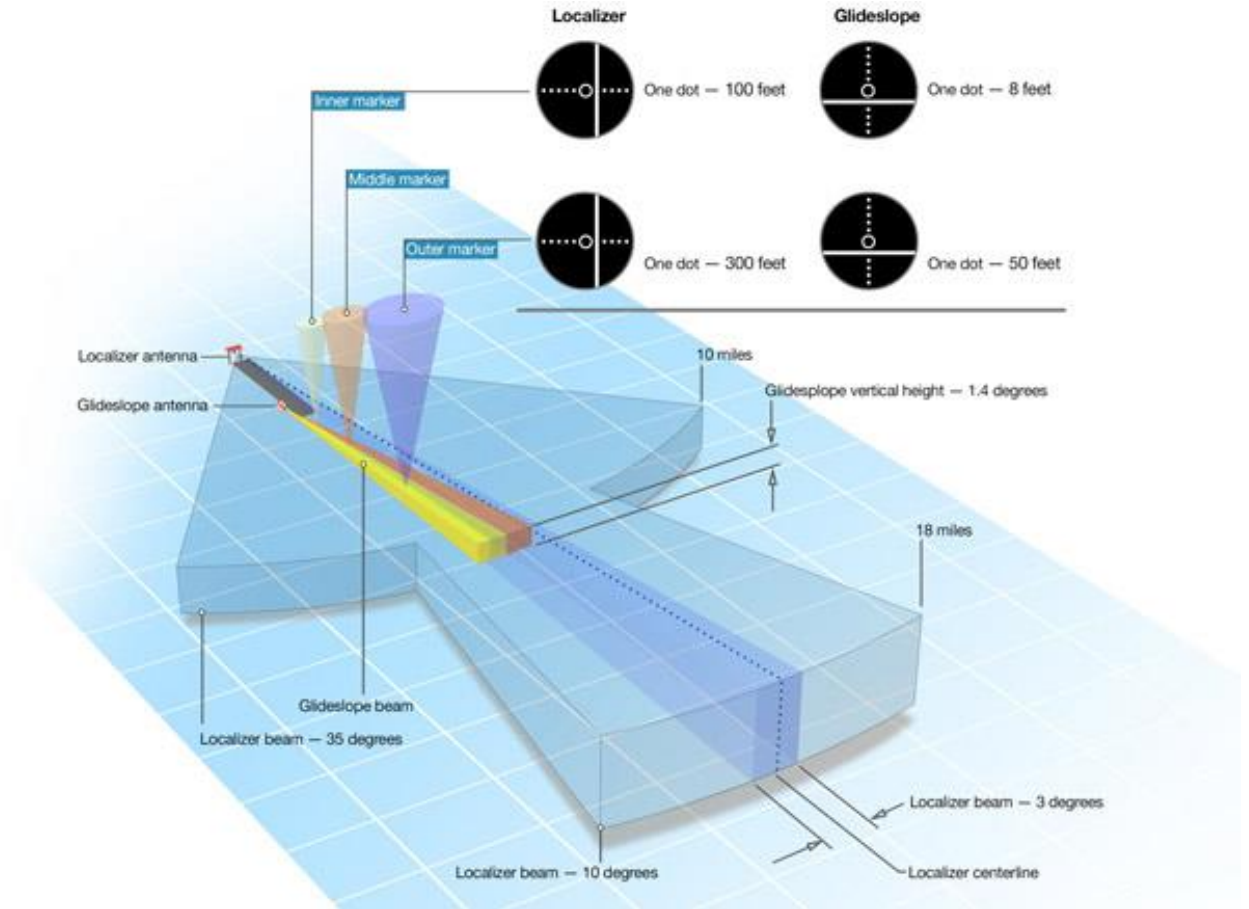


Figure 11: ILS 01 Deviations for Final 30 Minutes Based on FDR Data

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**Figure 12: Typical ILS Coverage (source: AOPA Pilot)**