

# GAO Highlights

Highlights of [GAO-15-443](#), a report to congressional requesters

## Why GAO Did This Study

The AF447 and MH370 disasters have raised questions about why authorities have been unable to locate passenger aircraft. In response to these aviation accidents, government accident investigators, international organizations, and industry have offered proposals that aim to enhance oceanic flight tracking and flight data recovery on a global scale. Given the implications for the U.S. commercial fleet, it is essential that the Congress understand the strengths and weaknesses of these proposals.

GAO was asked to review efforts to enhance aircraft tracking and flight data recovery. This report describes (1) the challenges in tracking aircraft and recovering flight data highlighted by recent commercial aviation accidents over oceanic regions; (2) government and industry proposals to enhance aircraft tracking, and how aviation stakeholders view their strengths and weaknesses; and (3) government and industry proposals to enhance the recovery of flight data, and how aviation stakeholders view the proposals' strengths and weaknesses. GAO reviewed reports by government accident investigators and others, and technology presentations by avionics manufacturers, including current cost data, which was not available in all cases. GAO also interviewed 21 aviation stakeholders, including FAA, the National Transportation Safety Board, and industry, selected based on their expertise in aviation technology and flight operations. FAA and NTSB provided technical comments on a draft of this report, which were incorporated as appropriate.

View [GAO-15-443](#). For more information, contact Gerald L. Dillingham, Ph.D. at (202) 512-2834 or [dillinghamg@gao.gov](mailto:dillinghamg@gao.gov).

April 2015

## AVIATION SAFETY

### Proposals to Enhance Aircraft Tracking and Flight Data Recovery May Aid Accident Investigation, but Challenges Remain

#### What GAO Found

The crash of Air France Flight 447 (AF447) off the coast of Brazil in June 2009 and the disappearance of Malaysia Airlines Flight 370 (MH370) in the southern Indian Ocean in March 2014 highlight several challenges authorities may face in locating aircraft in distress and recovering flight recorders. First, oceanic surveillance is limited, and an aircraft's position may not be precisely known. For example, MH370 continued to fly for several hours outside of radar coverage after onboard communications equipment were no longer working, according to investigators. Additionally, communication and coordination between air traffic control centers in oceanic regions pose challenges. Finally, these accidents show that investigators may have difficulty locating and recovering flight recorders, which are used to determine accident causes, because of the ocean's depth and terrain. For instance, locating AF447's flight recorders took 2 years at a cost of approximately \$40 million.

**Proposals to enhance aircraft tracking:** Following the disappearance of MH370, the international aviation community developed voluntary performance standards to establish a near-term aircraft tracking capability using existing technologies and a long-term comprehensive aircraft tracking concept of operations.

- **Near-term voluntary aircraft tracking performance standards:** An industry task force called for automatic position reporting to airlines every 15 minutes and faster reporting when triggers, such as an unusual change in altitude, are met. According to stakeholders, existing technologies can meet this standard, and many domestic long-haul aircraft are equipped to do so, although some additional ground infrastructure may be needed. However, some airlines may face costs to equip aircraft with these technologies. In the longer term, technologies like satellite-based surveillance may provide global aircraft tracking.
- **Long-term global aeronautical distress system:** The International Civil Aviation Organization has proposed a long-term framework, which is designed to ensure an up-to-date record of aircraft progress and, in the case of emergency, the location of survivors, the aircraft, and its flight recorders. Stakeholders noted that the new framework begins to address the need for improved coordination and information sharing. One component is a tamper-proof distress tracking system, which is not yet available.

**Proposals to enhance flight data recovery:** Low-cost actions are planned to increase the battery life of the underwater locator beacon—which emits a “ping” to help locate the flight recorders—from 30 to 90 days. In the longer term, two proposals seek to enable flight data recovery without underwater retrieval; however, neither would eliminate investigators' need to recover the wreckage itself or eliminate all search and recovery costs.

- **Automatic deployable recorders:** Designed to separate automatically before a crash and float, deployable recorders may be easier to recover. However, stakeholders are divided on equipping the commercial fleet. Some raised concerns that safety testing is needed and that equipage costs are high and potentially unnecessary given the rarity of oceanic accidents.
- **Triggered transmission of flight data:** Transmitting data automatically from the aircraft during emergencies would allow for some post-flight analysis when the flight recorders cannot be easily recovered. However, some stakeholders raised feasibility and data protection concerns.