NINTH MEETING OF THE ASIA PACIFIC ACCIDENT INVESTIGATION GROUP (APAC-AIG/9)

(27-28 October 2021 on Virtual Platform at 11.00 hrs. Bangkok Time UTC+7)

Agenda Item 4: Enhancing accident investigation capabilities

NEW FLIGHT RECORDER TRIANGULATION SYSTEM

(Presented by Singapore)

SUMMARY

Singapore's Transport Safety Investigation Bureau (TSIB) has successfully developed a new Flight Recorder Triangulation System to enhance its capability for locating flight recorders in an aircraft sea crash.

1. INTRODUCTION

1.1 Flight recorders of aircraft contain important information that can help investigators understand the circumstances leading to an aircraft crash. The early recovery of flight recorders is key to an effective investigation. The recovery of the flight recorders is even more challenging when the aircraft crash into water. As early as in 2009, after the crash of the AF447 in the Atlantic Ocean, the then AAIB Singapore had been exploring ways to expedite the locating and recovering of flight recorders from underwater.

1.2 In 2011, the AAIB developed a ruggedised laptop, with customised triangulation software and built-in GPS, and coupled to an Underwater Locator Beacon (ULB) detector and a digital compass, was used to automate the process of locating flight recorders from underwater. These hardware and software formed the first generation of TSIB's Flight Recorder Triangulation System (FRTS-1).

2. DISCUSSION

2.1 The FRTS-1 had successfully located and recovered the flight recorders in the aftermath of the following occurrences:

- Laos Airlines ATR72 Pakse Mekong River in 2013
- AirAsia A320 in 2014
- Lion Air B737 MAX in 2019

2.2 Due to aging of the FRTS-1 and obsolesce issues, a new system had to be developed to replace the FRTS-1 in order not to affect the capability in the underwater search of flight recorders.

2.3 The TSIB initiated a project in 2019 to develop the second generation of FRTS, the FRTS-2, through incorporating new software and sensors as well as TSIB investigators' feedback from

operational experience. The project was completed in early 2021 and FRTS-2 incorporated the following usability and functionality improvements:

- Better accuracy in triangulating for a probable flight recorder location
- New functions such as:
  - Creation of search plans to suit different phases of the search operation
  - Navigation guidance for investigators to guide a boat serving as the search platform to the next detection point
  - Export of data in common readable format to facilitate information sharing with external stakeholders, e.g. the search and rescue authority

2.4 FRTS-2 integrates search planning and triangulation features for TSIB to achieve a more streamlined operation. This enhances TSIB's capability to locate and recover the flight recorders in a short time. A quicker flight recorder recovery will reduce the cost and resources to remain out at sea.

2.5 TSIB has acquired three sets of FRTS-2 and is willing to support other States' underwater search operation for flight recorders.

3. ACTION BY THE MEETING

3.1 The Meeting is invited to note the content of this paper.

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