Sharing experience of investigation of Boeing 737-500 accident

Paper for ISASI Annual Seminar 2022

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On 9 January 2021, a Boeing 737-500 was being operated from Soekarno-Hatta Airport, Jakarta with intended destination of Supadio Airport, Pontianak, Indonesia. The aircraft departed at 14.36 LT, on board the aircraft was 2 pilots, 4 flight attendants and 56 passengers. About 13 minutes after departure, the flight ended on Java Sea, about 11 Nm from the departure airport. All of the occupants were fatally injured.

Komite Nasional Keselamatan Transportasi (KNKT), the Indonesia accident investigation authority, conducted investigation under the ICAO Annex 13. Participated in this investigation were the National Transportation Safety Board (NTSB) of the United States of America (Accredited Representative), Federal Aviation Administration (FAA), Boeing and General Electric (GE) (Advisor to NTSB Accredited Representative), Air Accident Investigation Branch (AAIB) of the United Kingdom and Transport Safety Investigation Bureau (TSIB) Singapore (States provide assistance).

The flight recorders recovery team utilized triangulation to locate the flight recorders Underwater Locator Beacon (ULB). The Flight Data Recorder (FDR) recovered on 12 January 2021 along with the ULB of both FDR and Cockpit Voice Recorder (CVR), and both flight recorder electronic units. The search for the CVR memory unit continued, as the ULB was no longer attached to the CVR, the search conducted manually.

Even in shallow water, which was about 16 meters deep, the search for the CVR was quite challenging. The team successfully recovered the CVR after 3 months of operation and utilizing several methods including the dredging.

The accident occurred during the Covid-19 pandemic. Quarantine was required for travelers from overseas to Indonesia. The KNKT requested special approval of quarantine exemption for the accredited representatives and advisers.

Several modifications were made to comply the health protocols while conducting the investigation such as meeting room adjustment, online interview protocol, group meeting and component examination. The restriction during the pandemic contributed to the prolong investigation.

The investigation conducted several examinations to the components that were removed prior to the accident. The component and aircraft manufacturer provided significant contributions to the investigation. The component examinations did not find any component abnormality.

The flight experienced Loss Control In-Flight (LOC-I) following asymmetric thrust levers position. The investigation also examined the maintenance actions that were taken during the rectification of several autothrottle malfunctions. The investigation believed that the thrust asymmetric was caused by the high friction on the mechanical component of the thrust levers.

The Cruise Thrust Split Monitor (CTSM) that was design to disengage the autothrottle during an asymmetric thrust levers did not active in time, resulted in the greater asymmetric power. The CTSM was function of several inputs, including both engines N1, thrust levers position, flap position, air data computer and flight spoiler position. The data showed that the CTSM eventually disengaged the autothrottle, however it was delayed. The investigation concluded that the delay of the CTSM was caused by rigging of the flight spoiler.

Following the asymmetric power, the aircraft turned to the left, instead of to the right. The pilots did not notice the condition until the EGPWS 'Bank Angle' warning active. Thereafter, the autopilot disengaged and the aircraft entered upset condition and unable to be recovered. The Upset Prevention and Recovery Training (UPRT) to the pilot had not been properly conducted.

The accident has attracted public attention. Shortly after the accident, some pilots made analysis based on the *flightradar-24* data and uploaded in the social media. This incorrect information might have created incorrect public opinion and became the investigation responsibility to correct the public opinion.