

Challenges in the Investigation of Underlying Root Causes in Aviation Accidents

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ABSTRACT:

The investigation of serious incidents and accidents is typically comprised of the chain of events and conditions, leading to unsafe occurrences. The air safety investigators are following a series of logical parameters and rational factors in the accident causal analysis. This paper and presentation are evaluating the association of latent risks in the investigation. The presentation utilizes the debrief of two accidents cases to demonstrate the hidden recurring root causes. The first accident is about a mechanical design failure, for the case of IIAF Flight 48, a 747 commercial derivative flight on the route from Tehran, Iran to McGuire Air Force Base in the United States, with layover in Madrid, Spain on May 9, 1976. The Boeing 747-131F operating the flight crashed during its approach to Madrid, killing all 17 people onboard. The next case is relevant to human factor in the case of IAF C-130, a military cargo aircraft on the domestic route from south of Iran to Captain Tehran in north, during Iran – Iraq war on September 29, 1981. The Lockheed Hercules crashed, killing 80 people onboard and a few survived the accident, including the pilot. Colonel Forghani was the primary investigator of both accidents and in the case of the first, the technical failure and 2nd case the human factor was identified as the main cause. The cascading causal events and conditions have led into similar catastrophic incidents and accidents. This study is evaluating the insidious sub surface factors in those investigations and the aftermath of final report. The paper closely reviews the record of facts and data, analysis of factual data and the conclusion of findings and causes. The authors debrief the final findings in the report for both cases and recurring similar predicaments in the investigations, leading to other similar accidents. Safety assertion and terminating corrective actions are discussed with pervasive indication of neglecting and ignoring risks trend, that hinder the accident prevention and safety management system today.

¹Bio. Col. Bahman Forghani was born in Tehran, Iran in 1944. He graduated from high school in 1961 and continued as an elementary teacher until 1964 when he joined Imperial Airforce Academy pilot training program as an aviation cadet. After completing 100 hours of training in T-6 Texan, he was sent to United State to attend undergraduate pilot training program at Craig Airforce Base Selma, Alabama on the historic day Martin Luther King Started his Rally. After graduation with 300 hours in Cessna T-41/T-37 and Lockheed T-33 T-Bird and receiving pilot wings as Second Lieutenant he was returned to Iran and assigned to 101 tactical reconnaissance squadron (TRS) at TAB-1 Mehrabad in 1966. While serving to fly RT-33 and newly arrived RF-5, he was assigned as the Assistance Safety chief of TAB -1 in 1967 until 1973. His first aircraft accident investigation was conducted in South of Tehran where two T-33 crashed into a mountain in formation flight. In 1971 he was sent back to United States to attend aerospace safety management program in University of Southern California, Los Angeles followed by jet engine accident investigation program in Chanute AFB, Illinois. In the last year of serving the 101 TRS he was transferred to F-4E as the pilot in command, later becoming instructor pilot and navigator. In 1973 he was transferred to TAB-3 Shahrokhy as the chief of safety of the base until 1977 when
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he was assigned to the IIAF headquarters as director of the fighter aircrafts safety. He remained in service through the 1979 Iranian revolution and was imprisoned and later released to resume service as the director of fighter aircrafts safety. In June 1980 he was transferred to TAB-4 Vahdati as the base commander where soon after Iran-Iraq war started in September 1980 lasting until august 1988. In 1985 he was assigned to investigate the total loss of an F-4E being a valuable asset in midst of the war - during an engine test run up by maintenance crew. The investigation results surfaced the direct order of the Airforce commander to conduct the engine run up inside a shelter against all the safety regulations. Due to close ties of the commander to the Iranian President Ali Khamenei (later supreme-leader) Col Forghani was forced into retirement to close the case. He has flown 4320 hours of fighter jets and more than 1000 hours of smaller transport aircrafts. He immigrated to US in 1989 and since then he has been operating his own business in Fan Francisco, California.

²Bio. Dr. Shahrooz Mark Jahanbin is a scientist, engineer, inventor and educator in the field of structural design, analysis, qualification, certification, and continued operational safety. His expertise in the domain of airworthiness / spaceworthiness, expands over two decades in leading industries such as former Boeing and currently Space Exploration Technologies or SpaceX. Mark Jahanbin was a senior safety manager and principal accident investigator for Leonardo Helicopter. His technical domain is the solution selection and compliance recommendation for design and manufacturing quality escapes, leading to serious incidents and accidents prevention programs. He has developed mutual authorities' accident investigation mandate for rotorcraft system with FAA and EASA regulatory agencies for AgustaWestland family fleets, including AW609. Mark Jahanbin has a PhD in mechanical and aerospace engineering, and a Master's in business advanced policy from Texas A&M University. He is an adjunct faculty with Embry Riddle Aeronautical University as well as sponsorship chairperson for the International Society of Air Safety Investigators (ISASI).

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