Examination of Mechanisms of Injuries due to Aircraft Slide Evacuation

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Abstract

This paper discusses potential injury mechanisms during emergency evacuation of commercial aircrafts operated under provisions of 14 CFR Part 121. As dictated by Code of Federal Regulations (14CFR § 25.810), exits in aircrafts at heights higher than 6 feet from the ground are required to have inflatable slides. Use of such slides for evacuation of the aircraft during accidents is essential. However, there are non-accident conditions which may require evacuation of aircrafts. In particular, smoke in cabins or suspicion of fire in the aircraft often results in emergency evacuation being ordered. Injuries purely due to use of such slides have been documented in the past. This study is focused on emergency evacuation events occurred during the more recent period of January 1st, 1996 to June 30th, 2006. Primary data sources included the FAA, NTSB, and commercially available databases. In addition data was colleted from Aircraft Rescue and Fire Fighting (ARFF) groups of major airports throughout the United States. During this time frame, 131 emergency evacuation events involving slides were identified. The data shows that over this period, the predominant injury mechanisms due to emergency slide evacuation are abrasions and sprains. The data also shows that on an annual basis, more than 30% of all emergency evacuations involving slides lead to injury. There was only one fatality for the entire 10-year period which was due to special circumstances.

One of the main objectives of this study is to examine and understand the mechanisms of injuries during slide evacuations and ways to reduce those injuries. In addition, external factors (such as wind) as well as airline protocol, ARFF procedures are considered. This paper presents an examination of the injuries using AIS (Abbreviated Injury Scale) and the mechanisms of the injuries.

KEY WORDS: emergency evacuation, slide, injuries, incidents, mechanisms, airplane, safety