AIRCRAFT SEATS PERFORMANCE EVALUATION FOR LARGER PASSENGER POPULATION USING ANALYTICAL METHODS

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Dynamic aircraft seat regulations are identified in the Code of Federal Regulations (CFR), 14 CFR Parts § XX.562 specifying full-scale dynamic testing on production seats. These tests are designed to demonstrate the structural integrity of the seat to the airframe structure to withstand an emergency landing loads and occupant safety. These tests are carried out on a 50th percentile Hybrid II Anthropomorphic Test Device (ATD) or equivalent, representing average 50 percent of human population. In this study, efforts have been made to evaluate seat performances for larger passenger population (95th percent) using analytical methods such as Finite Element Analysis (FEA). For this purpose, the base FEA seat model is validated with the test and then results comparison of the 50th percentile and the 95th percentile virtual ATD models (v-ATDs) is carried out on the test parameters such as the restraint loads, the floor reactions, the head paths and stresses in the seat components.