

New metal fuselage section arrangement minimize assembly time

ABSTRACT

The development approach of the aircraft industry is briefly explained. Analyzing innovation attempts from 1950s to present showed the introduction of the coil fuselage concept and how it developed into the integral frames and panels concept currently pursued. The novel design is then proposed to bridge the gap between impractical novel ideas and industry needs which put cost first. The new structure is to require minimum time for assembly. It is also to eliminate the need for advanced manufacturing, usually suggested by innovative ideas in the field. The new structure is based on common aluminum alloy sheets to minimize variance from the conventional semi-monocoque structure manufacturing requirements. Whereas numerical comparison with the conventional structure showed up to 15% weight savings and about 45% decrease within inquired maximum stress could be achieved. The stress reduction was suggested to be a result of the new structure's arrangement homogeneity.

Keyword: Fuselage; Integral; Airframe; Assembly; Design; Manufacture