Use of Dynamic Analysis for CBA

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Ipeco Holdings Limited: Products Range

- **Seating**
  - Crew seats (pilot & co-pilot);
  - Flight deck (Obs.) and attendant seats;
  - Executive passenger seats;

- **Galley Equipment**
  - Galley inserts;
  - Beverage maker;
  - Oven, Fridge/Cooler.

- **Electronics**
  - Power supply modules;
  - Power systems/Battery chargers.

- **Composites**
  - Aircraft seating & interiors;
  - Aerospace primary & secondary structures;
  - Rail & Space.
Use of Analysis

• Ipeco has with increasing success used dynamic analysis since 2001 to guide design and improve confidence in the outcome of physical testing.

• The number of certification and occupant injury tests is minimal per program when compared against a typical cabin seating program.
  – Therefore not the same incentive to take a certification by analysis approach.

• The variety and complexity of the moving parts and mechanisms do not easily lend themselves to certification by analysis.

• Actively involved in SAE Seating Committee (Andrew Cullen).
CBA - Developments

• Dynamic properties of foams with an understanding of the effects of the containment leather/cover (e.g. friction).

• Approximations are made by modelling bolts as rigid bodies. More and faster computer resource will be required to produce detailed models.

• Other modelling approximations for locking, height, rotation, recline and pan tilt mechanisms. These will have to be replaced by substantiated detailed models.

• Substantiation of analysis models for a widely differing range of products will be time consuming. Commonality will not be an option.

• Development of methods of quality assurance for Modelling & Simulation for CBA. Validation Analysis Report alone is insufficient – more rigorous checking on every stages of M&S.
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