Title: Crashworthiness Research on Cabin Structure at JAXA

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Abstract:

The Crashworthiness Section of Aviation Program Group in Japan Aerospace Exploration Agency (JAXA) is responsible for crashworthiness research and impact dynamics matters on aircraft. Research at our section is aimed at developing improved numerical and analysis methods to improve the capability of simulation tools for providing substantiation to airworthiness certification and designing safety aircraft structure. For this purpose, we have been conducting many crash tests on various scale size articles to acquire reference data for numerical simulation, for example, MH2000 helicopter full-scale crash test, YS-11 airliner fuselage section vertical drop tests, scaled fuselage section vertical drop tests, scaled underfloor fuselage substructure vertical drop tests and component compression impact tests. We do numerical simulation with using a nonlinear transient dynamic finite element code LS-DYNA. Now we acquire retired YS-11 airliner full-scale structure and plan to conduct vertical drop tests of fuselage sections in near future. In the tests, we will not only use the test results as verification of our numerical simulation modeling method, but also will refit underfloor components or structure. We will evaluate their ability to reduce crash damage and to absorb shock energy in order to find safer fuselage underfloor structure concept.

In this presentation, we explain our brief history of crashworthiness research on cabin structure, current activity and near future activity plan and would like to discuss our activities and probability of cooperation research with other organizations in near future, especially for the YS-11 fuselage section vertical drop tests.