Numerical simulations of high temperature jets from the main propulsion system and auxiliary power unit impinging against a construction of the passenger plane

[1]

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Newly designed passenger aircraft should meet safety and reliability requirements in imaginable emergency situations, one of which is the burn-through of a combustion chamber body of the main propulsion system (MPS) and of the auxiliary power unit (APU), both on the ground and in-flight.

In accordance with the international safety standards, an emergency case is investigated using STAR-CCM+ and Abaqus in which, due to local disruption of the combustion chamber, a flame jet is erupted. As a result of the flame jet impingement some parts of the aircraft fuselage can substantially be heated, deformed and, possibly, ruptured.

This presentation gives results of numerical investigations of deformation of aircraft parts entering the zone of possible gas-dynamic and thermal effects from the flame jet.

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