

IAF SPACE TRANSPORTATION SOLUTIONS AND INNOVATIONS SYMPOSIUM (D2)
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REUSABLE CRUISE ROCKET FOR URGENT CARGO DELIVERY IN CASE OF DISASTER

Abstract

One of the most important problems of XXI century is global climate changing. An aspect of particular concern is total rapid growth of earthquakes, storm cyclones, tsunamis, hurricanes and other natural disasters that prevails in last decade.

In the event of a disaster, the time is of the essence and the main factor of saving people is speed of vital means delivery. Nowadays the fastest way to deliver cargo is rocket, but it was never used for saving people lives, and first rockets were developed to sow death and destruction. Only over time, they became an indispensable means of space exploration.

Reusable cruise rocket development for vital means urgent delivery to the disaster epicenter at any point of the planet is most desirable. It will deliver, for example, lifeboats, first-aid kits and life jackets to the place of disaster.

The cruise rocket consists of a slender fuselage containing propellant tankage and payload bay, combined (air-breathing and rocket engines) propulsion system, with delta wings. The vehicle takes off and lands horizontally on its own undercarriage. The rocket uses combined propulsion system in air-breathing mode to accelerate from take-off to Mach 6 which allows 440 tons of atmospheric air to be captured and used in the engines, of which 100 tons is oxygen which therefore does not have to be carried in propellant tanks. At Mach 6 and 30 kilometers altitude the combined propulsion system transitions to its rocket engines, using liquid oxidizer stored on board, to continue its flight to target point at a speed of Mach 25. The fastest transport systems are achievable through the high efficiency of the combined propulsion system and the elimination of the need to carry on-board oxidizer during air-breathing flight segments. The resulting increased system performance enables aircraft-like horizontal takeoff and landing operations, which reduce cost, infrastructure, and mission timelines while increasing responsiveness and system reusability. The cruise rocket will be able to deliver vital cargo to any part of the planet in case of natural or technological disasters.

If we are able to create something for saving people lives, we have to implement it. We are not able to control environmental destructive forces, but we can use human ability to invent for saving people lives.