SPACE TRANSPORTATION SOLUTIONS AND INNOVATIONS SYMPOSIUM (D2)
Heavy lift launchers capabilities and new missions (8)

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ZENIT-BASED MODULAR HEAVY AND SUPERHEAVY CAPACITY ROCKETS

Abstract

The efficient way to reduce expenses when building the heavy-lift launch vehicle is to use modular concept. For example, Energia launch vehicle, Delta IV Heavy etc. One of the options of heavy and superheavy capacity rockets development is to use Yuzhnoye-designed Zenit Stage 1 module as a first stage. Such rocket module emerged from the development of heavy-lift Energia LV, which strap-on booster (Module) was initially a Zenit stage as a result of Yuzhnoye and NPO Energia cooperation. Rocket module is of excellent specific performance and is highly reliable, since its technologies and structural components are already test-proven after multiyear use in Zenit and Energia family launches. If necessity arises reusable option is feasible as well as its use as a part of LV to launch the reusable shuttle. Different objectives and developer resources may prompt different options of applications of Stage 1 rocket module in heavy and superheavy capacity rockets. Versatility of the concept allows different combinations of rocket modules and core. Countries planning to develop heavy and superheavy LV can become potential partners. Yuzhnoye SDO has already obtained experience in design of modular concept heavy-lift launch vehicles. Besides the above mentioned Energia LV, Yuzhnoye has also developed the family of heavy-lift launch vehicles with capacity to lift 55 tons to LEO (late 80s). Advanced heavy and superheavy launch vehicles can be applied to orbit blocks of bulky orbital complexes, large-sized geostationary platforms or clusters of heavy spacecraft, as well as large-size components of lunar or interplanetary manned complexes or space solar power station.