

SPACE TRANSPORTATION SOLUTIONS AND INNOVATIONS SYMPOSIUM (D2)
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THE GERMAN CONTRIBUTION TO THE DEVELOPMENT OF ARIANE 6

Abstract

Following the decisions made at the ESA Council at Ministerial level in December 2014, European industry has started the development of a new launch system – Ariane 6. The overarching goal of Ariane 6 is to reduce launch service costs by almost half, compared to current European launchers, while still maintaining the reliability and technical excellence.

Germany contributes about 23% of the overall development budget of Ariane 6 and is, after France, the second strongest participant to this programme. This participation is a continuation of German activities related to launch systems development and exploitation, going back to 1960s and the original developments of the "Europa" rocket and the developments of Arianes 1 to 5. With this level of contribution, Germany underlines its strategic objective to continue to be an indispensable partner for all European launcher activities.

The German space transportation sector, composed both of industrial companies as well as public organisations, has competences and abilities that are unique in Europe. In the first part of this paper, after giving a short programmatic overview of the overall Ariane 6 development activities, we will describe the German involvement in Ariane 6 in the four main areas of competence:

1. Upper Stage and Cryogenic Technologies (Airbus-Safran-Launchers, Bremen),
2. Liquid Engine Thrust Chambers and Combustion Devices (Airbus-Safran-Launchers, Ottobrunn),
3. Liquid Engine Qualification and Tests (DLR, Lampoldshausen) and
4. Metallic and Carbon Structures (MT-Aerospace, Augsburg).

Beside its participation in ESA-programmes, like Ariane 6, Germany also develops and matures technologies in a unilateral, national way. After reaching a sufficient level of maturity and technological readiness, those technologies can be "phased-in" to the relevant programme on ESA-level.

In the second part of this paper, we will present a selection of technologies, where this process of initial national development and subsequent introduction into a large launch-system-development-programme is on track. For this, we will mainly concentrate on:

- the resin-infusion process for production of carbon fibre solid rocket motor cases, matured within the FLPP FORC Project and to be demonstrated for Ariane 6 boosters and Vega C first stage application (P120C), supported by multiple national programmes on technology and process development level,
- a process of a new insulation foam for cryogenic tanks to be used on the Ariane 6 lower and upper stages.