

# THE SITE TRAUEN OF THE GERMAN AEROSPACE CENTER – PAST, PRESENT AND FUTURE OF THE LARGEST TEST SITE FOR ROCKET ENGINES IN GERMANY

Georg POPPE<sup>1</sup>, Stefan MAY<sup>1</sup>, Nora M. BIERWAGEN<sup>1</sup>, Thino EGGERS<sup>2</sup>

<sup>1</sup> Responsive Space Cluster Competence Center, German Aerospace Center (DLR), Faßberg, Germany

<sup>2</sup> Institute of Aerodynamics and Flow Technology, German Aerospace Center (DLR), Braunschweig, Germany

Georg.Poppe@dlr.de, www.DLR.de/RS

**Abstract:** The site Trauen of the German Aerospace Center (DLR) has been the place for several test facilities for rocket engines and other highly experimental aeronautical trials in the past. It was established in the year 1937 by famous rocket engineer Eugen Sänger near the municipality Faßberg and its air base in Northern Germany. To date it is the largest site by area of the DLR, which is located in a sparsely populated region, enabling it to be a preferential place for testing large rocket engines. In the beginning, a test facility for liquid rocket engines for a maximum thrust of about 10 MN was built and put into operation, but it was demolished after the Second World War. In the postwar period, the test facility “Viererblock” for medium-sized liquid and solid rocket engines and a test stand for the upper stage of the Europa-1 rocket were in use, but both mostly became abandoned after the program got cancelled in the 1970s.

Since 2009 the test facility “Viererblock” was being revived by the growing research interest in hybrid rocket engines. Primarily, a test stand for hybrid rocket engines using the oxidizer hydrogen peroxide (H<sub>2</sub>O<sub>2</sub>) is being used by the Institute of Aerodynamics and Flow Technology of the DLR. This also attracted several universities and student groups, which conducted various hybrid rocket engine tests at the “Viererblock” within the program STERN (Studentische Experimental-Raketen) of the German Aerospace Agency at DLR.

The newly established Responsive Space Cluster Competence Center (RSC<sup>3</sup>) offers an opportunity to revitalize the site Trauen. The goal of RSC<sup>3</sup> is to make it possible to deliver satellites to orbit within a time span as short as seven days. To accomplish this goal, it is necessary to enhance the technology base of the launch vehicle, the satellite itself and the communication infrastructure.

Until 2024, the test facility “Viererblock” will be completely modernized to additionally house a test stand for solid rocket motors with a thrust level of up to 300 kN and a fuel mass of up to 1 t. Subsequently there are concepts to more than double the area of the site Trauen to accommodate a new test facility for large solid rocket motors with a fuel mass of up to 15 t. The larger area will also enable establishing an industrial production facility for solid rocket motors. In addition, other companies and start-ups of the “New Space” economy enabling the goals of RSC<sup>3</sup> shall be facilitated as well.

Within this paper, the history and the present activities at the DLR site Trauen are illustrated. The future plans and opportunities on the use of the site regarding test facilities for solid and hybrid rocket motors are introduced.



Figure 1: Future vision for the DLR site Trauen based on ideas of Poppe et al.