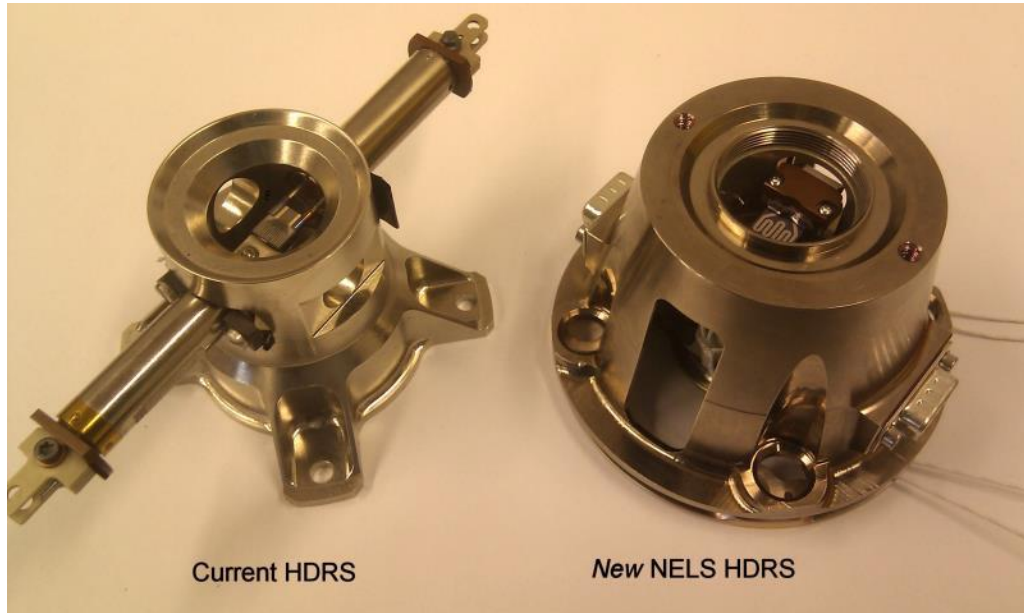


Low Shock Deployment System (NELS) ARTES 5.2: Achievements



The existing and well proven Airbus DS NL Hold Down and Release system was further developed into a Low Shock Deployment System (NELS) that enables higher pre-loads, can cut while emitting low shocks, and can cut after 6 months in orbit to allow GTO applications. In the course of development of the NELS in an ARTES 5.2 project Airbus DS NL have gone through the below phases:

Requirement Consolidations: The NELS system targets to serve a broad range of applications covering antennas, radiators, covers and solar arrays from small up to large sizes (15kN). The satellites that will potentially use the NELS system can have their application in Telecom, Earth Observation, Navigation and/or Science. Each of these applications will have their own specific temperature range.

Characterisation of Technology : The Endless loop cable turned out to be the preferred cable configuration, both in terms of technical performance and in terms of production and handling.

Both Kevlar and Vectran have excellent properties to deliver a reliable cable design. After a series of trade-off studies and test Vectran was chosen as the material, in combination with a spike end-fitting design. That established the basis for the **Engineering Model (EM) design**.

Two variants, one for Solar Array applications and one for deployment of an Articulated Deployment Systems are designed and build to meet these two application areas that are described by the requirements. After EM 1.0 testing a redesign was made to improve the performance. The EM 2.0 redesign has been analysed, and subsequently the 2 variants were build.

Engineering Testing: EM 2.0 hardware has been tested to proof feasibility of integration, requirements and performance. A large variety of tests has been performed. Two essential components, the restraint cable and the thermal knife, have been tested at component level. On stack level a functional test, cut and release, after thermal vacuum cycling has been performed.

The results were analyzed and reported. With ESA we concluded that the ARTES 5.2 conditions have been met, and the project can move to the next ARTES C&G C&G phase to qualify the design.