IAF MATERIALS AND STRUCTURES SYMPOSIUM (C2)
Manufacturing and industrialization for Launch Vehicle and Space Vehicle Structures and components (High volume production, industrialization, automatization and digitalization) (7)

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FOSTERING SUSTAINABILITY OF EUROPEAN LAUNCHER MANUFACTURING THROUGH THE ARIANE 6 & P120C PROCESS IMPROVEMENT PROGRAMME

Abstract

Together with Ariane 6 and P120C major industrialists, ESA identified a set of improvements with relevant cost assessment.

The principal purpose of the activities is to reduce the costs required to manufacture Ariane 6 and increase sustainability of the programme. In the longer term, ESA's contribution to, and management of, the Process Improvement activities are of the utmost importance to enable synergies and provide a framework for the optimisation of the Ariane 6 supply chain. Process Improvement means to modernise the launcher manufacturing in Europe by supporting the following industrial priorities:

- IIoT based asset management
- Intelligent automation
- Predictive maintenance

These activities enable and, are a precursor to, a fully automatised and smart end-to-end value chain. Three major achievements for the activities have been defined:

1. Achievement: Reduction of manufacturing costs
   For a given process, the current labour and material costs are determined. The industrialists will estimate a manufacturing cost reduction, resulting in a targeted cost reduction - to be achieved from the manufacturing of the sixteenth shipset onwards.
2. Achievement: Reduction in lead time
   For a given process, the industrialist will improve the process time, by reducing labour and machine hours; thus optimising the use of labour, assets and energy resources. The current process time will be determined and will be monitored against the targeted process time reduction.
3. Achievement: Reduction of environmental impact
   The environmental impact of the European Launcher product will be reduced through the introduction of more sustainable processes (eco-design approach). ESA pursuits a holistic approach to directly contract the industrialists and gain visibility on the currently established process, the later improved ones and the associated environmental assessments.

The currently ongoing pilot case with a major Ariane 6 industrialist, already displays the following key gains:

- reduction of internal and external logistic effort
- reduction in necessity for reworks

- replacement of environmental unfriendly and hazardous processes
- reduction of energy consumption

This approach sets the reduction of environmental impact as a priority for ESA/STS in one of its main Programmes.