

IAF MATERIALS AND STRUCTURES SYMPOSIUM (C2)
Advancements in Materials Applications and Rapid Prototyping (5)

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MULTI-CRITERIA DECISION-MAKING PROCESS IN ORDER TO SELECT AND REDESIGN A
SATELLITE COMPONENT IN LINE WITH ADDITIVE MANUFACTURING LOGICS**Abstract**

The Additive Manufacturing technologies are considered a key enabling technologies for both commercial and exploration missions. Hence, its use within the space systems is increasingly pervasive. In order to improve both technical and programmatic aspects of industrial process as a whole, this paper proposes a holistic method composed of the integration of two different approaches: Design for Additive Manufacturing and Concurrent Engineering [1] [2] [3]. The presented approach aims at selecting a satellite component made by traditional production process and shows an attempt to redesign it to improve: performances, multifunctional integration and system efficiency. To support component selection, a specific tool is developed based on Analytical Hierarchy Process [4] [5]. Furthermore, a new and optimized shape for the component is presented and discussed. The results of structural analyses demonstrate that optimized component has higher structural performances and is able to replace the original one bringing advantages to the whole system. Finally, it is demonstrated that the structured method presented in the paper improves the efficiency related to complex multi-criteria decision process. The presented method and results have been developed within the research project: “New Materials and Processes for Small Internet Delivery Satellites Production via Additive Manufacturing” financed by the Italian Space Agency involving the “Broglio Space Center” located in Malindi, Kenya.

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