

MATERIALS AND STRUCTURES SYMPOSIUM (C2)
Space Vehicles – Mechanical/Thermal/Fluidic Systems (7)

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THE STUDY ON IOT BASED MANUFACTURING SYSTEM FOR ASTRONAUTICAL PRODUCTS

Abstract

Internet-of-thing (IOT) based manufacturing system would get the real-time information of the entire working process, dispose the data island in the traditional basic workshop, and realize precise manufacture. the usage of IOT based manufacturing system in the manufacturing of aeronautical products would improve the manufacturing level and assembling accuracy significantly, and efficiently cope with the technical risk in the manufacturing of aeronautical products, especially the new developed products, which have complicated structure and large bulk such as the rockets and satellites, therefore it would shorten the production cycle of aeronautical products. This paper presents the implement of IOT based manufacturing system in the typical aeronautical workshop: a) Recording the running status of equipments, parameters of working environment and quality data in working process with all aspects continuously by embedded signal pickup devices and Wireless Sensor Network (WSN); b) Taking the integrated usage of radio frequency identification (RFID) and 2-dimensional bar code (QR Code, Data Matrix, et al.) technology to monitor the process of all the work-pieces being machined in the workshop, and as a basis for tracking the product process route; c) Constructing the data management platform for the workshop combined with the widely used enterprise IT system such as ERP/CAPP/MES, to sort out and analyze the real-time acquired data. By the analysis result, we can evaluate the finished manufacturing process, forecast and adjust the subsequent manufacturing process. By the specific application of IOT based manufacturing system in the enterprise, the related aeronautical workshop consummated the capability of quick response, enhanced the concurrent engineering for design and manufacture, complemented the function of learning and correction, and established the subsystem of failure diagnosis. Ultimately, it would be real that smart manufacture occurred in the aeronautical workshop. IOT based manufacturing system brings the aeronautical manufacturing industry a efficient method to shorten the production cycle and strengthen the defense for risk, it should be an achievement goal of aeronautical manufacturing industry.