MIRCE Science Approach to the Royal Reliability Challenge

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A few months prior the Royal visit the hosting Gliders Club has been informed that the King would like to fly around the area for about 2 hours to familiarise himself with the surrounding natural world. The organising Committee asked the Club Chairman which glider of the existing 12 should be allocated to this flight and approved extra founds for any maintenance work needed to be done to make the Royal Flight as safe as possible. Hence, the reliability engineer has been asked to provide the answers regarding the glider selection and maintenance actions taken.

The reliability engineer knew that the reliability of a system type is predicted through the system reliability function that is driven by the reliability of consisting components and their configuration (series, parallel, x-out-of-n, and so forth). This is a well known and applied process that is performed at the design stages of a new system. Hence, on the day of introduction of the system type in operation the reliability function is identical for each of them, irrespective of their actual number in existence. This practically means that the operational reliability of individual systems of that type cannot be predicted in accordance to the occurrences of in-service events that happened to them individually, as each consisting system of that type is defined by identical reliability functions. The main objective of this presentation is introduce the reliability professionals to the MIRCE Science based approach to the real-time prediction of the reliability, based on real-time time in-service data of each individual system, which ambles differentiation of the systems within a fleet. This will become possible through the development of the new technology based on the digital transformation and data connections. Additionally, before the deployment a request for the execution of targeted maintenance tasks could be placed in order to reach accepted risk of task completion.

The numerical example presented clearly demonstrates the advantages of this process that will considerably improve real-time management of individual systems and consequently will enable the real time management of the productivity, efficiency, safety, and sustainability within the each fleet of consisting systems. This is the path to the professional and factual answer to the Royal Reliability Challenge.