

USE OF HUMAN HAZARD ANALYSIS TO ENHANCE RESILIENT PERFORMANCE OF HELICOPTER MAINTENANCE SYSTEMS

Simon Gill

The Safeguarding Community, United Kingdom

Abstract

When designing a new helicopter, the manufacturer must consider the maintenance tasks required to keep the aircraft airworthy with maximum efficiency. This is based on the performance of previous designs and as much as possible, the experience of real maintenance engineers brought into the team. This is rarely perfect but the system displays resilient performance, driven from the flexibility and adaptability of maintenance engineers overcoming the real-life challenges of the maintenance environment to ensure we continue to deliver safe and available aircraft.

This presentation will explore Human Hazard Analysis, a process to compare the ‘Work-as-Imagined’ in design to the ‘Work-as-Done’ in the real maintenance environment to reveal design and organisational limitations, but more importantly the strengths of those conducting the maintenance. The process builds upon the “Safety-I” data collected, formally and informally, on how the system has failed, but introduces a “Safety-II” focus on the workarounds developed.

We bring together groups of people from across the industry with the aim of having a different conversation. Attendees include design engineers, manufacturer technical representatives, accident investigators, experienced and novice maintenance engineers, technical directors and human factors specialists. The ground rules are simple, that openness is key. The benefit comes from honest conversations, actively avoiding the risks of defending positions, rushing to assign blame, avoiding the acceptance of blame and protecting perceived reputations.

From the insights generated we are addressing weaknesses in helicopter design and documentation, organisational norms and training, and formalising the adaptive processes employed to improve the safety and efficiency of the maintenance process.

Keywords: Human factors, Maintainability, Resilient performance, Maintenance, Human hazard analysis, Helicopter