

**REFERENCE #637 - SUBMISSION OF ABSTRACT FOR RAeS CONFERENCE:
REDUCING MAINTENANCE COSTS THROUGH INNOVATION – 16TH SEP 2010**

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SUBJECT

The System Integrity Approach to Reducing the Cost Impact of ‘No Fault Found’ and Intermittent Faults

ABSTRACT

Safe and continued operation of aerospace platforms, from military UAS to civil airliners, depends on proactive and reactive maintenance activities to sustain both their airworthiness and capability, especially as innovative management and contracting approaches succeed in leveraging operational/business availability from ever-decreasing numbers of platforms. As platforms and systems mature with time and usage the emphasis on dedicated maintenance activity to sustain the integrity of their structure and systems must increase in order to maintain the foundation of airworthiness and capability. For avionics systems and the EWIS¹, chinks in the armour of their System Integrity begin to appear with increasing regularity in the guise of random, intermittent faults: fault which are often categorised as ‘No Fault Found’ (NFF) occurrences.

In the context of ‘Lean’ operations, intermittent fault occurrences create a huge amount of non-value added activity - or ‘waste’ - ranging from rework to excess inventory to delays. The repeated fault diagnosis and rectification work required to deal with a recurring, intermittent fault constitute the most obvious impact, but this is the tip of the iceberg when one attempts to quantify the full, end-to-end maintenance and operating cost.

This Paper will identify the key elements of the intermittent fault and NFF phenomena that drive up those maintenance costs and consider how these drivers have become an accepted part of aerospace maintenance practice. It will examine the relative merits of the approaches traditionally employed in dealing with NFF problems before concluding that there is a better way. This new perspective will reduce the maintenance cost impact of NFF by taking a fresh, knowledge-based approach to address the genuine root causes of the problem and thus tip the balance back to System Integrity. Not only can the System Integrity approach reduce operating and maintenance costs, it also links directly to improved platform and system availability and to bolstering the long-term sustainment of airworthiness.

INFORMATION ABOUT THE AUTHORS

¹ EWIS – Electrical Wiring Interconnection System.

Giles Huby was an RAF engineering officer, whose successful 16-year Service career encompassed the support of fast-jet operations and guided weapons in a variety of roles spanning Front Line operations, Depth support and Integrated Project Teams. Giles possesses considerable experience of Defence programme management and running large, aircraft maintenance organisations. He was extensively immersed in Lean process improvement activity in Defence and also accumulated significant incident investigation experience focused on Maintenance Human Factors. Giles is the Managing Director of Copernicus Technology Ltd and the Chairman of the Royal Aeronautical Society Highland Branch committee.

Jim Cockram is also a former RAF engineering officer, whose extensive 25-year Service career focused heavily on the maintenance and logistics support of fast-jet fleets and guided weapons systems, from the vantage point of roles in Forward, Depth and Integrated Project Team environments. He was a pioneering early advocate of applying *Lean Thinking* to Defence organisations. His experiences in programme management and running large, aircraft maintenance organisations led him to develop maintenance and data-exploitation strategies which he has employed in highly successful business improvement projects in the private and public sectors. Jim is the Technical Director of Copernicus Technology Ltd and an enthusiastic member of the Royal Aeronautical Society Highland Branch committee.