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SUBJECT

Using standardised data capture and analysis to maximise assets and minimise Maintenance Costs and also reduce No Fault Found.

ABSTRACT

- Lead in.
- Data important not standarised
- Analysis data needs to be standard
- Symptom Fault Fix
- Support Ship/Shelve policy; defer defects understand the unknown – move to knowledge-base discussion making.
- Save money, improve asset availability, improve safety.

Use the following text as baseline.

Symptom Diagnostics is a Viable Ventures bespoke method of carrying out data collection, analysis and data manipulation to enable companies and organisations to perform knowledge-based decisions in order to maximise resources and minimise maintenance costs.

Compared to a traditional craft and 'assumption-based' knowledge systems where no feedback or 'learning loop' exists, the SD approach provides significant cost-effective benefits through the implementation of standardised and codified information that can be correlated to provide knowledge-based data that can be used dynamically in maintenance environment.

In a non-standardised system there is a significant and constant danger that Information Gaps will occur. Information Gaps are at the root of inefficiencies in the operating of equipment, both for operators and maintainers alike.

For example, with the operating, maintenance and repair of the family car, if all three operations are carried out by the same person, then by definition, there are no Information Gaps. Any symptoms that occur are registered by the driver, analysed, assessed and acted upon. If the fault diagnoses and subsequent fix are not successful it would be unusual if the symptom re-appeared if the same fault was diagnosed and the same part/fix repeated; this is especially so if that same person was the 'head of finances' too! However, as soon as one of the operations of operator, maintenance or repair is carried by a 3rd person with less financial control to force a logical process, then an Information Gap occurs, and as a consequence so do the inefficiencies.

Symptom Diagnostics seeks to eliminate Information Gaps and allow accurate correlation of gathered data through:

- Symptom Diagnosis as seen by the operator or user and moving away from 'free text', word of mouth; in terms of standardised debriefs that speech the operators language and not the engineer's, and thus produce a codification of the Symptom.
- Fault Diagnosis using the Symptom Diagnostics to drive the engineer/technician to make knowledge-based decision.
- Fix of the system using the Fault Diagnosis.

Symptom – Fault - Fix

Significant Benefits of introducing Symptom Diagnosis:

- Reduced downtime.
- Reduced operating costs.
- Reduced supply chain.
- Increased system capacity.
- Better use of knowledge across discipline.
- Better morale within the workforce, less frustration and better confidence in the systems and equipment.

Learn more about benefits for: Managers, Operators, Employees, and Clients.

For more information see Symptom Diagnostics & Functional Criticality Analysis.

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 EWIS[1], 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,

[1] EWIS – Electrical Wiring Interconnection System.

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

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.