

Observations by Reviewer at Close of Workshop

Jeff Bird

NRC Institute for Aerospace Research
1200 Montreal Road
Ottawa, Ontario K1A 0R6
CANADA

Jeff.Bird@nrc-cnrc.gc.ca

SLIDE 1 – INTRODUCTION

NATO RTO Applied Vehicle Technology Panel AVT-144 Workshop

Enhanced Aircraft Availability through Advanced Maintenance Concepts and Technology
3 to 5 October 2006

Defence:

France, Czech, Germany, Sweden, UK, Canada, USAF, USN, ONR, Australia

OEM:

Boeing, EADS, Dassault

Technology:

BaE, Messier Dowty (CA), Casebank (CA), Smiths

National:

NLR, DSTL, DSTO, NRC

SLIDE 2 – MILITARY NEEDS

- Right diagnostic tools for field use, e.g. reliable condition status, no fault found/CND, BITE responses on startup.
- Planning tools adaptable to changing fleet sizes, roles, environments, flying rates, staffing, e.g. providing depth support at front line.
- Documented case studies of systems engineering designs and validations for planned and fielded fleets.
- Data access?: Probability distributions for delays, operations and maintenance.
- Case studies of incentivized contracting methods with integrated teams.

Observations by Reviewer at Close of Workshop

SLIDE 3 – CASE STUDIES

- Poland – with cost reduction.
- France – SIMMAD, pilot training.
- Czech – fleet management.
- Boeing – LR transport and strike aircraft.
- Canada – Maritime Helicopter acquisition program.
- USAF – Smart Operations depot development with Lean methods.
- OCCAR – A400.
- US – Avionics test equipment- Smart Test.
- Canada – Integrated Diagnostics System.
- UK fault identification and maintenance/supply process.
- UK-US – Aircraft Electrical HM.
- France – System analysis with damage for flight worthiness.

SLIDE 4 – CONCEPTS AND TECHNOLOGIES

- Conventional and On Condition Maintenance and Support.
- Integrated on-board-off-board OCM, HUMS, PHM.
- Lean Enterprise.
- Maintenance Free Operating Periods- Maintenance Recovery Periods.
- Open architecture CBM.
- Operations modeling tools at systems and LRU levels for forward and depth use at acquisition and mid life update.
- Module matching tools for lifed items.
- Damage accumulation estimation and repair (full – expedient) tools.
- Smart Strut with sensor, usage monitor.
- Sensors: Disc/blade HM with tip timing, corrosion, NDT scanning and phased array, virtual (power fluctuation).
- Data exploitation with adaptive, diverse tools.
- Advanced test methods and specialized test equipment.

SLIDE 5 – OPPORTUNITIES AND CHALLENGES

- Integrate new technologies and cost understanding to incorporate diagnostic and prognostics into operations with net benefits(s).

- Enable work/data/knowledge sharing: industry, government, military.
- Integrate processes within evolving military organizations: operational, environmental, financial people changes.
- Enable technology development: OEM-user-developer including cross functional assessments and Terminology database.
- Adapt planning tools to Make full use of all data streams and mid-life updates.
- Identify, develop and validate physics of failure understanding.

Observations by Reviewer at Close of Workshop

