Introduction to TATEM

• Who is in TATEM?
  – 58 Contractors from 12 countries across Europe + Australia + Israel.
  – Major OEM’s, System/Subsystem Suppliers, Industrial and Academic Research Institutes, MRO’s and an Airline.
  – Valued at ~40M€ of which the EU Funds 22.1M€.
  – Started in March 04 and will finish in 2008.
Introduction to TATEM

• What is the scope of TATEM?

  – The main technical focus is in the following areas:

  • Avionics
  • Utilities
  • Engines
  • Structures
  • Data Management
  • Ground Crew Support
Presentation Outline

• Overview of the elements of a Health Management Solution

• The TATEM Health Management Architecture

• A (very brief) example

• The TATEM vision of a Health Management Solution
The TATEM Solution

Concepts Supporting TATEM Research

Decisive Phases

✓ Withstand in-service defects
✓ Know the aircraft status
✓ Predict operational impacts
✓ Plan maintenance
✓ Execute maintenance

manage information in all phases

TATEM Concepts

Fault Tolerance
Health Monitoring
Health Management
HM-based maintenance scheduling
Mobile & Process oriented maintenance
Integrated Data Management

Embedded Training
Concepts supporting TATEM research

TATEM concepts

- Mobile & Process-oriented maintenance
- HM-based maintenance scheduling
- Health Management
- Health Monitoring

OSA – CBM

- #1 DATA ACQUISITION
- #2 DATA MANIPULATION
- #3 STATE DETECTION
- #4 HEALTH ASSESSMENT
- #5 PROGNOSTICS
- #6 DECISION SUPPORT
- #7 PRESENTATION

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The TATEM Solution

GCS Contribution to the Project Approach

A/C Level

Ground Crew

Embedded Training Technologies

Network Server System

Health Information / Data (IVHM)

Maintenance Execution

Ground Crew

HMI

Maintenance Management

Operational Support

Health Assessment

Usage-based Maintenance Planning

Crew Input

Flight Input

ACMS

ACARS

Other Input

CBR- Technologies

Operational and Health Data

Bayesian Network

Statistic

ISDB

Statist

Process oriented TD

Stochastic Models

Data Management Services
Elements of the proof of concept demonstration

1. Sensor data from an aircraft undercarriage.
   - Airbus UK (Nosewheel)
   - Messier Dowty (Simulation model of the MLG)
   - BAES – X-Plane simulator

2. Analysis of the sensor data.
   - BAES (PCA GMM, Time series analysis)

3. Decision tool to assess the health of the aircraft.
   - BAES (comparison of data with Messier Dowty’s model)

4. Maintenance management tool to advise and assist in carrying out appropriate maintenance actions.
   - Aerosystems International’s Maintenance Management System – Sapphire
Main Landing Gear Analysis & Classification
An A/C Health Assessment problem has been detected

A Hard Landing has been identified & logged

Maintenance action is initiated

Remedial actions are proposed

Multimedia assistance is provided

Jobs are signed off and A/C returned to service
What the Future might look like…

Forecast aircraft serviceability

Optimized daily operations

As-per-usage

Optimized planning

More flexible

Hangar Maintenance

Right & fast maintenance actions

Process-oriented

Mobile

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TATEM Project

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