AGARDograph: Safety and Risk Management for Test Flight

Proposed Guide to Established Risk Management Practices Across the Flight Test Community

Rusty Lowry – US Naval Test Pilot School, Patuxent River
Dennis Morley – BAE Systems, Military Air Solutions, Warton

For the NATO RTA Flight Test Technical Team (FT3)

Background - Flight Test Technical Team (FT3)

- The Flight Test Technical Team, FT3, is a Working Committee that operates as part of the NATO Research and Technology Organization (RTO)
- Currently consists of 17 leading flight test professionals from 12 NATO and Partnership countries
- Participants include Official, Research, Industry, Military and Academic Organisations actively engaged in flight test efforts.
- Mission is to inform and educate the greater Flight Test Community by way of Publications, Symposia, Training Courses and Other Activities to enhance the Art and Science of Flight Testing and enable commonality among NATO nations
- Publications are released as documents known as AGARDographs. These are typically available in the Public Domain

Background – Flight Test AGARDographs

- AGARDographs owe their name to one of the predecessor sponsoring organisations, AGARD: The Advisory Group for Aerospace Research and Development
- This was founded in 1954 under the leadership of Theodore von Karman and transitioned to the RTO in 1998
- The Flight Test Technical Team (and its predecessors) have producing AGARDographs covering Flight Test Instrumentation, the AG160 Series, and Flight Test Techniques, the AG300 Series, for approximately forty years
- FT3 continues to actively seek additional topics that will assist the Flight Test Community and would be appropriate for publication

Flight Test AGARDographs

- There are currently 46 published AGARDographs
- All are available from the NATO Research and Technology Organization, Systems Concepts and Integration Panel or from the appropriate RTO National Distribution Centres – found at:
  - www.rto.nato.int
- Topics range from general introductions to Flight Test Engineering and Instrumentation processes to more highly specific items such as:
  - ***Flight Test Measurement Techniques for Laminar Flow***
  - ***Optical Air Flow Measurements in Flight***
  - ***Precision Airdrop***
- Recent volumes:
  - Flight Testing of Night Vision Systems in Rotorcraft (Canada)
  - Differential Global Positioning System for Flight Testing (Italy)
  - Unique Aspects of Unmanned Air Vehicle Flight Testing (USA)

Flight Test Safety and Risk Management

- FT3 is investigating writing an AGARDograph to capture Flight Test Safety and Risk Management Practices in use across the International Flight Test Community

- The Vision is a document with two parts:

  - One consisting of an anthology of short papers from organisations that describe the approaches taken to manage Flight Test Safety and Risk.
  - The second being a commentary on those papers that draws out common and best practices and relates them to specific aspects of flight testing.

- FT3 is seeking the views of FTSW participants on this with the aim of developing a partnered approach in the research, writing, and promotion of the final document

Topics to be Covered

- SAFETY
  - Safety Office/Officer Review and Role
  - Safety Checklist Types and Content
  - Formal or Qualitative Safety Assessment
  - Ground Safety
  - Flight Safety
  - Safety Specific Training
- "Breaking the chain"
  - NO vote
  - ANYmouse

Topics to be Covered

- Risk Management & Mitigation
  - Test Hazard Analysis
  - Test Matrix
  - Currency
  - Qualifications
  - Review Process
  - Greybeard Review
  - Flight Test Data Card Review
  - Signature Authority
  - Flight Clearance

MIL STD -882B

Frequency of Occurrence	Severity			
	(1) Catastrophic	(2) Critical	(3) Marginal	(4) Negligible
(A) Frequent	1A	2A	3A	4A
(B) Probable	1B	2B	3B	4B
(C) Occasional	1C	2C	3C	4C
(D) Remote	1D	2D	3D	4D
(E) Improbable	1E	2E	3E	4E

Risk Categories: High Serious Medium Low

Topics to be Covered

Lessons Learned

- Safety Successes
- Safety Failures
- Safety "Almosts"

Other Industry Examples

- Mining
- Automotive
- "Hollywood"
- Others?

"Common practices to solve common problems"

Commentary

- "EXPERT" Summary
  - Identify common themes
  - Highlight successful strategies
  - Label persistent mistakes
  - Match specific approaches with specific tests
  - Encourage continued development
- *Potential* Role for FTSW?

Status – Flight Test Safety AGARDograph

- FT3 has discussed this proposal amongst its Membership
  - With FTSW organizers at Patuxent River, Maryland in Oct ‘08
  - Most recently two weeks ago at the ’09 Spring FT3 Meeting in Paris.
- FT3 represented organizations have committed to prepare papers summarising their approaches including:
  - US Navy, Patuxent River Maryland
  - Edwards AFB, California
  - BAE Warton. United Kingdom
  - Saab Aerospace, Linkoping Sweden
- What other organizations could participate/commit?

VIEWS FROM THE FLIGHT TEST SAFETY WORKSHOP

Big Three (3) Questions

(1) Worthwhile or not?

(2) What should the next step be?

(3) Who will sign up to contribute?

FT3 Points of Contact

- Rusty Lowry – Chairman

  US Naval Test Pilot School
  301-757-5052
  Wilson.lowry@navy.mil

- Dennis Morley – AGARDograph Sponsor

  BAE Systems, Military Air Solutions Flight Test, Warton, UK
  +44-(0)1772-854146
  Dennis.morley@baesystems.com

- Paul Kissman – Canadian

  Canadian National Research Council, Ottawa, Canada
  613-998-4764
  Paul.Kissmann@nrc-cnrc.gc.ca