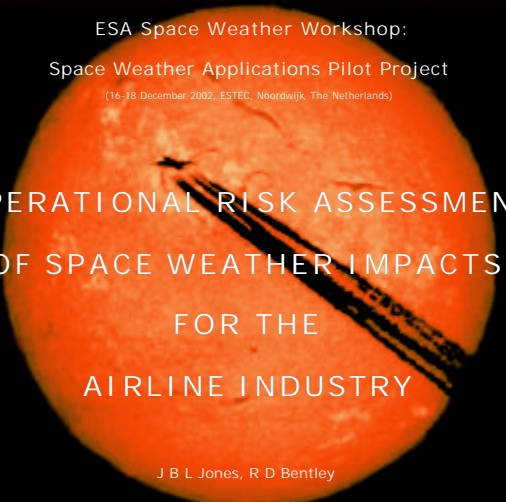


ESA Space Weather Workshop:
Space Weather Applications Pilot Project
(16-18 December 2002, ESTEC, Noordwijk, The Netherlands)



OPERATIONAL RISK ASSESSMENT
OF SPACE WEATHER IMPACTS
FOR THE
AIRLINE INDUSTRY

J B L Jones, R D Bentley

OPERATIONAL RISK ASSESSMENT

Proposal to ESA ITT AO/1-4246/02/NL/LvH:

“Development of a Virtual Airline Space Weather Service through Operational Risk Modelling of Space Weather Impacts”

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OPERATIONAL RISK ASSESSMENT

Participants:




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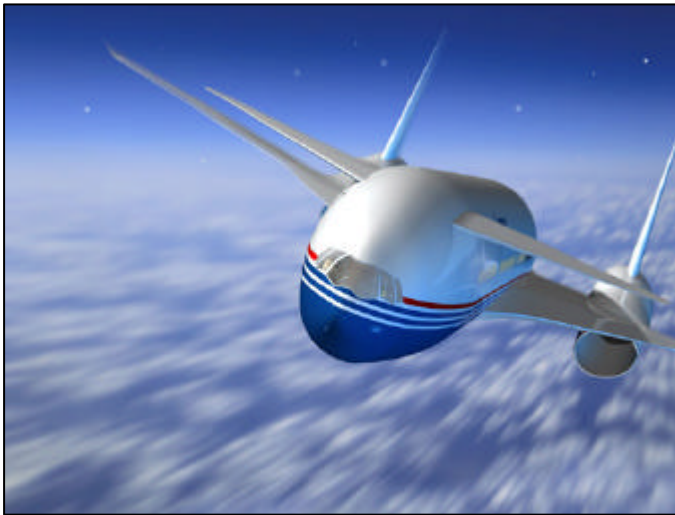
OPERATIONAL RISK ASSESSMENT

Overview:

- Situation
- User Requirement
- Proposed Approach
- Deliverable



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OPERATIONAL RISK ASSESSMENT

Situation:

- SW effects Airline Operations
- Technological Advancements
- Poor Awareness & Understanding
- Minimal or Zero Research

Investigate Operational & Commercial Risks

ESA SW Applications Pilot Project, ESTEC 16-18 Dec 2002

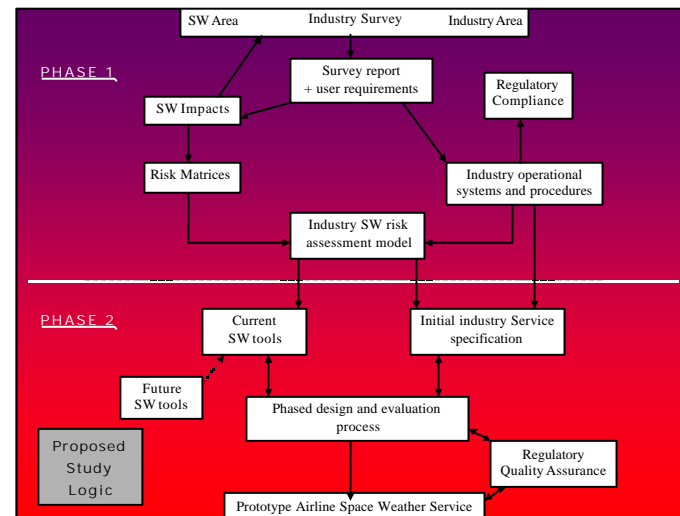
OPERATIONAL RISK ASSESSMENT

User Requirement:

- Asses all SW hazards
- Asses Impacts on Operations

Maintain SAFE & SECURE Operations

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OPERATIONAL RISK ASSESSMENT

Proposed Approach: PHASE 1

Industry Survey (ESYS)

- Current Industry SW Understanding
- Operations Communication Methods
- Envisaged Technological Developments
 - Aircraft Design, Flight Deck Solutions
 - Passenger Services & Connections














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OPERATIONAL RISK ASSESSMENT

Proposed Approach: PHASE 1

Risk Assessment - Impacts (QinetiQ)

- Investigate SW Events & Impact Areas
- Gather SW Event Statistics
- Derive Probability & Severity Database
- Output Risk Matrix


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OPERATIONAL RISK ASSESSMENT

Proposed Approach: PHASE 1

Risk Assessment - Risk to Operation

- Apply Matrices to "At Risk" Elements
 - Engineering (critical, non-critical)
 - Flight Operations (CR, Flight Safety, Commercial)
 - Air Traffic Management (ATM) & Infrastructure (Galileo, GMES)














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OPERATIONAL RISK ASSESSMENT

Proposed Approach: PHASE 2

Definition of Service - Planning

- Ensure Regulatory Compliance
- Global Data Comms (Met Office)
- Consider IT & C³I Capabilities
- Data Priority & Time Building Blocks
- Derive Initial Service Specification

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OPERATIONAL RISK ASSESSMENT

Proposed Approach: PHASE 2

Definition of Service - SW Tools

- CR Exposure Tool (NPL)
- Assess Current SW Tools for "At Risk"
- Consider C³I Integration
- Identify Areas without SW Tools
- Identify Future SW Tools

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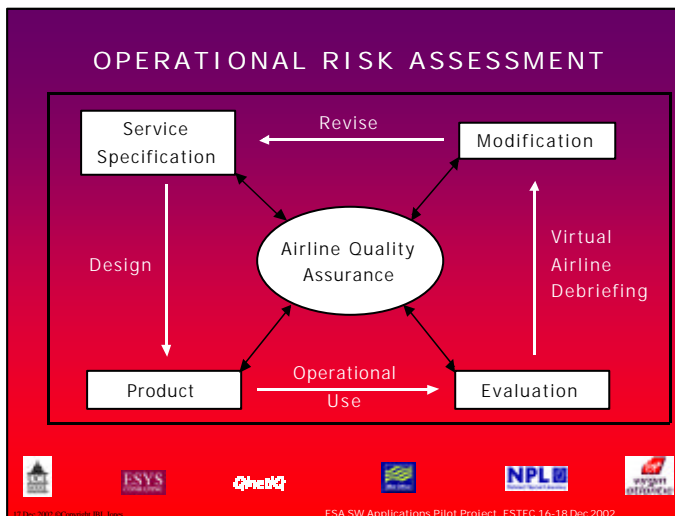
OPERATIONAL RISK ASSESSMENT

Proposed Approach: PHASE 2

Service Development

- Cyclic Design, Evaluation, Modification

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OPERATIONAL RISK ASSESSMENT

Proposed Approach: PHASE 2

Service Development

- Cyclic Design, Evaluation, Modification
- Real-Time Assessment in Operations

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