



Space weather Operational Airline Risks Service SOARS

Bob Bentley¹
Bryn Jones^{1,2,3}


ESA Space Weather Workshop:
Developing a European Space Weather Service Network
(3-5 November 2003, ESTEC, Noordwijk, The Netherlands)

1. Mullard Space Science Laboratory
2. SolarMetrics Limited
3. Virgin Atlantic Airways Limited

INTRODUCTION

- Overview
 - Objectives
 - Work Packages
- Recent Events
- Status
- Summary

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OVERVIEW

- Objectives
 - Consider all SW events
 - Assess Impacts & Risk to Industry
 - Human Health
 - Operations
 - Engineering
 - Prototype Service

Flight Safety
C³I
Commercial
Future Systems

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WORK PACKAGES


<u>Phase I</u>	<u>Phase II</u>
Industry Survey	Definition of Service:
Impacts: Hazard to Humans	Requirements, C ³ I, IT
Avionics	Current & Future Models
Comms & Navigation	Service Development:
Terrestrial Weather	Service Evaluation
Risk to Operations:	Prototype delivery
Engineering	
Flight Operations	
Air Traffic Management & Infrastructure	

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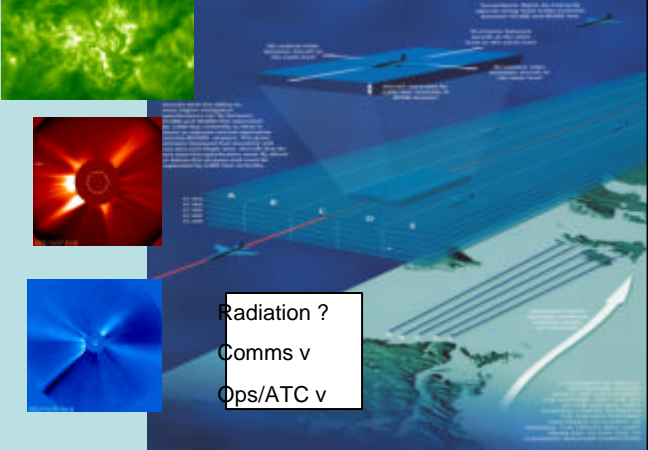
RECENT EVENTS – 24th Oct - 2nd(?!) Nov 2003

Sunspot 488 and Airplane
31st October 2003



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RECENT EVENTS – 24th Oct - 2nd(?!) Nov 2003




Radiation ?
Comms v
Ops/ATC v

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STATUS


- Industry Survey
- Impacts
 - Hazard to Humans & Avionics
 - Communications & Navigation
- Risk to Operations
 - Technological Developments
 - Regulatory requirements



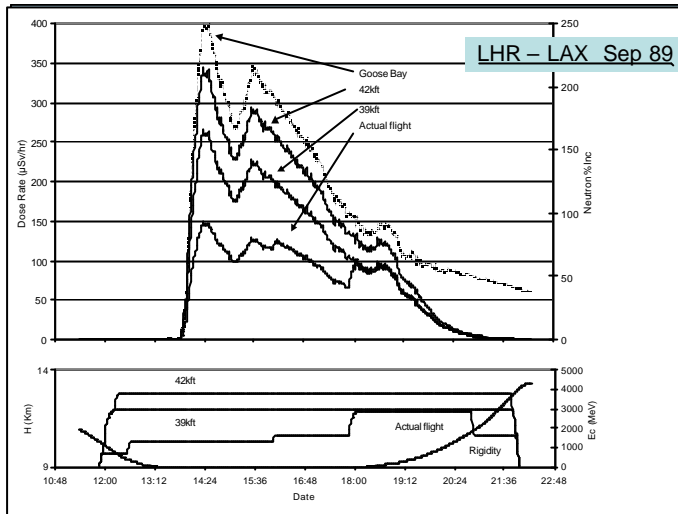
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HAZARD TO HUMANS & AVIONICS

- Clive Dyer et al Poster
“Solar Particle Effects at Aircraft Altitudes”



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COMMUNICATION & NAVIGATION

- Review of Impacts is Progressing
 - Navigation
 - Prof. Terry Moore, Institute of Engineering, Surveying and Space Geodesy, Univ. Nottingham

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NAVIGATION

- Assessment split into 4 basic threads
 - Understanding Global Positioning Systems
 - Ionospheric Scintillation
 - Understanding when and why scintillation occurs
 - How it affects GPS systems
 - Causal Space Weather Mechanisms
 - Prediction Capabilities
 - Techniques that could be used, useful indices etc.
 - Ionospheric Scintillation common to other SDAs

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COMMUNICATION & NAVIGATION

- Review of Impacts Progressing
 - Navigation
 - Prof. Terry Moore, Institute of Engineering, Surveying and Space Geodesy, Univ. Nottingham
 - Communications
 - Prof. Paul Cannon, QinetiQ (Malvern) & Univ. Bath
 - Sections of the Phase I report partly prepared; suitable tools (Phase II) also being assessed

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RISKS TO OPERATIONS

- Technological Developments
 - Government Papers
 - NATS, EuroControl, FAA
 - Satellite utilisation, e.g., Galileo
 - Aircraft Manufacturers
- Regulatory Requirements
 - National (CAA, NATS, Met Office)
 - International (ICAO, IATA)




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SUMMARY

- Real impacts demonstrated
- Media attention – PR opportunity
- SDA collaborations
- Severe SW impacts on observing instruments
 - Shut down for protection & saturation a problem
 - impacts ability to run models for developing predictive service



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FOOTNOTE

- Topical Group Spokesperson
 “Spacecraft & Aircraft Environments”

Discuss: Workshop & SWWT meeting
 Membership: Confirm
 Contact: bryn.jones@solarmetrics.com



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