



Space Weather User 's Workshop

ALCATEL/LPCE Team Presentation

ESTEC, December 12th, 2000

ESA Study for SPACE WEATHER PROGRAMME



Team Build-Up (1/2)

- ▼ Association of Labs, Research Institutes, Companies & Industries
 - all technical expertise necessary for SPACE WEATHER Topics
 - all aspects of a Future SPACE WEATHER Programme
 - ⇒ Physical Phenomenon Modelling & Parameters (Solar Physics; interplanetary medium, Ionosphere, Thermosphere, ...)
 - ⇒ Prediction Softwares production
 - ⇒ Ground Infrastructure knowledge
 - ⇒ Services definition
 - ⇒ Space Segment assessment : Instruments + System
 - ⇒ Market assessment

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Team Build-Up (2/2)

- ▼ Team Members at Core Level & their applied area of expertise :
 - ALCATEL Space : Space Segment; SW Impacts on Space activities
 - LPCE : SW related programs; Plasma Physics; Sun/Earth relationship
 - IRF : Service Provider ; SW forecasting/prediction software
 - BAS : User 's Needs; Magnetosphere & Ionosphere impacts
 - MSSL : Space science & Instrumentation for SPACE Weather monitoring
 - ESYS : Market development assessment; economical aspects
- ▼ Team Members at Level 2 :
 - LPG : Earth Environment description
 - LPSH : Solar Activity & Solar-Earth relationship; Ground measurements
 - Imperial College : CME's & SW prediction software
 - Univ of Greifswald : SW Parameters & Solar-Earth relationship; Services

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Main On-going Tasks

- ▼ Users ' Requirements Assessment
 - close to completion .
- ▼ Market Assessment
 - first attempt completed; iterations all along the study
- ▼ First Iteration of an ESA Space Weather Programme
 - First Attempt to set up an Architecture as of Today 's understanding
- ▼ Space Segment definition
 - Elaboration of a reference list of Parameters for Space Weather
 - Identification of Instruments (existing &/or future) for SW
 - Definition of the appropriate Space Segment
- ▼ Services Definition
 - Development of a Prototype for a Space Weather prediction software

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User 's Requirements Assessment : Objectives

- ▼ Identify areas of application for a future Space Weather Programme
- ▼ Qualitative and quantitative assessment of Space Weather impacts on human activity around and on Earth
- ▼ Inventory of required parameters by potential Users for a Space Weather prediction service
 - provide a bottom-up approach
- ▼ Characterise the needs of Users for a Space Weather Prediction service
 - Forecast (long term & short term)
 - Nowcast & Warnings
 - Post-event analysis

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User 's Requirements Assessment : Process (1/2)

- ▼ Inventory of all potential Users and their contacts
 - already involved as customers of today 's services
 - potentially concerned by Space Weather due to their activity
 - identified through consultancy of scientific community
- ▼ Lead Interviews & investigations through phone contacts, direct visit, interviews during conferences
- ▼ Use of a « Questionnaire » & « Aide memoire » as powerful tool
 - to provide the users with « information on What means Space Weather »
 - to synthesize the parameters of a Prediction service
 - to guide the Users to specify their need

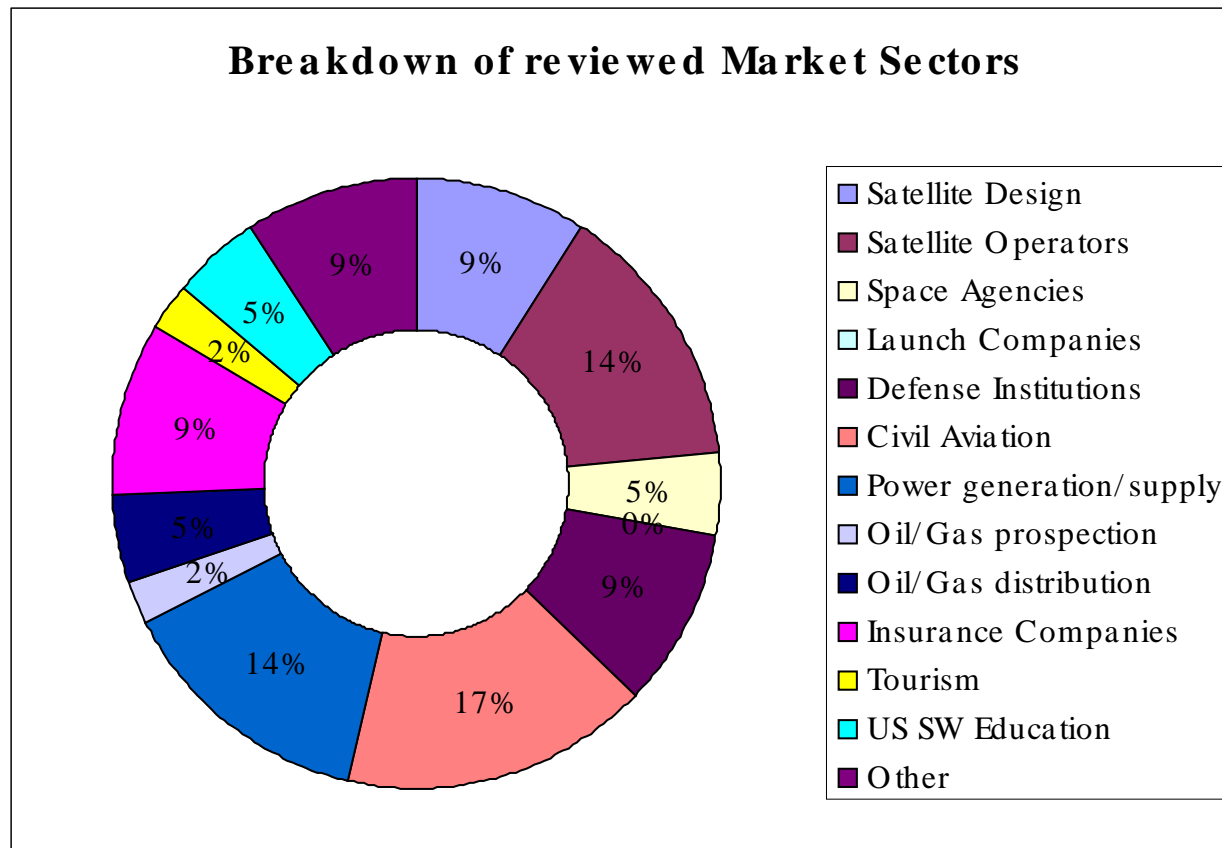
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User 's Requirements Assessment : Process (2/2)

- ▼ Concatenate received answers with synthesis of Users ' Needs
 - Parameters to be addressed for a Space Weather Space Segment
 - Characteristics for a Space Weather Prediction Service
- ▼ Provide statistics of answers
- ▼ Identify areas to be further developped
 - Impacts of Space Weather to be better assessed
 - Application areas deserving more quantitative assessment of needs
 - Research areas for future SW applications (if any)
- ▼ Provide inputs for the SW Market Assessment

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User 's Requirements Assessment : Statistics



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User 's Requirements Assessment : Outcomes (1/2)

- ▼ Potential Users of a Space Weather Programme
 - concern a large span of application areas : space & ground human activity
 - involves many different large scale phenomena
- ▼ Understanding of Space Weather Impacts is not homogeneous
 - need for information among the user 's community
 - need for users to get aware of SW consequences
 - need for applied research to quantify the impacts

⑤ *Users ' community is born to grow through « education »*

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User 's Requirements Assessment : Outcomes (2/2)

- ▼ Very variable approach of services at time being
 - Deterministic like High quality prediction of GIC 's for Power Companies
 - Many on-going developments/studies for : Space based systems; Aurora prediction; Ionosphere distortion with different types of Outputs
 - Various solutions possible to cope with Space Weather impacts :
 - designs according to worst cases ?
 - Define operationnal procedures to « go through » SW events ?
- ▼ « Space Weather services » has several developping area
 - consolidation of data for i.e. Space Based systems
 - refinement of GIC 's predictions
 - promising areas like GPS-based system; radiation hazards for Aircrafts, Aurora prediction, ...

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Issues for Space Weather User 's Workshop

- ▼ **Users community to better appraise what means Space Weather**
 - Impacts
 - Operationnal constraints
 - What is at Stake
- ▼ **Users community to contribute to Size & Characterise the Needs**
 - Parameters
 - Services
- ▼ **Users community to help to size the financial impacts**
- ▼ **Users community to get involved in a continuous process of Requirements assessment**

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