Extreme space-weather events such as geomagnetic storms are natural phenomena caused by solar activity that can have a serious impact on modern technological infrastructures such as electrical power grids, telecommunication, global satellite navigation (GNSS) and banking. In view of the upcoming solar maximum expected in 2013 the “Space-Weather Awareness Dialogue” aims at raising awareness of the potential impact of space weather on critical infrastructures in view of the growing risk of technological catastrophic events. The dialogue aims to identify related operational and policy challenges for disaster prevention, preparedness and mitigation and to make recommendations for concrete actions. The final outcome of the event will be to establish a roadmap to go from awareness to action at the EU policy level in order to secure EU critical infrastructures in the presence of extreme space-weather events.

Programme

 Registrations of participants (9:30 - 10:20)

 Objective

 The event is structured into six sessions organised as panel discussions supported by moderators and rapporteurs. The panellists, who are all invited high-ranking representatives and experts from the various stakeholder groups, will discuss different aspects of space weather and its impact on critical infrastructures from a variety of operational and organisational perspectives. In addition, the moderators will actively involve the audience in the discussions.

 Format

 The opening session will set the scene of the event, outlining its objectives in the context of the EU policies and industrial landscape.

 Dominique Ristori
 Director General, Joint Research Centre
 European Commission
 and host of the event;

 Marco Malacarne
 Head of Unit
 Directorate-General Enterprise and Industry
 European Commission
 and co-host of the event.

 Contributors and Participants:

 Invited policy makers and experts from industry, research organisations, infrastructure operators and government agencies.
### Programme (Day 1)
25 October 2011

#### Session 1
**Space Weather Today - Introduction**

**Duration:** 1.5 hours (11:00 – 12:30)

**Objective:** This session will give an introduction to space-weather phenomena that give rise to events such as geomagnetic storms and their potential impact on critical infrastructures on and around the Earth. The session will take a broad view of the subject, including taking stock of related initiatives around the world.

**Moderator:** Stephan Lechner, Director, IPSC, Joint Research Centre, European Commission  
**Rapporteur:** Elisabeth Krausmann, Senior Scientist, Joint Research Centre, European Commission

**Panellists:**
- Norbert Jakowski, Team Leader, Institute of Communications and Navigation, DLR, Germany
- Mike Hapgood, Head, Space Environment Group, RAL Space, UK
- Patrice Brudieu, Deputy Director, Directorate for Strategy, Programmes and International Affairs, CNES, France
- Stephanie R. Langhoff, Chief Scientist, NASA Ames Research Centre, USA
- Volker Bothmer, Senior Lecturer and Project Lead Stereo/Corona, University of Göttingen, Germany

### Lunch (12:30 – 14:00)

#### Session 2
**Impact on Space-Based Services and Infrastructures**

**Duration:** 2 hours (14:00 – 16:00)

**Objective:** This session will discuss the potential impact of space-weather phenomena on various space-based infrastructures e.g. satellite navigation, communications, and broadcasting, meteorological services, earth observation, space exploration etc. Resilience of these infrastructures to space-weather events will also be addressed.

**Moderator:** Reinhard Schulte-Braucks, Head of Unit, Space Research and Development, Directorate-General Enterprise and Industry, European Commission  
**Rapporteur:** Pravir Chawdhry, Senior Scientist, Joint Research Centre, European Commission

**Panellists:**
- Mikael Rattenborg, Director of Operations, EUMETSAT
- Nicolas Bobrinsky, European Space Agency
- René Oosterlinck, Adviser to the DG of ESA and State University of Ghent, Belgium
- Aarti Holla-Maini, Secretary General, European Satellite Operators’ Association
- Olivier Lemaître, Head of Brussels office, ASD-Eurospace
- Joaquim Fortuny-Guasch, Senior Scientist, Joint Research Centre, European Commission
- Gerald Braun, Deputy Head, Space Situational Awareness Centre, Federal Armed Forces, Germany

#### Coffee break (16:00 – 16:30)

#### Session 3
**Impact on Ground-Based Infrastructures**

**Duration:** 2 hours (16:30 – 18:30)

**Objective:** This session will discuss potential direct or indirect impact of space-weather phenomena on various ground-based infrastructures e.g. the electrical power grid, telecommunication systems, railways, aviation, banking. Technological sensitivities of these infrastructures as well as their resilience will also be the subject of discussion.

**Moderator:** Paul Verhoef, Head of Unit, Research and Innovative Transport Systems, Directorate-General Mobility and Transport, European Commission  
**Rapporteur:** Alois J. Sieber, Head of Unit, Security Technology Assessment, Joint Research Centre, European Commission

**Panellists:**
- Mikael Odenberg, Director General, Swedish National Grid
- John Vincent, Deputy Director Strategic Safety, European Aviation Safety Agency
- Ken Ashton, Head of Navigation and Spectrum, NATS En-route Ltd., UK
- Phil Lawton, Grid Operations 2020 Manager, National Grid plc, UK
- Aleksandar Jovanovic, CEO, European Virtual Institute for Integrated Risk Management, Germany
- Ari Viljanen, Senior Scientist, Finnish Meteorological Institute

### Dinner (19:30) on invitation by the host
Programme (Day 2)
26 October 2011

Session 4
Risk Management and Preparedness

Duration: 1.5 hours (11:00 – 12:30)

Objective: This session will address the consequences of and preparedness for severe space-weather events. Experts will discuss potential risk exposure of infrastructure operators and public services to suffer losses due to space-weather events. They will explore short-term and long-term strategies for effective risk management that will allow operators and EU/MS authorities to prevent service disruptions due to extreme space-weather events or to plan for mitigating their consequences so as to ensure business continuity.

Moderator: Tom Bogdan, Director, Space Weather Prediction Center, NOAA, USA
Rapporteur: Elisabeth Krausmann, Senior Scientist, Joint Research Centre, European Commission

Panellists:
- Reto Schneider, Director, Swiss Reinsurance Company Ltd.
- David Wade, Chief Space Underwriter, Atrium Space Insurance Consortium
- Bengt Sundelius, Special Adviser, Swedish Civil Contingencies Agency
- Ian Clark, Head of Unit, Civil Protection Policy, Prevention, Preparedness and Disaster Risk, Directorate-General Humanitarian Aid & Civil Protection, European Commission
- Zarko Sivcev, Adviser COO, Directorate Network Management, Eurocontrol

Session 5
From Awareness to Action

Duration: 1.5 hours (14:00 – 15:30)

Objective: The final session will focus on the key messages from the foregoing dialogue. The aim of this session is to establish a road map to go from awareness to action at the EU policy level in order to secure EU critical infrastructures in the presence of extreme space-weather events. Discussion will explore the scope of international cooperation in responding to these needs.

Moderator: Alois J. Sieber, Head of Unit, Security Technology Assessment, Joint Research Centre, European Commission
Rapporteur: Pravir Chawdhry, Senior Scientist, Joint Research Centre, European Commission

Panellists: Moderators for Sessions 1-5

Closing of the Space-Weather Awareness Dialogue (15:30-16:00)