

Space Weather

WRC23 AI 9.1a

Definition – What is space weather

Those not involved with the ITU process wouldn't believe the difficulty we have had defining space weather.

Wikipedia has no such difficulty..

“Space weather is a branch of space physics and aeronomy, or heliophysics, concerned with the time varying conditions within the Solar System, including the solar wind, emphasizing the space surrounding the Earth, including conditions in the magnetosphere, ionosphere, thermosphere, and exosphere”

But we are really concerned with the effects

Space Weather is a natural hazard recognized on the national risk register

Astronauts high
radiation dose

Solar cell degradation
Radiation damage,
Surface charging

Satellite navigation and
timing
errors / loss of service

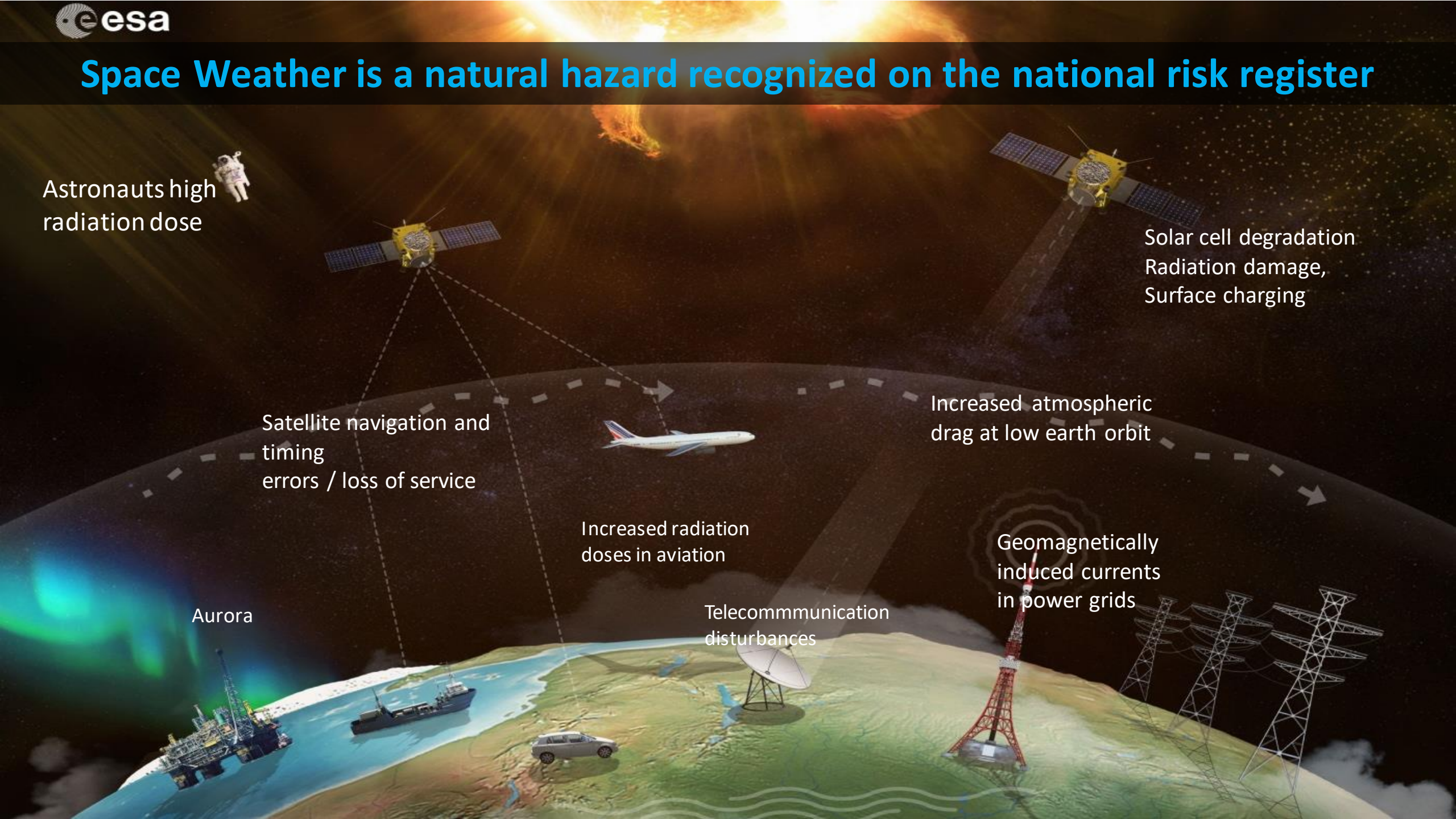
Increased atmospheric
drag at low earth orbit

Increased radiation
doses in aviation

Geomagnetically
induced currents
in power grids

Aurora

Telecommunication
disturbances



Space Weather Sensors

To protect against space weather, it is important to be able to forecast it

- That requires observations
 - Many of the observations rely on other radiocommunications services
 - Solar radio emissions, ionospheric sounders etc.
 - Signals of opportunity, e.g. RNSS
- These observations are crucial to resilience

but,

Despite space weather sensors operating for a century, Space Weather is not defined in the Radio Regulations, Space weather sensors have no Radio Service nor any spectrum allocations

This means space weather sensors operate without protection at a time when increasing sharing is needed. Without recognition, they can not be taken into account. This needs to be resolved – hence WRC23 agenda item 9.1 and the draft WRC27 agenda item

Outcome from WRC23 – High priority

- 1 Get space weather properly defined in Article 1**
- 2 Introduce space weather as a subset of MetAids in Article 4:**

➤ MetAids (space weather) service

- 3 Secure agenda item for WRC27**

Study potential new MetAids (space weather) allocations for operations of receive-only space weather observations

Report RS.2456 (Summary of current sensors),

Two draft new reports covering requirements and protection criteria

WRC27 Agenda Item

- Receive only – i.e. Passive sensors and sensing signals of opportunity
- Should be restricted to a limited set of frequency bands
- Any new allocations shall not constrain the current and future development of applications of incumbent services in bands and in adjacent bands

Now in the process of agreeing an ECP on these changes and preparing a draft new resolution for the future agenda item.

Work ongoing in WP7C