



European Satellite Operators Association



- Satellite Operators & Space Security -

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- 11 satellite operators in 8 EU Member States



- Flying over 150 satellites
- Global coverage of communications services
- The world's 4 largest satellite operators are European companies



COLLISIONS:

- During launch phase from debris in LEO orbit
 - 4800 satellites launched since 1957
- During normal GEO operations
 - Military satellites (no info available for ca. 100sats)
 - Other operators
 - Debris

SPACE WEATHER !!

- Solar flares
- Geomagnetic storms
- Cosmic background radiation
- Micro-meteoroids

⇒ 'High Impact, Low Occurrence' events:

- ⇒ Total failures are rare
- ⇒ Risk of collision is low, BUT:

A single event can be catastrophic,
therefore Satops take the subject very seriously

RISKS TO SPACE OBJECTS ARE NOT NEW!

- Something we have been aware of for a long time

BIGGEST SAFEGUARD IS DESIGN & QUALITY OF INTEGRATION OF THE SATELLITE

- Making sure sat is as 'immune' as possible & provides redundancy to ensure ongoing operations even in case of incident e.g. solar flare

INCIDENTS CANNOT ALWAYS BE PREVENTED, BUT:

- ⇒ Optimizing DESIGN with today's knowledge, &
- ⇒ Securing & exchanging maximum DATA (space environment & previous incidents)

Better understanding malfunctions can feedback into future satellite design



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Public Perception of Risks

E.g. Space Weather

A SUBJECT HUGELY EXAGGERATED IN THE MEDIA:

- August 2010: Popular press grossly exaggerated solar activity & predicted 'dire consequences' for satops. No malfunctions reported.
- Sept 2011: Articles followed completion of a study: *"Solar megastorm could cripple satellites for a decade"*. No context/ no predictions.

MEDIA COVERAGE INFLUENCES POLICY-MAKING:

- Prime Minister's Question Time (UK)
- Brussels MEPs

LET'S ADD A DOSE OF REALITY!

- 4 solar maxima in 50 years: never a solar mega-storm, never major sat disruption
- A Carrington-type event predicted to happen every 500 years!
- Not just satellites that are affected, terrestrial infrastructures too (national grids/ undersea cable repeaters/ telephone exchanges)

'Hysterical' media attention should not be allowed to influence policy decisions!
Reasoned technical discussion required!

INCIDENTS DO OCCUR, MOST OFTEN THERE IS NO CONCLUSIVE EVIDENCE ON THEIR CAUSE

SATOPS ARE ABLE TO REACT IN A VERY ROBUST WAY

- Flexibility to move services to adjacent sats/ reshuffle services
- Ability to choose which services should be lost/ maintained/ restored

IN CASE OF INCIDENT, PRESSURE ON SATOPS FROM CUSTOMERS & INSURERS

- Satops therefore put pressure on manufacturers to ensure optimum redundancy/ quality

Impact of an incident on satellite services is generally manageable,
unless total satellite failure

DESIGN & DATA ARE CRUCIAL IN BEING PREPARED FOR INCIDENTS

INSUFFICIENT DATA SOURCES AVAILABLE

- Data on military satellites is not available
- Former sources of data e.g. LANL (US military science institution) no longer share with non-US agencies!

SOME SATOPS HAVE PUT SSA SENSORS ON THEIR OWN SATELLITES (To monitor solar activity/ space environment activities e.g. RF interference issues)

SMALL GROUP OF SATOPS HAS ESTABLISHED THE SPACE DATA ASSOCIATION “SDA”

- Protects legal sensitivity of data received
- Acts as an early warning of incidents for Satops by computing data received
- An expanding private initiative, could be ideal vehicle to receive SSA data as well

Need for Data Maximization & Exchange in form of Pragmatic Solutions
E.g. more SSA sensors as hosted payloads on commercial satellites