

Mitigating Actions

Given a warning of a high risk space weather event there are several things that satellite operators can do to reduce the risk of damage or disruption to service:

- Initiate power saving actions by switching off unnecessary equipment, reducing battery charge rates and shedding customer traffic (in the case of a communications satellite). These actions may be relevant if the proton environment becomes very severe and solar array output degrades (most spacecraft have a sufficient margin, but in some cases there may be very little margin due to design constraints or previous solar array anomalies).
- Disable Magnetic Torquer (Magtorquer) operation in order to prevent spacecraft attitude disturbances / spacecraft pointing errors. This may be necessary in the case of a severe Geomagnetic Storm. Some older geosynchronous spacecraft use Magtorquers; such equipment is still very commonly used in MEO / LEO spacecraft designs.
- Shut down sensitive imaging sensors (astronomy or missile warning satellites).
- Curtail use of Star Sensors / Star Trackers and use alternative Attitude Determination and Control sensors.
- Power down sensitive or radiation susceptible hardware.
- Implement review of onboard attitude / orbit calculation data (may be relevant for spacecraft using onboard GPS receivers).
- Implement increased orbit determination frequency and carry out orbit analysis based on increased drag models.
- Postpone stationkeeping manoeuvres unless they are absolutely vital.

In addition to the above active measures:

- Increase manning in Spacecraft Operations Centres (SOCs).
- Postpone SOC database / software updates (in order to maintain availability of the SOC to urgently respond to spacecraft anomalies).
- Increase SOC staff awareness of current and near term space environment conditions.
- Prepare detailed briefing information for internal and external customers.