35th IAA SYMPOSIUM ON SPACE AND SOCIETY (E5)
Space Assets and Disaster Management (4)

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PLEIADES NEO SATELLITES: NEW ASSETS FOR EMERGENCY RESPONSE AND DISASTERS MANAGEMENT

Abstract

The use of Earth Observation satellites in support of emergency response is not new: signed in October 2020, the International Charter "Space and Major Disasters" was the first international initiative aimed at establishing a unified system for triggering the acquisition of space data when a major disaster strikes. In Europe, the Copernicus Emergency Management Service, whose precursor service was launched in 2009, is operational since April 2012.

The very high resolution satellites are the most interesting assets, in particular after earthquakes, hurricanes or other disasters affecting urban areas: beyond the first estimates of damages, they allow to provide detailed delineation and grading maps supporting the first responders and other users involved in crisis management. Launched in 2021, the two Pleiades Neo satellites are the most recent assets worldwide providing both very high resolution and very fast revisit.

The first part of this paper explains how this operational performance became a reality with significant efforts in technology development in an end-to-end perspective: - Performance of the imaging instrument, providing the 30-cm native imagery. - Performance of the satellite platform, aimed at improving revisit frequency and daily coverage - Performande of the network of ground stations and the operation command, control and tasking procedures, designed to optimise the end-to-end acquisition time (from tasking decision to reception of the first image of the area of interest). - Performance of the ground processing and image distribution chain with very innovative features.

In particular, it will emphasize the benefits of a disruptive processing solutionq, based on machine-learrning algorithms, aimed at delivering 15-cm High Definition products from native imagery at 30-cm resolution or able to automatically extract 3D building from stereo pairs. The second part of the paper shows Pleiades Neo satellites in action with recent representative examples of operational use, e. g. during the wild fires season (summer 2023), after the Earthquake in Morocco (September 2023), the deadly floods in Lybia (September) and other more recent disasters. These examples will highlight the benefits of the products but also how the operational procedures were implemented.

The final section provides an outlook of future work planned by Airbus Defence aimed at improving even more the operational performance.