

SPACE OPERATIONS SYMPOSIUM (B6)  
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THE NEW TREND ANALYSIS PLAN FOR COSMO-SKYMED GROUND AND ILS&OPS SEGMENTS

**Abstract**

COSMO-SkyMed is an Earth Observation space program jointly managed by the Italian Space Agency (ASI) and It-MoD (Ministry of Defence).

In the framework of the current programmatic phase concerning the operational management of the constellation, a set of qualified teams was introduced in order to perform technical, operational and engineering activities on the system. Moreover some tailored information flows were developed in order to continuously guarantee the performances and the availability of the system and to identify potential enhancements.

To support this operational management phase a Trend Analysis system has been introduced. In fact the main aim of Trend Analysis techniques is to support the decision making process to analyse the system status and consequently:

- Maintain the system fully-operative identifying particular patterns suggesting some corrective actions to avoid faults;
- Grant the nominal behaviour of the system identifying some hidden degradation trends to be corrected;
- Ensure that the system continues to meet the users' needs, that can evolve.

Most of these activities are identified as "Conditional Based Management" (CBM).

A classical CBM system is based on periodical measures performed on physical characteristics (e.g. temperature, fluid levels, etc.). Depending on their results some corrective actions are planned on system components. Most of the measures performed periodically on the COSMO-SkyMed Space Segment are used for the CBM and are very important to check the status of the satellites and to plan preventive actions.

However most of the Ground and ILSOPS (Integrated Logistic Support and Operations) Segments subsystems, except the antennas, are not suitable for the classical CBM. So the Trend Analysis activity on these two Segments has to analyse circumstances that cannot be preliminarily defined and that can

be solved or mitigated only with not preliminary defined recovery actions. In most cases the periodical analysis is only used to identify recurrent anomalies suggesting that something could not work in a nominal way. It is mainly based on the periodical collection and review of the Trouble Tickets that can suggest analysing more in depth some ambiguous behaviour. They define a valuable (but not only) source of data on the behaviour of the system which helps to identify the variables to be monitored. This further analysis has to be designed in detail and specifically to every case. The results of this in-depth analysis are used to locate the problem and consequently plan all mitigation or corrective actions.