

EARTH OBSERVATION SYMPOSIUM (B1)  
International Cooperation in Earth Observation Missions (1)

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DESIGN CONCEPT AND ARCHITECTURE OF MUSIS – CIL: A COMMON INTEROPERABILITY  
LAYER FEDERATING THE OPTICAL SPACE SYSTEM CSO AND THE RADAR IMAGING  
SYSTEM CSG.

**Abstract**

MUSIS is an endeavour launched by several European nations to bring together the coming generation of military and dual-use space-based imaging systems. MUSIS stands for "*MUltinational Space-based Imaging System for surveillance, reconnaissance and observation*". The main objective of MUSIS is to provide continuity of service of the current generation of optical and radar satellites and to ensure adequate access of the partners to space systems which will enter into service in the coming years. It is within this spirit that two MUSIS participants, France and Italy, recently entrusted OCCAR with a set of activities called MUSIS Federating Activities aimed at defining a ground interoperable architecture federating the optical space system CSO (*Composante Spatiale Optique* under realization in France) and the radar imaging system CSG (*COSMO-SkyMed Seconda Generazione* under realization in Italy). On behalf of the two nations the OCCAR Executive Administration placed a contract with the Italian and French space industry which is in charge of defining an architecture for the CIL. This federated system will provide Italy and France with an easy and reliable access from their national own space system to optical and radar images which will be acquired by two space systems, envisaging, in addition, the possible future access of other MUSIS partners and to other MUSIS space components. The solution retained consists in developing an advanced bridge called Common Interoperability Layer (CIL) to be placed on the ground between the two space systems, CSO and CSG, which are to be designed with enhanced interoperable, flexible and modular interfaces. The CIL will enable operators from one nation to order image products from the partner's system, task the satellites of the other nation, receive the image products (both new acquisitions and stored in common archives) and store them in a fully secure way. The personnel needed to operate the CIL will be kept at minimum, thereby reducing lifecycle costs. Through a suite of services (i.e. hardware and software either developed in common or made available by one nation to the other), standard formats interface and a secured network, the CIL will be subsequently open to the access of

other partners and to additional MUSIS space components. This paper, starting from the operational needs, focuses on the design concept and provides an architectural overview of MUSIS CIL, the France and Italian new approach for the cooperation in future space-based imaging systems.