

SYMPOSIUM ON INTEGRATED APPLICATIONS (B5)
Integrated Applications End-to-End Solutions (1)

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SPACEGRID : TOWARDS THE INTEGRATION OF SPACE TECHNOLOGIES IN THE POWER
GRID MANAGEMENT SYSTEM

Abstract

Nowadays, the efficient transmission and dispatching of electricity is fundamental in order to guarantee to European Union activities and its citizens the necessary energy resources. In the last years the energy demand has grown dramatically. The growing complexity of the networks, due to the always increasing number of interconnections and of renewable energy sources, calls for a more efficient management and control of the energy production, transmission and dispatching. In 2006, in the frame of the General Study Programme of the European Space Agency, Carlo Gavazzi Space has initiated a systematic study on potential added values of the integration of different space technologies in the management of the grid; such activity has been carried out in close partnership with TERNA, a major energy transmission grid operator. The company is the primary owner of the Italian National High Voltage Electricity Transmission Grid, with nearly 60 thousand km of lines throughout the national territory. Terna is the first independent operator in Europe and the seventh in the world in terms of kilometres of lines managed. The company is also responsible for the transmission and dispatching of energy throughout the entire territory, and therefore for the safe management of the balance between electricity supply and demand in Italy, 365 days a year and 24 hours a day. As first result of this collaboration, the concept of the "SpaceGrid" system has been defined, whereby Satellite Earth Observation and Satellite Communications are integrated in the Power Grid Management system in order to provide an innovative powerful tool for facing current and rapidly evolving needs of power grid managers. A first core of applications has been defined, focused on the electricity dispatching and to the power grid maintenance inspection operations. The consolidation of the technical feasibility and economical viability of the SpaceGrid core system concept has been started in early 2010 and will be completed by mid 2010. The next step will consist on the set up a prototype SpaceGrid system, able to demonstrate to the grid managers that space technologies fulfil their requirements and to allow space industry engineers to refine and optimise the implementation of such services. Once these prototypes are demonstrated and refined, the ultimate objective will be to develop and implement the integrated services and guarantee their exploitation in a sustainable environment.