Siemens PTI Advises on the USTDA-Funded Feasibility Study of the Second Uruguay-Brazil Electrical Interconnection Project

Siemens PTI recently completed an assignment entitled “Technical Assistance for the Uruguay-Brazil Electrical Interconnection Project” (or, the “Project”), funded by the United States Trade and Development Agency (USTDA). The client was the National Directorate of Energy and Nuclear Technology (DNETN) of the Ministry of Industry, Energy and Mines (MIEM) of Uruguay. As part of this engagement, Siemens PTI provided products and services from its three main areas of business: consulting services, software products, and training services. This clearly enabled the DNETN to take advantage of Siemens PTI’s entire portfolio of products and services in an integrated manner.

The assignment started in January 2007 and was completed in June 2008. The Siemens PTI project team included the following subcontractors: Taylor-DeJongh (USA), TRC Global Management Solutions (USA), and PwC (Uruguay). The Siemens PTI project members were Carlos Dortolina (Project Manager), Dr. Ramón Nadira, Dr. Paloma De Arizón, and Dr. Carlos Grande-Morán.

The Project involves the construction of a second electrical tie line between the countries of Uruguay and Brazil that will enable the further exchange of electric power between these two countries. One of the main challenges relative to this tie line is that the power systems in these countries operate at different frequencies: Brazil is a 60 Hz system while Uruguay operates at 50 Hz. As a result, the Project is comprised of an AC transmission line (50 Hz) of approximately 300 km in length on the Uruguayan side (from San Carlos to Melo), a back-to-back converter station to be located east of Melo in Uruguay, and a 90 km AC transmission line (60 Hz) from Melo to Candiota in Brazil. The Project is designed for a nominal voltage of 500 kV and a transfer capacity of about 500 MW.

Siemens PTI worked with the DNETN, the MIEM and UTE (the national electric power utility in Uruguay) and specifically advised on the operational, commercial and regulatory aspects of the Project. The scope of work also included the provision of the Power System Simulator for Engineering (PSS®E) software, computers to run the software, and training in the use of PSS®E. In combination, this engagement transferred to DNETN the technical tools and knowledge necessary to independently assess future regional electrical interconnection projects.

The consulting activities of the engagement were organized into the following seven tasks: (i) review and analysis of comparable interconnection projects (case studies included tie-lines between countries as well as interconnections between regions/grids in the same country); (ii) assessment of regulatory, commercial and operational framework (with the objective of identifying existing barriers to the implementation of the interconnection project and recommending measures to eliminate these barriers); (iii) identification and assessment of potential sources of financing, led by Taylor-DeJongh, who examined the issue of structures and options available for the financing of the interconnection; (iv) preliminary review and assessment of the environmental impacts of the project, led by TRC Global Management Solutions; (v) identification and assessment of the key host country developmental impacts, also led by TRC Global Management Solutions; (vi) identification of potential US-based sources of supply; and (vii) development of a project implementation plan. The objective of this last task was to recommend a high-level step-by-step listing of anticipated next steps necessary to transition the Project to full implementation and operation (e.g., announcement of bidding, selection of winning bidder, establishment of operating
authority, securing of funding from both Uruguay and Brazil, etc.). Included in this Project Implementation Plan were the key steps attendant to the raising of financing for the Project, and the suggested timing and phasing of those steps.

In addition, Siemens PTI delivered to the DNETN five computer workstations, five copies of PSS®E with power flow, unbalanced fault analysis and dynamic simulation (including extended term dynamics), five copies of GMB (Graphical Model Builder), and three copies of PSS®MUST. Training in the use of PSS®E was delivered in Montevideo, Uruguay, by Dr. Paloma De Arizón (power flow and unbalanced fault analysis), and Dr. Carlos Grande-Morán (dynamic simulation) in late 2007.

Finally, it is important to mention that this assignment enjoyed considerable visibility from the highest levels of government in Uruguay. Meetings convened to discuss the results of the assignment were well attended, and at times even the Minister and Vice-Minister of Industry, Energy and Mines of Uruguay themselves participated in these meetings. We hope that the potential benefits from this interconnection project – which appear to be quite significant – can be fully realized in the near future.