

Incorporating Pumped Storage Power Plant in the Sri Lankan Electricity Sector

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Abstract

Sri Lanka is anticipated to experience a coal dominant electricity sector within this decade with the introduction of planned large scale coal power plants. Developing Pumped Storage Power Plant (PSPP) would be one of the most promising options to utilise the additional coal power and to effectively handle the peaking scenario. Comprehensive study on PSPP was carried out with the due considerations on the possible sites for the power plant, the electricity transmission aspects and the future load demand. As the first step, suitable site locations were selected for a new PSPP interconnection based on existing power plants such as Kotmale, Victoria, Polpitiya and Laxapana. The Sri Lankan transmission system was modelled using the Integrated Power System Analysis (IPSA) software package for two different load demand conditions in 2016. Then the technical feasibility was analysed in the modelled transmission network with the introduction of candidate PSPPs for different loading conditions. Each of the case in the study was established with the load flow, fault level study and transient analysis. Finally the optimum capacity for each power plant was estimated by comparing the voltage stability, overloading conditions and the overall transmission losses. This study anticipates assisting the policy makers and PSPP designers in selecting an optimal option to address the peaking scenario and the urgent electricity needs of Sri Lanka.