



**SELECTION OF TRANSMISSION  
NETWORK CONFIGURATION FOR  
TRINCOMALEE POWER PLANT GRID  
CONNECTION -  
TECHNICAL AND FINANCIAL FEASIBILITY STUDY  
FOR 220kV/400kV CONFIGURATIONS**

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by  
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## Abstract

According to the Long Term Generation Expansion Plan 2009-2022 published by the Transmission and Generation Planning Branch of Ceylon Electricity Board there will be Four 250MW and Four 300MW coal plant units in Trincomalee area by the year 2020. Therefore a necessity has arisen for identify, plan and formulate the transmission grid connection for the above mentioned coal fired power plants. Because of the large quantity of power which has to be transmitted from the proposed Trincomalee Power Station it has been decided to investigate the possibility of utilizing 400kV as the transmission voltage against the present practice of transmitting power using 220kV.

Detailed power system analysis consisting of load flow and stability studies were conducted under night peak and day peak loading conditions to identify areas where the planning criteria were violated using the 'Power System Simulator for Engineering' (PSSE) software package. Conclusions of the most feasible transmission network configuration for power plant-grid connection were drawn based on all the above power system analysis results, economic analysis results and other concerns. Studies were conducted for year 2016 based on the 'Long Term Transmission Development Plan 2008-2016' and for year 2020 based on the Master Plan Study on the Development of Power Generation and transmission System in Sri Lanka - January 2006'.

It is possible to identify 220kV and 400kV transmission network configurations, which are capable of successfully transmitting 2200MW power generated at Trincomalee Power Plant in year 2020. But the 220kV configuration is economically viable with compare to' 400kV configuration for Trincomalee Power Plant Grid Connection. By considering all the advantages and disadvantages of selected 220kV and 400kV transmission network configurations, it is recommended that 220kV configuration be used as the Trincomalee Coal Fired Power Plant Grid Connection.