TECHNO ECONOMIC ANALYSIS ON THE USE OF HTLS CONDUTORS FOR SRI LANKA'S TRANSMISSION SYSTEM

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Degree of Master of Science

Department of Electrical Engineering

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DECLARATION

I declare that this is my own work and this dissertation does not incorporate without acknowledgement any material previously submitted for a Degree or Diploma in any other University or institute of higher learning and to the best of my knowledge and belief it does not contain any material previously published or written by another person except where the acknowledgement is made in the text.

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The above candidate has carried out research for the Masters Dissertation under our supervision.

Signatures of the supervisors:

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Dr. K.T.M.U. Hemapala

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ABSTRACT

High Temperature Low Sag (HTLS) conductors are introduced into the electricity transmission systems by the conductor manufacturers, with the idea of mitigating some of the disadvantages shown by conventional overhead conductors such ACSR (All Aluminium Conductor Steel Reinforced).

Compared to conventional conductors, HTLS conductors have some of the improved electrical and mechanical characteristics, where by employing these conductors in overhead transmission lines, some of the complex issues related to power transmission could be resolved.

However due to their novel appearance and lack of service experiences in the field, most of the utilities in the world are in a dilemma whether to use these conductors instead of ACSR or other conventional types of conductors that have provided a great service to the utilities throughout hundreds of years.

Situation in Sri Lanka is also not that different. Almost the entire Sri Lanka's transmission system is comprising with overhead lines constructed using conventional conductors, especially ACSR. Therefore the knowledge and the experience regarding the use of HTLS or any other types of conductors remain minimal among utility engineers.

Therefore under this study, the use of these so called HTLS conductors for Sri Lanka's electricity system is discussed in terms of technical and economic aspects under three different categories of overhead line construction. Conclusions are drawn based on simulations results and comparisons are also elaborated.

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ROW	-	Right of Way
HTLS	-	High Temperature Low Sag
ACSR	-	Aluminium Conductor Steel Reinforced
AAAC	-	All Aluminium Alloy Conductor
EMF	-	Electromagnetic Field
KPT	-	Knee Point Temperature
TACSR	-	Thermal Resistant Aluminium Alloy Conductor Steel Reinforced
CEB	-	Ceylon Electricity Board
G(Z)TACIR	-	Gap Type (Super) Thermal Resistance Aluminium Conductor Steel Reinforced
ACCC	-	Aluminium Conductor Composite Core
ACSS	-	Aluminium Conductor Steel Supported
CCC	-	Current Carrying Capacity
NPV	-	Net Present Value
IEE	-	Initial Environment Examination

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