REAL TIME DYNAMIC THERMAL RATING METHOD TO UPRATE THE AMPACITY OF OVERHEAD TRANSMISSION LINES IN SRI LANKA

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DECLARATION

I declare that this dissertation does not incorporate without acknowledgement any material previously submitted for a degree or diploma in any University or institution 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.

……. Date: ……

S.Rishanthi

I endorse the declaration by the candidate:

Signature of the supervisor:

…….. Date: ……

Dr.Asanka Rodrigo

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ABSTRACT

Real time dynamic thermal rating (RTTR) is a smart-grid technology, which allows to utilize the overhead line conductors by increasing the current carrying capacity of the line based on real time weather data. Traditionally, Static thermal rating (STR) calculates current rating based on 'Worst case weather conditions", which is used in Ceylon Electricity Board (CEB) as well as most of the utilities around the world. These assumptions may reduce the actual line capacity whenever real weather conditions are less stressful.

The optimal current carrying capacity(CCC) of a line is primary determined by the critical span along the line route. Therebefore the sag of the line has been analysed in detailed to identify the critical span with help of PLSCADD Software. Then, the real time weather data have been applied and RTTR values for interested transmission lines has been calculated.

In this research, current rating using real time weather cases have been calculated for selected transmission lines in Sri Lanka and compared the results with static thermal rating methods. A software based RTTR model was also developed in VBA platform in order to calculate the real time CCC. This software interface can be used to analyse entire transmission network of Sri Lanka to calculate weather based current ratings.

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LIST OF ABBRIVIATIONS

CCC	-	Current Carrying Capacity
RTTR	-	Real-time thermal rating
STR	-	Static Thermal Rating
ACSR	-	Aluminium Conductor Steel Reinforced
CEB	-	Ceylon Electricity Board
HTLS	-	High Temperature Low Sag
UTM	-	Universal Transverse Mercator
GL	-	Ground Level
VBA	-	Visual Basic for Application
GP	-	Ground Points
BP	-	Bend Points