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A Re-engineered Transmission Line Parameter Calculator

Sanjay Bahadoorsingh [a, Ψ], Suraj Ramsawak[b], Arvind Singh[c], and Chandrabhan Sharma[d]

Department of Electrical and Computer Engineering, Faculty of Engineering, The University of the West Indies, St. Augustine, Trinidad and Tobago, West Indies
[a]E-mail: sanjay.bahadoorsingh@sta.uwi.edu
[b]E-mail: suraj.ramsawak@yahoo.com
[c]E-mail: arvind.singh@sta.uwi.edu
[d]E-mail: chandrabhan.sharma@sta.uwi.edu

[Ψ] *Corresponding Author*

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Abstract: *This paper documents the development and testing of a Transmission Line Parameter Calculator (TLPC), which computes the impedance parameters for short and medium transmission lines. LPARA, an existing software at The Trinidad and Tobago Electricity Commission (T&TEC), has been taken as the standard for comparison, since it has been tested and proved consistent with Power World Software, as well as it has been satisfactorily employed for decades at T&TEC. Comparative testing of the newly developed TLPC with LPARA revealed a maximum percentage difference of 0.05%, 0.02% and 0.80% in Series Resistance, Series Reactance and Shunt Admittance Matrices, respectively. The package, when compared to its FORTRAN based predecessor, LPARA, has a user friendly Graphical User Interface (GUI) with an expandable database of support structures and conductors. The TLPC has interactive program help, error checking, and validation of all user inputs. It is tailored to T&TEC, but yet flexible enough for use by other similar electric utilities. The finished product has demonstrated a vast improvement in the overall speed of parameter calculations, the reduced susceptibility to input errors and it has addressed recent compatibility issues which LPARA experiences as T&TEC upgrades and transitions to 64-bit Operating Systems.*

Keywords: *Power transmission line, power system planning, transmission line theory, admittance impedance matrix*