AN IMPROVED DC LOAD FLOW TECHNIQUE FOR RELIABILITY STUDIES OF POWER SYSTEMS

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LIST OF SYMBOLS

α, β	-	deterministic vectors which distribute the system load to individual buses.
B	-	susceptance of series element of transmission line (i,k)
D	-	number of days of study
d_j	-	mean duration of a contingency state
e	-	mean duration of system load being in a peak state
$E_i = V_i e^{j\theta i}$	-	complex voltage at node i
E_i^*	-	complex conjugate of voltage E_i
erf	-	the error function
exp	-	exponent
I_i	-	current through line (i,k) at node i
i,k	-	node identification
j	-	complex operator
Lcj	-	critical load of a contingency network state
L_i	-	system load being in a peak state
L_o	-	system load being in a low state
λ	-	failure rate of a component
μ	-	repair rate of a component
θ_{ik}	-	voltage angle difference between nodes i and k, $(\theta_i - \theta_k)$
θ_i	-	voltage angle at node i (reference to slack node)

N - duration of normal weather

N_j - contingency state of a transmission network

N_o - normal state of a transmission network

P_i - real power flow in line (i,k) at node i

Pr - probability

p^{pq}_{mn} - the probability of overload of line mn due to line pq being out of service

Q_i - reactive power flow in line (i,k) at node i

Q_m - modified reactive power in line (i,k)

q - reactive power generated in line (i,k)

ρ - random variable for system load

r_{ik} - series resistance of line (i,k)

R - sensitivity factor

S_i - complex power flow in line (i,k) at node i, $(S_i = P_i - jQ_i)$

V_i - voltage magnitude at node i

x_{ik} - series reactance of line (i,k)

$\hat{x}_{ik}$ - inverse of the series susceptance of line (i,k), $\left(\hat{x}_{ik} = \frac{1}{B}\right)$

y^{sh}_{ik} - shunt susceptance of line (i,k)

z_{ik} - series impedance of line (i,k), $z_{ik} = (r_{ik} + jx_{ik})$