LIST OF ABBREVIATIONS

ACA  - Ant Colony Algorithm
BA  - Bee Algorithm
$V_i$ - Bus voltage
CSAPSO - Chaotic Self Adaptive Particle Swarm Optimization
CEED - Combined Economic Emission Dispatch
$g_k$ - Conductance of the conductor
$c_1, c_2$ - constants
DE - Differential Evolution
ELD - Economic Load Dispatch
$F_2(x)$ - Emission minimization
EED - Environment Economic Dispatch
FFA - Firefly Algorithm
FACTS - Flexible AC Transmission System
FPA - Flower Pollination Algorithm
$F_1(x)$ - Fuel cost of generation
GA - Genetic Algorithm
HS - Harmony Search
hr - Hour
IP - Interior Point
$F_4(x)$ - L-index minimization
LP - Linear Programming
$F_3(x)$ - Loss minimization
$Q_{gi}^{\text{min}}$ - Lower limit of Reactive Power Generation
$P_{gi}^{\text{min}}$ - Lower limit of Real Power Generation
$V_{i}^{\text{max}}$ - Maximum bus voltage limit
UPFC$_i^{\text{max}}$ - Maximum size of UPFC
$T_i^{\text{max}}$ - Maximum Transformer Tap Settings
$X_{\text{max}}$ - Maximum value of control variable
MVAR - Mega Volt Ampere reactive
MW - Mega Watt
$V_i^{\text{min}}$ - Minimum bus voltage limit
UPFC$_i^{\text{min}}$ - Minimum size of UPFC
$T_i^{\text{min}}$ - Minimum Transformer Tap Settings
$X_{\text{min}}$ - Minimum value of control variable
MOEA - Multi Objective Evolutionary Algorithm
NLP - Non Linear Programming
nbr - Number of branch or transmission line
$NCV$ - Number of control variables
$NG$ - Number of generators
$NT$ - Number of transformers
$N_{\text{UPFC}}$ - Number of UPFC
OPF - Optimal Power Flow
PSO - Particle Swarm Optimization
QP - Quadratic Programming
$Q_D$ - Reactive Power Demand
$Q_G$ - Reactive Power Generation
$Q_{gi}$ - Reactive Power Generation
$Q_L$ - Reactive Power Loss
$Q_C$ - Reactive power support in the bus
RGA - Real coded Genetic Algorithm
$P_D$ - Real Power Demand
$P_g$ - Real power generation
$P_G$ - Real Power Generation
$P_{gi}$ - Real Power Generation
$P_L$ - Real Power Loss
\( V_j \) - Receiving end bus voltage magnitude
\( \Theta_j \) - Receiving End Voltage Angles
\( V_i \) - Sending end bus voltage magnitude
\( \Theta_i \) - Sending End Voltage Angles
SA - Simulated Annealing
STATCOM - Static Synchronous Compensator
SSSC - Static Synchronous Series Compensator
\( T \) - Transformer tap position
\( T_i \) - Transformer Tap Settings
UPFC - Unified Power Flow Controller
\( Q_{gi}^{\text{max}} \) - Upper limit of Reactive Power Generation
\( P_{gi}^{\text{max}} \) - Upper limit of Real Power Generation
\( V_s \) - Voltage magnitude of generator bus
\( w \) - Weight