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3.3.2 Number of books and chapters in edited volumes/books published and papers published in national/ international conference proceedings per teacher during a year 2019-20					
Sr. No.	**Name of the teacher**	**Title of the book/chapters published**	**Title of the paper**	**Title of the proceedings of the conference**	**Name of the conference**
1	Dr. Jagtap H. P.	Reliability, Safety and Hazard Assessment for Risk-Based Technologies, Lecture Notes in Mechanical Engineering (Springer Publications),	Markov probabilistic approach-based availability simulation modeling and performance evaluation of coal supply system of the thermal power plant, Reliability, Safety and Hazard Assessment for Risk-Based Technologies	NA	International Conference on Advanced Technologies for Societal Applications
2	Dr. Jagtap H. P.	AI Techniques for Reliability Prediction for Electronic Components (Book chapter)	Traditional and non-traditional optimization techniques to enhance reliability in process industries	NA	NA
3	Pramod Magade	Techno-Societal 2018	Development and Testing of Novel Small Wind Turbine (NSWT) Set	NA	International Conference on Advanced Technologies for Societal Applications
4	Dr.Kulkarni C.N.	NA	A comparative study and graphical analysis in designing and operation of Solar Thermal circular concentrator for enhancing efficiency of solar concentrating system	E3S Web of Conferences	NA

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Lecture Notes in Mechanical Engineering

Prabhakar V. Varde
Raghu V. Prakash
Gopika Vinod *Editors*

Reliability, Safety and Hazard Assessment for Risk-Based Technologies

Proceedings of ICRESH 2019

Springer

Markov Probabilistic Approach-Based Availability Simulation Modeling and Performance Evaluation of Coal Supply System of Thermal Power Plant

Hanumant P. Jagtap and A. K. Bewoor

Abstract The high demand of electricity from the society can be fulfilled by various sources, and thermal power plant is one of the largest sources of power generation in India. Availability of thermal power plant is dependent upon its subsystem and equipment in use. The equipment of thermal power plant can be maintained highly reliable if suitable maintenance is performed at defined time interval. This paper presents availability simulation modeling for coal supply subsystem using Markov birth–death probabilistic approach for thermal power plant generating 500 MW from Unit 1 located in western region of India. The equipment considered for availability analysis is coal mill, stacker reclaimer, and wagon tippler. For this reason, the differential equations are generated. These equations are solved using normalizing condition so as to find out the steady-state availability of coal supply system. The effects for occurrence of failures activity as well as availability of repair facilities on system performance are investigated. This study revealed that stacker reclaimer is the most critical equipment of coal supply system which needs more attention for form maintenance point of view and followed by coal mill and wagon tippler. The results show that availability simulation modeling based on Markov birth–death probabilistic approach is very effective tool finding critical equipment of thermal power plant. Further, particle swarm optimization method is used for finding the optimized availability parameter which in turn helps to select maintenance strategy.

Keywords Availability analysis · Critical equipment · Markov approach · Particle swarm optimization · Thermal power plant

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AI Techniques for Reliability Prediction for Electronic Components

Cherry Bhargava
Lovely Professional University, India

A volume in the Advances in Computational Intelligence and Robotics (ACIR) Book Series

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Chapter 4
Traditional and Non-Traditional Optimization Techniques to Enhance Reliability in Process Industries

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ABSTRACT

At present, optimization techniques are popular to solve typical engineering problems. It is the action of making the best or most effective use of a situation or resources. In order to survive in the competitive market, each organization has to follow some optimization technique depending on their requirement. In each optimization problem, there is an objective function to minimize or maximize under the given restrictions or constraints. All techniques have their own advantages and disadvantages. Traditional method starts with the initial solution and with each successive iteration converges to the optimal solution. This convergence depends on the selection of initial approximation. These methods are not suited for discontinuous objective function. So, the need of non-traditional method was felt. Some non-traditional methods are called nature-inspired methods. In this chapter, the authors give the description of the optimization techniques along with the comparison of the traditional and non-traditional techniques.

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Prashant M. Pawar · Babruvahan P. Ronge
R. Balasubramaniam · Anup S. Vibhute
Sulabha S. Apte *Editors*

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Development and Testing of Novel Small Wind Turbine (NSWT) Set

B. Magade Pramod and P. Chavan Shrirang

Keywords Wind energy · Horizontal axis wind turbine · Novel blade profile · Wind turbine prototype · Wind power

1 Introduction

Wind energy is strong growing and the gifted renewable energy source. The investment expenses of wind turbines have shortened over the years, making wind energy economically competitive to conventionally generate electricity. Wind blades turn the kinetic energy in the wind into mechanical power. A wind turbine works the opposite of the principle of a fan. Instead of using electricity to turn into the wind, like a fan, wind turbines use wind to get electricity. The variation in the pressure and temperature, warm air arises dropping the atmospheric pressure at the earth's surface, Therefore cooler air is drawn in to replace the hotter air [1–5].

The extensive research has been carried out in past to upgrade the wind turbine. Ameku et al. [6] focused on wind turbine of a 3 kW prototype blade design. Kosasih and Tondelli [7] Ali et al. created a novel vertical axis wind turbine, in which the energy creation of the system was investigated and turbine blades were tested for various arrangements and wind speed values for wind turbines that are utilized contained by urban areas. The wind turbine is suitable to the environment, with low noise as well as less turbulence by taking into consideration of surrounding structures. In spite of these questions, there remains an increasing concentration for roof-mounted wind turbines [8–11]. ANSYS parametric file helps to develop new techniques for dynamic analysis of 1.5 KW wind blade system. Lift and drag coefficient was optimized with respect to Angle of Attack (AOA) to achieve artificial neural network [9].

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- Energy and Management

A comparative study and graphical analysis in designing and operation of Solar Thermal circular concentrator for enhancing efficiency of solar concentrating system

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Abstract. The present line concentrator system with constant concentration ratio exhibits rise in temperature of working media, however if the difference between outlet and inlet temperature of working media is large then they exhibit lower efficiency. Also the rate of fall of efficiency with increase in its temperature difference is high. To overcome this problem it is proposed to have a variable concentration ratio concentrator system. The variable concentration ratio is achieved by employing receiver consisting of the pipes having different diameters; with the larger diameter pipe at start followed by small diameter receiver. Thus, the concentrator system will have different diameter receivers offering variable concentration ratio system. This concept is confirmed with the help of G.O. Lof, Fester and Duffie Beck paper. The present paper describes above concept by graphical analysis carried out for the newly proposed circular line concentrator with variable concentration ratio. The results of superimposition of graphs leads to confirmation for the promisingly use of variable concentration ratio receivers for enhancing efficiency of solar concentrating system.

1 Introduction

Energy is the fundamental and moreover strategic tool to have a better quality life. The conventional energy resources are limited; also their excess utilization has led towards major environmental issues like global warming.[7] The solar energy can be harvested either by the technology referred as solar thermal or by photovoltaic. In case of photovoltaic technology the solar radiations are converted directly into electricity where in the solar thermal technology the heat from solar rays is extracted and is used for down line applications such as power generation, or material processing. In the present study attempts are made to design and develop effective solar concentrator system for midrange temperature yielding high efficiency with minimum heat loss.[8]Also, it is proposed to have the system with minimum change in a existing system, so that the existing system can be improved upon within less time and less expenses. In the present paper concentrator with variable diameter is proposed after the experimental study and graphical analysis of previous research work done by authors G.O. Lof, Fester and Duffie J.A., William A. Beckman [1] as a experimental output of these authors which concludes “Energy balance on a parabolic cylindrical solar collector” where they uses size of receiver 0.060meter and 0.027 meter and 1.89 is the reflector aperture where they illustrate that for largest diameter receiver factor of intercept and heat losses are in excess amount.[1] B.S. Singh et al [2] studied and illustrates the relation between increment in the thermal losses with the developing area of aperture. Houtan Moaveni [3] has performed the experimental analyses, mathematical simulation and explained change of temperature in receiver is more sensible to the intercept factor of collector and also for the mirror reflectivity.

2 Theoretical Considerations

The figure.1 illustrates that as size of receiver tube decreases concentration ratio increases. Concentration ratio is represented by using lower limit curve where absorbed energy and thermal losses are equal [4]. Concentration ratio is nothing but the ratio of area of the collector aperture to the area of the surface of receiver. [5] A flux concentration ratio is defined as the ratio of the average energy flux on the receiver to that on the aperture, but generally there are substantial variations in energy flux over the surface of a receiver. Concentration ratio (CR) is defined as the ratio of the collector aperture area to the surface area of the receiver. The area concentration ratio is

$$C = Aa/ Ar$$

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1	Dr. Rishikaysh Kaakandikar	Performance Analysis of Selected Public and Private Mutual Funds	---	---	---

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Suunil Losarwarr

Performance Analysis of Selected Public and Private Mutual Funds

LAP LAMBERT Academic Publishing

Investors' growing interest in mutual funds is evidenced by the fact that over the last year investment is growing tremendously in mutual funds. The significance of this investment has heightened interest in performance evaluation by both practitioners and academic researchers. Although claims of superior performance are often used to market mutual funds to investors, academic studies of mutual fund performance find that as a group the fund managers fail to create value for investors. It is a known fact that Mutual Fund Institutions in India have grown significantly during the last decade. These institutions certainly play a crucial role in the Indian economy. The rapid growth of Mutual Funds has compelled us to take a deeper look into their Investment Policy & performance of Mutual Funds, taking into account the expectations of investors, ability of Fund Managers and market timings of the Portfolio Managers. This would enable investors to assess how much returns has been generated by Portfolio Managers and what risk level was assumed in generating such funds. Similarly, Fund Managers would be able to identify their fund performance over the time.

Dr. Rishikaysh Kaakandikar has an outstanding academic career. His experience covers almost 8 years of teaching and 1 year of industrial experience. He is currently working as Associate Professor at ZES'S Zeal College of Engineering and Research, Department of Management, Pune.

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Mutual Funds Schemes in India

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Performance Analysis of Selected Public and Private Mutual Funds

LAP LAMBERT Academic Publishing

Kaakandikar, Losarwarr

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Sr. No.	**Name of the teacher**	**Title of the book/chapters published**	**Title of the paper**	**Title of the proceedings of the conference**	**Name of the conference**
1	Prof. Satya Prakash	NA	Design and development of Wind Solar Energy Charging System for Electric Vehicle	2019 2nd International Conference on Power and Embedded Drive Control (ICPEDC)	2019 2nd International Conference on Power and Embedded Drive Control (ICPEDC)
2	Prof. M. R. Hans, Prof. Satya Prakash	NA	Design and simulation of Series Active Power Filters for Mitigating Voltage Harmonics in non-linear load	2019 International Conference on Innovative Trends and Advances in Engineering and Technology (ICITAET)	2019 International Conference on Innovative Trends and Advances in Engineering and Technology (ICITAET)
3	Prof. M. R. Hans	NA	A low voltage Dc link Hybrid Static Compensator with A wide Mitigation	Fourth International Conference on Inventive systems and Control (ICISC 2020)	Fourth International Conference on Inventive systems and Control (ICISC 2020)
4	Prof. Rupesh Jha	NA	Power sizing of wireless power systems feeding in-motion electric vehicles at constant power	IECON 2019-45th Annual Conference of the IEEE Industrial Electronics Society	IECON 2019-45th Annual Conference of the IEEE Industrial Electronics Society

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2nd International Conference on Power and Embedded Drive Control (ICPEDC-2019), August 21-23, 2019, Chennai, INDIA

Design and development of Wind Solar Energy Charging System for Electric Vehicle

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Abstract—With severity in the emission level on the globe, there has been increase in the demand of methods for reducing the pollution level. Drastic change in the climate and its adverse effect has forced the researchers to explore new forms of energy. Abundant availability of wind and solar energy on globe became one of the alternative source of energy. Harnessing this form of energy as was convenient hence we started developing techniques to exploit the same. This article describes the wind and solar based energy charging system (WSCS) to enable charging the battery bank of electric vehicles (EVs). The charging mechanism comprises of both a wind generator and the solar panel (PV) modules. The WSCS reduces to a great extent the use of fossil fuels to produce electricity; hence reducing COX and NOX emission. As electric vehicle have come up and will be the next generation transportation system hence the emission will also get reduced. To encourage the use of electric vehicles the range of the vehicle has to be more. In order to have greater range there are two ways. One the capacity of the battery can be increased or the charging duration and the charging stations have to increase in number. This paper deals with the development of mechanism to efficiently charge the vehicle with minimizing the emission. The prototype developed in a combination of both solar and wind system i.e. a hybrid system.

Keywords—Electric Vehicle, Power, Solar panel, Wind Solar Charging System (WSCS),

I. INTRODUCTION

Electric vehicles have been in use since 1990s, with emphasis on increase the life of storage system, cost reduction, and the flexible grid connectivity, which is still under research. Advancement in alternative energy system in place of the conventional fuel had played an important role in energy saving and emission reduction of greenhouse gases. Power stations are the power supply places for electric vehicles. The electricity of the power station is supplied by power grid traditionally. A power station with solar wind hybrid system can save energy and reduce greenhouse emission more deeply. This solar-wind hybrid system is to be used to provide electricity to electric vehicle. The optimal mix of wind solar distribution system along with the traditional grid for energy loss minimization simulation has been studied [1]. The probabilistic performance assessment of standalone wind solar charging system autonomous energy conversion systems has been emphasized for effective use [2]. With increasing demand of energy it has become difficult to fulfill the energy need with conventional sources of energy. Wind energy and solar power are energy sources which has been looked upon for few decades as a reliable alternative source. Abundant sunlight and turbulent wind has motivated researchers to experiment and explore methods to harness them. In order to harness maximum wind, vertical axis has been incorporated [3]. In order to have a justifiable cost of installation of wind mill location is the most viable constraint as discussed by the author [4]. The average available wind speed in our country is around 10 mph (miles per hour) [5]. This average speed can be raised to a level if the air turbulence available on the highways due to vehicle movement can be utilized [6]. Vehicle movement on the highway is able to produce a wind of approximately 70 mph [7].

II. DESIGN ASPECT OF WIND MILL

In order to harness the energy from the high speed air being generated by the moving traffic on the road, a wind mill is required. The design of the structure in order to get maximum efficiency depends on the evaluation of the air profile available at a given location [8]. Moreover the required power to be generated with the wind mill has also to be considered. Optimization of design is dependent on the parameters like weight of structure, surface area available for the wind to strike on the structure, friction to rotation of blades and feasible dimension of the wind mill [9].

Kinetic energy available due to vehicle movement can be calculated with help of different models like operational street pollution model. In this model a relationship has been developed between the kinetic energy and the velocity generated by the vehicle.

$$E_{wmt} = c^2 V_{av}^2 \quad (1)$$

where

V_{av} depicts the average speed of vehicle.
c is coefficient of aerodynamic drag (constant)

Design and simulation of Series Active Power Filters for Mitigating Voltage Harmonics in non-linear load.

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Abstract **- Harmonic in the system due to nonlinear loads has been addressed in the studied carried out. Comparative analysis is carried out for different control techniques comprising of varied compensation methodologies. Hybrid control methodology has been implemented and simulation results are analysed. Application of active filter of series configuration with power level and hybrid control technique to the system has directly resulted in decreasing the THD (Total Harmonic Distortion) to almost 83 %. The techniques implemented for comparison is PWM technique and triangular comparison method. The source side THD has been taken to be 0%. Considering the load parameters the simulation has been carried out.**

Keywords- Series Filter, Harmonics, Distortion, Compensation, FFT

I. INTRODUCTION

Power is the life stream of progress for any country and it is more so since we are in a developing phase industrially. The modern power systems are interconnected and operated in an integrated manner due to technical reasons and economic benefits. However, there are number of problems arising with increasing usage of variety of nonlinear loads, automated processes in industries, electronic controllers and computerized applications. A power system network comprises of variety of apparatus for generation, transmission and distribution spread over a large area catering to all kinds of loads, many of which are very sensitive to any deviations in the variables from their rated values. It is highly complex, nonlinear, large scale; time varying operates in real time mode, interactive, multi input – multi output and prone to get continuously subjected to large disturbances due to both internal defects and external causes.

The application has covered wide range such as distribution networks, domestic and industrial loads, modern semiconductor switching devices are increasingly being used. Examples of their application are regulators, household appliances, and office use instruments like copier machine, fax machine, industrial drives and many more. Such power electronics systems offer cost-effective and consistent solutions to help achieve consistent usage of electrical power [1]. These semiconductor devices have nonlinear operating characteristics that introduce voltage distortion and current waveforms distortion at the point where industrial loads are usually coupled [2]. In modern power systems the semiconductor devices play important role in almost all the application, hence its non-linear characteristics have created trouble with the power quality. Major power quality issues in today's power system network is mainly due to the wide usage of semiconductor devices [3][4]. Similar is the picture with the usage of microprocessors and microcontrollers. These are again fall into the category of elements creating trouble in power quality [5]. Such systems are prone to the reliability of power supply and are fragile.

Power semiconductors, however, are being roughed up at various level to solve complexities with the distribution system. Power electronics performs three types of roles in distribution systems: one that integrates various equipment of both household and industry together; secondly these equipment generate disturbances in the network; and finally semiconductor are the once which are applied for problem solving of numerous issues in the network [6][7][8]. Moreover, the application of these electronic equipment have definitely added a flavor to living standard and led to improvisation in the industrial setup [9]. On the other hand, these same sensitive developments are overlapping and constantly pinching the issues towards reliable and quality power supply to the consumers [10][11]. The same is directly dependent on the expenses being borne by the individuals for various maintenance issues.

Out of many issues the major issue remains to be power outage and low voltage at the consumer side [12][13]. The literature suggests that microelectronics based machines are among various others who are in the trouble of maintaining proper power quality [14]. Semiconductors based equipment are also responsible for the emission which again is devastating to the environment [15].

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A Low Voltage DC-Link Hybrid Static Compensator With A Wide Mitigation

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***Abstract*— A hybrid static compensator (STATCOM) used to provide compensation for the reactive power required by the load. For each phase of electrical energy, the hybrid STATCOM includes a thyristor controlled LC (TCLC) which contains an inductive coupling element; a power filter condenser and thyristor operated reactor linked in series to a power filter inductor. The active part of the inverter consisted of an electronic inverter and a DC capacitor linked to the voltage source inverters for every phase of electricity. This article proposes a transmission control system for three-phase with an extensive range of compensation and lowers DC voltage with the static hybrid synchronous compensators. This proposed system has impressive features as well as the expense of the machine can be reduced significantly. An evaluation is rendered and contrasted with the common and capacitive STATCOM (C-STATCOM) of voltage vs. current (V-I) characteristics of the proposed systems. Then, Considerations of the reactive power load range and the removal of the potential reverberation problem proposed system parameters. Henceforth, a hybrid STATCOM control method which allows working under different voltage and current conditions like unidirectional current, overvoltage and voltage collapse. Finally, the experiments started checking the wide range of DC interface, low voltage functionality and the excellent proposed STATCOM system dynamic performance.**

Keywords*— *C-STATCOM, hybrid-STATCOM, Low dc-link voltage, STATCOM, wide compensation range.

I. INTRODUCTION

Voltage and reactive power control are crucial in the operation of power systems. The high reactive current in the system reduces power system stability and increases transmission loss [1]. The reactive compensator can be used as one of the solutions to this problem. Although reactive power cannot provide useful work, it is critical for AC transmission and distribution systems and many other types of customer loads. Therefore, the real energy system requires active and reactive energy to function normally [2] [3]. An increase in reactive load reduces the system's ability to provide active energy and perform useful work. In severe cases, high reactive loads can cause large changes in voltage and current, which reduces the transmission potential of the energy system, making it almost impossible to deliver active energy [4]. There may also be other adverse effects like increased equipment heating and system losses.

In order to improve the natural electric characteristics of AC power systems, the VAR series and the shunt compensations are used. Serial compensation adjusts the transmission or distribution system parameters while the shunt compensation affects the corresponding load impedance. The reactive energy flows via the system can be regulated effectively in both situations, so as to increase the AC power performance network. SVC is traditionally used to compensate for the reactive current dynamically because the load sometimes changes [5]. The response of the harmonic current injection is caused by the resonance problem and SVC is slow, so a STATCOM was designed with quicker response, less harmonic injection current and excellent efficiency for reactive current compensation [6] [7]. Nonetheless, STATCOM usually allows for the use of a multi-layered transmission to reduce stress on DC link and every power switch condenser for medium or high voltage transmission, which reduces capital and operating costs [8]. The system control increases the control complexity. Later, it is recommended to use STATCOM series capacitive coupling (C-STATCOM) to reduce the operating voltage requirements of the system DC-link but if reactive power is needed, compensation power is turned off, the performance of the system may be greatly reduced when compensation range over sides.

II. SYSTEM MODELING

Higher supplies of high-quality Power have promoted the development of custom devices that connect directly to medium voltage systems [9]. Multi-level converters are commonly used for direct installation at the medium voltage and have several advantages over conventional two-level converters [6] [10]. A 19-level asymmetric DSTATCOM (synchronous static distribution compensator) including DC control circuits and reactive power for general multilevel cascade converters to enhance medium voltage distribution systems' energy efficiency [11] [12].

The STATCOM hybrid consists of a thyristor-controlled LC component, which is connected in series with the active inverter component, as shown in Figure 1. Thyristor-controlled LC components generate a wide range of compensated reactive power and generate huge drops in voltage between the system inverter voltages, which allows the active components of the inverter to continue operating at lower DC link voltage levels [10]. The efficiency of thyristor-controlled LC components is improved with the help of the active inverter components because it has a small rating and is able to engross the harmonic currents generated by the TCLC components [13].

IECON 2019

Power sizing of wireless power systems feeding in-motion electric vehicles at constant power

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Abstract **–The paper is concerned with the wireless power (WP) systems feeding in-motion electric vehicles (EVs) and focuses on the power sizing of three key WP system components, namely the track coils, the pickup and the voltage supply. It is assumed that the track is made of lumped type with no overlapped coupling of the pickup, and that the track coils and the pickup are compensated for by series resonating capacitors. Power sizing equations are formulated for a WP system that is controlled in the way of transferring a constant power to EVs during their motion over a large part of the track coils. Due to the variation of the coupling between the pickup and a track coil, the transfer of a constant power requires the adjustment of the currents in the WP system, obtained by commanding the embedded power conversion units. Two solutions are examined: by one solution, the pickup side current is controlled at a proper value whilst the track side current is regulated at a constant level; by the other solution, the opposite occurs. Power sizing equations are expressed in terms of specifications and parameters of the WP system. The equations outline that the power sizing is higher for the components in the side where the current control is executed. At last, the case study of a WP system is examined, showing the convenience of the track-side control.**

Index Terms—Wireless power transfer, Electric vehicles (EVs), In-motion EV wireless charging.

I. INTRODUCTION

Wireless power (WP) transfer [1], [2] is a feasible technology to feed the propulsion drive of the in-motion electric vehicles (EVs), leaving to the battery the task of acting as an energy buffer. From this perspective, the WP systems play the role of WP feeders (WPFs) of EVs rather than of WP rechargers of their battery.

Out of some WP transfer technologies, that one based on the inductive coupling is the most convenient for WPFs [3], with the transmitting coils, denoted as track, buried under the road surface and the receiving coil, denoted as pickup, mounted on the EV flatbed [4], [5]. Track coils and pickup are two key WPF components. To remedy the absorption of reactive power by the track coils and the pickup, they are supplemented with reactive compensation networks.

WPF tracks are either stretched or lumped [6]. Coils of the stretched tracks are somewhat longer than the pickup and the mutual inductance between the pickup and a track coil is constant and equal to the maximum value for most of the coupling interval, which is the interval along the EV route where the pickup has a non-zero mutual inductance with a track coil. Instead, coils of the lumped tracks have a length comparable with the pickup so that the mutual inductance between the pickup and a track coil is varying from zero to a maximum and again to zero along the coupling interval, with no or a very short interval where it is constant at the maximum value. Lumped tracks exhibit some merits over the stretched ones, like higher efficiency, and are hereafter considered [7], [8].

Another key component of WPFs is the voltage supply on the track side. It consists of a high-frequency (HF) voltage inverter whose output frequency is kept constant at many tens of kHz and whose output voltage magnitude is commanded by the phase-shift technique. HF inverter is one of the two power conversion units with control capabilities embedded in WPFs. The other one is the ac-dc converter located on the pickup side; it consists of the cascade of a diode rectifier (DR) and a chopper that definitively feds EV at the requested voltage level.

Variation of the mutual inductance between the pickup and a track coil during the EV motion affects the transferred power, with the shortcomings of a low exploitation of the WPF circuitry and a fluctuation of the power feeding EV. Indeed, with no any intervention, the nominal power is transferred from a track coil to the pickup in correspondence of the maximum of the mutual inductance, which commonly takes place when the pickup is aligned to the track coil, while it drops as soon as the pickup is situated before or after the alignment condition. To overcome the above-mentioned shortcomings, some countermeasures are taken. They are based on a suitable design of the compensation networks, which is carried out by means of two approaches. One approach is directed at minimizing the sensitivity of the transferred power to the variation of the mutual inductance [8]-[10]. The other one is directed at levelling the transferred power by extending the transfer of the nominal power in an interval around the alignment condition. [11]-[13]. These approaches are implemented by means of complex reactive compensation networks, often made of two or even three elements, that increase the cost of WPFs and impair their efficiency because of the losses in the parasitic resistances of the added elements; furthermore, the latter approach requests the oversizing of the WPF circuitry in terms of either voltage or current or both to reach the levelling objective.

In this paper, a workaround to the above-mentioned shortcomings is presented that, differently from the existing countermeasures, is aimed at keeping constant the transferred power along a large part of the coupling interval by adapting the WPF currents. In the paper, such a part of the interval is designated with WPF operating interval. Two solutions are

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