

“An Overview on Effect of Vehicle Charging Station on Power Quality Issues”

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Abstract: The global warming problem together with the environmental issues has already pushed the governments to replace the conventional fossil-fuel vehicles with electric vehicles (EVs) having less emission. This replacement has led to adding a huge number of EVs with the capability of connecting to the grid. It is noted that the presence of such vehicles may introduce several challenges to the electrical grid due to their grid-to-vehicle and vehicle-to-grid capabilities. In between, the power quality issues would be the main concern in electrical grids highly impacted by such vehicles. Thus, this study is devoted to investigating and reviewing the challenges brought to the electrical networks by EVs. In this regard, the current and future conditions of EVs along with the recent research works made into the issue of EVs have been discussed in this paper. Accordingly, the problems due to the connection of EVs to the electrical grid have been discussed.

Keywords:- Electric Vehicle (EV), Power Quality (PQ), Distribution Network.

1. INTRODUCTION

With In order to reduce the consumption of fossil fuel resources and growing concern about climate change due to carbon emission, Electric vehicles (EV) and hybrid electric vehicles (HEV) are widely promoted in the world. The main focus on the increasing use of electric vehicles will be helpful to not only reduce carbon emission, greenhouse gases but also to promote the use of renewable energy sources instead of fossil fuels. In plug- in electric vehicles, the batteries are charged from grid. The power electronic converter referred to be vehicle charger is only the intermediate in between the distribution feeder and electric vehicle.

Power-electronic-based devices are becoming more and more present in the electric grid. Those devices are used for the conversion and control of electric power and have made available new technologies for both power generation and consumption. In particular, power electronics has allowed for new methods of electricity power production by means of renewable sources as well as the advent of new types of loads. Nevertheless, some downsides arise and, among others, the increase of voltage and current distortion generated by the nonlinearity of these devices which may constitute a problem when excessively high. Some examples of new harmonic sources which can be found in the distribution grid and whose penetration can be expected to increase are: compact fluorescent lamps (CFLs), light-emitting