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Review on Active Islanding Detection Technique Used in PV Grid System with Drive Load

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Abstract: *Photovoltaic (PV) system is one of the popular choices among the non-conventional energy sources & it has too many advantages over the other energy production system. Specifically, it provides a free and abundant supply of electric energy. The issue of islanding in grid-tied PV systems remains a great challenge to fulfill the required guaranteed security of the PV system technique, drives load equipment & the prompt and reliable power supply. Due to islanding, the power supply was interrupted from load and unwanted hazardous conditions may occur for the connected load (drive system in industries) and PV system equipment. In industries this type of fault and interruption is uneconomical. This project aims at providing a study of various IDM's used for grid-tied PV system & simulation analysis of the drive load parameters when islanding condition occurs in the grid-tied PV system and simulate active IDM on PV grid-tied system to detect it which permits us to protect the system. The proposed system will be tested and simulated with the help of MATLAB simulation software.*

Keywords: IDM, PV, Grid, Drive Load

I. INTRODUCTION

The past few years have witnessed the PV system being increasingly contributing to energy production all over the world. The integration of new technologies into the actual power grids turns into smart grids. Capable of responding to different changes and requirements for the long term. Those grid-tied PV systems must be essential to detect any harmful faults, islanding, and other types of critical faults to protect the system & load side equipment and very much important to ensure the safety of the grid maintenance personnel. Islanding is one of the major faulty conditions that occur due to various reasons in PV grid-tied systems. This can be intentional or unintentional and create hazardous conditions for the system. This project works on the detection of both intentional or unintentional islanding conditions and protects drive load, equipment from hazardous faulty conditions. According to IEEE standards, the islanding detection methods have to detect islanding fault in PV grid-tied system to ensure the safety of load and PV system equipment. This project consists of two parts. The first part is the study of various islanding detection methods used or proposed for PV grid-tied system to detect islanding faults. After a detailed analysis of all methods, simulation of drive load parameter connected in PV grid-tied system for healthy or before faulty condition done on MATLAB Simulink software. After that simulation of drive load connected in PV grid-connected system when islanding condition occurs in the system and get results of both healthy and islanded system. The second part of this project is to simulate drive load connected in PV grid-tied system with active islanding detection method and get results of drive load parameter in islanded condition with active islanding detection method. After that, the analysis of simulation results of the heathy system, islanded system, islanded system with active islanding detection method was implemented.

II. LITERATURE SURVEY

[1]Islanding is a condition in which a part of the utility system containing load and distributed generation remains stimulated while disconnected from the rest of the utility grid.
[2] The study of technical parameters of load connected in PV grid-connected system is described in the literature.
[3] The islanding detection is an obligatory element for the PV system as indicated in global standards and rules
[4] Many IDMs have been presented in literature such as passive IDMs, and other IDMs.

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[5] An overview of the existing IDMs can be found.
[6] The study of islanding detection in a grid-connected PV system with load is described.

III. PROBLEM STATMENT

Those grid-tied PV systems must be essential to detect any harmful faults, islanding, and other types of critical faults to protect the system & load side equipment and very much important to ensure the safety of the grid maintenance personnel. Islanding is one of the major faulty conditions that occur due to various reasons in PV grid-tied systems. This can be intentional or unintentional and create hazardous conditions for the system. This project works on the detection of both intentional or unintentional islanding conditions and protects drive load, equipment from hazardous faulty conditions

IV. PROPOSED METHODOLOGY

The proposed work is planned to be carried out in the following manner:

- Study PV grid-tied system.
- Simulation of PV/IV characteristics with MPPT technique.
- Simulation of drive load parameters for PV grid-tied system with IM load in healthy and islanding conditions.
- Analysis of drive load parameters at active islanding detection method used in PV grid-tied system. ¬
- Analysis of the proposed topology.

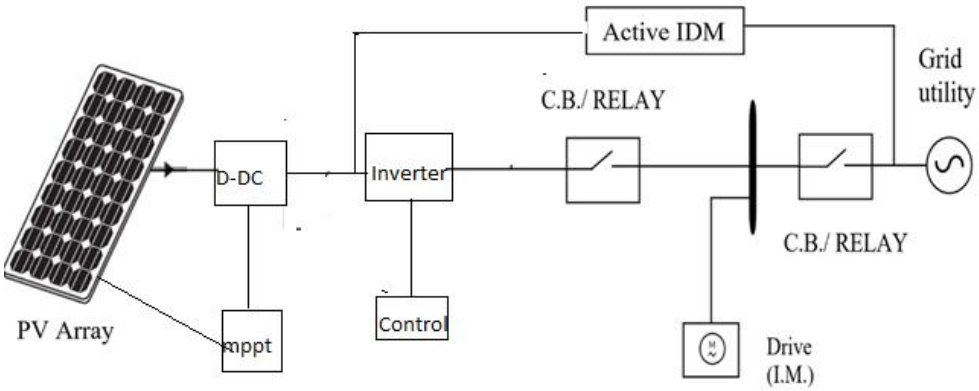

Fig 1 Proposed System

A block diagram broadly describing the elements of Active Islanding Detection Technique in PV Grid-Tied System is shown in Fig. 1. It consists of pv source , DC DC converter with MPPT and inverter. Power generated from solar panel send tog grid as well as drive load and in case of non availability of solar energy motor drive run from grid supply. The PVA inverter is connected with breaker operated with islanding detection algorithm .

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