



INTERNATIONAL JOURNAL OF CREATIVE RESEARCH THOUGHTS (IJCRT)

An International Open Access, Peer-reviewed, Refereed Journal

IMPROVING THE PERFORMANCE OF CASCADED H-BRIDGE INTERNLINED DYNAMIC VOLTAGE RESTORER

¹N.Ashokkumar , ²P.Madhanmohan.

¹Assistant Professor, Department of Electrical Engineering, SCSVMV University, Kanchipuram, India.

²P.G Students, Department of Electrical Engineering, SCSVMV University, Kanchipuram, India.

ABSTRACT:

An interline dynamic voltage restorer (IDVR) is another gadget for droop relief which is made of a few powerful voltage restorers (DVRs) with a typical DC interface, where each DVR is associated in arrangement with an appropriation feeder. During hang period, dynamic force can be moved from a feeder to another and voltage droops with long lengths can be moderated. IDVR pay limit, in any case, relies enormously upon the heap power factor and a higher burden power factor causes lower execution of IDVR. To conquer this constraint, a novel thought is introduced in this paper which permits to diminish the heap power factor under list condition, and along these lines, the pay limit is expanded. The proposed IDVR utilizes two fell H-connect staggered converters to infuse AC voltage with lower THD and wipes out need to low-recurrence separation transformers in a single side.

Keywords: IDVR, Power Quality, THD Reactive power, Sag & Swell.

INTRODUCTION:

The two clients and electric associations are stressed over the electric force quality. Force quality term is perhaps the most copious slang in the electrical organizations since 1980s. It is an idea of specific kinds of force framework issues. These issues falls under this thought are not new. New is that specialists are presently framework approach as opposed to taking care of them as free issues. New age load device are primary concerns. Force electronic and chip based gadgets are more delicate to control quality varieties than the gear's which were utilized in past. Ascend in utilization of gadgets, for example, shunt capacitors are utilized for power factor revision with the goal that misfortunes lessen and subsequently high effectiveness in flexible speed engine drives. This outcomes ascend in music on power frameworks. So any force issues display in voltage, recurrence, or current deviations that bring about breakdown or disoperation of the purchaser mechanical assembly can be arranged into power quality problem[1]. In request to convey unadulterated and clean force for example unadulterated sinusoidal voltage waveform, FACTS gadgets are utilized. Numerous FACTS gadgets are being utilized in electrical organization, some of them are, Static Synchronous Series Compensator (SSSC), Static Synchronous Compensator (STATCOM), Unified Power Flow Controller (UPFC), Interline Power Flow Controller (IPFC) and so forth In real interaction FACTS device were intended for the transmission framework and it very well may be utilized in dispersion framework additionally, named as Custom Power Devices. Some ordinarily utilized Custom Power Devices are: Dynamic Voltage Restorer (DVR), Distribution Static Synchronous Compensator (DSTATCOM), and Active Filter (AF) and so on With the assistance of these gadgets the quality issues are improved to extraordinary degrees. Because of its quick reaction, DVR is considered as quite possibly the best and productive force custom gadgets [2]. distribution frameworks has heaps of force quality issues for example swell, hang, drifters, and so forth however voltage list is the genuine issue which is mostly because of homeless people. To check voltage droop and voltage swell in circulation framework DVR is one of the successful and proficient custom force gadgets [9]. DVR is associated in arrangement with the line to repay the voltage list or swell in the heap side.

SCOPE OF PROJECT:

An interline dynamic voltage restorer (IDVR) is another gadget for droop relief which is made of a few powerful voltage restorers (DVRs) with a typical DC connect, where each DVR is associated in arrangement with a dispersion feeder. During droop period, dynamic force can be moved from a feeder to another and voltage droops with long terms can be alleviated

EXISTING SYSTEM:

Voltage list pay in the DVR can be accomplished by simply responsive force infusion or a blend of dynamic and receptive force. However, a restricted measure of voltage drop can be remunerated by simply responsive force infusion; consequently, much of the time, it is important to move dynamic force from a DC source, for example, a battery into AC line. The pay limit in the DVR relies upon the greatest attainable inverter voltage, the measure of put away energy in the DC connect, voltage hang length and its profundity.

PROPOSED SYSTEM:

An interline dynamic voltage restorer (IDVR) is another gadget for hang relief which is made of a few powerful voltage restorers (DVRs) with a typical DC interface, where each DVR is associated in arrangement with an appropriation feeder. During hang period, dynamic force can be moved from a feeder to another and voltage lists with long spans can be alleviated. IDVR pay limit, in any case, relies extraordinarily upon the heap power factor and a higher burden power factor causes lower execution of IDVR. To beat this limit, a groundbreaking thought is introduced in this paper which permits to diminish the heap power factor under list condition, and hence, the pay limit is expanded. The proposed IDVR utilizes two fell H- connect staggered converters to infuse AC voltage with lower THD and kills need to low-recurrence disconnection transformers in a single side.

MODULES:**VOLTAGE SAG:**

Voltage sags are brought about by unexpected expansions in burdens like shortcircuits or deficiencies, engines turning over, or electric radiators turning on, or they are brought about by sudden expansions in source impedance, regularly brought about by a free connection. Voltage swells are quite often brought about by an unexpected decrease in load on a circuit with a poor or

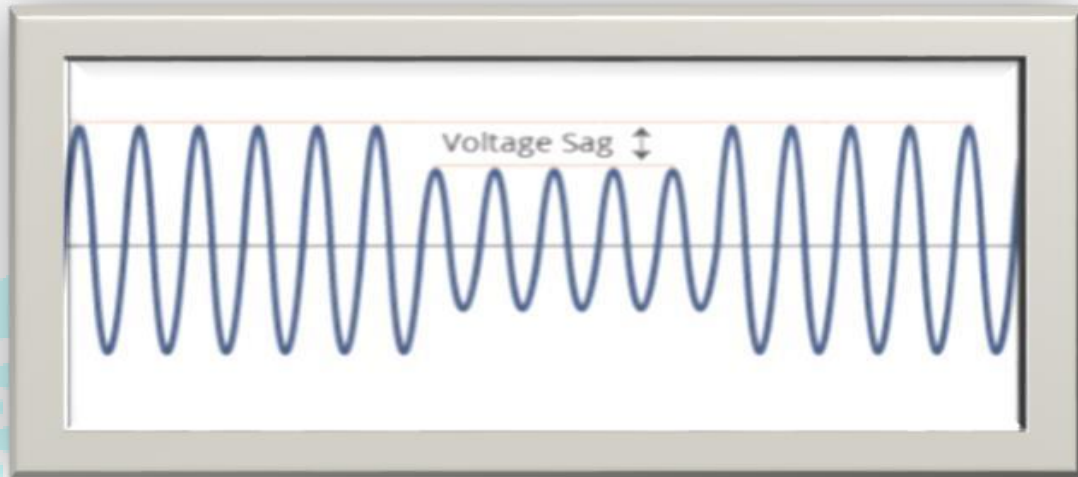


Fig 1:Waveform of Voltage Sag

harmed voltage controller, despite the fact that they can likewise be brought about by a harmed or free impartial association. Voltage lists are the most well-known force aggravation. At a regular modern site, it isn't strange to see a few hangs each year at the assistance entrance, and undeniably more at hardware terminals. Voltage hangs can show up from the utility; in any case, by and large, most of droops are created inside a structure. For instance, in private wiring, the most well-known reason for voltage hangs is the beginning current drawn by fridge and cooling engines. Hangs don't by and large upset glowing or fluorescent lighting, engines, or radiators. In any case, some electronic hardware needs adequate inward energy stockpiling and, hence, can't ride through hangs in the inventory voltage. Gear might have the option to ride through extremely short, profound lists, or it very well might have the option to ride through longer yet shallower droops.

IDVR:

Among the force quality issues, voltage lists are presumably the most serious aggravations. To beat these issues the idea of custom force gadget has become presented as of late. One of those gadgets is the Dynamic Voltage Restorer (DVR), which is perhaps the most proficient and present day custom force gadget utilized in power dispersion organizations. A DVR is an arrangement associated strong state gadget that infuses voltage into the framework to direct the heap side voltage. It is regularly introduced in a circulation framework between the stockpile and a basic burden feeder at the purported point of normal coupling (PCC). Its essential capacity is to quickly help up the heap - side voltage in case of a voltage hang to dodge any power disturbance to that heap.

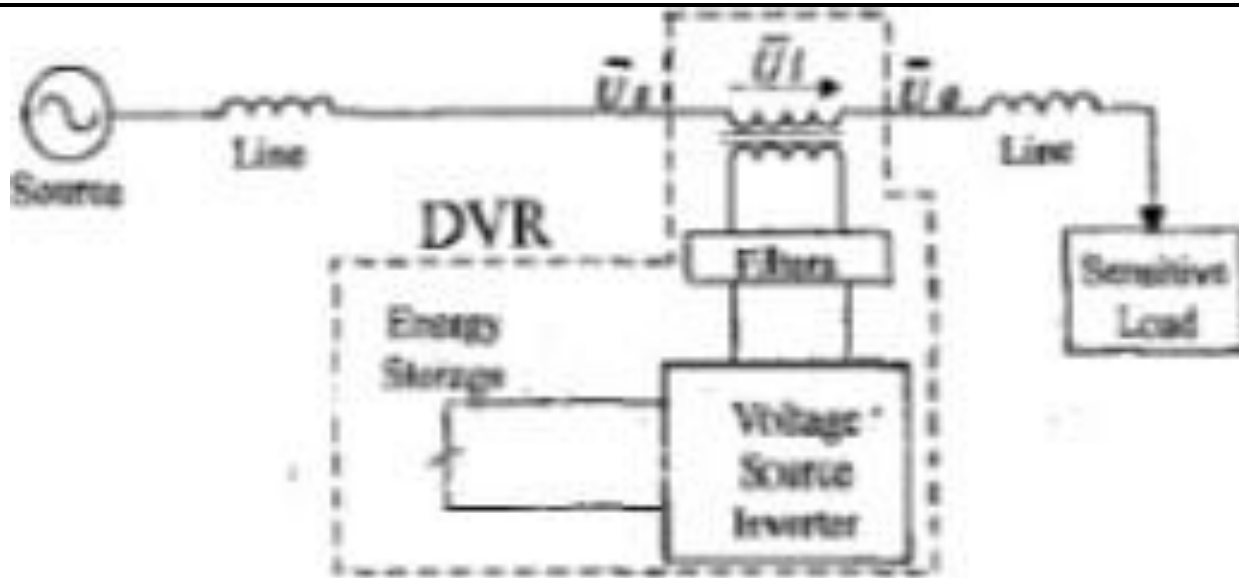


Fig 2: Dynamic Voltage Resistor Circuit Diagram

There are different circuit geographies and control conspires that can be utilized to execute a DVR together with voltage lists and swells remuneration, DVR can likewise have other The DVR is a force electronic- converter-based gadget equipped for shielding touchy burdens from most stock side aggravations.

POWER QUALITY:

power quality is frequently characterized as the electrical organization capacity to supply a clean also, stable force supply. All in all, power quality preferably makes an ideal force supply that is consistently accessible, has an unadulterated commotion free sinusoidal wave shape, and is consistently inside voltage and recurrence resiliences. Be that as it may, with expanding and differing energy requests from different mechanical cycles, numerous heaps consistently force aggravations on the framework, making deviations from these ideal conditions are regular.

Helpless force quality is an issue for a numerous ventures, from server farms to seaward oil rigs. Low force quality adds to high energy cost and rising energy and creation aggravations—which is particularly risky for progressively delicate current creation gear. Amusingly, it is regularly the actual hardware that creates the unsettling influences.

CIRCUIT DIAGRAM:

In other words, when feeder1 drops completely (or voltage sag amplitude is 1p.u.), IDVR can compensate it completely if the load power factor is 0.5. Most of the published literature in the field of DVR and IDVR deal with voltage source converters realized using two level converters. But, in high-voltage and high-power applications, a CHB based multilevel converter is a more attractive solution and its application in an IDVR is introduced in this paper. Among the multilevel topologies, cascaded H bridge converter is more interested for IDVR topology because of its modular structure, reaching medium output voltage levels using only

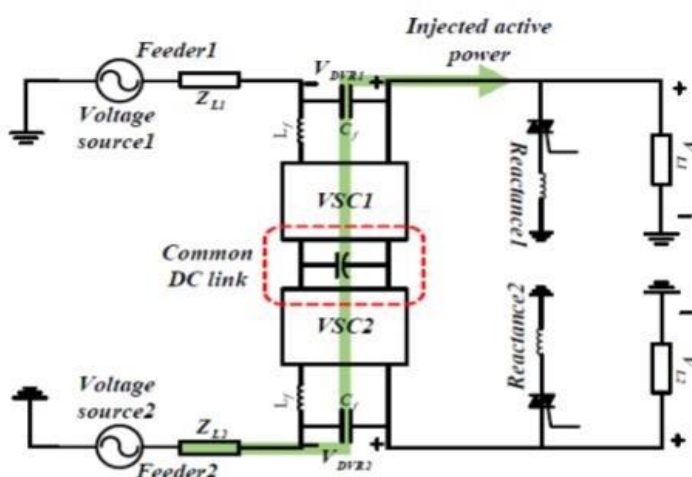


Fig 2: Power Circuit Schematic of the IDVR with Active Power Exchanging Capability

standard low voltage mature technology components, and the higher reliability. Moreover, low frequency modulation techniques and fault-tolerant algorithms can be easily applied in the CHB based IDVRs. In a CHB converter, depending on the number of voltage levels, which has to be synthesized, separate DC links are needed. In IDVR structure, however, by back-to-back connection of two CHB converters and use of low frequency isolation transformers in one side, distinct DC links are easily provided. Furthermore, this structure eliminates the necessity to isolation transformers in one side, which leads to lower size, weight and cost. The number of H- bridge cells in a CHB converter is chosen according to the required AC voltage and the voltage rating of power switches. A single phase 7-level CHB based IDVR which is used in simulation study and experimental investigation. Although a 7- level back-to-back converter is chosen for the study in this paper, the proposed control strategy can be applied to any number of voltage levels and there is no limitation from this point of view. In other words, the generated voltage

references by the control system will be synthesized by the CHB converter through well-known multilevel modulation techniques. The only issue is related to keeping voltage balance among DC link capacitors which has been addressed in [11] and [12] for any number of voltage levels.

CONCLUSION:

The necessity for power quality has transform into a difficult issue for ventures and clients. Voltage unbalance is considered as the greater influencing issue among them prompts decay in accomplishment of electrical mechanical assembly. Realities gadgets utilized for remuneration are the best system to defeat such issues. Among them IDVR considered the most skillful and financially savvy. Voltage insecurities, for example, voltage droop/swell are considered here. Both adjusted and uneven voltage conditions are thought of and reenactment results are appeared. Reproduction results shows that IDVR give great voltage guideline by repaying voltage droop and swell. The presentation of IDVR is agreeable.

REFERENCE:

- [1] Roger C. Dugan/Mark F. Mc Granaghan/Surya Santoso/H. Wayne Beaty, Electrical Power Systems, Quality, Second edition, Mc Graw Hill Publication.
- [2] N.G Hingorani, Flexible AC Transmission, IEEE Spectrum, vol. 30, pp. 40-44, 1993.
- [3] N.G Hingorani, "Introducing Custom Power", IEEE Spectrum, vol. 32, pp. 41- 48, 1995 Distribution Custom Power Task Force, 2003
- [4] K.R Padiyar, FACTS controllers in power transmission and distribution, new age international publications
- [5] Smriti Dey, Performance of DVR under various fault conditions in Electrical Distribution Systems, IOSR Journal of Electrical and Electronics engineering, vol- 8, Issue 1, pp-03-12, dec-2013
- [6] C. Benachiba and B. Ferdi, Power Quality Improvement using DVR, American Journal of Applied Sciences 6(3): 396-400, 2009 ISSN 146-9239
- [7] Samrat Shende and Nilesh Chamat, D- Statcom & DVR in power quality enhancement in distribution Network under various fault conditions, International Journal of Innovative Research in Science, Engineering and Technology, ISSN : 2319-8753
- [8] Math Works, (2012) : Power System Toolbox: Users Guide (R2012a)
- [9] <https://www.mathworks>
- [10] P.F. Comesana, D.F. Freijedo, J.D. Gandoy, O. Lopez, A.G. Yepes, J. Malvar, "Mitigation of voltage sags, imbalances and harmonics in sensitive industrial loads by means of a series power line conditioner"; Electric Power systems Research 84 (2012) 20–30
- [11] A. Felce, S. A. C. A. Inelectra, G. Matas, and Y. Da Silva, "Voltage Sag Analysis and Solution for an Industrial Plant with Embedded Induction Motors," In Industry Applications Conference, 2004. 39th IAS Annual Meeting. Conference Record of the 2004 IEEE, vol. 4, pp. 2573-2578. IEEE, 2004.