UTILIZATION OF SMALL-SCALE GRID TIED SOLAR PV GENERATION IN POWER DISTRIBUTION SYSTEM STRENGTHENING

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Use of Solar Power has now become ubiquitous so as to emphasize more on Green Energy. As on 31.08.2020, India is already having 35.739 GW over-all installed capacity of Solar Generation. Not only in reduction of quantum of coal used for conventional Thermal Power generation, but solar generation has also been becoming indispensable in power distribution planning, too. All DISCOMs are emphasizing much in smart investments now a days. Terminal areas of long 11 KV Distribution feeders often face low voltage problems due to incurrence of junk load like BORO Cultivation, Industrial Belt, Tourism etc. Eradication of this issue by feeder segregation or setting up a new Sub-station may not be always cost worthy and also ROW & other factors are very much involved in that. To counter this issue, small scale generation of Grid Tied Solar Power at different terminal points of 11 KV feeders often proves to be highly effective.

Such type of arrangements will be advantageous for the DISCOM in the following aspects:

i) Flattering of yearly load curve of the DISCOMs.

ii) Power shading due to lack of infrastructure & contingency is likely to be eliminated.

iii) If storage system can be employed like BESS (Battery Energy Storage System) , it may be beneficial to run other electrical appliances during night.

iv) At terminal locations of the DISCOMs, prevailing acute low voltage problem is likely to be eradicated.

v) Considerable quantum of line loss reduction is also possible by installation of Solar PV plant at proper load centre.

However, for utilizing grid connected PV System, the following factors must be kept in mind :

i) For feeding the solar generation to the load, power electronic components are required to be so designed so to minimize the harmonic contents.

ii) Maximum power to be extracted by means of Maximum Power Point Tracking (MPPT) Algorithm.

iii) Proper Reactive Power Compensation scheme should be designed.

iv) Proper islanding and protection schemes to be applied.

Though the intensity and quality of solar generation largely depend on factors like weather, place of installation etc, it is obvious that with implementation of proper protection and energy storage system, small scale grid tied PV generation will shortly become pioneer in the field of Electrical system Planning.