

DRE Grid integration -System Planning and operation strategy

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DRE GRID INTERCONNECTION

- THE ELECTRICITY ACT 2003
- NATIONAL ELECTRICITY POLICY
- NATIONAL ELECTRICITY PLAN
- MNRE

NEP on System Expansion

- Network expansion should be planned and implemented keeping in view the anticipated transmission needs that would be incident on the system in the open access regime. Prior agreement with the beneficiaries would not be a pre-condition for network expansion. CTU/STU should undertake network expansion after identifying the requirements in consultation with stakeholders and taking up the execution after due regulatory approvals.

DRE POWER TRANSMISSION PLANNING

- Responsibility for Transmission Planning
 - CTU , STU
- Transmission Planning Committees
 - CEA,CTU,RPC,STU
- Transmission plan criteria
 - CEA,CTU,STU
 - Redundancy criteria , Line loading etc.

GRID CONNECTIVITY

- TRANSMISSION FUNDING
- TRANSMISSION PRICING
- SCADA AND METERING
- RE TRANSMISSION AGENCY
- IEGC & STATE GRID CODE
- GRID PROTECTION

INTERNATIONAL EXPERIENCE

- Danish –Not to go for stringent norms initially(generic), to adopt norms in stages(specific) for economically sound and efficient solution
- USA – (2005 Energy Policy Act) UL 1741 to be used in conjunction with IEEE Std 1547(power quality, response to abnormal conditions) and IEEE Std1547.1(Testing)

GRID OPERATION WITH DRE POWER

- SPECIAL NATURE OF RE GENERATORS
- GENERATION & ABSORPTION OF RE POWER
- INFLUENCE OF RE POWER ON GRID OPERATION

Special nature of RE Generators

- Small sized
- Synchronous Generators
- Asynchronous Generators
- Asynchronous converted synchronous Generators
- DC converted AC

INFLUENCE OF RE POWER ON GRID OPERATION

- GRID STABILITY
- FREQUENCY CONTROL
- REACTIVE POWER SUPPORT
- POWER QUALITY

SCADA AND METERING

- SCADA TO ENABLE GRID CONTROL
- INDIVIDUAL GENERATOR METERING
- SUB-STATION CONNECTING GROUP OF RE UNITS
- TRANSMISSION RE SS INTERFACE METERING

OPERATION (RE POWER)

- RES Sub LDC
- All energy generated may have to be absorbed
- Commercial
 - To be included in Balancing and settlement Code
 - Frequency Error penalty may have to be deferred

RE Transmission

- MNRE may fund RE transmission projects with defined financial norms by constituting "RE transmission agency/committee" to co-ordinate with the National Transmission Planning Committee. The agency/committee may further obtain inter-State transmission license from CERC, based on need.

SUGGESTIONS

- Voltage level-based reactive power pricing shall have to be evolved. Reactive power absorbed by the system from the generator at the time of need has to be compensated.
- The central transmission licensee and private transmission licensee may have to supplement the effort of the State transmission licensee relating to implementation of RE grid integration projects.

SUGGESTIONS (Contnd...)

- Ancillary service market development may help resolve grid balancing issues attributable to RES.
- Energy converter scope is limited to supply of electrical energy at a common pooling point.

DRE GRID INTEGRATION may ensure

- Increase in percapita consumption
- Improved voltage profile in Rural India
- Loss reduction in Transmission and Distribution
- Improvement in reliability and quality of power to villagers
- Improved Power Availability
- More green power to consumers
- DSM & energy Conservation

**Join & Contribute to ensure
Quality(50Hz) Reliable Power to
Rural India through DRE grid
Integration**

THANK YOU ALL