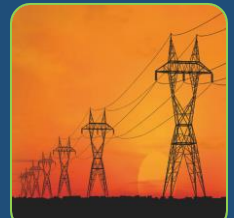
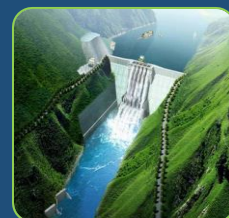


SOUTH ASIA REGIONAL INITIATIVE FOR ENERGY INTEGRATION (SARI/EI)

Summary note on the Report On

“Harmonization of Grid Codes, Operating Procedures and Standards to Facilitate/Promote Cross-Border Electricity Trade in the South Asia Region: Framework Grid Code Guidelines”



Release of Report

On

4th October, 2017

Hotel Druk, Thimpu, Bhutan





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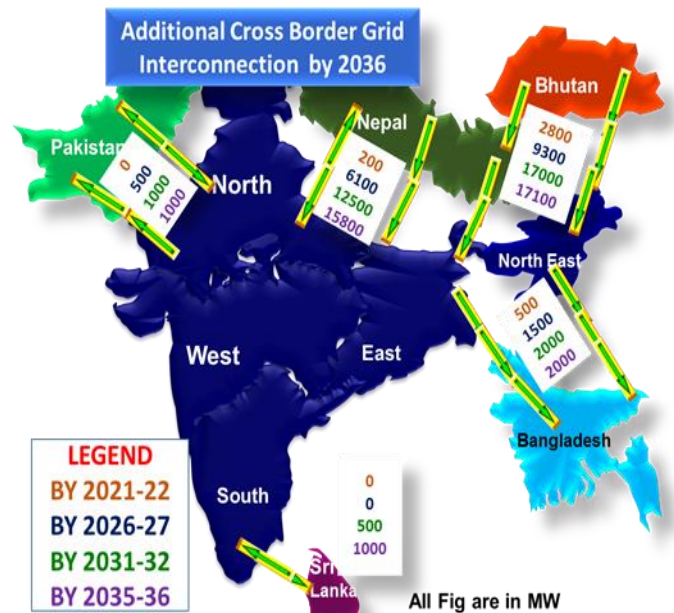
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Cross Border Electricity Trade (CBET) in South Asia is gaining momentum with more and more number of cross border power projects and transmission interconnections being planned (fig-1) and proposed which will enable greater Integration of Power Systems of South Asian Countries (SACs). The SACs envisages a manifold increase in the quantum of CBET by the end of next decade. The policy environment is becoming increasingly more and more conducive for CBET as eight member states of SAARC countries signed SAARC Framework Agreement of Energy (Electricity) Cooperation. Further, the historic Power Trade Agreement (PTA) signed between India and Nepal, opens up whole range of new possibility for trade electricity between Nepal-India, and also gives an access to Nepal Power Developers to Indian Power Market. India-Bangladesh and India-Bhutan are taking steps to increase quantum of CBET in manifold. With these increased Cross Border Electricity Trade, power system in South Asia will be more regionally integrated power system.

Electric Power System is a large, complex system involving many entities executing their respective activities and responsibilities. With the multi-stakeholder perspective like the generation, transmission and distribution licensees, system operators, traders and other participants in system, the stakeholders should function in proper co-ordination with each other; follow the regulations, standards and procedures for the safe and reliable operation of the grid. Grid codes provide basic design criteria and operational rules and responsibilities to be followed by the generating stations, transmission utilities, distribution utilities and traders.

Many common specifications appear in grid codes of various countries. Different sections of the grid code will be of varying significance to the generation, transmission and distribution utilities. Some of the rules may be for promoting competitive environment for generators whereas some may be critical for the operation/maintenance of generating plant. Therefore it is essential that while interconnecting two transmission systems, the respective grid codes have to be compared and reviewed to understand the underlying principles of individual systems and then harmonize the relevant rules to suit cross-border interconnection and trading. Transmission System Operators (TSOs) of all the member countries of a planned regional grid interconnection should first establish a common framework for preparation and implementation of operating guidelines and procedures, maintenance schedules, exchange of data, dispute settlement, power exchanges, electricity market mechanisms etc. Therefore, harmonization of the grid codes is an important step towards streamlining cross-border power trade.

There are many rules and criteria in every grid code dealing with generation, transmission, distribution, protection, metering, maintenance, buying and selling of power, ancillary services, etc. Electricity Grid Code document of a country depends on the past practices of its electricity sector, present hierarchical structure of its electricity sector, energy sources available and its legal, technical and commercial aspects etc.



Source Data : <http://www.cea.nic.in/reports/others/ps/ps02/ptp.pdf>
Perspective Transmission Requirements for 2022-36

Figure 1 Additional Cross Border Power Transmission System Interconnections by 2036

Disclaimer : By making any reference to a particular geographic area or by using the term "country" and Map in this document, IRADe/USAID does not intend to make any judgement as to the legal or other status of any area/Map. The map used is without prejudice to the status of or sovereignty over any territory, to the delimitation of international frontiers and boundaries, and to the name of any territory, city or area.

With Cross Border Electricity Trade is expected to increase and there by additional Cross Border Power Transmission System Interconnections is expected to be built , it is of paramount importance that the power grids of each South Asian Countries are integrated through a harmonized/coordination of grid codes for the smooth, optimal, secure and reliable power system operation of CBET across the SA nations.

Considering the volume of electricity trade to increase manifold in future and importance of secure and reliable grid to operate in South Asia Region, SARI/EI Task Force-2 committee represented by country nominated Members from Energy/Power Ministries, Transmission Utilities etc.; commissioned a study on Harmonization of grid codes, operating procedures and standards to facilitate/promote CBET in the south Asia region. The objective of harmonization of grid code is to arrive at a practical working arrangement for secure and reliable grid operation, and it should not be construed as an attempt to impose a uniform grid code. The report was finalized after a two years of the detailed and extensive deliberation and analysis among task forces members/technical team at SARI/EI and various stakeholders and based on interaction of the SARI/EI technical delegation to South Asian Countries¹. The study is very comprehensive and this study is being published in three volumes which covers the analysis of existing Grid Codes of South Asian countries, Gap analysis, international best practices, impact analysis based on the review/analysis of the international power pools etc. Volume –I covers Findings of the analysis of existing Grid Codes of South Asian countries, findings of the Gap analysis and recommendations for South Asia. Volume –II covers findings of review and analysis of International regional power pools, international best practice, impact analysis and recommendation for South Asia. Volume –III covers framework Grid Code Guidelines, Implementation provisions and brief Summary of Gap analysis, international experience review which is being released today. They key findings of the Study were also presented and deliberated in the 2nd and 3rd meeting² of SAARC energy regulators meetings. It is also important to provide action ability to the Articles of the SAARC Inter-Governmental Framework Agreement (IGFA) for Energy Cooperation by defining them into operating rules and common grid code guidelines w.r.t CBET transactions through Grid Code Harmonization, this study is therefore an humble attempt in this regard.

Based on detailed analysis the study has recommended Framework Grid Code Guidelines (FGCG) has been developed which provides basic criteria for system planning, connection and operational rules and responsibilities to be followed by the Generating stations, Transmission utilities, Distribution utilities and traders. Framework Grid Code Guidelines (FGCG) establishes a clear technical framework and Grid code & related regulatory environment vis-à-vis a coordinated /harmonized cross border Grid Codes for smooth, reliable , secure cross-border Electricity trading and provides consistency across technical parameters in CBET transactions and gives certainty to grid users and other stakeholders.

Keeping in view of the international experiences and considering the technical complexity involved with respect to grid code harmonization and integrated planning and operation of a regional power system in South Asia, the study has recommended to create a Regional Technical Institutions/Body such as South Asia forum of transmission system utilities of SACs or South Asian Forum of Transmission Utility (SAFTU), which shall be mandated for coordinated, reliable and secure operation of the interconnected transmission network as well as for coordinated system planning and integrated system/network development and grid code harmonization.

For more information about the study/report you may contact Mr.Rajiv Ratna Panda @rajivratanpanda@irade.org
Report can be downloaded from the link below

<http://sari-energy.org/publications-list/list-harmonisation-of-grid-codes-operating-procedures-30th-august-2017-nepal-rajiv-1-2-volume-iii/>

1<http://www.irade.org/Brief%20Report%20on%20SARI-EI%20Technical%20Delegation%20to%20Bangladesh%20on%20the%20Study%20on%20Harmonization%20of%20Grid%20Codes-19th%20April,2016.pdf>
<http://www.irade.org/Brief%20Report%20on%20SARI-EI%20Technical%20Delegation%20to%20Bhutan-6th-7th%20April,%202016%20for%20Grid%20Code%20Harmonization..pdf>
2<http://sari-energy.org/wp-content/uploads/2016/09/Key-Findings-on-the-Study-on-Harmonization-of-Grid-Codes-Operating-Procedures-Standards-to-Facilitate-Promote-CBET-in-SA-by-Rajiv-Ratna-Panda-Head-TechnicalSARI-EI-IRADe-3rd-SAARCRegulators-Meeting.pdf>
<http://sari-energy.org/wp-content/uploads/2017/03/Brief-Report-on-SARIEI-Delegation-to-3rd-Meeting-of-SAARC-Energy-Regulators.pdf>
<http://sari-energy.org/wp-content/uploads/2016/05/Brief-Report-on-SARI-EI-Delegation-to-the-2nd-Meeting-of-SAARC-Energy-Regulators-Feb-2016-2.pdf>



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