

Concept Paper

PRG-82/2015/POSIT

SAARC Perspective Workshop on the Past, Present and Future of High Voltage DC (HVDC) Power Transmission (2-day, Pakistan)

Background:

An aggressive, integrated approach is required to make energy accessible, affordable and reliable in South Asia – home of more than 1.6 billion people. These targets for South Asia, like any other part of the world, are necessary yet difficult since the stakeholders have different interests when it comes to energy. For energy transition in South Asia, in view of the huge quantum of the population versus limited economic capability, we particularly require smart solutions and the best utilization of the latest technological developments to offset large scale deployment.

2. In its brief history, SAARC Energy Centre (SEC) has been able to launch a number of initiatives within its core areas of activity, essentially aiming at materializing the SAARC Energy Ring comprising of various links among the Member States. Power interconnections are perceived between Sri-Lanka, Nepal-India-Pakistan, Nepal-India-Bhutan-Bangladesh, Iran-Afghanistan-Turkmenistan-Uzbekistan-Kyrgyzstan-Tajikistan-Pakistan.

3. Without exception, all these electrical power links, bilateral or regional, require extension in existing power transmission lines and power interconnections. It is imperative to keep the technical workforce, comprising of planners and engineers in this case, updated and informed of the modern international practices with respect to bulk power transmission.

Introduction:

4. High Voltage Direct Current (HVDC) specifies a system used for transmitting electrical power by means of direct current instead of conventional alternating current. HVDC is meant to transmit bulk electricity over long or very long distance by overhead transmission lines or submarine cables, since it then becomes economically attractive over a conventional AC transmission line. HVDC is thus considered to be the key technology for interconnecting regions and countries.

5. Most of the electric power transmission systems involve 3-phase AC system. Rationale for preferring HVDC over AC in a certain case involves complex assessment. SEC is proposing this workshop with the aims to facilitate experiential learning among the power transmission professionals of the SAARC Member States with respect to the bulk power transmission through HVDC options with pertaining to its usage/application i.e. Back-to-back interconnections (connecting 'mismatched' AC networks such frequency mismatch) and Point-to-point connections (connecting generation facilities to distant load-centres and developing energy highways to transfer large amounts of power over long distances). This workshop will cater the much needed knowledge and understanding of HVDC and HVAC options.

Objectives:

6. SEC has especially envisaged this training workshop, undertaking the strengthening the power transmission engineers and planners of the SAARC Member States with the following major objectives:

- Informed the professionals of transmission utilities of the new developments, trends and challenges with respect to the bulk power transmission.
- Learning and experiences of the experts would help guiding the Member States in opting the HVDC or HVAC for their future power transmission projects particularly regional power inter-connections.
- Creating opportunity for the power transmission professionals to enhance their knowledge through interactive sessions based on regional and international experiences

Major Aspects to be Covered:

7. The workshop would focus on strengths, weaknesses, opportunities and threats for HVDC technological developments in comparison to the High Voltage Alternating Current (HVAC) Power Transmission and in view of the regional and international experiences. Using the perspectives that emphasize both positive and negative aspects of HVDC power transmission, technological options (Voltage-Sourced Converter (VSC-HVDC) and Line-Commutated Converter (LCC-HVDC) are to be brought into focus, challenged and discussed at length during the workshop. HVDC applications would be discussed with focus on HVDC modeling (Harmonics, System integration), HVDC network integration, Risk assessment, Security & reliability of HVDC grid, etc.

Methodology:

8. Experts from the SAARC Member States would be identified and invited for sharing their experience on Power Interconnection with respect to contrast between HVDC and HVAC technologies with respect to technology options, length of transmission line, interconnection capacity, constraints, economic feasibility, professional expertise, etc.

Participants of the Workshop:

9. SEC would seek participation of two professionals from each of the SAARC Member States representing Planning and Design components of the Power Transmission Utility. The delegation from each Member State will be required to give a ten-minute presentation to the participants of the workshop on the prevailing practices for the development of power system planning.

Venue of Workshop:

10. This 2-day workshop will be organized in Lahore, Pakistan in collaboration with a suitable organization to be recommended by GB Member from Pakistan.

Time and Duration:

11. The training workshop will be conducted in August 2015.

Activity↓	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Identification of relevant Collaborating Organization												
Announcement												
Preparations												
Workshop Holding												
Report												