InConversation

'1200kV line will save land'

With India's limited experience in developing 800 kV alternating current system and growing power requirement both for the industry and households across the country, Power Grid Corporation (PGCL) has taken the world by surprise by developing the know-how for 1200 kV ultra high voltage AC transmission system at Bina in Madhya Pradesh. The man behind the mission, **S.K. Agarwal**, who is also Executive Director, Technology & Development, PGCL, speaks to **Alok Sharma** and explains the benefits which technology would bring considering the issues of land acquisition. Edited excerpts:

India has ample expertise in 11 kV to 420 kV systems and also in 800 kV systems to an extent. What was the need to develop the know-how for 1200 kV system?

We needed this technology to put the power transmission sector on fast track. As a country, we need to achieve in the next three to four years what we did in the last 30 years in terms of power transmission and distribution infrastructure.

Besides generating power there is a need to minimize its wastage as the country cannot afford to let go the precious resource. There is also a growing need to transmit the power which has been generated as there is a large population out there which requires electricity to raise its standard of living. Considering the gravity of the problem, Power Grid brought together about 35 manufacturers with proven excellence in setting up 400 kV and 800 kV power systems.

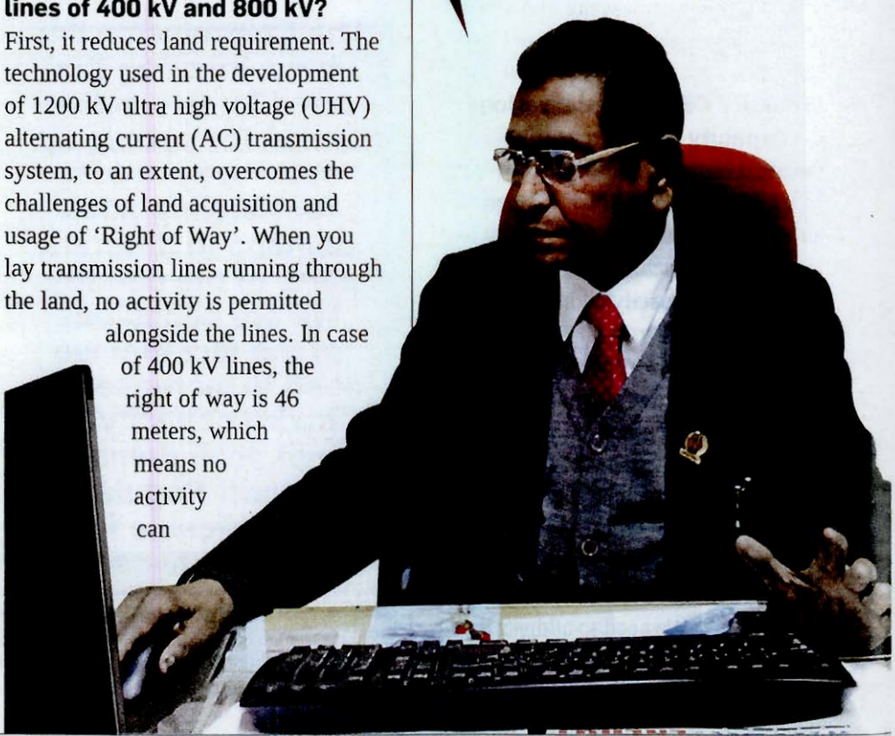
It is a unique public private partnership model where every equipment was developed within the country, barring one which we imported through a tender and supplied to the manufacturers.

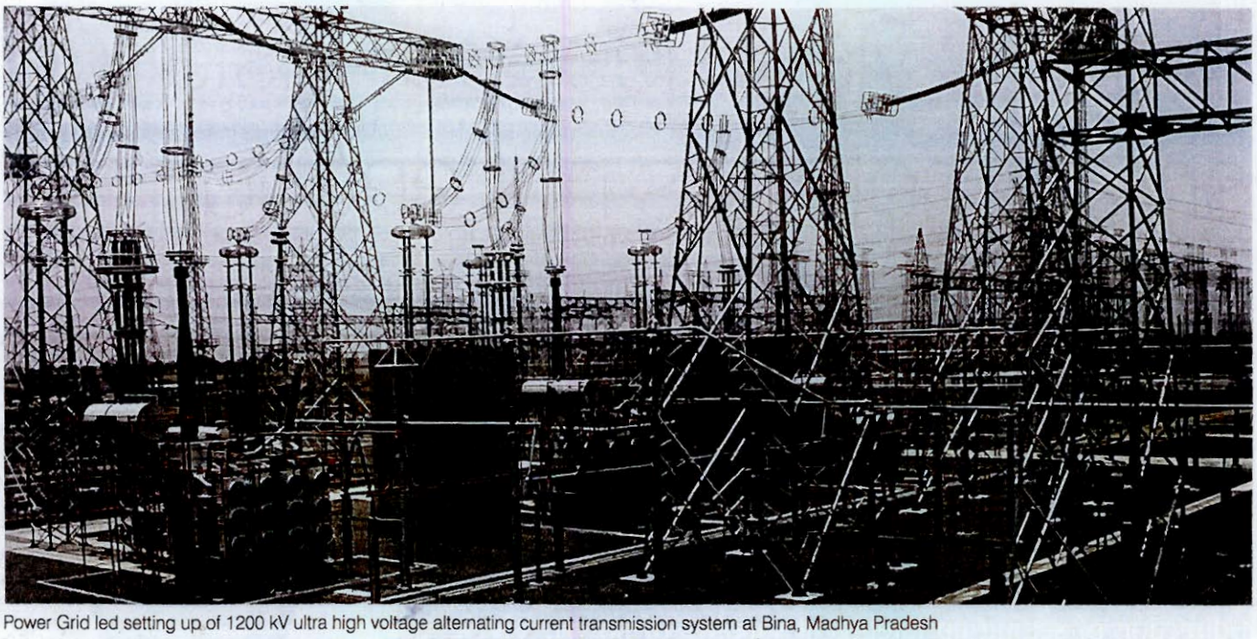
The technology used in 1200 kV systems allows us to transmit 12 times more electricity on every meter of land used

What are the benefits of a 1200 kV transmission line, compared to the existing lines of 400 kV and 800 kV?

First, it reduces land requirement. The technology used in the development of 1200 kV ultra high voltage (UHV) alternating current (AC) transmission system, to an extent, overcomes the challenges of land acquisition and usage of 'Right of Way'. When you lay transmission lines running through the land, no activity is permitted alongside the lines. In case of 400 kV lines, the right of way is 46 meters, which means no activity can take place in a 23-meter wide strip of land on both sides of the line. In case of 800 kV the right of way is 64 meters. In 1200 kV it stands at only 92 meters. The technology used in 1200 kV systems allows us to transmit 12 times more electricity on every meter of land used as compared to 400 kV and when compared with 800 kV system it is 2.5 times more. It is a huge benefit considering the shortage of land.

Power Grid took the lead in developing the know-how to set up such as system in order to meet the country's long-term power transfer requirement especially considering the socio-economic challenges such as ever diminishing land availability and 'Right of Way'.





Power Grid led setting up of 1200 kV ultra high voltage alternating current transmission system at Bina, Madhya Pradesh

What kind of challenges did you face while developing this technology and how did you overcome them?

The main challenge was the non-availability of standard parameters and limited application of UHV technology in countries such as India and China. The need for ultra high voltage level to transmit large blocks of power from distant generation sources to load centres was always felt due to the growing problem of land availability. Before the disintegration of USSR, experts in Russia were working on the development of this technology but the efforts were discontinued post disintegration. Japan started developing a 1,000kV UHV system in 1978 and tests are still on. China started developmental work on a 1,100 kV UHV system in 2005 and a pilot project is at present under testing.

We appointed two technical experts to help us achieve this challenging task. Interestingly, we hired them on work basis which means they were paid only when their expertise was required to solve the challenges that cropped up during the setting up of this system.

The main challenge was the non-availability of standard parameters and limited application of UHV technology in countries such as India and China. The need for this technology was always felt due to the growing problem of land availability.

Handling 35 different manufacturers would have been a challenge. What was the major issue when you were dealing with such a large number of company representatives?

While handling 35 different manufacturers the biggest challenge was to maintain transparency while developing the system and simultaneously give the manufacturers the confidence that their technology would not be shared with others. There were issues of intellectual property rights as manufactures were shy of discussing their technology with other manufacturers and then we decided to discuss only the broad points in our meetings and finer points were discussed with the specific manufacturer engaged in the task concerned.

We may be the first ones to develop the technology but China is not too far. They too have successfully developed 1100 kV transmission system. For how long can your system retain the top slot?

We have developed the know-how of setting up such a system which is the first in the world and we are the world leaders in this technology. We have done further research and now we are capable of transmitting 50-55 per cent more electricity through the same lines as compared to the same equipment that China manufactures.

We have set up a committee to prepare the standards for the usage and implementation of such a system. India would be the first one to have standards for 1200 kV UHV AC transmission system.

For full version of the interview, visit www.infraline.com
For suggestions email at feedback@infraline.com