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## **BHEL develops India's first Ultra High Voltage AC 1200 kV Transformer through in-house Research and Development efforts**

Bharat Heavy Electricals Limited (**BHEL**)'s sustained focus on developing new technologies and products through in-house R&D initiatives has once again paid rich dividends with the successful indigenous development of the country's first 1200 kV Ultra High Voltage Alternating Current (UHVAC) Transformer of 333 MVA rating. Significantly, India's first 1200 kV, 333 MVA Transformer has been developed, manufactured and successfully tested by **BHEL** entirely through in-house know-how. With its successful development and type testing as per international standards, India joins a select band of countries in the world possessing this technology. The development of the 1200 kV UHVAC transformer is the outcome of two years of rigorous research by the engineers of **BHEL**. The technology for such leading-edge products is specific and available with very few manufacturers worldwide and is zealously guarded and not available for transfer. **BHEL** had to develop each facet of the technology through in-house R&D efforts to develop a product that is comparable to the best in the world. The transformer has been manufactured under a controlled environment using the contemporary, state-of-the-art manufacturing and testing facilities at the newly constructed transformer block in **BHEL**'s Bhopal plant to meet stringent quality requirements for operation of such transformers. **BHEL** had signed an MoU with PowerGrid for development of this transformer which is also the largest equipment used in a substation. The 333 MVA, 1150/400/33 kV, single-phase, Auto Transformer successfully developed by **BHEL** shall be installed in India's first experimental 1200 kV National Test Station at Bina (MP) being set up by PowerGrid. This is a major mile stone for India towards self reliance in UHVAC transmission systems. Having introduced 765 kV as the highest transmission voltage, the country is aspiring to shift to 1200 kV voltage transmission networks during the XIIth plan period. A large network comprising 1200 kV transmission superhighways is being planned as part of the National Transmission Network. **BHEL** has also recently successfully tested and despatched India's first indigenously developed 500 MVA, 765 kV Transformer for a substation project being set up in Western India by PowerGrid. In addition, the company has manufactured and installed a 1200 kV, 180 MVA Transformer to be used as a testing transformer in its UHV Test Laboratory at Bhopal. For the transmission sector, **BHEL** has developed various systems and products which include Power Transformers, Instrument Transformers and Disc Insulators suitable for UHVAC systems of 765 kV and 1200 kV. It has also earned the distinction of being the only manufacturer in the world to have successfully manufactured and tested its Ceramic Disc Insulators for + 800 kV UHVDC transmission systems at STRI Sweden. The company has recently won an order to execute PowerGrid + 800 kV, 6000MW HVDC Multi Terminal System Package associated with the North East/Eastern Region " Northern/Western Region Interconnector " I in consortium with ABB, Sweden. This project will be the world's biggest HVDC project and on commissioning of the project, India will shift HVDC transmission voltage from the present + 500 kV to + 800 kV which is the highest DC voltage in the world. Significantly, India will also become only the second country in the world possessing this technology. **BHEL** is also supplying its indigenously developed Disc Insulators for construction of the transmission lines associated with this project. **BHEL** manufactures transformers, shunt reactors, instrument transformers, capacitors, extra high voltage circuit breakers and medium voltage switchgear at its facilities located at Bhopal, Hyderabad and Jhansi, besides providing total systems solution for HVDC, Extra High Voltage Alternating Current (EHVAC) and UHVAC Systems. **BHEL** is the biggest transformer manufacturer in

India with a capacity to manufacture 45,000 MVA of transformers/reactors per annum. The company has set up a modern state-of-the-art manufacturing plant of 12,000 MVA at Bhopal to manufacture large sized EHV, HVDC and UHVAC transformers and reactors.

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