



Sandip Foundation's
Sandip Institute of Technology & Research Centre, Nashik

Department of Electrical Engineering

Academic Year 2017-18

Report on Industrial Visit

Event Title: Industrial Visit at 500KV HVDC Terminal Padghe, Dist Thane

Event Date: 28th March 2018

Event Conduction Duration: 10:00 am to 2:00 pm

Event Venue: 500KV HVDC Terminal Padghe, Dist Thane

Event Resource Person Details: Dy. Engineer, Sunil Shenava

Name of Event Co-ordinator: Prof. D. S. Badgujar & Prof. R. B. Sadaphale

No of Participants: 47 Students and Two Staff

Event Objective:

1. HVDC Substation layout , HVDC Switch yard
2. DC to AC Converter unit of 500MVA Capacity
3. HVAC substation layout, HVAC switch yard

Outcome: Power Transmission

The **Chandrapur–Padghe HVDC transmission system** is an HVDC connection between Chandrapur and Padghe (near Mumbai) in the state of Maharashtra in India, which was put into service in 1999. It connects the coal-fired Chandrapur Super Thermal Power Station to the major load Centre of Mumbai. The project has a 752 kilometers (467 mi) long bipolar overhead line. The transmission voltage is $\pm 500\text{kV}$ and the maximum transmission power is 1,500 megawatts. The scheme uses thyristor valves, arranged in a single twelve pulse bridge per pole. The project was built by ABB and BHEL, and is owned by Maharashtra State Electricity Board (MSEB).

The eastern (Chandrapur) converter station is located 20 kilometres (12 mi) from the Chandrapur back to back HVDC station. The close proximity of the two converter stations meant that the control systems needed to be carefully coordinated, a task made more challenging by the

fact that the two stations were built by different manufacturers.

The converter station is located 20 kilometres (12mi) from the eastern terminal of the Chandrapur–Padghe HVDC transmission system. The close proximity of the two converter stations meant that the control systems needed to be carefully coordinated, a task made more challenging by the fact that the two stations were built by different manufacturers. To address this problem a series of joint simulation studies, involving the control equipment from both converter stations connected to a common simulator, was performed.

On 31 December 2013, the Northern, Eastern and Western grids were synchronized with the Southern regional grid, creating a single synchronous AC grid over the whole of India. As a result, the converter station is no longer required for its original purpose of asynchronously linking the Western and Southern grids, although it can still be used as an embedded power flow device to help control power flow within the AC system. The stations could potentially be shifted to elsewhere to export/import power from other countries. Sometimes the excess power fed to the southern grid by this HVDC link is flowing back to Western region through the 765 kV AC lines between Southern grid and the Western grid with futility.



Electrical Engg, SITRC : Staff and Students at Padghe ,500KV Substation

Dy. Engineer, Sunil Shenava explaining Single Diagram and Power Flow to Students





HVDC Layout at Padghe