

**Executive Summary- ESIA for Kharghar Vikhroli
Transmission Private Limited (KVTPL) Project, Maharashtra**

Executive Summary

Introduction

Adani Transmission Limited hereinafter referred as “ATL”, headquartered in Ahmedabad, Gujarat is the largest private sector power transmission company in northern, western and central India. ATL owns and operates various High voltage AC transmission lines and substations of 132kV, 220kV, 400kV, 765kV voltage level and High Voltage DC transmission lines and substations of +/- 500kV voltage level. Today, ATL has portfolio of more than 14,000 ckt km of transmission lines and around 27,000 MVA of power transformation capacity. This report intends to assess Environmental and Social Impact Assessment (ESIA) of the proposed transmission line.

The Government of Maharashtra has set a goal for strengthening of Mumbai transmission system aiming additional power to be brought into Mumbai and would thus help in meeting the future demand of the city. ATL has won the project named Kharghar Vikhroli Transmission Line and has established the Special Purpose Vehicle (SPV) named “Kharghar Vikhroli Transmission Private Limited” (KVTPL) to execute the project which of approximately 34 km of 400 kV and 220 kV transmission lines along with 1500 MVA 400kV GIS Substation at Vikhroli in Mumbai on build, own, operate and maintain basis Competitive Bid.

Based on the initial screening and the preliminary assessment it can be said with a degree of certainty that the transmission line does not pass through any protected area or any area of ecological importance. Further most of the impacts of the project during construction are site specific, reversible with mitigation measures, short time and co-terminus with the construction activities. The ESIA has assessed overall acceptability of environmental and social impacts likely to arise as a result of construction and operation of transmission line for KVTPL project. With the available information and presented in this report, the proposed project passes through ecological and socially sensitive areas. However, the proponent has agreed to include additional mitigation measures. The Critical habitat assessment is under process and based on the assessment the category of the project will be specified.

Route of Transmission line

The proposed transmission project includes 400 kV Kharghar-Vikhroli D/C & M/C line with bays at Kharghar & Vikhroli (with conductor capacity of 2,000 MW per circuit) along with 400 kV Bus extension at 400 kV Kharghar end, LILO on 400 Talegaon-Kalwa line at 400 kV Vikhroli GIS S/S with bays, LILO of existing 220 kV Trombay – Salsette I & II and 220 kV Trombay – Salsette III & IV at 400/220 kV Vikhroli S/S. The project is also included the installation of 1x 125 MVAR 400 kv BUS reactor, along with 400/220 KV GIS substation with 3 x 500 MVA, 400/220 kv ICTS. There is also a line diversion of existing 110 KV Dharavi Salsette via Vikhroli lines considering future 220 KV upgradation.

Need & Objective

The objective of the ESIA is

- To document various environmental and social impacts related to field activities that are being undertaken by ATL for laying of transmission line and
- To highlight the environmental and social management strategies, systems and procedures being employed along the transmission line route and to meet the environmental and social requirements of the funding institutions.

Project Description

The length of the KVTPL transmission line is 36.953 KM in total which includes the 400 kV Kharghar-Vikhroli D/C & M/C line with bays at Kharghar & Vikhroli as well as the LILO on 400 kV Talegaon Kalwa line. This line passes from the Kharghar in Navi Mumbai Region to Vikhroli in Mumbai Region and from Vikhroli to Airoli. The transmission line passes through three districts namely, the Mumbai Suburban Area, Thane, and Raigarh Districts. The transmission line fall

under the jurisdiction of three different Municipal Corporations namely, The Navi Mumbai Municipal Corporation, Brihan Mumbai Municipal Corporation and the Panel Municipal Corporation.

The land on which the project is to be constructed is public land, forest land or land belonging to bigger private entities. No private residential land has been used for the project. It shall also be noted that the transmission line route does not have any R & R issues.

400 KV Kharghar – Vikhroli TL: This line passes from the Kharghar in Navi Mumbai Region to Vikhroli in Mumbai Region. The entire route is going to follow the existing transmission line route. So, the approach roads use for maintaining of the existing towers, will be used for approaching the proposed towers.

LILO on 400 kV Talegaon-Kalwa line at 400 kV Vikhroli GIS S/S with bays: This route starts near Airoli, crosses Thane Creek and passes through Core zone of Thane Creek Flamingo Sanctuary, mangroves, salt pans, MCGM Dumping Ground near Kanjurmarg, Godrej property and ends at Vikhroli GIS S/S. Width of the approach access to the proposed tower locations are to be 4 m. Hence, a 4 m wide shortest possible belt connecting the tower base to the existing approach access was also considered while calculating mangrove tree cover damage. There are existing bunds (walkways made for Salt pans) at most of the locations which will be used for approaching the proposed towers.

The Right of Way of the transmission line has been defined as per as per IS 5613. In case of 400 KV lines 46 m is considered as the ROW while in case of 220 KV line the ROW is stipulated to be 35 m. This is also the horizontal clearance required for transmission line of these capacity. The minimum ground clearance for 400 kV transmission lines shall be 8.84 m and for 220kV D/C transmission lines shall be 7.01m, so that maximum electric field does not exceed 10kV/m within the ROW and does not exceed 5kV/m at the edge of the ROW as per international guidelines.

During the O&M stage of the project ground patrolling would be carried out. The patrolling would monitor the growth of trees in violation of the minimum safety clearance., development of any house or settlement within the RoW. Roads and bridges constructed within the ROW would also reduce the minimum safety clearance so these would also be monitored.

The foundation construction team would have around 15-20 labours while the tower erection teams which would have 20-25 people. Finally, the stringing team would also have around 30-40 people involved in the job. During the foundation and tower construction approximately 2-3 teams would be working in parallel. Thus approximately 100-120 labours would be working at any time in the project.

Pollution and control measures

The pollution expected from construction activities includes fugitive dust emission due to excavation and project related vehicular movement and waste debris from casting of foundations. There is potential for disturbance to habitations in proximity of the towers due to construction activities.

Implementation of suggested measures will enable suppression of dust generation, disposal of waste debris and other adverse impacts.

Description of Environment

The baseline studies have profiled the environmental and social conditions along the transmissions line, covering in general a buffer distance of 500m of both side of the alignment where any significant environmental sensitive is identified. The studies were designed to collect information from secondary sources and to obtain primary information through site visits and consultation with local communities and other related stockholders. Overall the study is reflective of the environmental and social landscape of the districts through which the alignment would pass.

The transmission line is in north-east suburb of Mumbai in the state of Maharashtra. Geographically, the Study Area comprises a part of the Thane Creek, an inlet in western shoreline of the State of Maharashtra. The proposed project comprises of construction of 12 km transmission line between MSETCL's existing 400 kV Receiving station at Kharghar and Tata Power's 400 kV Receiving station at Vikhroli for meeting additional load requirement of power to Mumbai metropolitan area. This line emanates from MSETCL's Kharghar Receiving Station, passes through hilly area and

reaches Devisaddle. From Devisaddle, the transmission line runs on existing Right of Way of two 110kV Transmission lines of Tata Power and reaches Vashi via Palm beach road.

The topography of the Study Area is generally flat, with an overall gentle slope draining into the creek. The land is drained mainly by small tributaries into a large creek. The eastern part of the Study Area lies near the Kharghar Hill Range, which is a contiguous range of hills nestled between the city. Most of these hills are covered with natural vegetation, while a few patches along hill slopes are degraded. The natural terrestrial habitats of the Study Area mainly comprise tracts of natural forests, grasslands and mangroves. The natural aquatic habitats of the Study Area mainly comprise the creek, seasonal or perennial streams and lakes. The modified habitats in the Study Area comprise habitations, gardens, salt pans, substations, bunds, culverts and roads. The land-use in the Study Area is dominated by habitation, mangrove forests and wetlands.

A part of the Study Area overlaps with Thane Creek Flamingo Sanctuary, a legally protected area and a key biodiversity area. Approximately 2.2 km stretch of the project alignment passes through the southern, western and northern part of the core boundary of the sanctuary, while 16.5 km of the project alignment passes through its proposed Eco-sensitive Zone, towards the west of the sanctuary.

The climate of Mumbai city area is a tropical wet and dry climate type with moderate temperatures with high level of humidity. Its coastal and tropical location ensure moderate temperature throughout the year, average of 27.2 °C and annual average precipitation of 242.2 cm (95.35 inches). According to the CGWB report of Greater Mumbai the average ambient temperature of this area is on average about 32.2°C in summer and 16.3°C in winter. Rainfall Mumbai experiences heavy rainfall during the monsoon time as it is in the windward side of Western Ghat. Between June and September, the south west monsoon rains splurge the city July and August are the wettest months all over the region. Towards the later part of the season, there are breaks in between, when the oppressive hot weather is associated with high humidity along the coast. The average rainfall in the region is nearly 2000 mm.

In the Environmental Status Report of Navi Mumbai Municipal Corporation-2018-19 reported the Air Quality Index (AQI) of the area following the calculation suggested by CPCB in consultation with IIT (Indian Institute of Technology) Kanpur. It is reported that as per the air quality monitoring data of 2018-19 the Navi Mumbai is clean for NO_x, SO₂ and Ozone pollutants as most of the observations are either in Good or Satisfactory category. In terms of Carbon Monoxide (CO), 23% of total observations were recorded under Moderate category.

According to CGWB report, the broad physiographic feature of the greater Mumbai area is broad and flat terrain flanked by north – south trending hill ranges. The eastern and western part of the area having hilly ranges. The maximum elevation of the area is 450 m above mean sea level. Malbar, Colaba, Worli and Pali hills are the isolated small ridges trending north – south in the western part of the district. The Powai – Kanheri hills form the largest hilly terrain in the central part of the Salsette island and are the feeder zone for the three lakes viz., Powai, Vihar and Tulsi. There are a number of creeks, dissecting the area. Thane is the longest creek. Other major creeks are Manori, Malad and Mahim which protrudes in the mainland and give rise to mud flangs and swamps. Two types of soils have been observed in the district viz., medium to deep black and reddish soil.

The pre-monsoon average depth to water levels recorded by National Hydrograph Network Stations (NHNS) of CGWB during May 2011 ranges between 2.67 m bgl and 4.25 m bgl. The depth to water levels during post-monsoon recorded in November 2011 in major part of the district ranges between 2 and 5 m bgl.

Due to ingress of sea water, the ground water quality of deeper aquifer is brackish to slightly saline in some localities such as Colaba, Dharavi, and Khar.

Flora

Two hundred and thirty-six (236) higher floristic species were recorded in the Study Area as part of the biodiversity sampling. These include one hundred and twenty-seven (127) woody species, which contribute to the perennial groundcover of the Study Area, as well as, one hundred and nine (109) non-woody species, which predominantly contribute to the seasonal ground-cover of the Study Area.

Birds

At least three hundred and three (303) species of birds have reported ranges that include the Study Area. These include one hundred and seventy-seven (177) species which are resident with respect to the Study Area and one hundred and twenty-six (126) species, which are migratory with respect to the Study Area. With respect to the IUCN Red List, two (02) bird species of the Study Area are designated as Critically Endangered, two (02) as Endangered, four (04) as Vulnerable and twelve (12) are listed as Near Threatened. With respect to the WPA Schedules, six (06) bird species of the Study Area are listed under Schedule I. Forty-four (44) species of birds, consisting of thirty-one (31) resident species and thirteen (13) migratory species, were recorded as part of the primary data.

Socio Economic Condition

The length of the KVTPL transmission line is 74KM in total which includes the 400 kV Kharghar-Vikhroli D/C & M/C line with bays at Kharghar & Vikhroli as well as the LILO on 400 kV Talegaon Kalwa line. This line passes from the Kharghar in Navi Mumbai Region to Vikhroli in Mumbai Region and from Vikhroli to Airoli. These areas fall under the jurisdiction of 3 different Municipal Corporations namely, The Navi Mumbai Municipal Corporation, Brihan Mumbai Municipal Corporation and the Panel Municipal Corporation.

The land on which the project is to be constructed is public land, forest land or land belonging to bigger private entities. No private residential land has been used for the project.

Consultations carried out in the influence area of the transmission line have been limited in number. It could be ascertained from the primary survey and observations that most of the people in the study area depend on occupations other than agriculture and industries. This includes work in the service sector, construction, small business and shops, etc. The modes of transportation used by people include public transport like local trains, buses, etc. as well as auto rickshaws and other private modes like cars, two-wheelers, etc. Amenities like drinking water, sanitation, etc. are provided in the influence area by the municipal corporations of Mumbai, Navi Mumbai and Panvel. Many primary and secondary schools, colleges, other educational institutions, both private and government-run, are present in the influence area. Private hospitals, clinics, dispensaries, etc. and other health-related facilities are present in the influence area of the transmission line. Places of religious and cultural importance like temples, cinema halls, theatres, etc were also visible in the influence area.

It was noted through the primary survey and observations that the land on which the transmission tower is to be erected is public land, hence, compensation for the use of this land was not given to any private entities. Ownership of the said land is still with public and would be open for public use

Impact Assessment and Mitigation Measures

Potential impacts of proposed transmission line during:

Construction phase for casting of foundation, tower erection and stringing activities will be mainly disturbance to fauna and flora, traffic hazards, noise, safety issues.

Impact during the operational phase is limited to effect of electromagnetic field at disturbances from noise for corona effect.

Environmental and Social Management Plan

The ESMP provides a delivery mechanism to address potential adverse impacts, to instruct contractors and to introduce standards of good practice to be adopted for project activities taken up during construction and operation phases of the project. Inspection and monitoring of the environmental and social components phase activities will increase the effectiveness of suggested mitigations.

Through the process of inspection, audit and monitoring KVTPL will ensure that all the contractors comply with the requirements of conditions of any required clearance, and other permits including suggested action plans.

The inspection and audits will be done by trained team ATL's Environment, Health and Safety (EHS) department as well subject to be reviewed and conducted by external agencies/experts. The entire process of inspections and audits are being documented. The inspection and audit findings are to be implemented by the contractors in their respective areas.

Conclusion

The project is likely to generate some environmental and social impacts both during construction and operation. During construction phase the environmental impacts expected from the project include disturbance to fauna and flora, construction waste of disposal, increase of noise level and social impacts mainly from engagement of land and loss of crop. During operation phase the impacts include disturbance to vegetation, noise generation and social impacts of restricted activities within corridor.

Environmental and social management plan describes implementation mechanism for recommended mitigation measures during construction and operation phase to verify overall project performance.