

# Initial Environmental Examination

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Project Number: 55040-001  
September 2023

## Bangladesh: Dhaka Power System Expansion and Strengthening Project

### Appendices XIV to XIX

Prepared by Ministry of Power, Energy and Mineral Resources for the Asian Development Bank.

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## **Appendix XIV: Bird Survey Report Tongi (Winter 2022/2023)**



# Proposed Tongi Substation Bird Survey Report



Final Report  
February 2023

*Submitted to*  
Asian Development Bank (ADB)

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## Executive Summary

The Asian Development Bank (ADB) has recruited a national consultant to undertake bird surveys in December 2022, January and February 2023 at the proposed Tongi substation in Bangladesh. The primary objective of the task is to undertake a desk-based study and monthly bird counts during the wintering period covering the entire area of the wetland to record the number and distribution of different bird species present at the project site and generate a survey report with density and diversity of birds as well ecological description of the habitats surveyed.

The study area comprises mixed seasonal agricultural lands on the edge of wetlands, human settlements, wetland plants such as Dhol Kolmi (*Ipomoea fistulosa*) and invasive Water Hyacinth (*Eichhornia crassipes*), and open water. The area of wetland in December 2022 was 30,819 m<sup>2</sup>, which drastically reduced, both naturally and artificially through drainage, in the following months.

Block count and strip transect methods were used to determine the abundances of waterbird and density of non-waterbird species. A total of 43 bird species were observed, including 33 resident and 10 migratory species. Notable waterbirds and wetland-dependent species were also observed, including Great Egret (*Ardea alba*), Green Sandpiper (*Tringa ochropus*), Temminck's Stint (*Calidris temminckii*), and Eurasian Hoopoe (*Upupa epops*). The most frequently sighted species was Indian Pond-Heron (*Ardeola grayii*).

Based on the survey results, minor recommendations are proposed to reduce disturbance during the construction phase, such as controlling noise, dust and light pollution, and preventing harm to local wildlife. Moreover, some post-construction measures are recommended to benefit local biodiversity, such as planting native grass and butterfly host plants, planting flowering and fruiting trees, and installing PVC pipes on non-load-bearing walls to encourage birds to nest or roost in the substation. Finally, consulting a biodiversity expert and landscape architect is recommended while finalizing the design of the substation and conducting a site visit by biodiversity experts after the construction is complete to assess the ground situation and recommend further small-scale conservation interventions.

# Proposed Tongi Substation Bird Survey Report

## February 2023

### Background

The Asian Development Bank (ADB) is considering providing project loans to the Government of Bangladesh to finance energy sector investment projects envisaged in the Country Operations Business Plan: Bangladesh 2021-2023. To this end, ADB has recruited a national consultant to undertake bird surveys in December 2022, January and February 2023 at the proposed Tongi substation, covering the entire area of the wetland associated with the proposed Tongi substation site. This is required for the proposed Expansion and Strengthening of Electrical Infrastructure Project for the construction of substations, transmission and distribution lines including overhead and underground cables, ring main units and distribution transformers across the entire DESCO distribution area. A natural waterbody exists in the area, which has been largely modified for various human use such as agriculture during the dry season and fisheries during the wet season.



**Photo 1:** Proposed Tongi Substation wetland areas on 21 December 2022.

## Study Objectives

Primary objectives of this task are to: (a) undertake a desk-based study and analyse secondary information on existing species recorded around the project site (using platforms such as *eBird*) and ecological designation, including consultation with biodiversity related NGOs and government offices holding information; (b) conduct monthly bird counts during the wintering period covering the entire area of the wetland associated with the proposed Tongi substation site; (c) record the number and distribution of different bird species present at the project site and (d) generate a survey report with density and diversity of birds as well ecological description of the habitats surveyed; (e) review the environmental assessment work undertaken for national EIA approval and suggest on the adequacy of the mitigation measures proposed with respect to ensuring no net loss of biodiversity given survey findings.



**Photo 2:** Bird survey at the project site on 18 February 2023.

## Methods

### *Study Area*

The proposed project site is located at Darail village in Gushulia, Tongi, Gazipur of Dhaka Division and can be listed as suburban habitat type in ecological context (Angold *et al.* 2006). Habitat types that were surveyed for birds included homestead vegetation, paddy fields, open fields and waterbodies etc. The area of wetland in December 2022 was 30,819 m<sup>2</sup>, which drastically reduced in the following months, both naturally and artificially through drainage.

### *Bird Surveys*

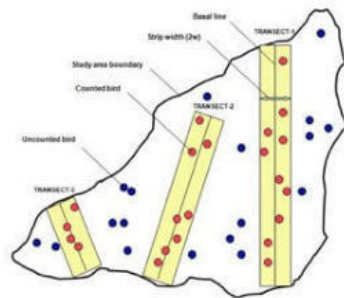
Land-based surveys by walking around the wetland areas were conducted on 21 December 2022, 24 January 2023 and 18 February 2023 between 7:00hrs am 11:00hrs. The aim was to determine diversity and abundance of migratory and resident birds in the study area. Surveys was conducted by two ornithologists led by the lead consultant.

Bird density was determined using strip transect sampling method. This method is a combination of quadrat sampling and line transect sampling where objects (birds) are counted from straight, long and narrow strips (Bibby *et al.* 2000. Khan *et al.* 2012). This is suitable for population estimation or abundance or density of visible and mobile organisms. In this method some permanent strips are selected where the total counts of the objects are made. This method was applied for non-waterbird species (Table 3), for which a complete count is not possible.

One permanent strip transect were established, where the observers slowly moved (c. 1.5 km/hr) along a bank (basal line) of the wetland through the study area and counted the objects from both sides. The observation-range of 25 m on either side is normally suitable, so the width of transect was 50 m (25 m each side).

Each strip transect count is actually the total count of an area of the strip [length of the strip X width of the strip (2 X observation-range)]. Suppose there are  $k$  number of strips, each of width  $2w$  ( $w$  is the observation-range on either side of the centerline), and the total length of all strips

(same strips repeated are treated as new strips) is L in a study area. If the total number of recorded objects in all strips is N, the population density D is estimated as --



$$D = N / 2wL$$

Relative abundance of each bird species is classified (Chowdhury 2020) based on Encounter Rate (Table 2) and as “Common” (encountered 7-10 times during all visits), “Uncommon” (encountered 4-6 times during all visits) and “Rare” (encountered 1-3 times during all visits).



**Photo 2:** Great Egret (*Ardea alba*) foraging at shallow water taking advantage of the newly drained wetland area 18 February 2023.

## Habitat Assessment

Local habitat use was assessment visually during each visit, through photographs and satellite imagery. During each field visit, observers walked along the banks of the waterbody and recorded tracks and by using these tracks, waterbody areas during a given visit was calculated using Google Earth. In addition, a total of 20 local people were interviewed to determine how locals utilize natural resources from the wetland and the state of the wetland during the wet season.

## Results

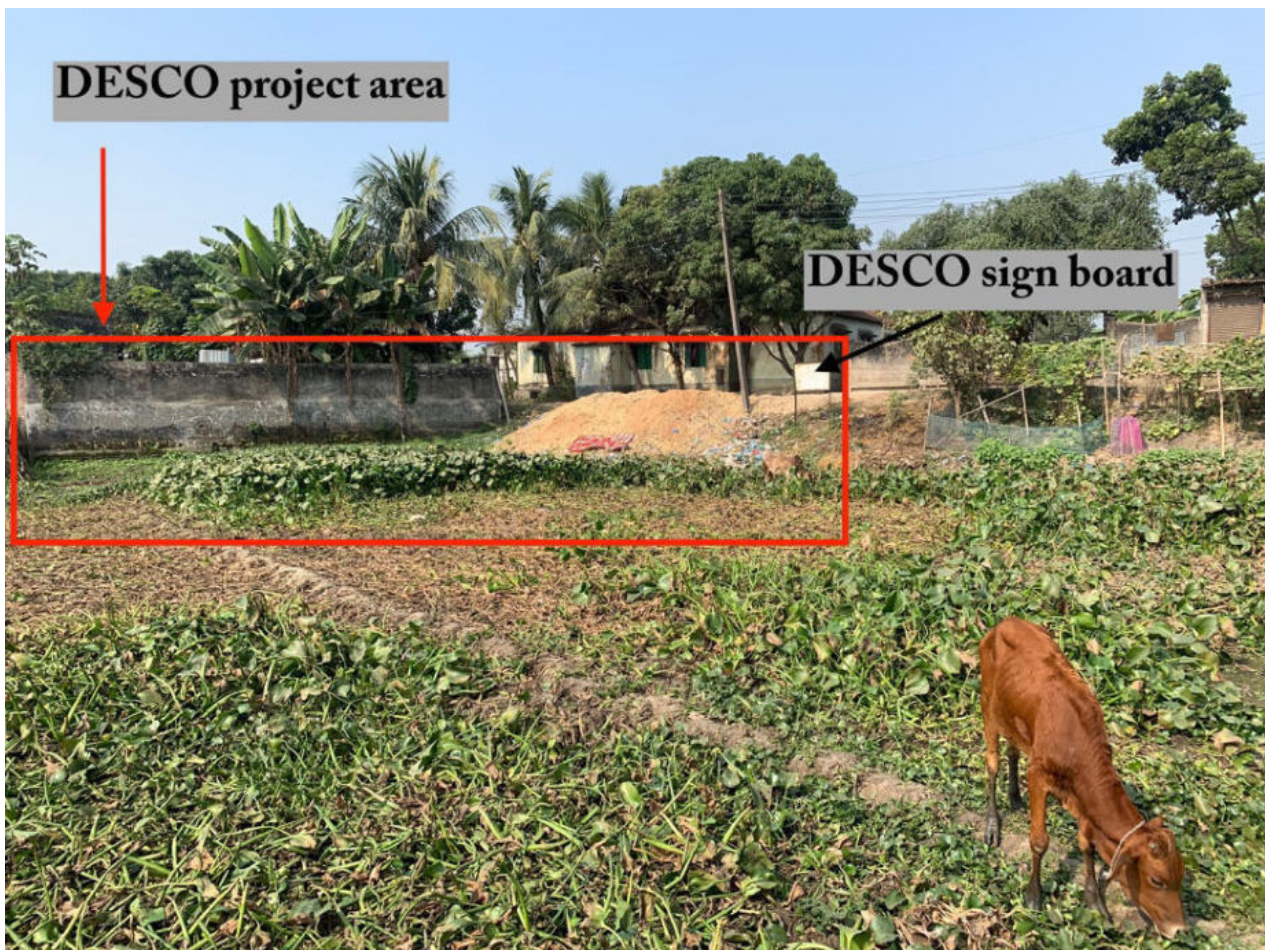
Habitat comprises mixed of seasonal agricultural lands on the edge of wetlands, human settlements, wetland plants such as Dhol Kolmi (*Ipomoea fistulosa*) and invasive Water Hyacinth (*Eichhornia crassipes*) and open water (Figure 1). The area of wetland in December 2022 was 30,819 m<sup>2</sup>, which drastically reduced in the following months, both naturally and artificially through drainage.



**Figure 1:** Map of the approximate project site (red polygon) and waterbody (green polygon) adjacent to the project site with transect line (white line).

### *Wetland Use*

In December 2022, small-scale agricultural practices were observed during the field visit and in January 2023, a large portion of the wetland in the northern corner were converted into rice paddies as the water level dropped (Table 1). In February 2023, water level further dropped and rice paddies were expanded and the entire wetland was drained using water pumps in order to collect fish in shallow water. Based on the information gathered from the local people, this is an annual phenomenon and traditional land use practice. 78% (n=20) of the locals informed that the open water areas of the wetland do not support large (>250) congregation of waterbirds during any season. However, resident or local migrants such as Whistling Ducks historically (c.10-15 years) used the waterbody.



**Figure 2:** Red marked area is the approximate construction site. Image taken on 18 December 2022.

**Table 1:** Area of wetland during three different months of winter and factors that influenced in the areas of open water.

Date	Wetland Area	Factor
21 Dec 22	Approximately 30,819 m <sup>2</sup>	Natural
24 Jan 23	Approximately 20,819 m <sup>2</sup>	Natural
18 Feb 23	Approximately 7,532 m <sup>2</sup>	Drained

### *Bird Diversity*

A total of 43 species were observed during all visits including 33 resident and 10 migratory species (Table 2). None of the species observed have conservation concern. Notable waterbirds and wetland-dependent species include Great Egret (*Ardea alba*), Green Sandpiper (*Tringa ochropus*), Temminck's Stint (*Calidris temminckii*), and Eurasian Hoopoe (*Upupa epops*) and the most frequently sighted species was Indian Pond-Heron (*Ardeola grayii*).

**Table 2:** Bird species observed during all three visits at the project site. Migratory and resident bird species are indicated under ‘Seasonal Status’. ‘Encounter Rate’ is the number of times each species was detected. ‘Relative Abundance’ is classified as ‘Common’ (encountered 7-10 times), ‘Uncommon’ (encountered 4-6 times) and ‘Rare’ (encountered 1-3 times). Species that are dependent on wetlands and open water are listed under ‘Wetland-dependent’ and indicated with Yes/No.

	Counts on 21 Dec 22	Counts on 24 Jan 23	Counts on 18 Feb 23	Encounter Rate	Relative Abundance	Seasonal Status	IUCN Red List Status (International)	IUCN Red List Status (National)	Wetland-dependent
<b>Species:</b> Common Name ( <i>latin name</i> )									
Rock Pigeon ( <i>Columba livia</i> )	0	3	0	1	RARE	Resident	LC	LC	NO
Spotted Dove ( <i>Spilopelia chinensis</i> )	0	4	3	7	COMMON	Resident	LC	LC	NO
Yellow-footed Green-Pigeon ( <i>Treron phoenicopterus</i> )	0	1	5	3	RARE	Resident	LC	LC	NO
Asian Koel ( <i>Eudynamis scolopaceus</i> )	0	1	1	2	RARE	Resident	LC	LC	NO
Asian Palm Swift ( <i>Cypsiurus balasiensis</i> )	0	4	15	8	COMMON	Resident	LC	LC	NO
White-breasted Waterhen ( <i>Amaurornis phoenicurus</i> )	0	1	0	1	RARE	Resident	LC	LC	YES
Little Ringed Plover ( <i>Charadrius dubius</i> )	1	0	3	5	UNCOMMON	Resident	LC	LC	YES

Temminck's Stint ( <i>Calidris temminckii</i> )	0	0	10	2	RARE	Migratory	LC	LC	YES
Common Sandpiper ( <i>Actitis hypoleucos</i> )	0	0	2	2	RARE	Migratory	LC	LC	YES
Green Sandpiper ( <i>Tringa ochropus</i> )	2	1	2	4	UNCOMMON	Migratory	LC	LC	YES
Little Cormorant ( <i>Microcarbo niger</i> )	0	5	8	5	UNCOMMON	Resident	LC	LC	YES
Great Egret ( <i>Ardea alba</i> )	0	0	1	1	RARE	Resident	LC	LC	YES
Little Egret ( <i>Egretta garzetta</i> )	0	0	7	2	RARE	Resident	LC	LC	YES
Indian Pond-Heron ( <i>Ardeola grayii</i> )	4	16	29	10	COMMON	Resident	LC	LC	YES
Black Kite ( <i>Milvus migrans</i> )	6	3	1	5	UNCOMMON	Resident	LC	LC	YES
Brahminy Kite ( <i>Haliastur indus</i> )	2	0	1	4	UNCOMMON	Resident	LC	LC	YES
Eurasian Hoopoe ( <i>Upupa epops</i> )	1	2	1	4	UNCOMMON	Migratory	LC	LC	YES
Common Kingfisher ( <i>Alcedo atthis</i> )	2	4	2	6	UNCOMMON	Resident	LC	LC	YES
White-throated Kingfisher ( <i>Halcyon smyrnensis</i> )	5	4	2	7	COMMON	Resident	LC	LC	YES
Asian Green Bee-eater ( <i>Merops orientalis</i> )	3	0	0	3	RARE	Resident	LC	LC	NO
Black-rumped Flameback ( <i>Dinopium benghalense</i> )	1	0	1	3	RARE	Resident	LC	LC	NO
Black-hooded Oriole ( <i>Oriolus xanthornus</i> )	0	1	1	2	RARE	Resident	LC	LC	NO
Rose-ringed Parakeet ( <i>Psittacula krameri</i> )	0	1	0	1	RARE	Resident	LC	LC	NO
Black Drongo ( <i>Dicrurus macrocercus</i> )	7	10	8	8	COMMON	Resident	LC	LC	NO
Brown Shrike ( <i>Lanius cristatus</i> )	0	1	1	3	RARE	Migratory	LC	LC	NO
Long-tailed Shrike ( <i>Lanius schach</i> )	0	3	1	3	RARE	Resident	LC	LC	NO
House Crow ( <i>Corvus splendens</i> )	1	15	11	7	COMMON	Resident	LC	LC	NO
Large-billed Crow ( <i>Corvus macrorhynchos</i> )	0	2	4	8	COMMON	Resident	LC	LC	NO
Bengal Bushlark ( <i>Mirafra assamica</i> )	0	0	1	1	RARE	Resident	LC	LC	NO
Common Tailorbird ( <i>Orthotomus sutorius</i> )	0	1	0	1	RARE	Resident	LC	LC	NO
Striated Grassbird ( <i>Cincloramphus palustris</i> )	1	3	3	5	UNCOMMON	Resident	LC	LC	YES
Barn Swallow ( <i>Hirundo rustica</i> )	12	4	5	7	COMMON	Migratory	LC	LC	NO
Red-vented Bulbul ( <i>Pycnonotus cafer</i> )	3	16	6	8	COMMON	Resident	LC	LC	NO
Dusky Warbler ( <i>Phylloscopus fuscatus</i> )	1	0	0	1	RARE	Migratory	LC	LC	NO
Indian Pied Starling ( <i>Gracupica contra</i> )	9	30	19	8	COMMON	Resident	LC	LC	NO
Common Myna ( <i>Acridotheres tristis</i> )	6	7	10	9	COMMON	Resident	LC	LC	NO
Jungle Myna ( <i>Acridotheres fuscus</i> )	0	7	2	4	UNCOMMON	Resident	LC	LC	NO
Oriental Magpie-Robin ( <i>Copsychus saularis</i> )	3	5	3	7	COMMON	Resident	LC	LC	NO
Taiga Flycatcher ( <i>Ficedula albicilla</i> )	1	1	0	2	RARE	Migratory	LC	LC	NO
House Sparrow ( <i>Passer domesticus</i> )	3	12	9	8	COMMON	Resident	LC	LC	NO
Citrine Wagtail ( <i>Motacilla citreola</i> )	0	0	3	2	RARE	Migratory	LC	LC	YES
White-browed Wagtail ( <i>Motacilla maderaspatensis</i> )	1	0	1	4	UNCOMMON	Resident	LC	LC	YES
White Wagtail ( <i>Motacilla alba</i> )	2	6	4	7	COMMON	Migratory	LC	LC	YES
TOTAL SPECIES	23	31	36						

## Seasonal Variations

Maximum number of species (36) were recorded in February 2023 including several species of waterbirds. This is presumably because the wetland drainage allowed greater areas of exposed mud on the banks and shallow water areas where prey items such as fish is relatively easy to catch. Species that are listed as common (Table 2) were detected during all visits. Out of 43 species, a total of 18 species can be listed as wetland dependent.

## Density of Non-waterbird Species

Since the waterbody is relatively small and a full count of all waterbirds present in the area were possible, density of waterbirds are not calculated. Density of non-waterbird species are determined using method outlined in Methods section above. By following this method, we estimated likely population size of these species (Table 3) that may occur in the study area.

**Table 3:** Non-waterbird species recorded at the project site and density/km<sup>2</sup> of each species.

Species: Common Name ( <i>latin name</i> )	Counts on 21 Dec 22	Counts on 18 Feb 23	Counts on 24 Jan 23	Transect LENGTH (km)	Transect WIDTH (km)	Area (km <sup>2</sup> )	Mean of counts	Density (/km <sup>2</sup> )
Rock Pigeon ( <i>Columba livia</i> )	0	0	3	1.15	0.05	0.0575	1.00	17
Spotted Dove ( <i>Spilopelia chinensis</i> )	0	3	4	1.15	0.05	0.0575	2.33	41
Yellow-footed Green-Pigeon ( <i>Treron phoenicopterus</i> )	0	5	1	1.15	0.05	0.0575	2.00	35
Asian Koel ( <i>Eudynamys scolopaceus</i> )	0	1	1	1.15	0.05	0.0575	0.67	12
Asian Palm Swift ( <i>Cypsiurus balasiensis</i> )	0	15	4	1.15	0.05	0.0575	6.33	110
Black Kite ( <i>Milvus migrans</i> )	6	1	3	1.15	0.05	0.0575	3.33	58
Brahminy Kite ( <i>Haliastur indus</i> )	2	1	0	1.15	0.05	0.0575	1.00	17
Eurasian Hoopoe ( <i>Upupa epops</i> )	1	1	2	1.15	0.05	0.0575	1.33	23
Asian Green Bee-eater ( <i>Merops orientalis</i> )	3	0	0	1.15	0.05	0.0575	1.00	17
Black-rumped Flameback ( <i>Dinopium benghalense</i> )	1	1	0	1.15	0.05	0.0575	0.67	12
Black-hooded Oriole ( <i>Oriolus xanthornus</i> )	0	1	1	1.15	0.05	0.0575	0.67	12
Rose-ringed Parakeet ( <i>Psittacula krameri</i> )	0	0	1	1.15	0.05	0.0575	0.33	6
Black Drongo ( <i>Dicrurus macrocercus</i> )	7	8	10	1.15	0.05	0.0575	8.33	145
Brown Shrike ( <i>Lanius cristatus</i> )	0	1	1	1.15	0.05	0.0575	0.67	12

Long-tailed Shrike ( <i>Lanius schach</i> )	0	1	3	1.15	0.05	0.0575	1.33	<b>23</b>
House Crow ( <i>Corvus splendens</i> )	1	11	15	1.15	0.05	0.0575	9.00	<b>157</b>
Large-billed Crow ( <i>Corvus macrorhynchos</i> )	0	4	2	1.15	0.05	0.0575	2.00	<b>35</b>
Bengal Bushlark ( <i>Mirafra assamica</i> )	0	1	0	1.15	0.05	0.0575	0.33	<b>6</b>
Common Tailorbird ( <i>Orthotomus sutorius</i> )	0	0	1	1.15	0.05	0.0575	0.33	<b>6</b>
Striated Grassbird ( <i>Cincloramphus palustris</i> )	1	3	3	1.15	0.05	0.0575	2.33	<b>41</b>
Barn Swallow ( <i>Hirundo rustica</i> )	12	5	4	1.15	0.05	0.0575	7.00	<b>122</b>
Red-vented Bulbul ( <i>Pycnonotus cafer</i> )	3	6	16	1.15	0.05	0.0575	8.33	<b>145</b>
Dusky Warbler ( <i>Phylloscopus fuscatus</i> )	1	0	0	1.15	0.05	0.0575	0.33	<b>6</b>
Indian Pied Starling ( <i>Gracupica contra</i> )	9	19	30	1.15	0.05	0.0575	19.33	<b>336</b>
Common Myna ( <i>Acridotheres tristis</i> )	6	10	7	1.15	0.05	0.0575	7.67	<b>133</b>
Jungle Myna ( <i>Acridotheres fuscus</i> )	0	2	7	1.15	0.05	0.0575	3.00	<b>52</b>
Oriental Magpie-Robin ( <i>Copsychus saularis</i> )	3	3	5	1.15	0.05	0.0575	3.67	<b>64</b>
Taiga Flycatcher ( <i>Ficedula albicilla</i> )	1	0	1	1.15	0.05	0.0575	0.67	<b>12</b>
House Sparrow ( <i>Passer domesticus</i> )	3	9	12	1.15	0.05	0.0575	8.00	<b>139</b>
Citrine Wagtail ( <i>Motacilla citreola</i> )	0	3	0	1.15	0.05	0.0575	1.00	<b>17</b>
White-browed Wagtail ( <i>Motacilla maderaspatensis</i> )	1	1	0	1.15	0.05	0.0575	0.67	<b>12</b>
White Wagtail ( <i>Motacilla alba</i> )	2	4	6	1.15	0.05	0.0575	4.00	<b>70</b>



**Photo 3:** Eurasian Hoopoe (*Upupa epops*) foraging on dry areas of wetland area 18 February 2023.

## Potential impacts

1. Loss of wetland habitats – the proposed location for the sub-station is located at the edge of the norther part of the wetland, which needs to be infilled for any construction work. This will reduce existing wetland habitats including riparian vegetated land.

2. Environmental degradation – temporary effects of air, noise, dust, light especially during the construction-phase.
3. Human presence – continuous presence of humans during the construction-phase will prevent local wildlife to utilize the site and surrounding areas, and local movement.
4. Direct mortality – could happen during the construction phase, e.g. bird strike during construction or construction workers intentionally killing local wildlife.

## Recommendations

Bird survey result indicate all species present at the proposed substation location are listed as Least Concern (Table 3), therefore no further assessments are needed and minor recommendations are proposed below to reduce disturbance.

### Construction-phase:

Possible impacts to local flora and fauna during the construction phase are listed below as well as mitigation or control measures.

**Table 4:** Controls and mitigation measures for impacts to local flora and fauna

Activity/ Source of Potential Impact	Affected Resource	Nature of Potential Impact	Controls and Mitigation Measures
Clearance and grading of construction	Flora	Damage to local flora from clearance of construction yard	<ul style="list-style-type: none"> <li>• Prohibit clearing and any other damaging activity to flora outside of project site</li> <li>• Develop and implement a Site Rehabilitation Plan</li> <li>• Minimize the footprint of temporary and permanent areas required on land</li> </ul>
	Fauna	Degradation of habitat and disruption from clearance and human presence (including light and noise)	<ul style="list-style-type: none"> <li>• Prohibit hunting and fishing by workers</li> <li>• Minimize use of lighting to avoid disturbing local fauna</li> <li>• Minimize number of personnel allowed at the construction site</li> <li>• Identify peak time (early morning and late afternoon) for bird activity and aim to avoid/minimize impacts (e.g. reduced team size, low noise activity periods)</li> <li>• If possible, install sound barriers between construction yard</li> <li>• Develop clear restricted areas/buffer zones for contractors and staff to avoid disturbance to the nearby wetland</li> <li>• Workers clearly instructed to minimise noise while unloading raw materials at the construction site, which usually takes place around midnight</li> </ul>

### Long-term / post construction-phase:

1. Since the project site is surrounded by a freshwater wetland and if there is unused land available post-construction, creating a small freshwater pond (3-5 meter<sup>2</sup>) with native water

tolerant plants and reed on the banks would benefit local biodiversity. Such small patch could support migratory warblers, and resident butterflies, dragonflies, frogs and other small wildlife.

2. It is suspected that the land will be infilled and elevated before construction, in that case the slopes can be planted with native grass, short water tolerant and butterfly host plants such as Dhol Kolmi (*Ipomoea fistulosa*), Rosary Pea/Kunch (*Abrus precatorius*), Pigeon Pea/Arhar (*Cajanus cajan*) and reed.

3. Along the northern boundary, native plants such as Red Silk-cotton Tree/ Shimul (*Bombax ceiba*), Hijol (*Barringtonia acutangula*), Fig (*Ficus bengalensis*), Indian Fig Tree/ Bot (*Ficus racemose*), Indian Coral tree/ Mandar (*Erythrina variegata*), Indian Jujube/ Indian Plum (*Ziziphus mauritiana*) etc. could be planted as well. These are likely to be food sources for nectarivorous and frugivorous birds, as well as butterfly host plants.

4. If there is an opportunity for rooftop gardening, then that would also support local fauna such as birds, butterflies and dragonflies.

5. A biodiversity expert and a landscape architect could be consulted while finalizing the design of the substation in order to ensure the above-mentioned points.

6. A site visit by biodiversity experts after the construction is complete is also recommended. This will allow the experts to further assess the ground situation and recommend small-scale conservation interventions.



**Photo 4:** A White-throated Kingfisher nesting in a vacant PVC pipe attached to a building in Dhaka city, February 2023.

7. If there is no technical issue of birds visiting the sub-station then 3-5 inches PVC pipes (Photo 4) could be installed on non-load-bearing walls, minimum 3 meters above ground.

## References

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### Appendix 1:

Illustrated comparison of wetland areas and open water at the study site in early (December) and late (February) winter.



**Study area on 21 December 2022 when the water level was highest**



**Study area on 18 Feb 2023 when the water level was lowest with drainage**



**Study area on 21 December 2022**



**Study area on 18 Feb 2023**



**Study area on 21 December 2022**



**Study area on 18 Feb 2023**



**Study area on 21 December 2022**



**Study area on 18 Feb 2023**

Appendix 2:  
December 2022 survey form:

Species	Count	Location	Observation type	Observation date	Start Time	# of species
<i>Little Ringed Plover (Charadrius dubius)</i>	1	Darail Wetlands	Traveling	21-Dec-22	11:45	23 species
<i>Green Sandpiper (Tringa ochropus)</i>	2	Darail Wetlands	Traveling	21-Dec-22	11:45	23 species
<i>Indian Pond-Heron (Ardeola grayii)</i>	4	Darail Wetlands	Traveling	21-Dec-22	11:45	23 species
<i>Black Kite (Milvus migrans)</i>	6	Darail Wetlands	Traveling	21-Dec-22	11:45	23 species
<i>Brahminy Kite (Haliastur indus)</i>	2	Darail Wetlands	Traveling	21-Dec-22	11:45	23 species
<i>Eurasian Hoopoe (Upupa epops)</i>	1	Darail Wetlands	Traveling	21-Dec-22	11:45	23 species
<i>Common Kingfisher (Alcedo atthis)</i>	2	Darail Wetlands	Traveling	21-Dec-22	11:45	23 species
<i>White-throated Kingfisher (Halcyon smyrnensis)</i>	5	Darail Wetlands	Traveling	21-Dec-22	11:45	23 species
<i>Asian Green Bee-eater (Merops orientalis)</i>	3	Darail Wetlands	Traveling	21-Dec-22	11:45	23 species
<i>Black-rumped Flameback (Dinopium benghalense)</i>	1	Darail Wetlands	Traveling	21-Dec-22	11:45	23 species
<i>Black Drongo (Dicrurus macrocercus)</i>	7	Darail Wetlands	Traveling	21-Dec-22	11:45	23 species
<i>House Crow (Corvus splendens)</i>	1	Darail Wetlands	Traveling	21-Dec-22	11:45	23 species
<i>Striated Grassbird (Cincloramphus palustris)</i>	1	Darail Wetlands	Traveling	21-Dec-22	11:45	23 species
<i>Barn Swallow (Hirundo rustica)</i>	12	Darail Wetlands	Traveling	21-Dec-22	11:45	23 species
<i>Red-vented Bulbul (Pycnonotus cafer)</i>	3	Darail Wetlands	Traveling	21-Dec-22	11:45	23 species
<i>Dusky Warbler (Phylloscopus fuscatus)</i>	1	Darail Wetlands	Traveling	21-Dec-22	11:45	23 species
<i>Indian Pied Starling (Gracupica contra)</i>	9	Darail Wetlands	Traveling	21-Dec-22	11:45	23 species
<i>Common Myna (Acridotheres tristis)</i>	6	Darail Wetlands	Traveling	21-Dec-22	11:45	23 species
<i>Oriental Magpie-Robin (Copsychus saularis)</i>	3	Darail Wetlands	Traveling	21-Dec-22	11:45	23 species
<i>Taiga Flycatcher (Ficedula albicilla)</i>	1	Darail Wetlands	Traveling	21-Dec-22	11:45	23 species
<i>House Sparrow (Passer domesticus)</i>	3	Darail Wetlands	Traveling	21-Dec-22	11:45	23 species
<i>White-browed Wagtail (Motacilla maderaspatensis)</i>	1	Darail Wetlands	Traveling	21-Dec-22	11:45	23 species
<i>White Wagtail (Motacilla alba)</i>	2	Darail Wetlands	Traveling	21-Dec-22	11:45	23 species

### Appendix 3:

January 2023 survey form:

Species	Count	Location	Observation type	Observation date	Start Time	# of species
Rock Pigeon (Feral Pigeon) ( <i>Columba livia</i> (Feral Pigeon))	3	Darail Wetlands	Traveling	24-Jan-23	7:33	31 species
Spotted Dove ( <i>Spilopelia chinensis</i> )	4	Darail Wetlands	Traveling	24-Jan-23	7:33	31 species
Yellow-footed Green-Pigeon ( <i>Treron phoenicopterus</i> )	1	Darail Wetlands	Traveling	24-Jan-23	7:33	31 species
Asian Koel ( <i>Eudynamys scolopaceus</i> )	1	Darail Wetlands	Traveling	24-Jan-23	7:33	31 species
Asian Palm Swift ( <i>Cypsiurus balasiensis</i> )	4	Darail Wetlands	Traveling	24-Jan-23	7:33	31 species
White-breasted Waterhen ( <i>Amaurornis phoenicurus</i> )	1	Darail Wetlands	Traveling	24-Jan-23	7:33	31 species
Green Sandpiper ( <i>Tringa ochropus</i> )	1	Darail Wetlands	Traveling	24-Jan-23	7:33	31 species
Little Cormorant ( <i>Microcarbo niger</i> )	5	Darail Wetlands	Traveling	24-Jan-23	7:33	31 species
Indian Pond-Heron ( <i>Ardeola grayii</i> )	16	Darail Wetlands	Traveling	24-Jan-23	7:33	31 species
Black Kite ( <i>Milvus migrans</i> )	3	Darail Wetlands	Traveling	24-Jan-23	7:33	31 species
Eurasian Hoopoe ( <i>Upupa epops</i> )	2	Darail Wetlands	Traveling	24-Jan-23	7:33	31 species
Common Kingfisher ( <i>Alcedo atthis</i> )	4	Darail Wetlands	Traveling	24-Jan-23	7:33	31 species
White-throated Kingfisher ( <i>Halcyon smyrnensis</i> )	4	Darail Wetlands	Traveling	24-Jan-23	7:33	31 species
Rose-ringed Parakeet ( <i>Psittacula krameri</i> )	1	Darail Wetlands	Traveling	24-Jan-23	7:33	31 species
Black Drongo ( <i>Dicrurus macrocercus</i> )	10	Darail Wetlands	Traveling	24-Jan-23	7:33	31 species
Brown Shrike ( <i>Lanius cristatus</i> )	1	Darail Wetlands	Traveling	24-Jan-23	7:33	31 species
Long-tailed Shrike ( <i>Lanius schach</i> )	3	Darail Wetlands	Traveling	24-Jan-23	7:33	31 species
House Crow ( <i>Corvus splendens</i> )	15	Darail Wetlands	Traveling	24-Jan-23	7:33	31 species
Large-billed Crow ( <i>Corvus macrorhynchos</i> )	2	Darail Wetlands	Traveling	24-Jan-23	7:33	31 species
Common Tailorbird ( <i>Orthotomus sutorius</i> )	1	Darail Wetlands	Traveling	24-Jan-23	7:33	31 species
Striated Grassbird ( <i>Cincloramphus palustris</i> )	3	Darail Wetlands	Traveling	24-Jan-23	7:33	31 species
Barn Swallow ( <i>Hirundo rustica</i> )	4	Darail Wetlands	Traveling	24-Jan-23	7:33	31 species
Red-vented Bulbul ( <i>Pycnonotus cafer</i> )	16	Darail Wetlands	Traveling	24-Jan-23	7:33	31 species
Indian Pied Starling ( <i>Gracupica contra</i> )	30	Darail Wetlands	Traveling	24-Jan-23	7:33	31 species
Common Myna ( <i>Acridotheres tristis</i> )	8	Darail Wetlands	Traveling	24-Jan-23	7:33	31 species
Jungle Myna ( <i>Acridotheres fuscus</i> )	7	Darail Wetlands	Traveling	24-Jan-23	7:33	31 species
Oriental Magpie-Robin ( <i>Copsychus saularis</i> )	5	Darail Wetlands	Traveling	24-Jan-23	7:33	31 species
Taiga Flycatcher ( <i>Ficedula albicilla</i> )	1	Darail Wetlands	Traveling	24-Jan-23	7:33	31 species
House Sparrow ( <i>Passer domesticus</i> )	12	Darail Wetlands	Traveling	24-Jan-23	7:33	31 species
White Wagtail ( <i>Motacilla alba</i> )	6	Darail Wetlands	Traveling	24-Jan-23	7:33	31 species
Paddyfield Pipit ( <i>Anthus rufulus</i> )	2	Darail Wetlands	Traveling	24-Jan-23	7:33	31 species

## Appendix 4:

February 2023 survey form:

Species	Count	Location	Observation type	Observation date	Start Time	# of species
<i>Spotted Dove (Spilopelia chinensis)</i>	3	Darail Wetlands	Traveling	18-Feb-23	7:08	36 species
<i>Yellow-footed Green-Pigeon (Treron phoenicopterus)</i>	5	Darail Wetlands	Traveling	18-Feb-23	7:08	36 species
<i>Asian Koel (Eudynamys scolopaceus)</i>	1	Darail Wetlands	Traveling	18-Feb-23	7:08	36 species
<i>Asian Palm Swift (Cypsiurus balasiensis)</i>	15	Darail Wetlands	Traveling	18-Feb-23	7:08	36 species
<i>Little Ringed Plover (Charadrius dubius)</i>	3	Darail Wetlands	Traveling	18-Feb-23	7:08	36 species
<i>Temminck's Stint (Calidris temminckii)</i>	10	Darail Wetlands	Traveling	18-Feb-23	7:08	36 species
<i>Common Sandpiper (Actitis hypoleucos)</i>	2	Darail Wetlands	Traveling	18-Feb-23	7:08	36 species
<i>Green Sandpiper (Tringa ochropus)</i>	2	Darail Wetlands	Traveling	18-Feb-23	7:08	36 species
<i>Little Cormorant (Microcarbo niger)</i>	8	Darail Wetlands	Traveling	18-Feb-23	7:08	36 species
<i>Great Egret (Ardea alba)</i>	1	Darail Wetlands	Traveling	18-Feb-23	7:08	36 species
<i>Little Egret (Egretta garzetta)</i>	7	Darail Wetlands	Traveling	18-Feb-23	7:08	36 species
<i>Indian Pond-Heron (Ardeola grayii)</i>	29	Darail Wetlands	Traveling	18-Feb-23	7:08	36 species
<i>Black Kite (Milvus migrans)</i>	1	Darail Wetlands	Traveling	18-Feb-23	7:08	36 species
<i>Brahminy Kite (Haliastur indus)</i>	1	Darail Wetlands	Traveling	18-Feb-23	7:08	36 species
<i>Eurasian Hoopoe (Upupa epops)</i>	1	Darail Wetlands	Traveling	18-Feb-23	7:08	36 species
<i>Common Kingfisher (Alcedo atthis)</i>	2	Darail Wetlands	Traveling	18-Feb-23	7:08	36 species
<i>White-throated Kingfisher (Halcyon smyrnensis)</i>	2	Darail Wetlands	Traveling	18-Feb-23	7:08	36 species
<i>Black-rumped Flameback (Dinopium benghalense)</i>	1	Darail Wetlands	Traveling	18-Feb-23	7:08	36 species
<i>Black-hooded Oriole (Oriolus xanthornus)</i>	1	Darail Wetlands	Traveling	18-Feb-23	7:08	36 species
<i>Black Drongo (Dicrurus macrocercus)</i>	8	Darail Wetlands	Traveling	18-Feb-23	7:08	36 species
<i>Brown Shrike (Lanius cristatus)</i>	1	Darail Wetlands	Traveling	18-Feb-23	7:08	36 species
<i>Long-tailed Shrike (Lanius schach)</i>	1	Darail Wetlands	Traveling	18-Feb-23	7:08	36 species
<i>House Crow (Corvus splendens)</i>	11	Darail Wetlands	Traveling	18-Feb-23	7:08	36 species
<i>Large-billed Crow (Corvus macrorhynchos)</i>	4	Darail Wetlands	Traveling	18-Feb-23	7:08	36 species
<i>Bengal Bushlark (Mirafra assamica)</i>	1	Darail Wetlands	Traveling	18-Feb-23	7:08	36 species
<i>Striated Grassbird (Cincloramphus palustris)</i>	3	Darail Wetlands	Traveling	18-Feb-23	7:08	36 species
<i>Barn Swallow (Hirundo rustica)</i>	5	Darail Wetlands	Traveling	18-Feb-23	7:08	36 species
<i>Red-vented Bulbul (Pycnonotus cafer)</i>	6	Darail Wetlands	Traveling	18-Feb-23	7:08	36 species
<i>Indian Pied Starling (Gracupica contra)</i>	19	Darail Wetlands	Traveling	18-Feb-23	7:08	36 species
<i>Common Myna (Acridotheres tristis)</i>	10	Darail Wetlands	Traveling	18-Feb-23	7:08	36 species
<i>Jungle Myna (Acridotheres fuscus)</i>	2	Darail Wetlands	Traveling	18-Feb-23	7:08	36 species
<i>Oriental Magpie-Robin (Copsychus saularis)</i>	3	Darail Wetlands	Traveling	18-Feb-23	7:08	36 species
<i>House Sparrow (Passer domesticus)</i>	9	Darail Wetlands	Traveling	18-Feb-23	7:08	36 species
<i>Citrine Wagtail (Motacilla citreola)</i>	3	Darail Wetlands	Traveling	18-Feb-23	7:08	36 species
<i>White-browed Wagtail (Motacilla maderaspatensis)</i>	1	Darail Wetlands	Traveling	18-Feb-23	7:08	36 species
<i>White Wagtail (Motacilla alba)</i>	4	Darail Wetlands	Traveling	18-Feb-23	7:08	36 species

## **Appendix XV: Environmental Audit Report of Existing Facilities**



**Audit Report for Existing Facilities**  
**Dhaka Power System Expansion and Strengthening Project in DESCO**  
**Area**

**April 2023**



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## 1. Introduction

The proposed Dhaka Power System Expansion and Strengthening Project will (i) construct four 132 kilovolts (kV)/33 kV substations and four 33 kV/11 kV substations; (ii) install 30 double-circuit km (cct-km) of 132 kV, 50 cct-km of 33 kV, and 100 km of 11 kV underground distribution cables; (iii) install 250 km of 11 kV and 0.4 kV overhead line. This will provide reliable power supply to 200,000 new customers and 1.1 million existing customers. The project is categorized as B for environment in accordance with ADB's Safeguards Policy Statement (2009).

The construction of substations will involve existing facilities in four sites identified which are covered by this audit report. For projects involving facilities and/or business activities that already exist or are under construction before ADB's involvement, ADB requires relevant external experts to conduct an environment audit, including on-site assessment. This applies to projects involving an upgrade or expansion of existing facilities, such as substations under this project. The environmental audit will determine the existence of any areas where the existing substations may cause or are causing environmental risks and impacts. Existing facilities must comply with the ADB's Safeguard Policy Statement (2009) and applicable national laws and regulations on environment, health, and safety. Where existing facilities are found not to be in accordance with the environment safeguard principles and requirements applicable to the Project, a Corrective Action Plan (CAP) is to be prepared, including implementation schedule and sufficient budget, to bring the existing facilities into compliance.

This environment audit has been conducted with the aim of assessing the compliance of four existing substations with:

- (i) National (Bangladesh) laws and regulations on environment, health and safety as detailed in IEE (EIA); and
- (ii) Environmental safeguards according to ADB's Safeguard Policy Statement (2009) and IFC EHS Guidelines.

## 2. Scope and Methodology

The audit covers existing facilities of the project which includes: i). Uttara 132/33/11 kV grid substation (SS); ii). Purbachal Sector-2 132/33/11 kV grid SS; iii). Bashundhara D Block 132/33/11 kV grid SS; and iv). Mirpur (Digun) 132/33 kV grid SS ( PGCB's<sup>1</sup> SS).

An audit was carried (that included review of documents, field visit and report writing) out by Rezaul Khan, National Environment Safeguards Specialist (ADB TA Consultant) during 08 March-06 April 2023 with the guidance of Jenny Baer-Paztory, International Environment Safeguards Specialist (ADB TA Consultant) for the existing facilities of Dhaka Power System Expansion and Strengthening Project in DESCO area.

As part of the audit, different personnel (Annex-1) of DESCO and PGCB were met, documents, records etc. were reviewed, direct observations were made, and photos were taken during the site visits. The audit considered the presence of EH&S plans, asbestos-containing materials, SF6, adequacy of staffing/site supervision, drainage, sanitation, any complaints etc. The audit revealed many of the good practices as well as gaps that need to be addressed by DESCO and PGCB.



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<sup>1</sup> Power Grid Company of Bangladesh (PGCB).

### 3. Description of Existing Substations

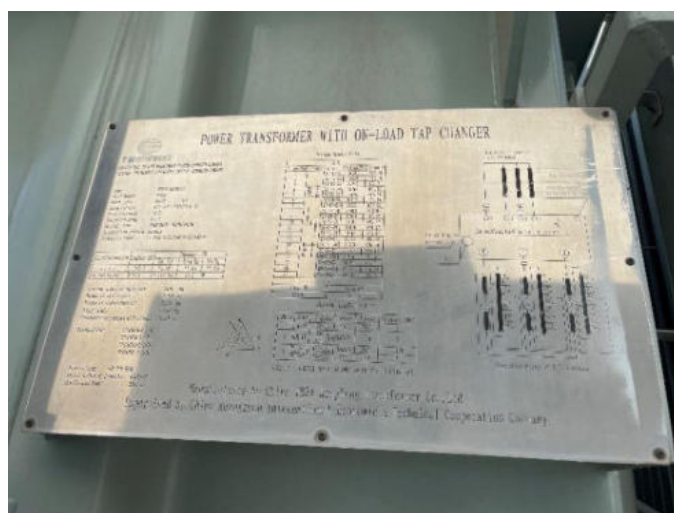
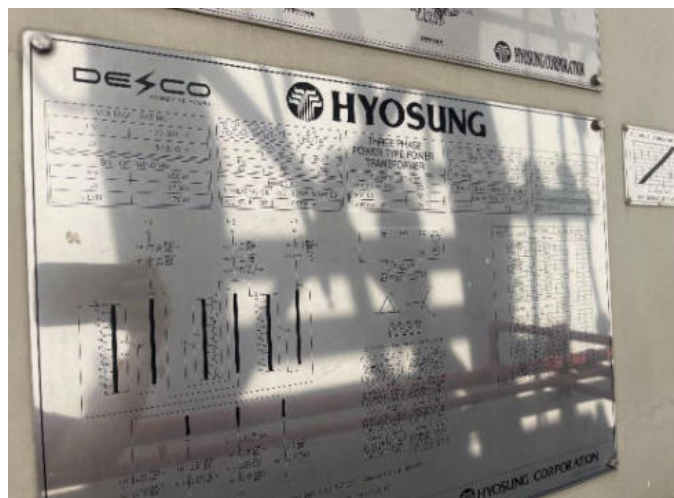
**Uttara 132/33/11 kV grid SS:** This is a GIS SS which was established in 2005 by DESCO. The voltage of the SS is 132/33/11 kV. This has eight nos. of transformers. The noise level at the site entrance was 70 decibel (dB). The noise level adjacent to the transformers was around 74 dB. The SS is located on 1.72 acres of land, and it is a plain land. More specific information on this SS is provided in Table 1.

**Table 1: Information on Uttara 132/33/11 kV Grid SS**

Substation Name:	Uttara 132/33/11 kV Grid SS
Year of establishment:	2005
Type of Substation (GIS/AIS):	GIS
Voltage:	132/33/11 kV
No. incomers and voltage:	Two nos. and 132 kV
No. outgoers and voltage:	Eight nos. of 33 kV and nine nos. of 11 kV
Grid Reference: ( SS identification no.)	N/A
Aerial map of substation:	
Photo of substation compound:	
Photo of any control building and details of wall/roof materials:	Referring photo above. The materials of the wall and roof brick, cement and mild steel (MS) rod.

No. transformers with make/model, MVA, manufacturer name and dates of manufacture/installation with photo of rating plate:

3 nos. of 132/33 and 3nos. 33/11 kV and 2 nos. Auxiliary (for internal use in SS) transformers of 500 kVA.




Noise level at site entrance, indicative reading:

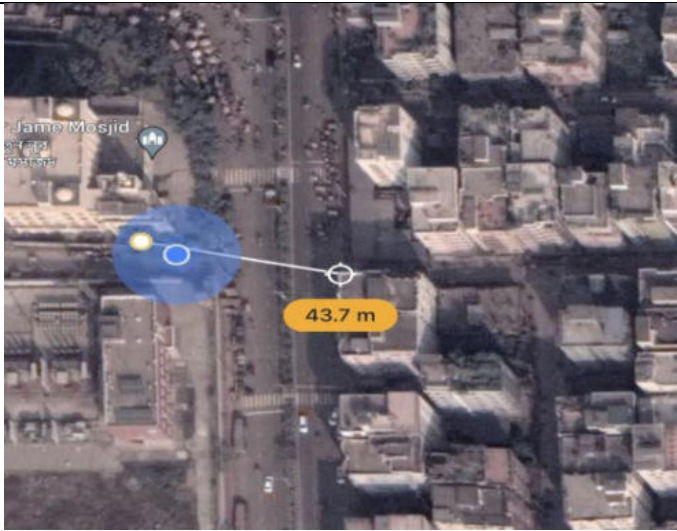

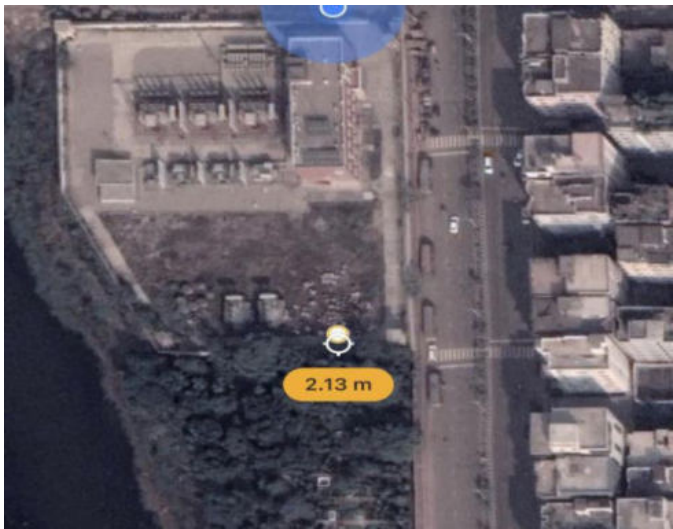
70 dB


Noise level adjacent to transformer, indicative reading:

74 dB

EMF level at site entrance, indicative reading:	49 <sup>2</sup> micro tesla ( $\mu$ T)
EMF level adjacent to transformer, indicative reading:	64 $\mu$ T
Outside temperature, indicative reading:	31 Degree Celsius
Area of substation, and layout map (area in use and available for expansion):	1.72 acres, sales and distribution (S&D) office may be established in open space.
Photo of vehicle entrance: Is it off a paved road?	Yes, paved road. 
Topography – flat land, sloped, or steep terrain:	Flat land
Previous land use (if known):	Waterbody
Describe the land uses within 500m (supported with photos): Confirm presence or absence of agricultural land-cultivated or uncultivated, protected or environmentally sensitive areas, community or protected forest, water bodies, religious or ancestral cultural resources (e.g. temples, shrines, sacred trees)?	No agriculture land, residents buildings, school, college, 12 no. sector city corporation grave yard etc.
Nearest protected or key biodiversity area (distance in m)?	10 km ( Mirpur, Dhaka Botanical Garden)
Have endangered species been encountered in the vicinity (elephant, tiger, etc.)?	No
No. buildings within 50m and no. inhabitants:	Eight nos. of building with approximately 170 inhabitants.
Nearest individual residence (distance in m, mark on aerial map if possible):	Nearest residence is 32.6m away from the boundary.

<sup>2</sup> All such readings were taken by mobile based apps and the reading may not be very accurate.




	 <p>An aerial photograph showing a yellow dot and a blue circle. A line connects the dot to a mosque labeled 'Jame Masjid'. A yellow callout box indicates a distance of 43.7 m.</p>
Nearest habitation (name and distance in m, mark on aerial map if possible):	N/A
No. community facilities (schools, health centre etc.) within 50m with estimated no. of visitors (mark on aerial map if possible):	<p>One Mosque 19.8 m away and one city corporation graveyard that is 2.13 m away from the boundary of SS.</p>   <p>The top image shows a yellow dot and a blue circle. A line connects the dot to a mosque labeled 'Baitun Noor Jame Masjid'. A yellow callout box indicates a distance of 19.8 m.</p> <p>The bottom image shows a yellow dot and a blue circle. A line connects the dot to a city corporation graveyard. A yellow callout box indicates a distance of 2.13 m.</p>

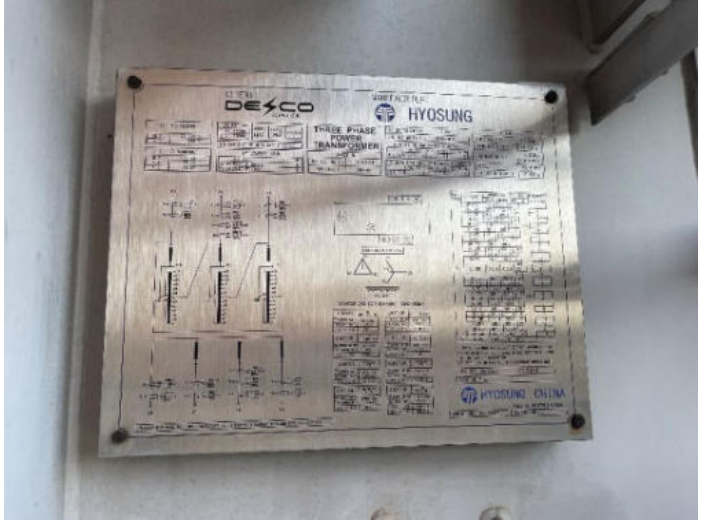

Nearest surface water (distance in m, mark on aerial map if possible):	Lake, 10.6 m 
No. groundwater wells/pumps/springs within 50m (mark on aerial map if possible):	10
Total staff at substation (technical and non-technical): No. men / no. women:	Seventeen and all are male.


**Purbachal Sector-2 132/33/11 kV grid SS:** This is a GIS SS which was established in 2019 by DESCO. The voltage of the SS is 132/33/11 kV. This has seven nos. of transformers. The noise level at the site entrance was 58 dB. The noise level adjacent to the transformers was 62 dB. The SS is located on one acre of land, and it is a plain land. More specific information on this SS is provided in Table 2.

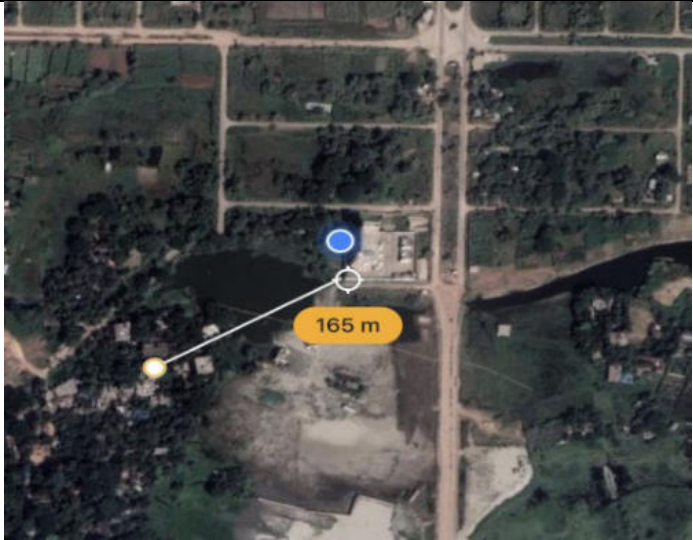


**Table 2: Information on Purbachal S-2 132/33/11 kV Grid SS**

Substation Name:	Purbachal S-2 132/33/11 kV Grid SS
Year of establishment:	2019
Type of Substation (GIS/AIS):	GIS
Voltage:	132/33/11 kV
No. incomers and voltage:	Two nos. of 132 kV
No. outgoers and voltage:	Four Nos. of 33 kV and nine nos. of 11 kV
Grid Reference: ( SS identification no.)	N/A

Aerial map of substation:	
Photo of substation compound:	
Photo of any control building and details of wall/roof materials:	Referring photo above. The materials of the wall and roof brick, cement and MS rod.
No. transformers with make/model, MVA, manufacturer name and dates of manufacture/installation with photo of rating plate:	<p>Two nos. of 132/33 and three nos. of 33/11 kV and two nos. of auxiliary transformers (500 kVA for internal use)</p> 

	 
Noise level at site entrance, indicative reading:	58 dB
Noise level adjacent to transformer, indicative reading:	62 dB
EMF level at site entrance, indicative reading:	36 $\mu$ T
EMF level adjacent to transformer, indicative reading:	98 $\mu$ T
Outside temperature, indicative reading:	35 Degree Celsius
Area of substation, and layout map (area in use and available for expansion):	1 acre, 132/33 kV capacity of one transformer and three incomers may be increased.
Photo of vehicle entrance: Is it off a paved road?	Yes, paved road

	
Topography – flat land, sloped, or steep terrain:	Flat land
Previous land use (if known):	Fellow land of Purbachal housing project.
Describe the land uses within 500m (supported with photos): Confirm presence or absence of agricultural land- cultivated or uncultivated, protected or environmentally sensitive areas, community or protected forest, water bodies, religious or ancestral cultural resources (e.g. temples, shrines, sacred trees)?	Fellow land for Purbachal housing development project.
Nearest protected or key biodiversity area (distance in m)?	22 km ( Mirpur Botanical Garden)
Have endangered species been encountered in the vicinity (elephant, tiger, etc.)?	No
No. buildings within 50m and no. inhabitants:	No
Nearest individual residence (name and distance in m, mark on aerial map if possible):	165m away from SS boundary

	
Nearest habitation (name and distance in m, mark on aerial map if possible):	N/A
No. community facilities (schools, health centre etc.) within 50m with estimated no. of visitors (mark on aerial map if possible):	<p>One Mosque 172m away from SS boundary</p> 
Nearest surface water (distance in m, mark on aerial map if possible):	<p>17.7 m (canal is closed)</p> 

No. groundwater wells/pumps/springs within 50m (mark on aerial map if possible):	Two
Total staff at substation (technical and non-technical): No. men / no. women:	Twenty one and all are male.

**Bashundhara D Block 132/33/11 kV grid SS:** This is a GIS SS which was established in 2018 by DESCO. The voltage of the SS is 132/33 kV. This has five nos. of transformers. The noise level at the site entrance was 68 dB. The noise level adjacent to the transformers was 76 dB. The SS is located on 1.2 acres of land, and it is a plain land. More specific information on this SS is provided in Table 3.

**Table 3: Information on Bashnudhara D Block 132/33 kV Grid SS**

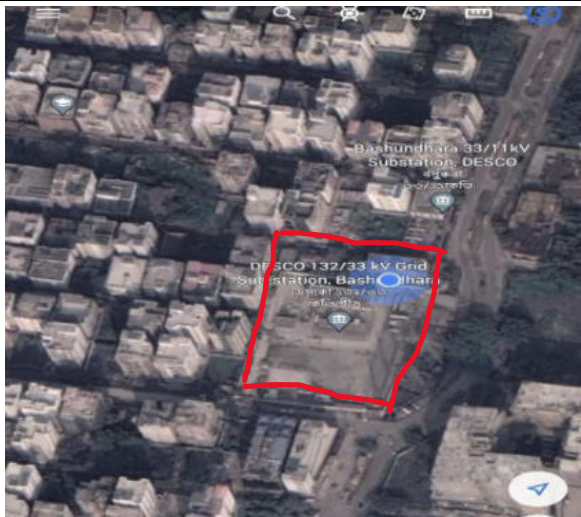

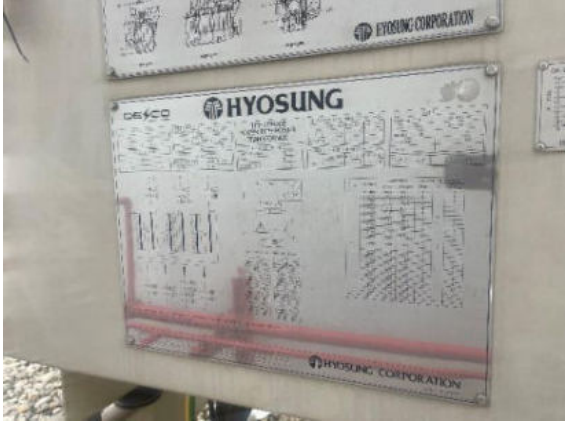



Substation Name:	Bashnudhara D Block 132/33 kV Grid SS
Year of establishment:	2018
Type of Substation (GIS/AIS):	GIS
Voltage:	132/33 kV
No. incomers and voltage:	Four nos. of 132 kV
No. outgoers and voltage:	Two Nos. 132 kV and 13 nos. of 33 kV.
Grid Reference: ( SS identification no.)	N/A
Aerial map of substation:	

Photo of substation compound:	
Photo of any control building and details of wall/roof materials:	Referring photo above. The materials of the wall and roof brick, cement and MS rod.
No. transformers with make/model, MVA, manufacturer name and dates of manufacture/installation with photo of rating plate:	Two nos. of 132/33 kV and three nos. of numbers of auxiliary (500 kVA for internal use)  
Noise level at site entrance, indicative reading:	68 dB
Noise level adjacent to transformer, indicative reading:	76 dB
EMF level at site entrance, indicative reading:	53 $\mu$ T
EMF level adjacent to transformer, indicative reading:	71 $\mu$ T
Outside temperature, indicative reading:	35 Degree Celsius

Area of substation, and layout map (area in use and available for expansion):	1.2 acres, one transformer of 132/33 kV may be installed.
Photo of vehicle entrance: Is it off a paved road?	Yes, paved road 
Topography – flat land, sloped, or steep terrain:	Flat land
Previous land use (if known):	AIS SS
Describe the land uses within 500m (supported with photos): Confirm presence or absence of agricultural land-cultivated or uncultivated, protected or environmentally sensitive areas, community or protected forest, water bodies, religious or ancestral cultural resources (e.g. temples, shrines, sacred trees)?	Residences, school, market and mosque
Nearest protected or key biodiversity area (distance in m)?	16 km (Mirpur Botanical Garden)
Have endangered species been encountered in the vicinity (elephant, tiger, etc.)?	No
No. buildings within 50m and no. inhabitants:	12 nos. of building with approximately 1,150 inhabitants
Nearest individual residence (name and distance in m, mark on aerial map if possible):	Miss garden
Nearest habitation (name and distance in m, mark on aerial map if possible):	N/A
No. community facilities (schools, health centre etc.) within 50m with estimated no. of visitors (mark on aerial map if possible):	Bashundhara eye hospital and Mehedi Mart (supermarket)
Nearest surface water (distance in m, mark on aerial map if possible):	250 m (canal)

	
No. groundwater wells/pumps/springs within 50m (mark on aerial map if possible):	Sixteen
Total staff at substation (technical and non-technical): No. men / no. women:	Sixteen and all are male.

**Mirpur (Digun) 132/33 kV grid SS:** This is an AIS SS which was established in 1981 by PGCB. The voltage of the SS is 132/33 kV. This has three nos. of transformers. The noise level at the site entrance was 60 dB. The noise level adjacent to the transformers was 81 dB. The SS is located on 7 acres of land, and it is a plain land. More specific information on this SS is provided in Table 4.

**Table 4: Information on Mirpur (Digun) 132/33 kV Grid SS**



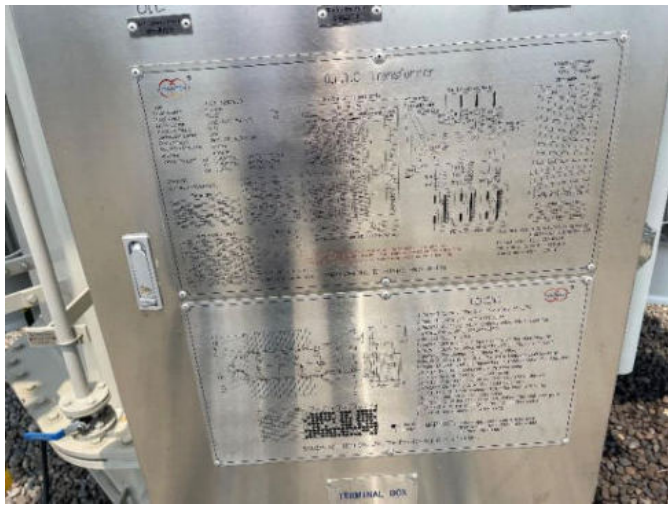

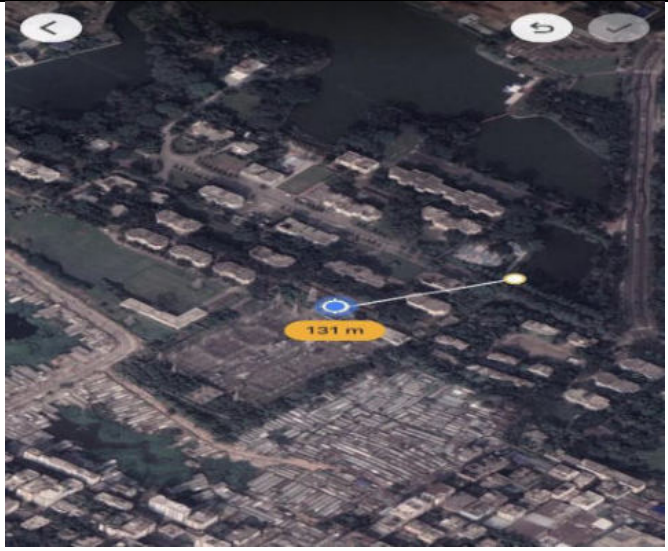
Substation Name:	Mirpur (Digun) 132/33 kV Grid SS
Year of establishment:	1981
Type of Substation (GIS/AIS):	AIS
Voltage:	132/33 kV
No. incomers and voltage:	Four nos. of 132 kV
No. outgoers and voltage:	Two nos. of 132 kV
Grid Reference: ( SS identification no.)	245
Aerial map of substation:	

Photo of substation compound:	
Photo of any control building and details of wall/roof materials:	Referring photo above. The materials of the wall and roof brick, cement and MS rod.
No. transformers with make/model, MVA, manufacturer name and dates of manufacture/installation with photo of rating plate:	Three 
Noise level at site entrance, indicative reading:	60 dB
Noise level adjacent to transformer, indicative reading:	81 dB
EMF level at site entrance, indicative reading:	27 $\mu$ T
EMF level adjacent to transformer, indicative reading:	70 $\mu$ T
Outside temperature, indicative reading:	32 Degree Celsius
Area of substation, and layout map (area in use and available for expansion):	Seven acres, control room can be constructed.
Photo of vehicle entrance: Is it off a paved road?	Yes, paved road

	
Topography – flat land, sloped, or steep terrain:	Flat land
Previous land use (if known):	Waterbody
Describe the land uses within 500m (supported with photos): Confirm presence or absence of agricultural land-cultivated or uncultivated, protected or environmentally sensitive areas, community or protected forest, water bodies, religious or ancestral cultural resources (e.g. temples, shrines, sacred trees)?	No agriculture land or protected or environmentally sensitive areas.
Nearest protected or key biodiversity area (distance in m)?	5 km (Mirpur Botanical Garden)
Have endangered species been encountered in the vicinity (elephant, tiger, etc.)?	No
No. buildings within 50m and no. inhabitants:	Three
Nearest individual residence (name and distance in m, mark on aerial map if possible):	Cantonment quarter, 150m
Nearest habitation (name and distance in m, mark on aerial map if possible):	N/A
No. community facilities (schools, health centre etc.) within 50m with estimated no. of visitors (mark on aerial map if possible):	One School ( Torch international School)
Nearest surface water (distance in m, mark on aerial map if possible):	Staff college lake ( 131m)

	
No. groundwater wells/pumps/springs within 50m (mark on aerial map if possible):	Three pumps (one for PGCB, one DESCO and one cantonment).
Total staff at substation (technical and non-technical): No. men / no. women:	17 (One Female and 16 male)

#### 4. Summary of National and Local Environmental Laws and Regulations Applicable to the Substations

The applicable national environmental laws and regulations related to SS along with their summary and applicability to DESCO's project are mentioned in Chapter 2 of the EIA report.

#### 5. Findings of the Audit

This chapter discusses the site-specific findings revealed from the audit. Uttara, Purbachal and Bashundhara substations belong to DESCO and the Mirpur substation belongs to PGCB.

##### 5.1 Findings at Uttara 132/33/11 kV grid SS

###### Good practices

Some of the good practices revealed by the audit of this facility are:

- I. The site was surrounded by secure fencing plus four watch towers and equipped with a security system.
- II. Emergency contact numbers were visible throughout the premises of the audited SS.
- III. Safety signage at different places on the site premises were found in place.
- IV. Adequate numbers of fire extinguishers, fire fighting buckets and fire hydrants were found in place at the site premises. Fire extinguishers were serviced and in date, and sand buckets were full of sand.
- V. Pictorial instructions on how to use the fire extinguishers were found on the wall.

- VI. As part of compliance for health and safety requirement SS followed the items of different ISO checklists.
- VII. Audit did not reveal use of Polychlorinated Biphenyl (PCB) at the SS (at all SS the transformer manufacturer and date of SS transformers were checked against UNIDO list of transformers at risk of containing PCBs).
- VIII. A well-maintained drainage system surrounded the SS premises.
- IX. Sanitation/toilet facilities found with adequate measure (e.g., septic tank).
- X. Different items of Personal Protective Equipment ( PPE) for the visitors, SS staff and workers found in place at the SS.
- XI. The transformers were placed on impermeable containment bunded with stone chips plus a layer of sand beneath to contain spills.
- XII. All floors were equipped with clearly marked emergency exit stairs.
- XIII. First aid box found in place at the site premises.
- XIV. The visited site is ISO certified (ISO 9001:2015 & ISO 45001: 2018) since 2014.
- XV. Audit found that different registers (e.g., shut down, work shifts, visitor, and checklists are maintained daily, weekly and monthly as applicable as part of ISO 9001:2015 & ISO 45001: 2018 (related to health and safety and quality).
- XVI. DESCO is concerned about the risk of sulfur hexafluoride (SF6) leakage and takes measures to handle the leakage. International Electrotechnical Commission (IEC) standard for maximum leakage rate is 0.5% per annum where DESCO ensures the rate less than 0.1% with the equipment it used in its network. This is ensured from the supplier by checking testing result as part of bidding process. In case of leakage, alarm is generated, and team identifies the leakage and immediately takes the gas to close container through suction. Hence, the supplier is informed who repairs the equipment and refills the gas from the container collected the gas. This practice has been adopted by DESCO recently. Previously, DESCO was handling this kind of risk manually through lime that may break the atomic formation of SF6 that could not be efficient and safer. These statements are also applicable for all other audited SS of DESCO.
- XVII. SS waste management is carried out following the DESCO Policy Guidelines for Condemnation/Auction of Obsolete and Unusable Materials which are sellable. In this connection, SS sends such materials to their central store from where they go through auction processes. This is applicable for all other audited SS (PGCB follow same process).
- XVIII. Overall housekeeping of the SS site was found good.
- XIX. A medical/first aid register was found at the site. No record was found at the register as no accident/injury occurred so far.

### **Gaps which need to be addressed**

Gaps revealed at the site that need to be addressed are:

- I. No demarcated/designated emergency assembly point was found at the site premises. It is recommended that a demarcated and designated emergency assembly point is ensured at the site premises.
- II. A designated waste oil store area was found at the site premises but that was without any secondary containment. It is suggested that the waste oil store area be provided with a bund.
- III. Damaged transformers and waste oil of transformer in barrels were found kept on open ground. It is recommended that the damaged transformers and barrels of waste oil are stored in designated, impermeable bunded stores and at absolute minimum on drip trays rather than keeping them on open ground.
- IV. No emergency evacuation plan and records on emergency drills (though SS staff mentioned that they used to participate in drills that is conducted by DESCO Head Quarter and Fire Service and Civil Defense Personnel) was found on premises. It is

recommended that an emergency evacuation plan is in place and clearly documented with records of drills kept.

- V. The SS staff members mentioned that they are used to participate in EHS training whenever arranged by headquarter staff at their office occasionally. EHS training needs to be conducted at SS site on regular basis and records on this training need to be maintained at the SS site.
- VI. Different PPE items (e.g., helmet, safety shoes, harness belt, hot stick) at the site kept randomly in different places. The PPE items need to be stocked at designated place.
- VII. There are 17 technical and nontechnical staff {one Assistant Engineer (AE)/SS In Charge, eight Sub-Assistant Engineer (SAE), four Substation Attendant (SSA), and four Security Guard (SG)} at SS and all of them are male. There is no EHS or HS staff. Regular monitoring on EHS issues at SS site needs to be ensured.
- VIII. Audit did not reveal any complaint number/ box within or outside the premises. It is recommended to ensure grievance box/numbers as applicable within (for workers) and outside (for community) of the premises and maintain a grievance register at the site.

## 5.2 Findings at Purbachal Sector-2 132/33/11 kV grid SS

### Good practices

Some of the good practices revealed by the audit of this facility are:

- I. The site was surrounded by secure fencing plus four watch towers and equipped with a security system.
- II. Safety signage at different places on the site premises were found in place.
- III. Adequate numbers of fire extinguishers and firefighting buckets were found in place at the site premises. Fire extinguishers were serviced and in date, and sand buckets were full of sand.
- IV. Pictorial instructions on how to use the fire extinguisher were found on the wall.
- V. As part of compliance for health and safety requirement SS followed the items of different ISO checklists.
- VI. Audit did not reveal use of PCB at the SS.
- VII. A well-maintained drainage system surrounded the SS premises.
- VIII. Sanitation/toilet facilities found with adequate measure ( e.g., septic tank).
- IX. Different items of PPE for the visitors, SS staff and workers found in place at the SS.
- X. The transformers were placed on impermeable containment bunded with stone chips plus a layer of sand beneath to contain spills.
- XI. Clearly marked emergency exit stairs were found on all floors.
- XII. First aid box was found in place at the site premises.
- XIII. Overall housekeeping of the SS site was found good.
- XIV. The visited site is ISO certified (ISO 9001:2015 & ISO 45001: 2018) since 2014.
- XV. Audit found that different registers (e.g., shut down, work shifts, visitor, and checklists are maintained daily, weekly and monthly as applicable as part of ISO 9001:2015 & ISO 45001: 2018 (related to health and safety and quality).

### Gaps which need to be addressed

Gaps revealed at the site that need to be addressed at Purbachal Sector-2 132/33/11 kV grid SS site are:

- I. Emergency contact numbers were not found visible at the premises of audited SS (found only at control rooms). It is recommended that emergency contacts numbers are posted at different places on the site premises.
- II. No accident register was found at the site. It is recommended to ensure accident register at the site.
- III. No demarcated/designated emergency assembly point was found at the site premises. It is recommended that a demarcated and designated emergency assembly point is ensured at the site premises.
- IV. No emergency evacuation plan was observed at the site premises. It is recommended that an emergency evacuation plan is ensured at the site premises with records of drills kept.
- V. No records on emergency drills (though SS staff mentioned that they used to participate in drills that is conducted by DESCO Head Quarter and Fire Service and Civil Defense Personnel) was found on premises. It is recommended that clearly documented with records of drills kept.
- VI. The SS staff members mentioned that they are used to participate in EHS training whenever arranged by head quarter staff at their office occasionally. EHS training needs to be conducted at SS site on regular basis and records on this training need to be maintained at the SS site.
- VII. Different PPE items at the site kept randomly in different places. The PPE items need to be stocked at designated place.
- VIII. There are 20 technical and nontechnical staff (one AE/SS In Charge, eight SAEs, four SSAs, and four SGs) at SS and all of them are male. There is no EHS or HS staff. Regular monitoring on EHS issues at SS site needs to be ensured.
- IX. Audit did not reveal any complaint number/ box within or outside the premises. It is recommended to ensure grievance box/numbers as applicable within (for workers) and outside (for community) of the premises and maintain a grievance register at the site.

### 5.3 Findings at Bashundhara D Block 132/33/11 kV grid SS

#### Good practices

Some of the good practices revealed by the audit for Bashundhara D Block 132/33/11 kV grid SS site are:

- I. The site was surrounded by secure fencing plus four watch towers and equipped with a security system.
- II. Pictorial instructions on how to use the fire extinguisher were found on the wall.
- III. Safety signage at different places on the site premises were found in place.
- IV. A demarcated/designated emergency assembly point was found at the site premises.
- V. An emergency evacuation plan was found at the site.
- VI. Adequate numbers of fire extinguishers, firefighting buckets and fire hydrants were found in place at the site premises. Fire extinguishers were serviced and in date, and sand buckets were full of sand.
- VII. The transformers were placed on impermeable containment bunded with a bed of stone chips and sand to contain any spills.
- VIII. Clearly marked emergency exit stairs were found on all floors.

- IX. As part of compliance for health and safety requirement SS followed the items of different ISO checklists.
- X. Audit did not reveal use of PCB at the SS.
- XI. A well-maintained drainage system surrounded the SS premises.
- XII. Sanitation/ toilet facilities found with adequate measure (e.g., septic tank).
- XIII. Different items of PPE for the visitors, SS staff and workers found in place at the SS.
- XIV. First aid box found in place at the site premises.
- XV. Overall housekeeping of the SS site was found good.
- XVI. The visited site is ISO certified (ISO 9001:2015 & ISO 45001: 2018) since 2014.
- XVII. Audit found that different registers (e.g., shut down, work shifts, visitor, and checklists are maintained daily, weekly and monthly as applicable as part of ISO 9001:2015 & ISO 45001: 2018 (related to health and safety and quality).

### **Gaps which need to be addressed**

Gaps revealed at the site that need to be addressed at Bashundhara D Block 132/33/11 kV grid SS site are:

- I. Emergency contact numbers were not found visible at the premises of audited SS (found only at control rooms). It is recommended that emergency contacts numbers are posted at different places on the site premises.
- II. No accident register was found at the site. It is recommended to ensure accident register at the site.
- III. Damaged transformers and waste oil of transformer in barrels were found kept on open ground. It is recommended that the damaged transformers and barrels of waste oil are stored in designated, impermeable bunded stores and at absolute minimum on drip trays rather than keeping them on open ground.
- IV. The SS staff members participate in EHS training whenever arranged by head quarter staff at their office occasionally. EHS training needs to be conducted at SS site on regular basis and records on this training need to be maintained at the SS site.
- V. Different PPE items at the site kept randomly in different places. The PPE items need to be stocked at designated place.
- VI. There are 16 technical and nontechnical staff (one AE/SS In Charge, six SAs, four SSAs, and five SGs) at SS and all of them are male. There is no EHS or HS staff. Regular monitoring on EHS issues at SS site needs to be ensured.
- VII. Audit did not reveal any complaint number/ box within or outside the premises. It is recommended to ensure grievance box/numbers as applicable within and outside of the premises and maintain a grievance register at the site.

## **5.4 Findings at Mirpur ( Digun) 132/33 kV grid SS ( PGCB's SS)**

### **Good practices**

Some of the good practices revealed by the audit for Mirpur (Digun) 132/33 kV grid SS (PGCB's SS) site are:

- I. The site was found with secure fencing and a security system. It has also four watch towers for the security of the SS.
- II. Safety signage at different places on the site premises were found in place.
- III. A demarcated/designated emergency assembly point was found at the site premises.
- IV. An emergency exit plan was found at the site.
- V. Adequate numbers of fire extinguishers and firefighting buckets were found in place at the site premises. Fire extinguishers were serviced and in date, and sand buckets were full of sand.

- VI. Written with pictorial instructions on use of fire extinguisher were found on wall.
- VII. The transformers were found with arrangement of spill management (secondary containment with 110% impermeable bundh).
- VIII. As part of compliance for health and safety requirement SS followed the items of different ISO checklists.
- IX. Audit did not reveal use of PCB at the SS.
- X. A well-maintained drainage system surrounded the SS premises.
- XI. Sanitation/toilet facilities found with adequate measure ( e.g., septic tank).
- XII. Different items of PPE for the visitors, SS staff and workers found in place at the SS.
- XIII. First aid box found in place at the site premises.
- XIV. The SS is ISO 45001:2018 certified.
- XV. Audit found that different registers (e.g., shut down, work shifts, visitor, and checklists are maintained daily, weekly and monthly as applicable as part of ISO (related to environment, health and safety and quality).

### **Gaps which need to be addressed**

Gaps revealed at the site that need to be addressed for Mirpur (Digun) 132/33 kV grid SS (PGCB's SS) site are:

- I. Emergency contact numbers were not found visible at the premises of audited SS. It is recommended that emergency contacts numbers are ensured at different places on the site premises.
- II. No accident register was found at the site. It is recommended to ensure accident register at the site.
- III. Transformers' waste oil of transformer in barrels were found kept on open ground. It is recommended that the barrels of waste oil are stored in designated stores and at absolute minimum on drip trays rather than keeping them on open ground.
- IV. There was no ISO certificate at worksite. As ISO certified, the certificate should be kept at SS site.
- V. The staff members of this PGCB SS also participate in EHS training whenever arranged by head quarter staff at their office occasionally. EHS training needs to be conducted at SS site on regular basis and records on this training need to be maintained at the SS site.
- VI. Different PPE items at the site kept randomly in different places. The PPE items need to be stocked at designated place.
- VII. There are 17 (one female and 16 male) technical and nontechnical staff at SS. But there is no EHS or HS staff. Regular monitoring on EHS issues at SS site needs to be ensured.
- VIII. Audit did not reveal any complaint number/ box within or outside the premises. It is recommended to ensure grievance box/numbers as applicable within and outside of the premises and maintain a grievance register at the site.

## 6. Recommended Corrective Action Plan

From the audit, some good practices were revealed, but also some gaps. DESCO/PGCB need to address these gaps to comply with ADB's environmental safeguard requirements. A Corrective Action Plan (CAP) is presented below which summarizes which actions need to be taken, by whom and when.

**Table 5: Suggested Corrective Action Plan**

SI	ACTION TO BE TAKEN	PARTY RESPONSIBLE	AGREED DEADLINE
<b>Uttara 132/33/11 kV grid SS</b>			
1	A demarcated and designated emergency assembly point is defined at the site premises.	DESCO	Before contractor is given entry to SS for connecting the facility with the intervention of Dhaka Power System Expansion and Strengthening Project in DESCO area
2	The waste oil storage area be bunded to 110% of capacity.	DESCO	Before contractor is given entry to SS for connecting the facility with the intervention of Dhaka Power System Expansion and Strengthening Project in DESCO area
3	The damaged transformers and barrels of waste oil are stored in designated, impermeable and 110% bunded storage areas and at absolute minimum on drip trays rather than keeping them on open ground.	DESCO	Before contractor is given entry to SS for connecting the facility with the intervention of Dhaka Power System Expansion and Strengthening Project in DESCO area
4	An emergency evacuation plan is ensured at the site premises. Monthly drills are to be performed with records kept.	DESCO	Before contractor is given entry to SS for connecting the facility with the intervention of Dhaka Power System Expansion and Strengthening Project in DESCO area
5	EHS training needs to be conducted at SS site on regular basis and records on this training need to be maintained at the SS site.	DESCO	Before contractor is given entry to SS for connecting the facility with the intervention of Dhaka Power System Expansion and Strengthening Project in DESCO area
6	The PPE items need to be stocked at designated place.	DESCO	Before contractor is given entry to SS for connecting the facility with the intervention of Dhaka Power System Expansion and Strengthening Project in DESCO area
7	Regular monitoring on EHS issues at SS site needs to be ensured	DESCO	Before contractor is given entry to SS for connecting the facility with the intervention of Dhaka Power System Expansion and Strengthening Project in DESCO area
8	Ensure grievance box/numbers as applicable within and outside of the premises and maintain a grievance register at the site.	DESCO	Before contractor is given entry to SS for connecting the facility with the intervention of Dhaka Power System Expansion and Strengthening Project in DESCO area

SI	ACTION TO BE TAKEN	PARTY RESPONSIBLE	AGREED DEADLINE
<b>Purbachal Sector-2 132/33/11 kV grid SS</b>			
1	Emergency contacts numbers are to be posted at different places on the site premises.	DESCO	Before contractor is given entry to SS for connecting the facility with the intervention of Dhaka Power System Expansion and Strengthening Project in DESCO area
2	Ensure an accident register is kept at the site.	DESCO	Before contractor is given entry to SS for connecting the facility with the intervention of Dhaka Power System Expansion and Strengthening Project in DESCO area
3	A demarcated and designated emergency assembly point is defined at the site premises.	DESCO	Before contractor is given entry to SS for connecting the facility with the intervention of Dhaka Power System Expansion and Strengthening Project in DESCO area
4	An emergency evacuation plan to be provided at the site premises. Monthly drills are to be performed and records kept.	DESCO	Before contractor is given entry to SS for connecting the facility with the intervention of Dhaka Power System Expansion and Strengthening Project in DESCO area
5	EHS training needs to be conducted at SS site on regular basis and records on this training need to be maintained at the SS site.	DESCO	Before contractor is given entry to SS for connecting the facility with the intervention of Dhaka Power System Expansion and Strengthening Project in DESCO area
6	The PPE items need to be stocked at designated place.	DESCO	Before contractor is given entry to SS for connecting the facility with the intervention of Dhaka Power System Expansion and Strengthening Project in DESCO area
7	Regular monitoring on EHS issues at SS site needs to be ensured	DESCO	Before contractor is given entry to SS for connecting the facility with the intervention of Dhaka Power System Expansion and Strengthening Project in DESCO area
8	Ensure grievance box/numbers as applicable within and outside of the premises and maintain a grievance register at the site.	DESCO	Before contractor is given entry to SS for connecting the facility with the intervention of Dhaka Power System Expansion and Strengthening Project in DESCO area
<b>Bashundhara D Block 132/33/11 kV grid SS</b>			
1	Emergency contacts numbers are to be posted at different places on the site premises.	DESCO	Before contractor is given entry to SS for connecting the facility with the intervention of Dhaka Power System Expansion and Strengthening Project in DESCO area
2	An accident register is kept at the site.	DESCO	Before contractor is given entry to SS for connecting the facility with the intervention of Dhaka Power System Expansion and Strengthening Project in DESCO area
3	Damaged transformers and barrels of waste oil are stored in designated, impermeable	DESCO	Before contractor is given entry to SS for connecting the facility with the intervention of Dhaka Power System

SI	ACTION TO BE TAKEN	PARTY RESPONSIBLE	AGREED DEADLINE
	stores bundled to 110% capacity and at absolute minimum on drip trays rather than keeping them on open ground.		Expansion and Strengthening Project in DESCO area
4	EHS training needs to be conducted at SS site on regular basis and records on this training need to be maintained at the SS site.	DESCO	Before contractor is given entry to SS for connecting the facility with the intervention of Dhaka Power System Expansion and Strengthening Project in DESCO area
5	The PPE items need to be stocked at designated place.	DESCO	Before contractor is given entry to SS for connecting the facility with the intervention of Dhaka Power System Expansion and Strengthening Project in DESCO area
6	Regular monitoring on EHS issues at SS site needs to be ensured	DESCO	Before contractor is given entry to SS for connecting the facility with the intervention of Dhaka Power System Expansion and Strengthening Project in DESCO area
7	Ensure grievance box/numbers as applicable within and outside of the premises and maintain a grievance register at the site.	DESCO	Before contractor is given entry to SS for connecting the facility with the intervention of Dhaka Power System Expansion and Strengthening Project in DESCO area
<b>Mirpur (Digon) 132/33 kV grid SS (PGCB's SS) site</b>			
1	Emergency contacts numbers are to be posted at different places on the site premises.	PGCB	Before contractor is given entry to SS for connecting the facility with the intervention of Dhaka Power System Expansion and Strengthening Project in DESCO area
2	Ensure accident register at the site.	PGCB	Before contractor is given entry to SS for connecting the facility with the intervention of Dhaka Power System Expansion and Strengthening Project in DESCO area
3	Barrels of waste oil are stored in designated, impermeable stores bundled to 110% capacity and at absolute minimum on drip trays rather than keeping them on open ground.	PGCB	Before contractor is given entry to SS for connecting the facility with the intervention of Dhaka Power System Expansion and Strengthening Project in DESCO area
4	ISO certificate should be kept at SS site.	PGCB	Before contractor is given entry to SS for connecting the facility with the intervention of Dhaka Power System Expansion and Strengthening Project in DESCO area
5	EHS training needs to be conducted at SS site on regular basis and records on this training need to be maintained at the SS site.	PGCB	Before contractor is given entry to SS for connecting the facility with the intervention of Dhaka Power System Expansion and Strengthening Project in DESCO area
6	The PPE items need to be stocked at designated place.	PGCB	Before contractor is given entry to SS for connecting the facility with the intervention of Dhaka Power System

SI	ACTION TO BE TAKEN	PARTY RESPONSIBLE	AGREED DEADLINE
			Expansion and Strengthening Project in DESCO area
7	Regular monitoring on EHS issues at SS site needs to be ensured	PGCB	Before contractor is given entry to SS for connecting the facility with the intervention of Dhaka Power System Expansion and Strengthening Project in DESCO area
8	Ensure grievance box/numbers as applicable within and outside of the premises and maintain a grievance register at the site.	PGCB	Before contractor is given entry to SS for connecting the facility with the intervention of Dhaka Power System Expansion and Strengthening Project in DESCO area

## Annexes

### Annex-1: Person Met During the Audit

Note: Each SS is manned by an Assistant Engineer (AE) who is responsible for implementing the Safeguards with the support of Sub Assistant Engineer and SS Attendant.

SI	Name	Designation and Organization
1	Mr. Engr. Jyotish Chandra Roy	Project Director (Dhaka Power System Expansion and Strengthening Project in DESCO area) and Chief Engineer, DESCO
2	Mr. Md. Yasir Arafat	Deputy Project Director (Dhaka Power System Expansion and Strengthening Project in DESCO area) and Executive Engineer, DESCO
3	Mr. Arup Sarkar	Sub Assistant Engineer (SAE), (Dhaka Power System Expansion and Strengthening Project in DESCO area), DESCO
4	Mr. Md. Al Amin	Assistant Engineer (AE) and Uttara 132/33/11 kV grid SS in-charge, DESCO
5	Mr. Aman Uddullah	SAE, Uttara 132/33/11 kV grid SS, DESCO
6	Mr. Al Amin	SAE, Uttara 132/33/11 kV grid SS, DESCO
7	Mr. Md. Abdullah	AE and Purbachal S2 132/33/11 kV grid SS in-charge, DESCO
8	Mr. Md. Hamidur Rahman	SAE, Purbachal S-2 132/33/11 kV grid SS, DESCO
9	Mr. Md. Amanur Rahman	SAE, Purbachal S-2 132/33/11 kV grid SS, DESCO
10	Mr. Borhan Uddin	SS Supervisor, Purbachal S-2 132/33/11 kV grid SS, DESCO
11	Mr. Saiful Islam	AE and Bashundhara D block 132/33/11 kV grid SS in-charge, DESCO
12	Mr. Anwar Mohammad Shadat	SAE, Bashundhara D block 132/33/11 kV grid SS, DESCO
13	Mr. Anar Mohammad Hassan	SAE, Bashundhara D block 132/33/11 kV grid SS, DESCO
14	Mr. Md. Babul	SAE, Mirpur ( Digun) 132/33 kV grid SS , PGCB
15	Mr. Md. Rezaul Karim Sheikh	SAE, Mirpur ( Digun) 132/33 kV grid SS , PGCB
16	Md. Faruk Hossen	SAE, Mirpur ( Digun) 132/33 kV grid SS , PGCB

**Annex-2: Some of the Photos from the Audit**

**Photo 1: Fire extinguishers and instructions on use of them at Uttara 132/33/11 kV grid SS site**



**Photo-2: Message/signage on accident reporting at Uttara 132/33/11 kV grid SS site**



**Photo-3 Waste oil stored without secondary containment at Uttara 132/33/11 kV grid SS site.**



**Photo-4: Damaged transformers and waste oil barrels store on open ground at Uttara 132/33/11 kV grid SS site.**

**DESCO** **INTEGRATED MANAGEMENT SYSTEM** Document No.: ST-CSO-08  
 SYSTEM FORM Revision No.: 01  
 TITLE: DAILY CHECK LIST Effective Date: 20 Sep 18  
 Page 1 of 1

**DAILY CHECK LIST**  
 of Purbachal 132/33/11 kV Grid Substation, DESCO

Inspection should be made daily more or less at the same time (Evening peak hour is preferable)  
 Date of Inspection: 11/03/20

**1. Control Room**

a	Battery Charger Condition	Voltage	12.20 V	Current	1.1 A
b	Panel Board: Lamp Check	OK	✓	Problem	✓
c	Volt/Ampere Meter, per phase	OK	✓	Problem	✓
d	Any target appeared in relay/control panel Reporting to Manager/Action taken	Yes	✓	No	✓

**2. Switchyard**

a	132/33 kV (Out-door bus) any abnormalities (noise, bad sound, spark, oil leakage from equipment, etc.). Report in book	Normal	✓
b	Hot-hot in any bus connectors (Visually/ Use Thermo-vision camera/ Infrared gun to measure & record the temperature rise in a week)	Yes	No

**3. Transformer**

Similar format is applicable for 132/33 & 33/11 kV substations

a	Transformer cooling fan / test	Running/ stopped	Fan	11	T2	T3	Comments
b	Oil/Winding Temperature recording (°C)	Temp	Winding	11	T2	T3	
c	Grid Voltage, MW and Ampere recording	Record	Volt	11	T2	T3	
			MW	11	T2	T3	
			Amp	11	T2	T3	

**4. Circuit Breakers**

a	132 kV CB Gas Pressure & Hydraulic Oil Pressure recording	Line 1	Line 2	T-1	T-2	Coupler
b	Any relay operated or flag appeared in 132 kV circuit breaker cabinet	Gas Press	Hydraulic	11	T2	T3
c	33 kV CB Gas Pressure & Hydraulic Oil Pressure recording	Gas Press	Hydraulic	11	T2	T3
d	Any relay operated or flag appeared in 33 kV circuit breaker cabinet	Gas Press	Hydraulic	11	T2	T3

**5. Grounding**

a	Transformer neutral connection and other groundings- OK or not	Transformer Neutral	OK	✓	Not OK
		Other Equip. Grounding	OK	✓	Not OK

**6. Safety**

a	Security system / Check Post	OK	✓	Not OK
b	Security Lighting of Switchyard	OK	✓	Not OK
c	Sand & Water bucket	OK	✓	Not OK

Note: - 1. This is a sample format. This may be prepared as per requirement of the substation & Recorded in a separated register.  
 2. For 33/11 kV substation, Check list should be similar.

Counter Signed/Supervised by  
 Date: 11/03/20

Inspected by  
 Date: 11/03/20

Reviewed by (MR): Approved by (MD):

Photo-5: Daily checklist maintained (part of ISO) at Purbachal 132/33/11 kV grid SS site



Photo-6: Set up transformer at Purbachal S2 132/33/11 kV grid SS site



**Photo-7: Emergency exit stairs at Purbachal S2 132/33/11 kV grid SS site**



**Photo-8: Emergency assembly point at Bashundhara D block 132/33/11 kV grid SS site**



Photo-9: Safety signage at Bashundhara D block 132/33/11 kV grid SS site



Photo-10: Emergency evacuation plan at Bashundhara D block 132/33/11 kV grid SS site



**Photo-11: Damaged transformers and waste oil barrels stored on open ground at Bashundhara D block 132/33/11 kV grid SS site**



**Photo-12: Emergency assembly point at Mirpur (Digun) 132/33 kV grid SS (PGCB) site**

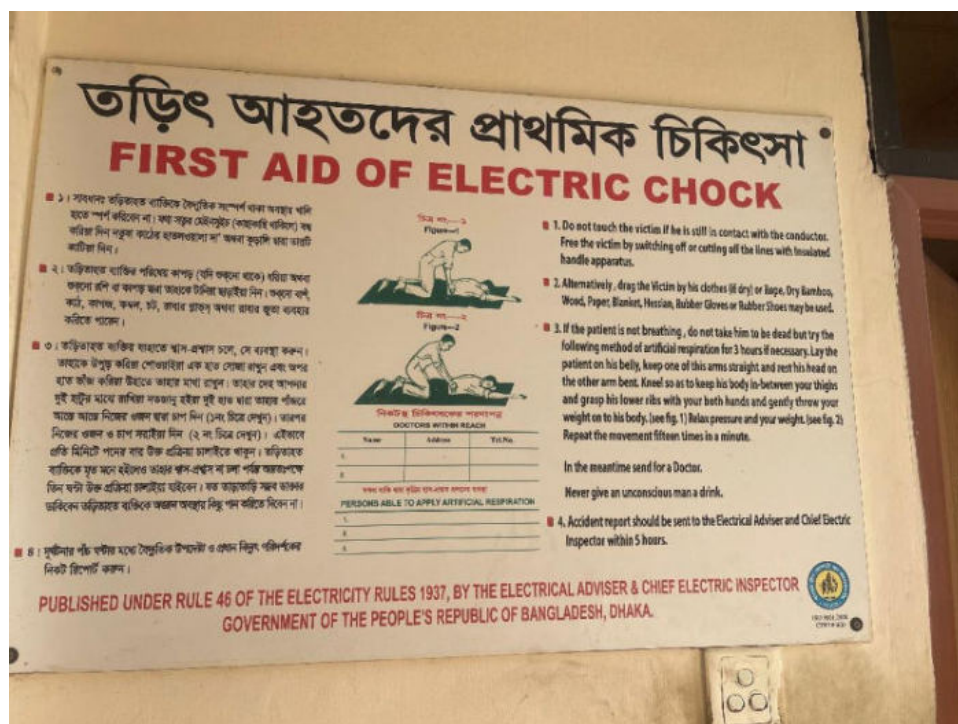


Photo-13: Messages on first aid of electric shock at Mirpur (Digun) 132/33 kV gird SS ( PGCB) stie



Photo-14: Waste oil barrels store on open ground at Mirpur (Digun) 132/33 kV gird SS (PGCB) stie



Photo-15: Mask kept for firefighting at Mirpur SS

2nd Circle: Dhaka (North)				Division: GMD Dhaka (North West)		Station/Substation: Mirpur 132/33 kV		
Date: 25/08/2022				Reference File: Fire Extinguisher		Identification No: 245		
Schedule: <input checked="" type="checkbox"/>				Emergency: <input type="checkbox"/>		Special: <input type="checkbox"/>		
Location	Total	Used	Net Total	Type	Weight / Pressure	Date of Refilling	Date of expired	Remarks
Control Room	4	0	4	CO2	5kg	07/07/2021	06/07/2023	CO2 - 01, ABC Powder - 04
Control Room	4	1	3	CO2	5kg			RPC Room Bank Unit 03
Capacitor Bank Room	4	0	4	Foam	10 Liter	07/07/2021	06/07/2023	Used to Remove Fire
Capacitor Bank Room	1	0	1	CO2	5kg	07/07/2021	06/07/2023	Date: 22.08.2022
125 Volt Battery Room	13	2	11	ABCE Powder	8kg/c m³	06/01/2022	05/01/2023	Time: 16:35
Fire Extinguisher Box	1	0	1	ABCE Powder	8kg/c m³	06/01/2022	05/01/2023	
Total = 23 nos.								

Measured By  Name: Md. Faruk Hossain Designation: Sub Assistant Engineer	Station Incharge  Name: Md. Mahfuzul Kabir Designation: Assistant Engineer
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Photo-16: Inspection records on fire extinguishers



Photo-17: Improper stocking of PPE at Mirpur SS and same was in all other audited SS

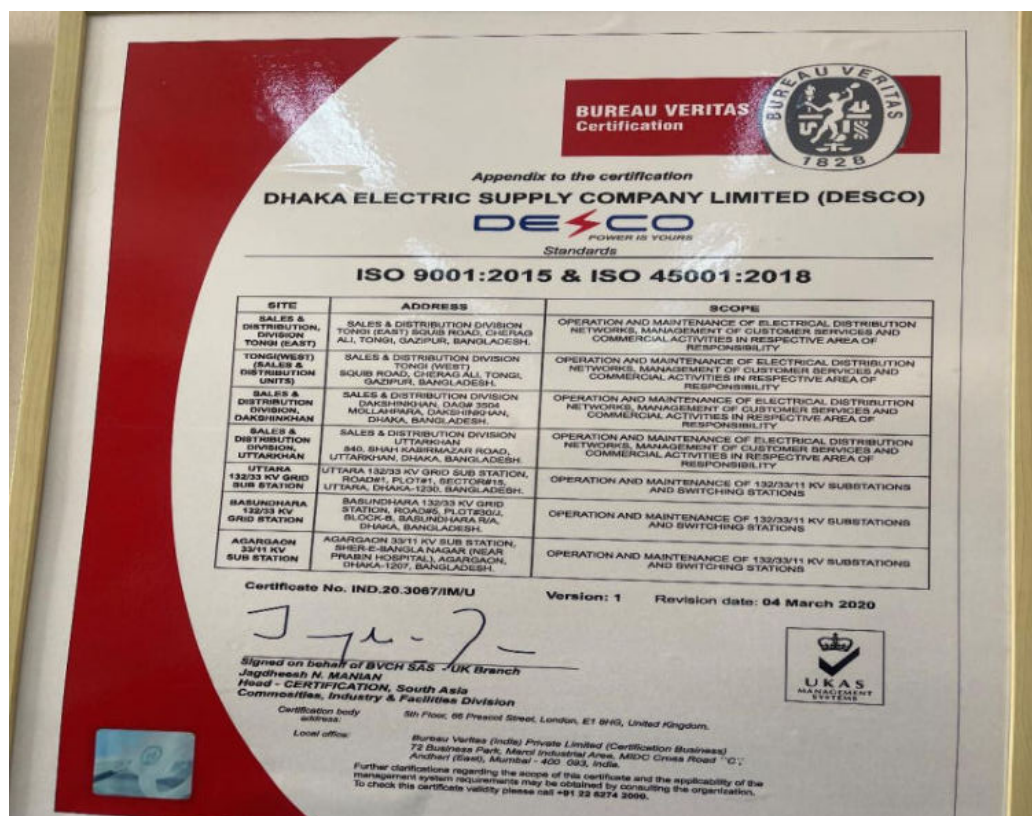


Photo-18: ISO certificate of DESCO SSs



**Photo-19: Exhaust fan for ventilation in battery room**



**Photo-20: Exhaust fan for ventilation at Uttara SS and same was found in all other SS**

## **Appendix XVI: Calibration Certificate – Sound Level Meter**



# 校正証明書

## CALIBRATION CERTIFICATE

品名	PRODUCT NAME	:	普通騒音計 Sound Level Meter
型式	TYPE	:	MODEL 4431
器物番号	PRODUCT NUMBER	:	132133
マイク	MICROPHONE	:	61742
製造者	MANUFACTURER	:	株式会社アコー ACO CO., LTD.

### ※特記事項

[基準器、校正機器のトレーサビリティ証明]

校正に使用した基準器、校正機器は国家基準にトレーサブルであることを証明致します。

### ※Special notes

[Traceability certificate of standard instruments and calibration equipment.]

We certify that the standard instruments and calibration equipment are traceable to the national standards.

平成27年4月13日

April 13, 2015

東京都世田谷区代沢2-6-10  
株式会社アコー  
代表取締役 寺園信一  
2-6-10 Daizawa Setagaya-ku  
Tokyo Japan  
President : Shinichi Terazono  
ACO CO., LTD.

# 校正証明書

## CALIBRATION CERTIFICATE

品名	PRODUCT NAME	:	普通騒音計 Sound Level Meter
型式	TYPE	:	MODEL 4431
器物番号	PRODUCT NUMBER	:	132133
マイク	MICROPHONE	:	61742
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### ※Special notes

[Traceability certificate of standard instruments and calibration equipment.]

We certify that the standard instruments and calibration equipment are traceable to the national standards.

2021年3月5日

March 5, 2021

東京都世田谷区代沢2-6-10  
株式会社アコー  
代表取締役 寺蘭信一  
2-6-10 Daizawa Setagaya-ku  
Tokyo Japan  
President : Shinichi Terazono  
ACO CO., LTD.

## **Appendix XVII: Tongi Site Land Record**



विद्यमान अड्डा:

১. এই নথিটির কপিটাইন অনলাইন মিডিয়েশন সিস্টেম কর্তৃক প্রদত্ত। ইহা বাংলাদেশতাবৈধ এবং সর্বস্বত্ব সংরক্ষিত।
২. অনলাইন কপিটাইন সিস্টেম ব্যবহারের জন্য কপিটাইন (QR) কোডটি স্ক্যান করে মুদ্রিত নথিটির প্রবেশদপট থেকে প্রবেশ করা যাবে।
৩. মুদ্রিত নথি থেকে অনলাইন কপিটাইন সিস্টেম ব্যবহার প্রয়োজনীয়তা নেই।
৪. মুদ্রিত নথি থেকে অনলাইন কপিটাইন সিস্টেম ব্যবহার করা যাবে না।

## **Appendix XVIII: ADB Environmental Monitoring Report Template**



## Environmental Safeguards Monitoring Report – Updated Format (as of Jan 2020)

{Red text serves as guide for report preparation, please delete it when the report is finalized}

### TITLE PAGE

**LIST OF ABBREVIATIONS** {All abbreviations used in the report should be listed here as well as being spelt out in full the first time they appear in the report}

### TABLE OF CONTENTS

**EXECUTIVE SUMMARY** {Maximum two-page summary following table like the sample below, if necessary cross reference the relevant section of the main report for details to keep summary succinct}

Project Name	
Executing Agency	
Implementing Agency	
Environment Safeguards Categorization	
Environment Safeguards Documentation	EARF/EIA/IEE/Existing Facilities CAP/EMP
Project Stage Obtained	Design/Pre-Construction/Construction/Commissioning/O&M
Detailed Design Required Post-Approval	Yes/No – if yes include remarks on status of design progress (%) and if more than one design package, provide details if any differences between the status
Contract(s) Awarded	Yes/No – if more than one contract package, provide details
Bidding Document(s) Include EMP Cleared by ADB	Yes/No – if more than one contract package, provide details if any difference between the status
Contract(s) Awarded Include EMP Cleared by ADB	Yes/No – if more than one contract package, provide details if any difference between the status
National Environment, Health and Safety Clearance(s) Obtained	Yes/No/NA – provide details if any clearances are outstanding or there is any difference between the status of contract packages, use NA if any clearances not yet required
Contractor(s) Given Access to Site	Yes/No – if more than one contract package, provide details if any difference between the status
Construction Progress (%)	If more than one contract package, provide details if any difference between the status
Unanticipated Impacts including Change of Scope or Design	Yes/No – if yes, provide brief details as to how the IEE and EMP will be updated as required
Number of Site Inspections and Audits Undertaken by Environment Safeguards Staff in Reporting Period	
Corrective Action Required from Previous Reporting Period	Yes/No/NA – use NA if this is the first project reporting period
Outstanding Corrective Action this Reporting Period	Yes/No/NA – if yes, provide bulleted summary of the key actions still required, use NA if the response to above is No or NA
Non-Compliances Recorded this Reporting Period	Yes/No – if yes, provide bulleted summary of the key non-compliances recorded
Corrective Action Required	Yes/No – if yes, provide bulleted summary of the key actions to be taken in response to non-compliances including timeline and budget
Number of Health and Safety Incidents	Provide brief details including how they were responded to

GRM Functional	Yes/No – briefly elaborate on set up if differs to description in IEE/EMP
Number of Unresolved Grievances from Prior Reporting Period	
Number of Grievances Received in Reporting Period	
Number of Grievances Resolved this Reporting Period	
Number of Grievances Still Outstanding	Provide brief details with timeline for resolution
Number of Grievances referred to Court of Law	Provide brief details
Number of Grievances referred to the Accountability Mechanism	Provide brief details

## 1.0 Introduction

### 1.1 Brief Project Description

{Maximum two pages to succinctly convey who the executing and implementing agencies are, the project outputs, construction works involved, details of contract packages, details of construction camps and other related facilities, national and ADB environmental safeguards project categorizations, and the environment safeguard documents (dates) applicable to the project}

{Include maps and plans showing the project site locations and project area of influence}

{Include table and/or organogram of environmental safeguards staffing and relationships between executing and implementing agencies, consultants, contractors, subcontractors, lenders, etc.}

### 1.2 Project Progress Status and Implementation Schedule

{Describe the implementation stage reached (design, pre-construction, construction, commissioning or O&M) and the % progress, main project activities and milestones achieved during the reporting period, including bidding documents issued and contracts awarded during the reporting period etc. No need to repeat progress information included in previous monitoring reports if no change, cross reference the previous monitoring reports if needed}

{Highlight any unanticipated impacts in relation to change in the project scope, locations or alignments of components, construction methods, and/or implementation schedule during the reporting period, if none confirm this.}

{Highlight any changes in the project organization and environmental safeguards staffing during the reporting period, if none confirm this}

{Report on any unanticipated impacts and updates to IEE/EMP that were required during the reporting period, status of delivery of documents, required amendments, consultation and disclosure undertaken etc.}

{The project Gantt chart may be included}

{Include a simplified table like the sample below to report progress}

Project Component/Stage	Target Completion Date {Revised Target Date, if delayed}	Progress Status {not yet started; ongoing; completed}	Percent Completed	Remarks
e.g. Substations (construction phase)				
• Contract award		Completed	100%	Contract awarded to XYZ contractor, copy of EMP included
• Construction (site clearance, earthworks, civil works, installation of equipment, ...)		Ongoing	85%	There was a delay in the delivery of equipment...

## 2.0 Compliance to National Regulations and International Agreements

{Status of compliance and further action to ensure ongoing compliance; if there is partial or no compliance recommendations for corrective action are required. Provide explanations of any instances where the requirements of regulations or agreements were breached along with details of responses taken to rectify the breach once identified. Include all the applicable National Regulations and International Agreements following the sample table below}

National Regulation or International Agreement	Compliance Requirements under the Regulation or Agreement including any Environmental Clearances Required	Compliance Status {complied; partially complied; not complied; still ongoing or n/a at current stage of the project}	Remarks {provide details (evidence) to show how compliance was achieved; or explain the corrective action to be taken if there was non-compliance including timeline and budget}

## 3.0 Compliance to Environmental Covenants from the ADB Loan Agreement

{Status of compliance and further action to ensure ongoing compliance; if there is partial or no compliance recommendations for corrective action are required. Provide explanations of any instances where covenants were breached along with details of responses taken to rectify the breach once identified. Include all the applicable Loan Agreement covenants on environment following the sample table below}

Schedule #, Para. #	Covenant	Compliance Status {complied; partially complied; not complied; still ongoing or n/a at current stage of the project}	Remarks {provide details (evidence) to show how compliance was achieved; or explain the corrective action to be taken if there was non-compliance including timeline and budget}

#### 4.0 Compliance to Project Administration Manual (PAM)

{Status of compliance and further action to ensure ongoing compliance; if there is partial or no compliance recommendations for corrective action are required. Provide explanations of any instances where tasks allocated to the executing or implementing agency and any consultants have not been undertaken along with details of responses taken to rectify the situation once identified. Include all applicable organizations with responsibility for environmental safeguards following the sample table below}

Organization	Tasks	Compliance Status {complied; partially complied; not complied; still ongoing or n/a at current stage of the project}	Remarks {provide details (evidence) to show how compliance was achieved; or explain the corrective action to be taken if there was non-compliance including timeline and budget}
Executing Agency			
Implementing Agency			
Consultants...			

#### 5.0 Compliance to Contract

{Status of compliance and further action to ensure ongoing compliance; if there is partial or no compliance recommendations for corrective action are required. Provide explanations of any instances where tasks allocated to the contractor have not been undertaken along with details of responses taken to rectify the situation once identified. Include all contract packages and provisions relating to environment, health and safety management following the sample table below}

Contract Package	Contract Provisions	Compliance Status {complied; partially complied; not complied; still ongoing or n/a at current stage of the project}	Remarks {provide sufficient details (evidence) to show how compliance was achieved; or explain the corrective action to be taken if there was non- compliance including timeline and budget}
Package 1			
Package 2			
Package 3...			

## 6.0 Compliance to Environmental Management Plan

{With reference to the EMP of the project, include a table following sample table below with the compliance status during the reporting period, with sufficient details (evidence) to show how compliance was achieved, or corrective action to be taken if there was non-compliance including timeline and budget}

{Flag if previous environmental monitoring report(s) included corrective action plan, if it did details of that corrective action plan should be incorporated into the EMP table and compliance status reported}

{Provide explanations of any instances where performance standards were temporarily exceeded during the reporting period, along with details of any response taken to rectify the exceedance once identified, even if at the end of the reporting period the project is deemed as being compliant}

{Copies of clearances, CEMP, construction method statements, and other documentation produced in accordance with EMP during the reporting period should be included as an appendix}

Item #	Requirement	Prior Corrective Action	Compliance Status {complied; partially complied; not complied; still ongoing or n/a at current stage of the project}	Remarks {provide sufficient details (evidence) to show how compliance was achieved; or explain the corrective action to be taken if there was non-compliance including timeline and budget}

## 7.0 Environmental Supervision and Monitoring Results

### 7.1 Environmental Supervision

{With reference to the EMP capacity development plan summarize trainings for the executing and implementing agencies, contractors, and subcontractors, and other activities completed. Include as appendices the training agenda, attendance sheets, and photos. If no trainings or other activities in reporting period, please confirm. Copies of training records related to EMP during the reporting period should be included as an appendix}

Trainings	Number and Position of Participant/s	Location/s and Date/s	Remarks

{With reference to the EMP budget table summarize details of budget allocated for EMP implementation and the current spend profile}

Activity	Allocated Budget	% Spend	Remarks
TOTAL			

{Site inspections and audits completed – summarize the number and type of site visits, persons involved, the issues covered, and status of compliance with them, the number of non-compliance notices given out to the contractor as a result of the site visit, and the checklists/reporting format used (sample of checklists and reports to be included as an appendix)}

Date	Type and Purpose of Visit	Location/s Visited	EA, IA, Consultant Staff Participating	Remarks

## 7.2 Quantitative Environmental Monitoring

{Environmental monitoring results – summarize in a table the reporting period’s quantitative monitoring activities and data obtained in accordance with the Environmental Monitoring Plan (EMoP) of the project. Provide explanations of any instances where performance standards were exceeded along with details of responses taken to rectify the exceedance once identified}

Typically, this section will include the results of:

- Noise and vibration surveys
- Water quality surveys
- Air quality surveys
- Flora and fauna surveys

{Indicate the monitoring locations using a map or plan, dates, times, duration of samples as applicable, weather conditions as applicable, parameters measured, equipment used, standards, tests, and limits used etc.}

{Corrective actions with timeline and budget are required to ensure any exceedances will be prevented in the future}

{Graphs can be used in this section to show trends; however, large tables of data or multiple graphs should be attached as an appendix.

{Calibration and QA certifications of monitoring equipment and laboratories analyzing samples should be included as an appendix}

## 7.3 Pollution Control Monitoring

{Pollution control monitoring results – summarize any pollution incidents during the reporting period in accordance with the Environmental Monitoring Plan (EMoP) of the project. Provide explanations of any instances where performance standards were exceeded along with details of responses taken to rectify the exceedance once identified}

{Corrective actions with timeline and budget are required to ensure any exceedances will be prevented in the future}

{Include the pollution control trainings/drills/inspections conducted during the reporting period following the sample table below. Include as appendices the training/drill/inspection agenda, attendance sheets, and photos. If no trainings/drills/inspections, please confirm}

Trainings/Drills/Inspections	Number and Position of Participant/s	Location/s and Date/s	Remarks

{If there were any materials used, solid or hazardous waste, or wastewater generated in the reporting period report following the sample table below. If no materials used or waste generated, please confirm}

Type of Materials/Waste	Approximate Volume (units)	Source or Destination	Remarks
Material examples: Transformer Oil Sand for Fill			
Waste examples: Sanitary Wastewater Spoil from Earthworks Old Transformers Hazardous Waste			

#### 7.4 Occupational and Community Health and Safety Monitoring

{Health and safety monitoring results – summarize the reporting period’s health and safety activities and data obtained in accordance with the Environmental Monitoring Plan (EMoP) of the project. Provide explanations of any instances where performance standards were exceeded along with details of responses taken to rectify the exceedance once identified}

{Corrective actions with timeline and budget are required to ensure any exceedances will be prevented in the future}

{Include the occupational and community trainings/drills/inspections conducted during the reporting period following the sample table below. Include as appendices the training/drill/inspection agenda, attendance sheets, and photos. If no trainings/drills/inspections, please confirm}

Trainings/Drills/Inspections	Number and Position of Participant/s	Location/s and Date/s	Remarks

{If there was any near-miss or accident, illness, or other occupational or community health and safety related incident during the reporting period (or a previously reported incident with ongoing rectification) report following the sample table below. Include as appendices work safety checklists, incident reports, and other relevant supporting documents. If no incidents, please confirm}

	Number and Position of Person/s Involved	Location/s and Date/s of Incident	Detailed Description of Incident	Time-bound Corrective Action
Fatality				
Non-fatal Injury (Lost Time)				
Non-fatal Injury (Minor)				
Near-miss				
Illness				
Other Incidents				

## 8.0 Meaningful Consultation and Grievance Redress

{Meaningful consultation – report on any ongoing consultation undertaken, and main issues raised by consultees; detailed consultation records should be included as an appendix. If no ongoing consultation, please confirm}

Date	Format/Venue	Participants (Occupation, M/F)	Main Issues Raised

{Include a brief description of the GRM, provide a flowchart, list of grievance redress committee members and any trainings they have received}

{If there was any grievance or complaint, regardless informal or minor, during the reporting period (or previously reported complaint with ongoing rectification) provide the corrective action taken following the sample table below. Detailed grievance records and response reports should be included as an appendix}

Complainant/s or Affected Persons	Location/s and Date/s of Complaint	Description of Grievance/Complaint	Timeline*	Time-bound Corrective Action

\* To be solved within 2 weeks

## 8.0 Conclusions and Recommendations

{Summarize the project's environmental performance during the reporting period based on the previous sections and, if any non-compliance identified, provide detailed recommendations including responsibilities, timeliness and budget for the preparation and completion of corrective action}

{If non-compliance is major or not readily addressed then a separate corrective action plan may need to be prepared. For minor and readily addressed non-compliances the corrective action plan can be incorporated into this final section of the environmental monitoring report following the sample table below}

Non-compliance	Corrective Action to be Taken	Responsibility	Timeline	Budget

## APPENDICES

**Photographs** {Include relevant photographs of the project site and project area of influence taken during the reporting period to provide evidence of compliance and/or non-compliance. For each photo, provide a caption with description of what it illustrates, accurate location, and date taken}

### Supporting Documents

- {E.g. Maps and plans
- Sample checklists and reports
- Clearances and documentation
- Training records
- Detailed monitoring data, laboratory results etc.
- Calibration and QA certificates
- Consultation records
- Meeting agendas and attendance records
- Grievance records
- Environment, health and safety report



**Appendix XIX: Terms of Reference for ESU, CSC and Individual ESMS  
Consultant**



### TOR Environment and Social Unit – DESCO Funded Staff

An Environment and Social Unit (ESU) comprising of qualified and experienced environmental and social development staff will be established under the DESCO management structure to support environmental and social safeguards implementation for DESCO's overall operations. The ESU technical staff will include the following suitably qualified and experienced staff (i) a full-time Environmental Officer, (ii) a full-time Health and Safety Officer, (iii) a full-time Social Officer, and (iv) a full time Labor Officer. The ESU technical staff will report to an Executive Engineer (Civil & Environment) managing the ESU who in turn would report to the Chief Engineer (Planning & Design).

Staff	Corporate Responsibility	Project Responsibility (delegated as part of PIU for various projects)	Qualifications and Experience
Executive Engineer (Civil & Environment)	<ul style="list-style-type: none"> <li>Management of ESU and liaison with DESCO management</li> <li>Ensuring all responsibilities of the team TOR are delivered</li> </ul>	<ul style="list-style-type: none"> <li>Management of ESU and liaison with PIU management</li> <li>Ensuring all responsibilities of the team TOR are delivered</li> </ul>	<ul style="list-style-type: none"> <li>Bachelors and masters in environmental management or related field</li> <li>At least 15 years of relevant experience</li> <li>Experience of ESU management</li> <li>Corporate ESMS implementation experience</li> </ul>
Environment Officer	<ul style="list-style-type: none"> <li>Plan and deliver corporate environment management training of DESCO staff and contractors</li> <li>Undertake inspections of DESCO operations to ensure staff and contractor environment compliance against ESMS requirements</li> <li>Corporate environment monitoring and reporting</li> <li>Support initial development of, annual review and updating of the environment aspects of the ESMS</li> </ul>	<ul style="list-style-type: none"> <li>Facilitation of environment management trainings</li> <li>Preparation of environmental assessment and/or manage consultants undertaking environmental assessment</li> <li>Review of contractor's environmental management plans</li> <li>Ensure implementation of EMP measures that are the responsibility of DESCO including during O&amp;M</li> <li>Support resolution environment related grievances</li> <li>Supervision and monitoring of project EMP implementation, instruction of corrective action through executive engineer</li> <li>Review contractor's progress reports, attend monthly meetings and support resolution of any issues</li> </ul>	<ul style="list-style-type: none"> <li>Bachelors and masters in environmental management or related field</li> <li>At least 5 years of relevant experience</li> <li>Experience of preparing environmental assessments</li> <li>Experience of environmental site supervision</li> <li>Experience of providing environment management training</li> <li>Corporate ESMS implementation experience</li> </ul>

Staff	Corporate Responsibility	Project Responsibility (delegated as part of PIU for various projects)	Qualifications and Experience
		<ul style="list-style-type: none"> <li>Prepare QPR inputs and environmental monitoring reports and/or manage consultants preparing them</li> </ul>	
Health and Safety Officer	<ul style="list-style-type: none"> <li>Plan and deliver corporate health and safety management training of DESCO staff and contractors</li> <li>Undertake inspections of DESCO operations to ensure staff and contractor health and safety compliance against ESMS requirements</li> <li>Corporate health and safety monitoring and reporting</li> <li>Support initial development of, annual review and updating of the H&amp;S aspects of the ESMS</li> </ul>	<ul style="list-style-type: none"> <li>Facilitation of health and safety management trainings and health and safety risk assessment workshops</li> <li>Review of contractor's health and safety risk assessments and management plans</li> <li>Ensure implementation of EMP measures that are the responsibility of DESCO including during O&amp;M</li> <li>Support resolution health and safety related grievances</li> <li>Supervision and monitoring of health and safety aspects of project EMP implementation, instruction of corrective action through executive engineer</li> <li>Review contractor's progress reports, attend monthly meetings and support resolution of any issues</li> <li>Provide inputs to and/or support review of consultant inputs to QPR and environment monitoring reports</li> </ul>	<ul style="list-style-type: none"> <li>Bachelors and masters in engineering or related field with IOSH, NEBOSH or equivalent health and safety certification</li> <li>At least 5 years of relevant experience</li> <li>Experience of preparing health and safety risk assessments and management plans</li> <li>Experience of health and safety site supervision</li> <li>Experience of providing health and safety training</li> </ul>
Social Officer	<ul style="list-style-type: none"> <li>Plan and deliver corporate social management training of DESCO staff and contractors</li> <li>Undertake inspections of DESCO operations to ensure staff and contractor environment compliance against ESMS requirements</li> <li>Corporate social monitoring and reporting</li> </ul>	<ul style="list-style-type: none"> <li>Facilitation of social management, community engagement and GRM trainings</li> <li>Preparation of Resettlement Plan and/or manage consultants undertaking Resettlement Plan</li> <li>Ensure implementation of EMP measures that are the responsibility of DESCO including ensuring active community and stakeholder involvement.</li> </ul>	<ul style="list-style-type: none"> <li>Bachelors and masters in social sciences or related field</li> <li>At least 5 years of relevant experience</li> <li>Experience of preparing resettlement, community engagement and gender action plans</li> </ul>

Staff	Corporate Responsibility	Project Responsibility (delegated as part of PIU for various projects)	Qualifications and Experience
	<ul style="list-style-type: none"> <li>Support initial development of, annual review and updating of the social aspects of the ESMS</li> </ul>	<ul style="list-style-type: none"> <li>Management of GRM at project level, maintenance of GRM records, support resolution social related grievances</li> <li>Supervision and monitoring of RP/GAP implementation and social/community engagement aspects of project EMP implementation, instruction of corrective action through executive engineer</li> <li>Review contractor's progress reports, attend monthly meetings and support resolution of any issues</li> <li>Prepare QPR/environment monitoring report inputs and social monitoring reports and/or manage consultants preparing them</li> </ul>	<ul style="list-style-type: none"> <li>Experience of managing a GRM</li> <li>Experience of providing social management training</li> <li>Corporate ESMS implementation experience</li> </ul>
Labor Officer	<ul style="list-style-type: none"> <li>Plan and deliver corporate labor management training of DESCO staff and contractors</li> <li>Undertake inspections of DESCO operations to ensure staff and contractor labor compliance against ESMS requirements</li> <li>Corporate labor monitoring and reporting</li> <li>Support initial development of, annual review and updating of the labor aspects of the ESMS</li> </ul>	<ul style="list-style-type: none"> <li>Facilitation of labor-related trainings</li> <li>Review of contractor's labor management plans</li> <li>Ensure implementation of EMP measures that are the responsibility of DESCO including during O&amp;M</li> <li>Support resolution labor related grievances</li> <li>Supervision and monitoring of labor aspects of project EMP implementation, instruction of corrective action through executive engineer</li> <li>Review contractor's progress reports, attend monthly meetings and support resolution of any issues</li> <li>Provide inputs to and/or support review of consultant inputs to QPR and environment monitoring reports</li> </ul>	<ul style="list-style-type: none"> <li>Bachelors and masters in social science or related field</li> <li>At least 5 years of relevant experience</li> <li>Experience of preparing labor management plans</li> <li>Experience of labor management site supervision</li> <li>Experience of providing labor management training</li> </ul>

### TOR of CSC Safeguards Team – Loan Funded

The PIU will engage a construction supervision consultant (CSC) to supervise the construction contractors to ensure compliance with detailed design standards and to assure the quality of the construction activities. The CSC will also include consultants to supervise the contractors on EMP and RP implementation.

For this purpose, CSC will engage one Environmental Specialist, one Health and Safety Specialist, one Social Development Specialist, and one Labor Specialist on a full time basis. In addition, the CSC will also engage part time technical specialists as required, such as, an ecologist for supervising of the project site clearance activities.

Role	Level	Time Input	Tasks	Qualifications
Environment Specialist (safeguard team manager)	International	Part-time 12 PM over 5 years	<ul style="list-style-type: none"> <li>Support DESCO in developing the training plan and provide environment and social training to the PIU and contractors as per the EMP requirement including operationalization of the grievance redress mechanism, ongoing meaningful consultation etc.</li> <li>Ensure the national environment, social and labor consultants are capacitated to undertake supervision and monitoring on a day-to-day basis.</li> <li>Provide inputs to and undertake quality assurance of IEE updates for design changes etc.</li> <li>Ensure EMP requirements are reflected in bidding and contract documents and reflected in bid evaluation, detailed designs prior to approval etc.</li> <li>Review and approve CEMP for the construction work with subplans for specific construction work activities, labor management subplan etc.</li> <li>Develop the systems for site inspections and weekly checks, record keeping and monthly reporting to PIU by the national environment, social and labor consultants.</li> <li>Participate (virtually) in monthly meetings to discuss EMP implementation progress and any issues</li> <li>Undertake quarterly site visits and lead on preparation</li> </ul>	<ul style="list-style-type: none"> <li>Bachelors and masters in environmental management or related field.</li> <li>At least fifteen (15) years of relevant experience including at least ten (10) years international experience.</li> <li>Experience in environment training and capacity development.</li> <li>Experience of environment supervision on MDB funded projects in a range of countries including those with mature environmental assessment and management enforcement practices and South Asia, ideally Bangladesh.</li> <li>Fluency in English is required.</li> </ul>

Role	Level	Time Input	Tasks	Qualifications
			of the environment monitoring reports.	
Health and Safety Specialist	International	Part-time 12 PM over 5 years	<ul style="list-style-type: none"> <li>• Support DESCO in developing the training plan and provide health and safety training to the PIU and contractors as per the EMP requirement.</li> <li>• Ensure the national health and safety and labor consultants are capacitated to undertake supervision and monitoring on a day-to-day basis.</li> <li>• Ensure health and safety aspects of the EMP requirements are reflected in bidding and contract documents and reflected in bid evaluation, detailed designs prior to approval etc.</li> <li>• Participate in H&amp;S risk assessment workshops for detailed design and for specific construction work activities, review and approve risk assessments and H&amp;S plans for the construction work with subplans for specific construction work activities.</li> <li>• Develop the systems for site inspections and weekly checks, record keeping and monthly reporting to PIU by the national health and safety and labor consultants.</li> <li>• Participate (virtually) in monthly meetings to discuss EMP implementation progress and any issues</li> <li>• Undertake quarterly site visits and contribute to preparation of the environment monitoring reports.</li> <li>• Provide the safeguards section including a detailed annex on safeguard performance of the project completion report.</li> </ul>	<ul style="list-style-type: none"> <li>• Bachelors and masters in engineering or related field with ISOH, NEBOSH or equivalent health and safety certification.</li> <li>• At least fifteen (15) years of relevant experience including at least ten (10) years international experience.</li> <li>• Experience in health and safety training and capacity development.</li> <li>• Experience of health and safety supervision on MDB funded projects in a range of countries including those with mature health and safety management practices and South Asia, ideally Bangladesh.</li> <li>• Fluency in English is required.</li> </ul>
Environment Specialist	National	Full-time	<ul style="list-style-type: none"> <li>• Review CEMP for the construction work with subplans for specific construction work activities.</li> <li>• Update the EIA/IEE as required including for final</li> </ul>	<ul style="list-style-type: none"> <li>• Bachelors and masters in environmental management or related field.</li> </ul>

Role	Level	Time Input	Tasks	Qualifications
			<p>routings of cables and lines including survey works and meaningful consultation.</p> <ul style="list-style-type: none"> <li>• Participate in monthly meetings to discuss EMP implementation progress and any issues</li> <li>• Undertake routine site inspections, weekly environment management checks and identify time bound corrective action where required</li> <li>• Support annual renewal of the EC from Department of Environment</li> <li>• Ensure contractor obtains and maintains records of all necessary environmental permits, licenses etc.</li> <li>• Ensure contractor undertakes environmental monitoring and maintains records per the EMoP</li> <li>• Support DESCO in undertaking any quantitative monitoring requirements e.g., air, noise, water quality levels.</li> <li>• Provide monthly reports to PIU and environment input to the QPR and environment monitoring reports</li> <li>• Support resolution of environment related grievances</li> </ul>	<ul style="list-style-type: none"> <li>• At least five (5) years of relevant experience.</li> <li>• Experience of preparing environmental assessments.</li> <li>• Experience of environment site supervision.</li> <li>• Fluency in English is required.</li> </ul>
Health and Safety Specialist	National	Full-time	<ul style="list-style-type: none"> <li>• Participate in H&amp;S risk assessment workshops for detailed design and for specific construction work activities, review risk assessments and H&amp;S plans for the construction work with subplans for specific construction work activities.</li> <li>• Participate in monthly meetings and H&amp;S committee meetings to discuss EMP implementation progress and any issues</li> </ul>	<ul style="list-style-type: none"> <li>• Bachelors and masters in engineering or related field with IOSH, NEBOSH or equivalent health and safety certification</li> <li>• At least 5 years of relevant experience</li> <li>• Experience of preparing health and safety risk assessments and management plans</li> </ul>

Role	Level	Time Input	Tasks	Qualifications
			<ul style="list-style-type: none"> <li>Undertake routine site inspections, weekly H&amp;S checks, issue internal stop notices, if necessary, for unsafe activities, and identify time bound corrective action where required</li> <li>Ensure contractor maintains H&amp;S statistics records for near misses, as well as incidents, report them accordingly to DESCO with lessons learned to avoid future repeats.</li> <li>Provide monthly health and safety reports to PIU and input to the QPR and environment monitoring reports</li> <li>Support resolution of health and safety related grievances</li> <li>Undertake awareness raising activities for workers and to the community to make them aware of the H&amp;S risks posed by the Project.</li> </ul>	<ul style="list-style-type: none"> <li>Experience of health and safety site supervision</li> <li>Fluency in English is required.</li> </ul>
Social Development Specialist	National	Full-time	<ul style="list-style-type: none"> <li>Participate in monthly meetings to discuss EMP implementation progress and any issues</li> <li>Update the EIA/IEE and RP as required including for final routings of cables and lines including meaningful consultation.</li> <li>Support DESCO in developing the community engagement plan and ensuring active community and stakeholder engagement.</li> <li>Provide monthly reports to PIU and social/community engagement input to the QPR and environment and social monitoring reports</li> <li>Ensure grievance records are being maintained.</li> <li>Support resolution of social related grievances</li> </ul>	<ul style="list-style-type: none"> <li>Bachelors and masters in social sciences or related field</li> <li>At least 5 years of relevant experience</li> <li>Experience of preparing resettlement, community engagement and gender action plans</li> <li>Experience of managing a GRM</li> <li>Fluency in English is required.</li> </ul>

Role	Level	Time Input	Tasks	Qualifications
Labor Specialist	National	Full-time	<ul style="list-style-type: none"> <li>Review labor management plans for the construction work.</li> <li>Ensure management of construction workers is per national and EMP requirements with labor camps and other contractor/subcontractor provided accommodation meeting international good practice standards.</li> <li>Ensure contractor and subcontractor labor records are being maintained and in compliance with national and EMP requirements including copies of insurances, contracts and working hours, eligibility of construction workers for employment etc.</li> <li>Participate in monthly meetings and H&amp;S committee meetings to discuss EMP implementation progress and any issues</li> <li>Undertake weekly sanitation and welfare facility checks and identify time bound corrective action where required</li> <li>Provide monthly labor reports to PIU and input to the QPR and environment monitoring reports</li> <li>Support resolution of labor related grievances</li> <li>Undertake awareness raising activities for workers</li> </ul>	<ul style="list-style-type: none"> <li>Bachelors and masters in social science or related field</li> <li>At least 5 years of relevant experience</li> <li>Experience of preparing labor management plans</li> <li>Experience of labor management site supervision</li> <li>Fluency in English is required.</li> </ul>
Ecologist	National	Part-time 4 PM over 5 years	<ul style="list-style-type: none"> <li>In accordance with the EMP requirements conduct ecology related field surveys/monitoring studies on behalf of DESCO.</li> <li>Provide ecological support in ensuring adherence to biodiversity provisions in the EMP e.g., full-time supervision of contractor's vegetation clearance.</li> </ul>	<ul style="list-style-type: none"> <li>Bachelors and masters in ecology or related field</li> <li>At least 5 years of relevant experience</li> <li>Experience of undertaking ecological survey work</li> </ul>

Role	Level	Time Input	Tasks	Qualifications
				<ul style="list-style-type: none"> <li>• Experience of ecological site supervision</li> <li>• Fluency in English is required.</li> </ul>

### TOR ESMS Expert – ADB TA Funded Consultant

The national Environment, Social Management Systems (ESMS) Expert will support DESCO by providing formal and on-the-job ESU staff training in relation to their corporate and project (initially in relation to the Dhaka Power System Expansion and Strengthening Project) responsibilities and developing together with the ESU staff a corporate ESMS that covers all DESCO's operations. The ESMS is to be designed so that it can be adopted by DESCO management at a corporate level with a view to securing ISO 14001 and ISO 45001 certification.

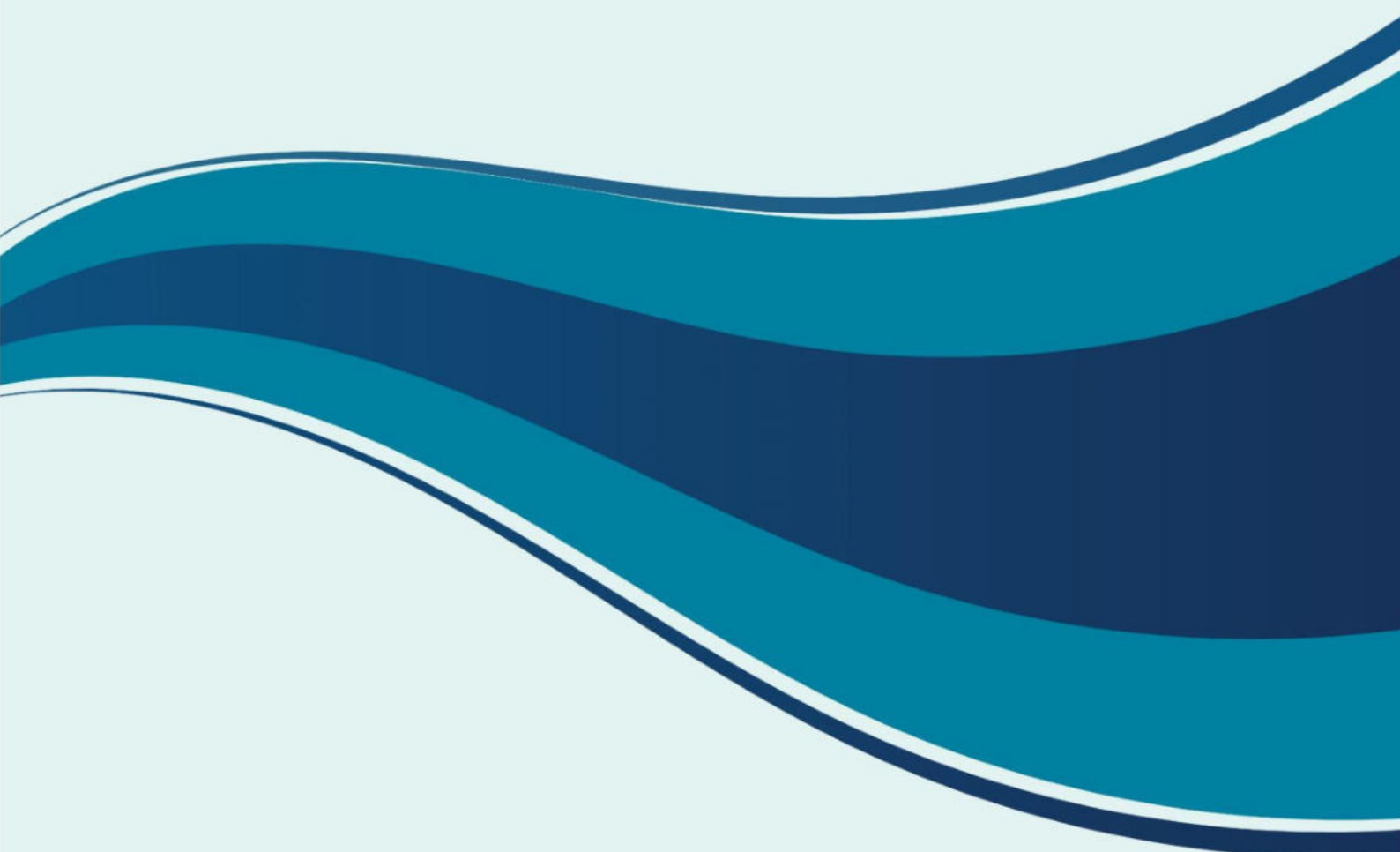
Role	Time Input	Qualifications
ESMS Expert	15 months = 6 months for initial training and ESMS establishment, followed by 9 months support over 5 years project implementation	<ul style="list-style-type: none"> <li>• Bachelors and masters in environmental management or related field.</li> <li>• At least fifteen (15) years of relevant experience in ESMS establishment.</li> <li>• Experience in environment training and capacity development.</li> <li>• Experience of developing ESMS to ISO certification standard for Bangladeshi energy sector organizations.</li> <li>• Experience of EHS supervision on MDB funded projects.</li> <li>• Fluency in English is required.</li> </ul>

The ESMS expert will be responsible for the following tasks:

- Familiarize with all of DESCO's operations through document reviews, meetings and consultations, and site visits to existing DESCO construction sites, maintenance works, operational substations, stores, test laboratories etc. and undertake gap analysis of the existing corporate-level systems of DESCO to inform ESMS development.
- Provide substantive inputs to and guide ESU staff and management on developing an ESMS at the corporate level which is included in the Design and Monitoring Framework outputs of the Dhaka Power System Expansion and Strengthening Project. As part of the ESMS development, environment and social policies, implementing procedures, SOPs, guidelines, and manuals will need to be prepared covering all aspects of environment management, health and safety management, involuntary resettlement, community engagement, labor management, gender, grievance redress, and other environment and social impacts and risks during the various construction, maintenance and operation activities of DESCO's operations.
- Ensure the resulting ESMS is agreeable to DESCO management to ensure its adoption by them, that it is capable of being ISO certified, and incorporates the following elements: (i) environmental and social policies and procedures, and applicable legal and other requirements; (ii) identification of impacts and risks of all DESCO's business operations (materials, processes, and services); (iii) organizational structure and staffing including skills and competencies on environmental and social safeguard-related areas; (iv) staff and contractor training and awareness; (v) operational monitoring including pollution, health and safety, and labor management inspections and records; (vi) annual internal

and third party ESMS audit arrangements and corrective action plans, as maybe required; and (vii) annual management reporting arrangement. GOB guidelines and GIIP such as the IFC ESMS Toolkit should be referred to by the ESMS expert ESMS: [https://www.ifc.org/wps/wcm/connect/6147cbba-efe8-4879-ba77-c7af63bede7c/ESMS\\_Toolkit\\_General.pdf?MOD=AJPERES&CVID=l50s00Z](https://www.ifc.org/wps/wcm/connect/6147cbba-efe8-4879-ba77-c7af63bede7c/ESMS_Toolkit_General.pdf?MOD=AJPERES&CVID=l50s00Z)

- Provide formal training and on-the-job advice and support to the initial and permanent ESU staff and management in relation to their corporate responsibilities in relation to the ESMS development and implementation, ensuring they have the capacity to identify future opportunities and advocate for environmentally sustainable and climate resilient planning and development in the future preparation of operational policies and procedures, strategies and road maps, and customer-oriented campaigns of DESCO.
- For roll out of the ESMS provide the ESU staff and management with formal training in the form of train-the-trainers on the ESMS to pave the way for its effective roll out and implementation following ESMS adoption. Training modules to cover environment, health and safety, involuntary resettlement, community engagement, labor, gender, grievance redress, and any other environment and social impacts and risks that are covered by the ESMS and in format that the ESU staff and management can deliver the training to other staff as part of the ESMS.
- Support and guide DESCO on getting the ESMS ISO certified .
- Provide formal training and on-the job-advice and support to the initial and permanent ESU staff and management in relation to their project responsibilities (initially this will be only in relation to the Dhaka Power System Expansion and Strengthening Project but will expand to other projects in future) to enable them to manage safeguard aspects in compliance with applicable MDB safeguard policies, loan covenants, national laws and regulations for environment, health and safety (labor), EMPs and RPs including quarterly site visits with ESU staff training them on identifying non-compliances, ensuring record keeping, preparing inputs to QPR and environmental and social monitoring reports etc.



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