Semi-Annual Social Safeguard Monitoring Report

Loan Number: 3365-IND

Reporting Period: Till Dec.'17

Green Energy Corridor and Grid Strengthening Project

Prepared by : ESMD, CORPORATE CENTRE, POWERGRID

Implementing Agency : POWERGRID

Executing Agency : POWERGRID

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ABBREVIATIONS

ADB	–	Asian Development Bank
CEA	–	Central Electricity Authority
CPTD	–	Compensation Plan for Temporary Damages
CTU	–	Central Transmission Utility
DFO	–	Divisional Forest Officer
ESPP	–	Environment and Social Policy & Procedures
ESMD	–	Environment & Social Management Department
EMP	–	Environmental Management Plan
GRM	–	Grievances Redressal Mechanism
GRC	–	Grievance Redressal Committee
HVDC	–	High Voltage Direct Current
IEE	–	Initial Environmental Examination
Km/km	–	Kilometers
MoEFCC	–	Ministry of Environment, Forest and Climate Change
NBWL	–	National Board for Wildlife
PAPs	–	Project Affected Persons
POWERGRID	–	Power Grid Corporation of India Ltd.
PMU	–	Project Management Unit
RE	–	Renewable Energy
RoW	–	Right of Way
S/s	–	Substation
SBWL	–	State Board for Wildlife
USD	–	United States Dollar
VSC	–	Voltage Source Converter

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SECTION 1: INTRODUCTION

Power Grid Corporation of India Ltd. (POWERGRID), the Central Transmission Utility (CTU) of the country, is engaged in power transmission with the mandate for planning, co-ordination, supervision and control over complete Inter-State transmission system. It has been contributing significantly towards development of Indian power sector by undertaking coordinated development of power transmission network along with effective and transparent operation of regional grids and through continuous innovations in technical & managerial fields.

The Green Energy Corridor and Grid Strengthening Project has been planned to facilitate the transfer of renewable energy, as well as increasing interregional connectivity. This project is a subset of India's 'green energy corridor' initiative to ensure that transmission system development is commensurate with renewable energy capacity development over time. The project will also incorporate increasing interregional transmission capacity between the southern and western regional systems via an 800 kV HVDC link. The Green Energy Corridor and Grid Strengthening Project includes of number of projects consisting of 800 kV HVDC, 765 kV and 400 kV, 320 kV VSC based transmission lines and associated 800 kV HVDC & 320 kV terminals, 765/400kV substation as part of increased inter-regional connectivity between India's western and southern regional power grids. The details of projects are as below;

a. Establishment of +800 kV, 6000 MW HVDC system between the Western (Raigarh) and Southern (Pugalur) Regions;

   Southern Region is facing power deficit mainly due to delay/deferment of anticipated generation projects and non-availability of gas for existing gas projects in Southern Region. Presently, maximum power demand of Southern region is about 39,000 MW and faces a deficit of about 3400 MW inspite of import capacity of about 4950 MW from NEW grid. As per 18th EPS of CEA the expected power demand of Southern region by the end of XII and XIII plan would be about 57,200 MW and 82,200 MW respectively. Power transfer requirement to Southern Region is expected to increase in coming years. Therefore, in view of large deficit and requirement of transmission system to meet future demands, the implementation of HVDC link has been proposed with a capacity of 6000 MW.

b. Establishment of Pugalur - Trichur 2000 MW VSC Based HVDC System;

   Considering the RoW problem in Kerala and dispersal of power beyond Pugalur, establishment of Voltage Source Converter (VSC) based 2000 MW HVDC link between Pugalur and North Trichur (Kerala) has been proposed. The present project will improve import capability of Southern Region.

c. Green Energy Corridor (Part-D);

   About 33 GW Renewable capacity addition has been envisaged in 12th Plan in the eight renewable energy rich States, viz. Rajasthan, Gujarat, Tamil Nadu, Maharashtra, Karnataka, Andhra Pradesh, Himachal Pradesh and J&K through Wind/ Solar & small Hydro generation. Considering above quantum of envisaged renewable capacity, it is expected that some of the Renewable Energy (RE) resource rich States including Rajasthan shall have more RE capacity than the capacity required for fulfilling their Renewable Purchase Obligations (RPO).

Further, such RE rich host State may not absorb full RE energy locally particularly during the other than peak hour conditions when renewable generation is at peak. Intermittency/ variability, inherent characteristics of renewable, also necessitates requirement of strong grid interconnections for grid stability.

For dispersal of power, high capacity transmission corridor, as part of inter-State transmission system, connecting major renewable pockets is being proposed right from the Bhuj Pooling Station in Gujarat (Western Region) to Moga in Punjab (Northern Region) via Chittorgarh/ Ajmer/ Bikaner in Rajasthan (NR). For onward dispersal of power beyond Ajmer/ Bikaner, 765 kV High capacity transmission corridor is proposed towards Moga in Punjab, a major load centre in Northern Region, as part of the subject scheme "Green Energy Corridors ISTS - Part-D".

d. 400 kV AC Power Transmission system associated with HVDC terminal stations at Pugalur, Tamil Nadu

The Project involves construction of 400 kV AC Transmission system for transfer of power from Pugalur HVDC Terminal to 400 kV AC network of Tamil Nadu.

The total project cost is about $2.5 billion However, to meet the funding requirement for the proposed project, Asian Development Bank (ADB) has accepted POWERGRID's proposal to finance $500 million as Sovereign loan under Loan No.-3365-IND for implementation of Green Energy Corridor and Grid Strengthening Project. The funding for the remaining part will be met from POWERGRID's own Internal Resources (IR). The above said was signed on 23rd February, 2017 and became effective from 22nd March, 2017. The loan closing date is 30th June, 2021.

1.1 OVERALL PROJECT DESCRIPTION

Following subprojects are covered under the subject loan:

1. Establishment of +800 kV, 6000 MW HVDC system between the Western (Raigarh) and Southern (Pugalur) Regions;

    a) Establishment of Raigarh ±800kV HVDC Station with 6000MW HVDC terminals.
    b) Establishment of Pugalur ±800kV HVDC Station with 6000MW HVDC terminals.

2. Establishment of Pugalur - Trichur 2000 MW VSC Based HVDC System;

    a) Establishment of VSC based ±320 kV, 2000 MW HVDC link between Pugalur and North Trichur (Kerala)- **Underground Cable portion: 32 km**
    b) ±320 kV, 2000 MW VSC based HVDC terminal at Pugalur.
    c) ±320 kV, 2000 MW VSC based HVDC terminal at North Trichur.

3. Green Energy Corridor (Part-D)

    a) Ajmer (New) – Bikaner (New) 765 kV D/c line – **263 km**
    b) Bikaner (New) – Moga (POWERGRID) 765 kV D/c line – **293 km**
    d) LILO of one circuit of 400 kV Bhadla (RVPN) - Bikaner (RVPN) D/c line at Bikaner (New) – **9 km**
    c) 765/400 kV Substation at Bikaner.

4. 400 kV AC Power Transmission system associated with HVDC terminal stations at Pugalur, Tamil Nadu

    a) Pugalur HVDC Station – Pugalur (Existing) 400 kV (quad) D/c line- **58 km**.
    b) Pugalur HVDC Station – Arasur 400 kV (quad) D/c line - **60 km**
    c) Pugalur HVDC Station – Thiruvalam 400 kV (quad) D/c line - **390 km**
    d) Pugalur HVDC Station – Edayarpalayam 400 kV (quad) D/c line - **57 km**
    e) Edayarpalayam – Udumulpet 400 kV (quad) D/c line - **54 km**

1.2 PROJECT OBJECTIVES

The objective of the project is to increase transmission of renewable energy and inter-regional connectivity leading to increase in overall efficiency and more reliable transmission system capacity in selected regions of India.

1.3 SAFEGUARD CATEGORY

As per the Asian Development Bank's (ADB) safeguard classification of project on the basis of potential impacts, the Green Energy Corridor and Grid Strengthening Project are classified under Involuntary Resettlement & Indigenous Peoples as category 'B' & "C" respectively.

1.4 SOCIAL PERFORMANCE INDICATOR:

The following parameters which are considered as key indicators for this project need to be monitored to evaluate the social performance.

i) Selection of optimum route/substation site having least social impacts and also avoiding socially sensitive areas like human habitations, places of cultural/historical significance;
ii) Taking due care of Project Affected Persons (PAPs) including timely payment of compensation and addressing their grievances, if any;
iii) Compliance to Loan Covenants agreed with ADB;
iv) Compliance to provisions mentioned in Compensation Plan for Temporary Damages (CPTD)/Environment Management Plan (EMP).

1.5 OVERALL PROJECT PROGRESS, AGREED MILESTONES & COMPLETION SCHEDULES

Name of project	Project Details	Progress as on Dec.'2017	Completion Schedule
Establishment of +800 kV, 6000 MW HVDC system between the Western (Raigarh) and Southern (Pugalur) Regions	**Substation:** Establishment of Raigarh ±800 kV HVDC Station with 6000 MW HVDC terminals. a) Establishment of Pugalur ±800 kV HVDC Station with 6000 MW HVDC terminals	Engineering, Foundation and Civil Works are under progress	Nov.'2019
Establishment of Pugalur - Trichur 2000 MW VSC Based HVDC System	**Transmission Line:** Establishment of VSC based ±320 kV, 2000 MW HVDC link between Pugalur and North Trichur (Kerala) (UG cable: 32 Kms)	Engineering and Civil Works are under progress	Apr.'2020

	Substation: a) ±320 kV, 2000 MW VSC based HVDC terminal at Pugalur. b) ±320 kV, 2000 MW VSC based HVDC terminal at North Trichur.		
Green Energy Corridor (Part-D)	**Transmission Line:** a) Ajmer (New) – Bikaner (New) 765 kV D/c b) Bikaner (New) – Moga (POWERGRID) 765 kV D/c c) LILO of one circuit of 400 kV Bhadla (RVPN) - Bikaner (RVPN) D/c line at Bikaner (New) **Substation:** a) 765/400 kV Substation at Bikaner.	Foundation and Erection are under progress.	May'2019
400 kV AC Power Transmission system associated with HVDC terminal stations at Pugalur, Tamil Nadu	**Transmission Line:** a) Pugalur HVDC Station – Pugalur (Existing) 400 kV (quad) D/c. b) Pugalur HVDC Station – Arasur 400 kV (quad) D/c. c) Pugalur HVDC Station – Thiruvalam 400kV (quad) D/c. d) Pugalur HVDC Station – Edayarpalayam 400kV(quad)D/c. e) Edayarpalayam – Udumulpet 400 kV (quad) D/c.	Engineering Works are under progress	Feb.'2020

SECTION 2: COMPLIANCE STATUS WITH MAJOR LOAN COVENANTS

POWERGRID has complied with various social safeguards as agreed in the loan covenants. The point wise compliance status is presented in the table below;

Project Specific Covenants	**Reference**	**Status of Compliance**
The Borrower shall ensure, or cause to be ensured, that all land and all rights-of-way required for the Project are made available to the Works contractor in accordance with the schedule agreed under the related Works contract and all land acquisition and resettlement activities are implemented in compliance with (a) all applicable laws and regulations of the Guarantor and the relevant States relating to land acquisition and involuntary resettlement; (b) ESPP; (c) the Involuntary Resettlement Safeguards; and (d) all measures and requirements set forth in the CPTD, and any corrective or preventative actions set forth in a Safeguards Monitoring Report.	LA, Sch. 5, para. 15	Complied/Being complied.

Without limiting the application of the Involuntary Resettlement Safeguards or the CPTD, the Borrower shall ensure that no involuntary resettlement takes place in connection with the Project until compensation and other entitlements have been provided to affected people. In the case of temporary damages, the provisions of the CPTD shall be ensured.	LA, Sch. 5, para. 16	Complied/Being complied.
In the event irrigation supplies are disrupted and affected farmers experience losses, the Borrower shall ensure that valuation of the losses shall be consistent with the provisions of the CPTD and timely compensation is provided in respect thereof.	LA, Sch. 5, para. 17	Complied/Being complied.
The Borrower shall make available necessary budgetary and human resources to fully implement the EMP, the CPTD and any corrective or preventative actions set forth in a Safeguards Monitoring Report.	LA, Sch. 5, para. 18	Complied/Being complied.
The Borrower shall ensure that all bidding documents and contracts for Works contain provisions that require contractors to: (a) comply with the measures relevant to the contractor set forth in the IEE, the EMP and the CPTD (to the extent they concern impacts on affected people during construction), and any corrective or preventative actions set forth in a Safeguards Monitoring Report; (b) make available a budget for all such environmental and social measures;	LA, Sch. 5, para. 19	Complied/Being complied.
(c) provide the Borrower with a written notice of any unanticipated environmental, resettlement or indigenous peoples risks or impacts that arise during construction, implementation or operation of the Project that were not considered in the IEE, the EMP, the CPTD and any corrective or preventative actions set forth in a Safeguards Monitoring Report; (d) adequately record the condition of roads, agricultural land and other infrastructure prior to starting to transport materials and construction; and (e) reinstate pathways, other local infrastructure, and agricultural land to at least their pre-project condition upon the completion of construction.		

The Borrower shall do the following: (a) submit semiannual Safeguards Monitoring Reports to ADB and disclose relevant information from such reports to affected persons promptly upon submission; (b) if any unanticipated environmental and/or social risks and impacts arise during construction, implementation or operation of the Project that were not considered in the IEE, the EMP and the CPTD, promptly inform ADB of the occurrence of such risks or impacts, with detailed description of the event and proposed corrective action plan; (c) report any actual or potential breach of compliance with the measures and requirements set forth in the EMP and the CPTD promptly after becoming aware of the breach; and (d) in the event unexpected significant safeguard impacts are identified, promptly engage qualified and experienced external expert or agency under terms of reference intimated to ADB, to verify information produced through the Project monitoring process, and facilitate the carrying out of any verification activities by such external experts.	LA, Sch. 5, para. 20	Being complied. No such issues come across till date. Will be complied in case of any breach. But till date no such breach reported. Will be complied if such situation warrants.
The Borrower shall ensure that subsequent to award of Works contract, no Works are commenced by the contractor unless the applicable provisions of the IEE, the EMP and the CPTD, as approved by ADB, have been complied with.	LA, Sch. 5, para. 21	Compliance ensured
In relation to the Project, the Borrower shall cause the contractors to undertake detailed survey of the affected persons during transmission line alignment finalization. The Borrower shall prepare the CPTD which meets ADB's requirements, and update it based upon the detailed design information during the survey carried out by Works contractors. The Borrower shall submit to ADB for approval the revised CPTD progressively during the implementation of the related Works.	LA, Sch. 5, para. 22	Complied/Being complied.
Any changes to the location, land alignment, or environment impacts on account of detailed designs of the Project shall be subject to prior approval by ADB before commencement of Works for transmission lines or substations under the Project.	LA, Sch. 5, para. 23	No such deviations reported so far.
In the event of any significant or related impacts on indigenous peoples, the Borrower shall prepare and implement an indigenous peoples plan in accordance with the applicable laws and regulations of the Guarantor and the relevant States, and the Indigenous Peoples Safeguards.	LA, Sch. 5, para. 24	Complied/Being complied.

SECTION: 3 STATUS OF LAND & SOCIAL COMPLIANCES

Details of land required for proposed substations, land status and social compliance is given below in **Table 1**.

Table 1: Details of Substation Land

S. N	Name of Substation	Area (acre)/ Land Type	Land Status	Land Compensation (In Rs. Million)	Social Compliance
1	±800 kV HVDC terminals at Raigarh.	110/ Govt.	Land already available in POWERGRID existing Raigarh (Kotra) substation	Not Applicable	Since the land is already available in its existing Raigarh (Kotra) substation, no fresh land is secured by POWERGRID. Hence, there is no need of Rehabilitation Action Plan (RAP).
2	±800 kV HVDC terminals at Pugalur	149.37 (144.9 Pvt. + 4.47 Govt.)	Land possession taken	189.53	**Private land:** Since, subject land was purchased through willing buyer-willing seller basis on negotiated rate, no involuntary acquisition is involved. Consequently, there are no Project Affected Persons (PAPs) and also R&R issues, hence, there is no need of Rehabilitation Action Plan (RAP). **Govt land:** No R&R issues involved hence, there is no need of Rehabilitation Action Plan (RAP).
3	±320 kV HVDC terminal at Pugalur.				
4	±320 kV, HVDC terminal at North Trichur	31.44 /Govt.	Land transferred to POWERGRID through MoU with Kerala Agricultural University	349.10	No R&R issues involved hence, there is no need of Rehabilitation Action Plan (RAP).
5	Transition Station at Vadakacheri	0.55/ Govt.	Land given to POWERGRID on long term lease by Kerala State Electricity Board	1.66	No R&R issues involved hence, there is no need of Rehabilitation Action Plan (RAP).
6	765/400 kV Substation at Bikaner.	120/ Govt.	Land transferred to POWERGRID	9.12	No R&R issues involved hence, there is no need of Rehabilitation Action Plan (RAP).

A summary of the environmental & social mitigation measures, their monitoring vis-à-vis compliance by POWRGRID is given in **Table- E1**.

a. Compensation for Tree/crop damages:

POWERGRID follows the principle of Avoidance, Minimization and Mitigation in the construction of line in agricultural field having crop due to inherent flexibility in phasing the construction activity and tries to defer construction in cropped area to facilitate crop

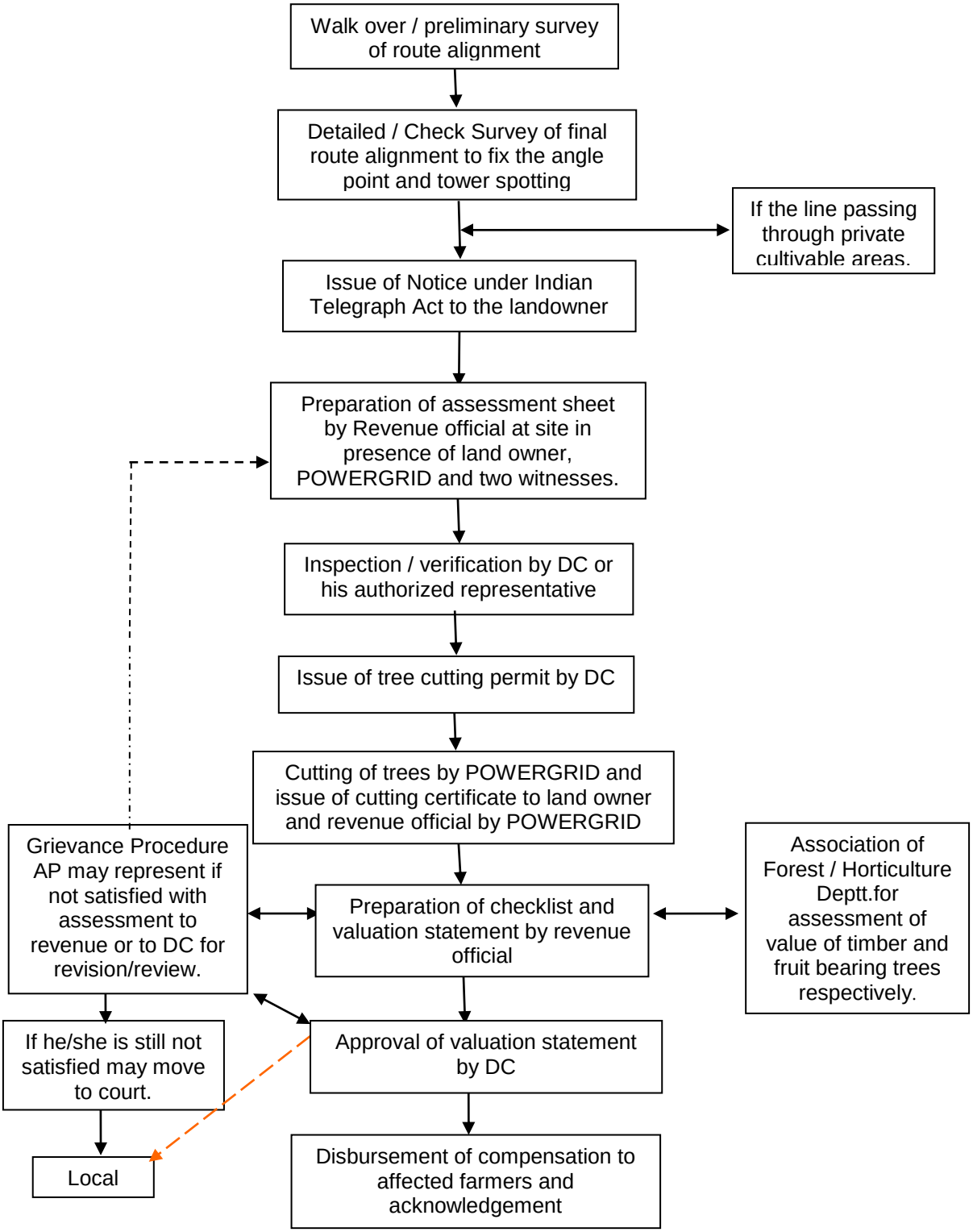
harvesting. However, if it is unavoidable and is likely to affect project schedule, compensation is given at market rate for standing crops. The process of tree/crop compensation is depicted in **Figure 1**. All efforts are also taken to minimize the crop damage to the extent possible in such cases. In the instant project also POWERGRID is taking all possible measures to avoid damages to crop/trees by taking up the construction activities during lean period or post-harvest season. As per the prevailing norms farming activity is allowed after the construction work is completed. However, compensation for the loss of crops/trees/any structure etc. are paid to Affected Persons (APs) for the area of damage to mitigate the impacts probably 3 times i.e. during foundation work, tower erection & stringing as per the prevailing situation. Details of line wise compensation paid for Tree & Crop damages is given in **Table- 2**

Table 2: Details of Crop & Tree compensation

S. No.	Name of the Line	Nos. of Person issued notice	Affected Land Area (Ha.)	Nos. of Tree	Compensation Paid for crop damages(Rs million)			Compensation Paid for Tree damages(Rs million)		
					Fdn.	Erection	Stringing	Fdn.	Erection	Strg.
A	**Establishment of +800 kV, 6000 MW HVDC system between the Western (Raigarh) and Southern (Pugalur) Regions**									
	Line is not under the scope of funding hence, compensation details are not included									
B	**Establishment of Pugalur - Trichur 2000 MW VSC Based HVDC System**									
	Only Underground portion is covered under scope of funding. However, as the line being laid underground along existing NH-544 corridor with RoW of 2 m. POWERGRID already obtained NoC from National Highways Authority of India (NHAI) after depositing cost @ 1 lakhs/km and hence additional compensation towards tree/crop is anticipated.									
C	**Green Energy Corridor (Part-D)**									
1	765 kV D/C Ajmer- Bikaner	813	177.41	Nil	9.27	5.87	Nil	Nil	Nil	Nil
2	765 kV D/c Bikaner- Moga	250	80.51	Nil	1.83	1.90	Nil	Nil	Nil	Nil
3	LILO 1 ckt 400kV Bhadla- Bikaner	10	1.76	Nil	0.192	Nil	Nil	Nil	Nil	Nil
	Sub-total(C)	**1073**	**259.68**	**Nil**	**11.292**	**7.77**	Nil	Nil	Nil	Nil
D	**400 kV AC Power Transmission System Associated with HVDC Terminal Station at Pugalur end**									
1	400 kV D/C Pugalur-Pugalur	Civil works not yet started								
2	400 kV D/C Pugalur-Arasur									
3	400 kV D/C Pugalur-Thiruvalam									
4	400 kV D/C Pugalur-Edayarpalayam									
5	400 kV D/C Edayarpalayam - Udumulpet									
	Sub-total(D)	Nil								
	Grand Total	**1073**	**259.68**	**Nil**	**11.292**	**7.77**	Nil	Nil	Nil	Nil

A total sum of **Rs 19.062 million** has been paid as tree/crop compensation till December, 2017 against the provision of Rs. 592 million as per DPR. A sample copy of crop compensation notice along with assessment sheet is enclosed at **Annexure-1.**

Figure 1 :TREE / CROP COMPENSATION PROCESS



b. Land Compensation as per MoP Guidelines:

Ministry of Power (MoP), Govt of India vide their guidelines dated 15th October 2015 mandated payment of 85% land cost for the land coming under tower base and payment of maximum 15% of land cost for the land coming under the line corridor. However, these guidelines are subject to adoption by state governments for implementation in respective states. Till date, only Govt. of Tamil Nadu & Kerala has adopted these guidelines among the states, where the project is being executed, while State of Rajasthan is yet to adopt these guidelines. The details of land compensation paid as per the provisions of the said guidelines are given in **Table- 3**:

Table -3 : Details of Land Compensation as per MoP Guidelines

S. No.	Name of the Line	Total Compensation paid for area under Tower Base (Rs)	Total Compensation paid for area under RoW Corridor (Rs)	Rate of Land Compensation (Rs)	Remark, if any
A.	**Green Energy Corridor (Part-D)**				
1	765 kV D/C Ajmer-Bikaner	Not Applicable	Not Applicable	Not Applicable	Rajasthan State has yet to adopt the MoP Guidelines
2	765 kV D/c Bikaner-Moga				
3	LILO 1 ckt 400kV Bhadla- Bikaner				
B.	**400 kV AC Power Transmission System Associated with HVDC Terminal Station at Pugalur end**				
1	400 kV D/C Pugalur-Pugalur	Civil works not yet started			
2	400 kV D/C Pugalur-Arasur				
3	400 kV D/C Pugalur-Thiruvalam				
4	400 kV D/C Pugalur-Edayarpalayam				
5	400 kV D/C Edayarpalayam - Udumulpet				
Total		**Nil**	**Nil**	**Nil**	

TABLE – E1 : ENVIRONMENT MANAGEMENT PLAN

Cl. No.	Project activity / stage	Potential Impact	Proposed mitigation measures	Parameter to be monitored	Measurement & frequency	Institutional responsibility	Implementation schedule	Compliance Status
Pre-construction								
1	Location of line towers and line alignment and design	Exposure to safety related risks	Setback of dwellings to line route designed in accordance with permitted level of power frequency and the regulation of supervision at sites	Tower location and alignment selection with respect to nearest dwellings	Setback distances to nearest houses – once	POWERGRID	Part of tower sitting survey and detailed alignment survey &design	Details of compliance provided in environment monitoring report.
2	Equipment specifications and design parameters	Release of chemicals and gases in receptors (air, water, land)	PCBs not used in substation transformers or other project facilities or equipment.	Transformer design	Exclusion of PCBs in transformers stated in tender specification – once	POWERGRID	Part of tender specifications for the equipment	
			Processes, equipment and systems not to use chlorofluorocarbons (CFCs), including halon, and their use, if any, in existing processes and systems should be phased out and to be disposed of in a manner consistent with the requirements of the Govt.	Process, equipment and system design	Exclusion of CFCs stated in tender specification – once	POWERGRID	Part of tender specifications for the equipment	
					Phase out schedule to be prepared in case still in use – once		Part of equipment and process design	
3	Transmission line design	Exposure to electromagnetic interference	Line design to comply with the limits of electromagnetic interference from power lines including those of ICNIRP	Electromagnetic field strength for proposed line design	Line design compliance with relevant standards – once	POWERGRID	Part of design parameters	

Cl. No.	Project activity / stage	Potential Impact	Proposed mitigation measures	Parameter to be monitored	Measurement & frequency	Institutional responsibility	Implementation schedule	Compliance Status
4	Substation location and design	Exposure to noise	Design of plant enclosures to comply with National ambient noise standards which are also compatible with the EHS guidelines of the World Bank.	Expected noise emissions based on substation design	Compliance with regulations - once	POWERGRID	Part of detailed siting survey and design	Details of compliance provided in environment monitoring report.
		Social inequities	Careful selection of site to avoid encroachment of socially, culturally and archaeological sensitive areas (i.e. sacred groves, graveyard, religious worship place, monuments etc.)	Selection of substation location (distance to sensitive area).	Consultation with local authorities - once	POWERGRID	Part of detailed siting survey and design	Complied during survey. Route alignment criterion is part of survey contract.
5	Location of line towers & line alignment and design	Impact on water bodies	Avoidance of such water bodies to the extent possible. Avoidance of placement of tower inside water bodies to the extent of possible	Tower location and line alignment selection (distance to water bodies)	Consultation with local authorities– once	POWERGRID	Part of tower siting survey and detailed alignment survey and design	Complied Route alignment criterion is part of survey contract.
		Social inequities	Careful route selection to avoid existing settlements and sensitive locations	Tower location and line alignment selection (distance to	Consultation with local authorities and land owners – once	POWERGRID	Part of tower siting survey and detailed alignment survey and design	
			Minimise impact on agricultural land	Tower location and line alignment selection (distance to agricultural land)	Consultation with local authorities and land owners – once			

Cl. No.	Project activity / stage	Potential Impact	Proposed mitigation measures	Parameter to be monitored	Measurement & frequency	Institutional responsibility	Implementation schedule	Compliance Status
			Careful selection of site and route alignment to avoid encroachment of socially, culturally & archaeological sensitive areas (i. g. sacred groves, graveyard, religious worship place, monuments etc.)	Tower location and line alignment selection (distance to sensitive area)	Consultation with local authorities - once			
6	Securing lands for substations.	Loss of land/ income change in social status etc.	In the case of Involuntary Acquisitions, Compensation and R&R measures are extended as per provision of RFCTLARRA, 2013[1]	Compensation and monetary R&R amounts/ facilities extended before possession of land.	As per provisions laid out in the act	POWERGRID	Prior to award/start of substation construction.	Land for proposed substations are either prior existing land under POWERGRID's control or Govt land or private land purchased through willing buyer – willing seller basis on negotiated rates. For details of lands & compensation thereof refer **Table- 2**.
7	Line through protected area/ precious ecological area	Loss of precious ecological values/ damage to precious species	Avoid siting of lines through such areas by careful site and alignment selection (National Parks, Wildlife Sanctuary, Biosphere Reserves/ Biodiversity Hotspots)	Tower location and line alignment selection (distance to nearest designated ecological protected/ sensitive areas)	Consultation with local forest authorities - once	POWERGRID	Part of tower siting survey and detailed alignment survey and design	Details of compliance provided in environment monitoring report.

[1] No Involuntary acquisition of land (permanent) is involved, hence this clause shall not be applicable.

Cl. No.	Project activity / stage	Potential Impact	Proposed mitigation measures	Parameter to be monitored	Measurement & frequency	Institutional responsibility	Implementation schedule	Compliance Status
			Minimize the need by using RoW wherever possible	Tower location and line alignment selection	Consultation with local authorities and design engineers- once	POWERGRID	Part of tower siting survey &detailed alignment survey and design	
8	Line through identified Elephant corridor / Migratory bird	Damage to the Wildlife/ Birds and also to line	Study of earmarked elephant corridors to avoid such corridors, Adequate ground clearance, Fault clearing by Circuit Breaker, Barbed wire wrapping on towers, reduced spans etc., if applicable	Tower location and line alignment selection. Minimum /maximum ground clearance	Consultation with local forest authorities – once. Monitoring – quarterly basis	POWERGRID	Part of tower sitting and detailed alignment survey & design and Operation	
			Avoidance of established/ identified migration path (Birds & Bats). Provision of flight diverter/ reflectors, bird guard, elevated perches, insulating jumper loops, obstructive perch deterrents, raptor hoods etc[2]., if applicable	Tower location and line alignment selection	Consultation with local forest authorities - once	POWERGRID	Part of tower siting survey and detailed alignment survey and design	
9	Line through forestland	Deforestation and loss of biodiversity edge effect	Avoid locating lines in forest land by careful site and alignment selection	Tower location and line alignment selection (distance to	Consultation with local authorities-once	POWERGRID	Part of tower siting survey and detailed alignment survey and design	

[2] As per International/National best practices and in consultation with concerned forest/wildlife Authority.

Cl. No.	Project activity / stage	Potential Impact	Proposed mitigation measures	Parameter to be monitored	Measurement & frequency	Institutional responsibility	Implementation schedule	Compliance Status
			Minimise the need by using existing towers, tall towers and RoW, wherever possible	nearest protected or reserved forest)	Consultation with local authorities and design engineers- once			
			Measures to avoid invasion of alien species	Intrusion of invasive species	Consultation with local forest authorities-once			
			Obtain statutory clearances from the Government	Statutory approvals from Government	Compliance with regulations – once for each			
10	Lines through farmland	Loss of agricultural production/ change in cropping pattern	Use existing tower or footings wherever possible.	Tower location and line alignment	Consultation with local authorities and	POWERGRID	Part of detailed alignment survey and design	Complied during survey which is a part of survey contract. However, as per law of land, no land is acquired for transmission line tower but all damages are compensated as per provisions of Electricity Act, 2003 and Indian Telegraph Act, 1885..
			Avoid sitting new towers on farmland wherever feasible	Tower location and line alignment selection	Consultation with local authorities and design engineers- once		Part of detailed sitting & alignment survey /design	
11	Noise related	Nuisance to neighbouring properties	Substations sited and designed to ensure noise will not be a nuisance and shall comply with National Ambient Noise Standards, which are also compatible with the EHS guidelines of the World Bank.	Noise levels	Noise levels to be specified in tender documents- once	POWERGRID	Part of detailed equipment design	Details of compliance provided in environment monitoring report
12	Interference with drainage patterns/	Flooding hazards/ loss of	Appropriate sitting of towers to avoid channel interference	Tower location and line alignment	Consultation with local authorities and	POWERGRID	Part of detailed alignment survey and design	Complied/Being complied. Appropriate siting of towers

Cl. No.	Project activity / stage	Potential Impact	Proposed mitigation measures	Parameter to be monitored	Measurement & frequency	Institutional responsibility	Implementation schedule	Compliance Status
	irrigation channels	agricultural production		selection (distance to nearest flood zone)	design engineers- once			ensured during alignment survey and Tower spotting to avoid channel interference.
13	Escape of polluting materials	Environmental pollution	Transformers designed with oil spill containment systems, and purpose-built oil, lubricant and fuel storage system, complete with spill clean up equipment.	Equipment specifications with respect to potential pollutants	Tender document to mention specifications – once	POWERGRID	Part of detailed equipment design /drawings	Details of compliance provided in environment monitoring report.
			Substations to include drainage and sewage disposal systems to avoid offsite land and water pollution.	Substation sewage design	Tender document to mention detailed specifications – once	POWERGRID	Part of detailed substation layout and design /drawings	
14	Equipments submerged under flood	Contamination of receptors	Substations constructed above the high flood level(HFL) by raising the foundation pad	Substation design to account for HFL (elevation with respect to HFL elevation)	Base height as per flood design- once	POWERGRID	Part of detailed substation layout and design/drawings	
15	Explosions /Fire	Hazards to life	Design of substations to include modern fire fighting equipment	Substation design compliance with fire prevention and control codes	Tender document to mention detailed specifications – once	POWERGRID	Part of detailed substation layout and design /drawings	
			Provision of fire fighting equipment to be located close to transformers					
Construction								
16	Equipment layout and installation	Noise and vibrations	Construction techniques and machinery selection seeking to minimize	Construction techniques and machinery	Construction techniques and machinery	POWERGRID (Contractor through	Construction period	Details of compliance provided in environment monitoring

Cl. No.	Project activity / stage	Potential Impact	Proposed mitigation measures	Parameter to be monitored	Measurement & frequency	Institutional responsibility	Implementation schedule	Compliance Status
			ground disturbance.		creating minimal ground disturbance- once at the start of each construction phase	contract provisions)		report
17	Physical construction	Disturbed farming activity	Construction activities on cropping land timed to avoid disturbance of field crops (within one month of harvest wherever possible).	Timing of start of construction	Crop disturbance – Post harvest as soon as possible but before next crop – once per site	POWERGRID (Contractor through contract provisions)	Construction period	Complied/ Being complied. Construction on farm land undertaken mostly during post-harvest period. Wherever, crop loss occurs, compensation is paid to farm owners and an amount of **Rs 19.062 million** has been paid till Dec.'17 (for details refer **Table -2**).
18	Mechanized construction	Noise, vibration and operator safety, efficient operation	Construction equipment to be well maintained.	Construction equipment – estimated noise emissions	Complaints received by local authorities – every 2 weeks	POWERGRID (Contractor through contract provisions)	Construction period	Details of compliance provided in environment monitoring report.
		Noise, vibration, equipment wear and tear	Turning off plant not in use.	Construction equipment – estimated noise emissions and operating schedules	Complaints received by local authorities – every 2 weeks	POWERGRID (Contractor through contract provisions)	Construction period	

Cl. No.	Project activity / stage	Potential Impact	Proposed mitigation measures	Parameter to be monitored	Measurement & frequency	Institutional responsibility	Implementation schedule	Compliance Status
19	Construction of roads for accessibility	Increase in airborne dust particles	Existing roads and tracks used for construction and maintenance access to the line wherever	Access roads, routes (length and width of new access roads to be constructed)	Use of established roads wherever possible – every 2 weeks	POWERGRID (Contractor through contract provisions)	Construction period	
		Increased land requirement for temporary accessibility	New access ways restricted to a single carriageway width within the RoW.	Access width (meters)	Access restricted to single carriage – way width within RoW – every 2 weeks	POWERGRID (Contractor through contract provisions)	Construction period	
20	Construction activities	Safety of local villagers	Coordination with local communities for construction schedules, Barricading the construction area and spreading awareness among locals	Periodic and regular reporting /supervision of safety arrangement	No. of incidents- once every week	POWERGRID (Contractor through contract provisions)	Construction period	
		Local traffic obstruction	Coordination with local authority, requisite permission for smooth flow of traffic. Imposing speed limits on Project vehicles in project/habitation areas.	Traffic flow (Interruption of traffic)	Frequency (time span)- on daily basis	POWERGRID (Contractor through contract provisions)	Construction period	
21	Temporary blockage of utilities	Overflows, reduced discharge	Measure in place to avoid dumping of fill materials in sensitive drainage area	Temporary fill placement (m^3)	Absence of fill in sensitive drainage areas – every 4 weeks	POWERGRID (Contractor through contract provisions)	Construction period	
22	Site clearance	Vegetation	Marking of vegetation to be removed prior to clearance, and strict control on clearing activities to ensure minimal clearance.	Vegetation marking and clearance control (area in m^2)	Clearance strictly limited to target vegetation – every 2 weeks	POWERGRID (Contractor through contract provisions)	Construction period	

Cl. No.	Project activity / stage	Potential Impact	Proposed mitigation measures	Parameter to be monitored	Measurement & frequency	Institutional responsibility	Implementation schedule	Compliance Status
			No use of herbicides and pesticides					
23	Trimming /cutting of trees within RoW	Fire hazards	Trees allowed growing up to a height within the RoW by maintaining adequate clearance between the top of tree and the conductor as per the regulations.	Species-specific tree retention as approved by statutory authorities (average and max. tree height at maturity, in	Presence of target species in RoW following vegetation clearance – once per site	POWERGRID (Contractor through contract provisions)	Construction period	
		Loss of vegetation and deforestation	Trees that can survive pruning to comply should be pruned instead of cleared.	Species-specific tree retention as approved by statutory	Presence of target species in RoW following vegetation	POWERGRID (Contractor through contract	Construction period	
			Felled trees and other cleared or pruned vegetation to be disposed of as authorized by the statutory bodies.	Disposal of cleared vegetation as approved by the statutory authorities (area cleared in m^2)	Use or intended use of vegetation as approved by the statutory authorities – once per site	POWERGRID (Contractor through contract provisions)	Construction period	
24	Wood/ vegetation harvesting	Loss of vegetation and deforestation	Construction workers prohibited from harvesting wood in the project area during their employment, (apart from locally employed staff continuing current legal activities)	Illegal wood /vegetation harvesting (area in m^2, number of incidents reported)	Complaints by local people or other evidence of illegal harvesting – every 2 weeks	POWERGRID (Contractor through contract provisions)	Construction period	
25	Surplus earthwork/soil	Runoff to cause water pollution, solid waste disposal	Soil excavated from tower footings/ substation foundation disposed of by placement along roadsides, or at nearby	Soil disposal locations and volume (m^3)	Acceptable soil disposal sites – every 2 weeks	POWERGRID (Contractor through contract provisions)	Construction period	

Cl. No.	Project activity / stage	Potential Impact	Proposed mitigation measures	Parameter to be monitored	Measurement & frequency	Institutional responsibility	Implementation schedule	Compliance Status
			house blocks if requested by landowners					
26	Substation construction	Loss of soil	Loss of soil is not a major issue as excavated soil will be mostly reused for leveling and re-filling. However, in case of requirement of excess soil the same will be met from existing quarry or through deep excavation of existing pond or other nearby barren land with agreement of local communities	Borrow area sitting (area of site in m^2 and estimated volume in m^3)	Acceptable soil borrow areas that provide a benefit - every 2 weeks	POWERGRID (Contractor through contract provisions)	Construction period	Details of compliance provided in environment monitoring report.
		Water pollution	Construction activities involving significant ground disturbance (i.e. substation land forming) not undertaken during the monsoon season	Seasonal start and finish of major earthworks(P^H, BOD /COD, Suspended solids, others)	Timing of major disturbance activities –prior to start of construction activities	POWERGRID (Contractor through contract provisions))	Construction period	
27	Site clearance	Vegetation	Tree clearances for easement establishment to only involve cutting trees off at ground level or pruning as appropriate, with tree stumps and roots left in place and ground cover left undisturbed	Ground disturbance during vegetation clearance(area, m^2)	Amount of ground disturbance – every 2 weeks	POWERGRID (Contractor through contract provisions)	Construction period	
				Statutory approvals	Statutory approvals for tree clearances – once for each site			

Cl. No.	Project activity / stage	Potential Impact	Proposed mitigation measures	Parameter to be monitored	Measurement & frequency	Institutional responsibility	Implementation schedule	Compliance Status
28	Tower erection Substation foundation-disposal of surplus earthwork/fill	Waste disposal	Excess fill from substation/tower foundation excavation disposed of next to roads or around houses, in agreement with the local community or landowner.	Location and amount (m^3)of fill disposal	Appropriate fill disposal locations – every 2 weeks	POWERGRID (Contractor through contract provisions)	Construction period	
29	Storage of chemicals and materials	Contamination of receptors (land, water, air)	Fuel and other hazardous materials securely stored above high flood level.	Location of hazardous material storage; spill reports (type of material spilled, amount (kg or m^3) and action taken to control and clean up spill)	Fuel storage in appropriate locations and receptacles – every 2 weeks	POWERGRID (Contractor through contract provisions)	Construction period	
30	Construction schedules	Noise nuisance to neighbouring properties	Construction activities only undertaken during the day and local communities informed of the construction schedule.	Timing of construction (noise emissions, [dB(A)]	Daytime construction only – every 2 weeks	POWERGRID (Contractor through contract provisions)	Construction period	
31	Provision of facilities for construction workers	Contamination of receptors (land, water, air)	Construction workforce facilities to include proper sanitation, water supply and waste disposal facilities.	Amenities for Workforce facilities	Presence of proper sanitation, water supply and waste disposal facilities – once each new facility	POWERGRID (Contractor through contract provisions)	Construction period	
32	Influx of migratory workers	Conflict with local population to share	Using local workers for appropriate asks	Avoidance/ reduction of conflict through enhancement/	Observation & supervision–on weekly basis	POWERGRID (Contractor through contract	Construction period	Complied/ Being Complied. Local workforce being used based on skill and

Cl. No.	Project activity / stage	Potential Impact	Proposed mitigation measures	Parameter to be monitored	Measurement & frequency	Institutional responsibility	Implementation schedule	Compliance Status
		local resources		augmentation of resource requirements		provisions)		no incidents of conflict reported so far
33	Lines through farmland	Loss of agricultural productivity	Use existing access roads wherever possible	Usage of existing utilities	Complaints received by local people /authorities - every 4 weeks	POWERGRID (Contractor through contract provisions)	Construction period	Being complied. No complaints received from local peoples/authorities
			Ensure existing irrigation facilities are maintained in working	Status of existing facilities				
			Protect /preserve topsoil and reinstate after construction completed	Status of facilities (earthwork in m^3)				
			Repair /reinstate damaged bunds etc after construction completed	Status of facilities (earthwork in m^3)				
		Loss of income.	Land owners/ farmers compensated for any temporary loss of productive land as per existing regulation.	Process of Crop/tree compensation in consultation with forest dept.(for timber yielding tree) and Horticulture deptt. (for fruit bearing tree)	Consultation with affected land owner prior to implementation and during execution.	POWERGRID	During construction	Tried to minimise the loss. However, if there is any damage to tree/crop then damages are compensated. An amount of **Rs 19.062 million** paid towards crops & tree compensation during construction till December' 17(for details refer **Table -2**)..
34	Uncontrolled erosion/silt runoff	Soil loss, downstream siltation	Need for access tracks minimised, use of existing roads.	Design basis and construction procedures (suspended solids in	Incorporating good design and construction management practices – once	POWERGRID (Contractor through contract provisions)	Construction period	Details of compliance provided is part of environment monitoring report
			Limit site clearing to work areas					

Cl. No.	Project activity / stage	Potential Impact	Proposed mitigation measures	Parameter to be monitored	Measurement & frequency	Institutional responsibility	Implementation schedule	Compliance Status
			Regeneration of vegetation to stabilise works areas on completion (where applicable)	receiving waters; area re-vegetated in m^2; amount of bunds constructed [length in meter, area in m^2, or volume in m^3])	for each site			
			Avoidance of excavation in wet season					
			Water courses protected from siltation through use of bunds and sediment ponds					
35	Nuisance to nearby properties	Losses to neighbouring land uses/ values	Contract clauses specifying careful construction practices.	Contract clauses	Incorporating good construction management practices – once for each site	POWERGRID (Contractor through contract provisions)	Construction period	Complied/ Being Complied. No complaints received so far.
			As much as possible existing access ways will be used	Design basis and layout	Incorporating good design engineering practices– once for each site			
			Productive land will be reinstated following completion of construction	Reinstatement of land status (area affected, m^2)	Consultation with affected parties – twice – immediately after completion of construction			

Cl. No.	Project activity / stage	Potential Impact	Proposed mitigation measures	Parameter to be monitored	Measurement & frequency	Institutional responsibility	Implementation schedule	Compliance Status
		Social inequities	Compensation will be paid for loss of production, if any.	Implementation of Tree/Crop compensation (amount paid)	Consultation with affected parties – once in a quarter	POWERGRID	Prior to construction	Compensation provided as per POWERGRID's procedure for tree/crop compensation. . An amount of **Rs 19.062 million** paid towards crops & tree compensation during construction till December' 17(for details refer **Table -2**).
36	Flooding hazards due to construction impediments of natural drainage	Flooding & loss of soils, contamination of receptors (land, water)	Avoid natural drainage pattern/ facilities being disturbed/blocked/ diverted by on-going construction activities	Contract clauses (e.g. suspended solids and BOD/COD in receiving water)	Incorporating good construction management practices-once for each site	POWERGRID (Contractor through contract provisions)	Construction period	Details of compliance provided is part of environment monitoring report
37	Equipment submerged under flood	Contamina-tion of receptors (land, water)	Equipment stored at secure place above the high flood level(HFL)	Store room level to be above HFL (elevation difference in meters)	Store room level as per flood design-once	POWERGRID	Construction period	
38	Inadequate siting of borrow areas (quarry areas)	Loss of land values	Existing borrow sites will be used to source aggregates, therefore, no need to develop new sources of aggregates	Contract clauses	Incorporating good construction management practices – once for each site	POWERGRID (Contractor through contract provisions))	Construction period	
39	Health and safety	Injury and sickness of workers and	Safety equipment's (PPEs) for construction workers	Contract clauses (18.1.3, 18.3.1.1, 18.3.1.4 etc)	Contract clauses compliance –	POWERGRID (Contractor through	Construction period	

Cl. No.	Project activity / stage	Potential Impact	Proposed mitigation measures	Parameter to be monitored	Measurement & frequency	Institutional responsibility	Implementation schedule	Compliance Status
		members of the public	Contract provisions specifying minimum requirements for construction workers camps	(requirements of worker camp, number of incidents and total lost-work days caused by injuries and sickness)	once every quarter	contract provisions)		
			Contractor to prepare and implement a health and safety plan.					
			Contractor to arrange for health and safety training sessions					
40	Inadequate construction stage monitoring	Likely to maximise damages	Training of environmental monitoring personnel	Training schedules	No. of programs attended by each person – once a year	POWERGRID	Routinely throughout construction period	Provides proper training and have very good environmental monitoring process. Appropriate clause incorporated in contact provision for EMP implementation. Site managers review the implementation on daily basis.
			Implementation of effective environmental monitoring and reporting system using checklist of all contractual	Respective contract checklists and remedial actions taken thereof.	Submission of duly completed checklists of all contracts for each site - once			
			Appropriate contact clauses to ensure satisfactory implementation of contractual	Compliance report related to environmental aspects for the contract	Submission of duly completed compliance report for each contract – once			
Operation and Maintenance								
41	Location of line towers and line alignment & design	Exposure to safety related risks	Setback of dwellings to overhead line route designed in accordance with permitted level of power frequency and the regulation of supervision at sites.	Compliance with setback distances ("as-built" diagrams)	Setback distances to nearest houses – once in quarter	POWERGRID	During operations	Since, the project is in construction stage, this clause is not applicable at present
42	Line through identified bird	Injury/ mortality to	Avoidance of established/ identified	Regular monitoring for	No. of incidents-once every	POWERGRID	Part of detailed siting and	-do-

Cl. No.	Project activity / stage	Potential Impact	Proposed mitigation measures	Parameter to be monitored	Measurement & frequency	Institutional responsibility	Implementation schedule	Compliance Status
	flyways, migratory path	birds, bats etc. due to collision and electrocution	migration path (Birds & Bats). Provision of flight diverter/reflectors, elevated perches, insulating jumper loops, obstructive perch deterrents, raptor hoods etc., if applicable	any incident of injury/mortality	month		alignment survey /design and Operation	
43	Equipment submerged under flood	Contamination of receptors (land, water)	Equipment installed above the high flood level (HFL) by raising the foundation pad.	Substation design to account for HFL ("as-built" diagrams)	Base height as per flood design – once	POWERGRID	During operations	-do-
44	Oil spillage	Contamination of land/nearby water bodies	Each transformer has a secure and impervious underlying pit with a storage capacity of at least 20% of the total oil volume of the transformer and the individual pits are connected to a main collection sump of capacity of 220% of largest transformer oil volume, which acts as a Secondary Containment, in case of a leakage. (refer para 8.6 of TS)	Substation bunding (Oil sump) ("as-built" diagrams)	Bunding (Oil sump) capacity and permeability - once	POWERGRID	During operations	-do-
45	SF_6 management	Emission of most potent GHG causing climate	Reduction of SF6 emission through awareness, replacement of old seals, proper handling	Leakage and gas density/level	Continuous monitoring	POWERGRID	During Operations	-do-

Cl. No.	Project activity / stage	Potential Impact	Proposed mitigation measures	Parameter to be monitored	Measurement & frequency	Institutional responsibility	Implementation schedule	Compliance Status
		change	& storage by controlled inventory and use, enhance recovery and applying new technologies to reduce leakage					
46	Inadequate provision of staff/workers health and safety during operations	Injury and sickness of staff /workers	Careful design using appropriate technologies to minimise hazards	Usage of appropriate technologies (lost work days due to illness and injuries)	Preparedness level for using these technologies in crisis – once each year	POWERGRID	Design and operation	-do-
			Safety awareness raising for staff.	Training/awareness programs and mock drills	Number of programs and percent of staff /workers covered – once each year			
			Preparation of fire emergency action plan and training given to staff on implementing emergency action plan					
			Provide adequate sanitation and water supply facilities	Provision of facilities	Complaints received from staff /workers every 2 weeks			
47	Electric Shock Hazards	Injury/ mortality to staff and public	Careful design using appropriate technologies to minimise hazards	Usage of appropriate technologies (no. of injury incidents, lost work days)	Preparedness level for using these technology in crisis- once a month	POWERGRID	Design and Operation	-do-
			Security fences around substations	Maintenance of fences	Report on maintenance – every 2 weeks			
			Barriers to prevent climbing on/ dismantling of towers	Maintenance of barriers				

Cl. No.	Project activity / stage	Potential Impact	Proposed mitigation measures	Parameter to be monitored	Measurement & frequency	Institutional responsibility	Implementation schedule	Compliance Status
			Appropriate warning signs on facilities	Maintenance of warning signs				
			Electricity safety awareness raising in project areas	Training/awareness programs and mock drills for all concerned parties	Number of programs and percent of total persons covered –once each year			
48	Operations and maintenance staff skills less than acceptable	Unnecessary environmental losses of various types	Adequate training in O&M to all relevant staff of substations & line maintenance crews.	Training/awareness programs and mock drills for all relevant staff	Number of programs and percent of staff covered – once each year	POWERGRID	Operation	-do-
			Preparation and training in the use of O&M manuals and standard operating practices					
49	Inadequate periodic environmental monitoring.	Diminished ecological and social values.	Staff to receive training in environmental monitoring of project O & M activities	Training/awareness programs and mock drills for all relevant staff	Number of programs and percent of staff covered – once each year	POWERGRID	Operation	-do-
50	Equipment specifications and design parameters	Release of chemicals and gases in receptors (air, water, land)	Processes, equipment and systems using chlorofluorocarbons (CFCs) including halon, should be phased out and to be disposed of in a manner consistent with the requirements of the Govt.	Process, equipment and system design	Phase out schedule to be prepared in case still in use – once in a quarter	POWERGRID	Operation	-do-

Cl. No.	Project activity / stage	Potential Impact	Proposed mitigation measures	Parameter to be monitored	Measurement & frequency	Institutional responsibility	Implementation schedule	Compliance Status
51	Transmission line maintenance	Exposure to electromagnetic interference	Transmission line design to comply with the limits of electromagnetic interference from overhead power lines	Required ground clearance (meters)	Ground clearance -once	POWERGRID	Operation	-do-
52	Uncontrolled growth of vegetation	Fire hazard due to growth of tree/shrub /bamboo along RoW	Periodic pruning of vegetation to maintain requisite electrical clearance No use of herbicides/ pesticides	Requisite clearance (meters)	Assessment in consultation with forest authorities- once a year (pre/post monsoon	POWERGRID	Operation	-do-
53	Noise related	Nuisance to neighbouring properties	Substations sited and designed to ensure noise will not be a nuisance	Noise levels {dB(A)}	Noise levels at boundary nearest to properties & consultation with affected parties if any - once	POWERGRID	Operation	-do-

SECTION: 4 APPROACH AND METHODOLOGY ENGAGED FOR SOCIAL MONITORING OF THE PROJECT

Monitoring is a continuous process and it continues throughout the Project life cycle, starting from site selection to construction and maintenance stage. A Project Management Unit (PMU), headed by Executive Director (Corporate Planning), has been set up at headquarters to coordinate and implement all environment and social issues with the assistance of functional department like Environment & Social Management Deptt., Engineering etc. Apart from site managers reviewing progress on daily basis, regular project review meetings are held at least on monthly basis, chaired by the Executive Director of the region, wherein the social aspects of the projects are discussed and remedial measures taken, wherever required. The exceptions of these meetings is submitted to the Directors and Chairman & Managing Director (CMD).

POWERGRID has a separate monitoring department, which carry out real time monitoring of all parameters of project implementation including the environment and social issues. Such issues are discussed in detail during every quarter in the Project Review Meeting (PRM), which is chaired by Director (Projects). CMD also takes periodic review of project implementation.

SECTION: 5 DETAILS OF GRIEVENCE REDRESS COMMITTEE AND COMPLAINT RECEIVED AND ACTION TAKEN

Grievance Redress Mechanism (GRM) is an integral and important mechanism for addressing/resolving the concerns and grievances in a transparent and swift manner. Many minor concerns of peoples are addressed during public consultation process initiated at the beginning of the project. For handling grievance, Grievance Redress Committee (GRC) has been established both at the project/scheme level and at Corporate/HQ level. The site/project level GRCs constituted also include members from POWERGRID, Local Administration, Panchayat Members, Affected Persons representative and reputed persons from the society on nomination basis under the chairmanship of project head. The corporate level GRC functions under the chairmanship of Director (Projects) and includes one representative from corporate ESMD who is conversant with the environment & social issues. As per information collected from different sites, no major complaints have been registered till date. However, some minor issues brought to the notice were resolved instantly through discussion & deliberation by local project officials.

Additionally, GRM process is in built in the tree & crop compensation process, where affected persons are given a chance to place their grievances after issuance of notice by revenue officials on the basis of assessment of actual damages. Grievances received towards compensation are generally addressed in open forum and in the presence of many witnesses. Process of spot verification and random checking by the district collector also provides forum for raising the grievance towards any irregularity/complaint. Apart from this, POWERGRID officials also listen to the complaints of affected farmers and the same are forwarded to revenue official for doing the needful and, if required, POWERGRID takes necessary action to mitigate the concern of the affected.

SECTION: 6 CONCLUSION

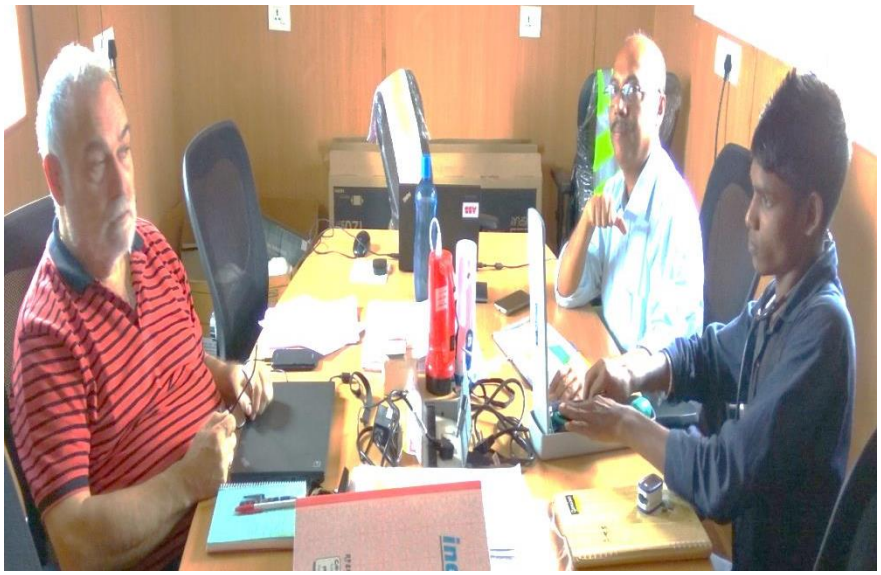
From the above discussions, it is evident that all efforts have been made to minimize the social impacts associated with the project. The endeavor to minimize the social impacts started right from the selection of land for the proposed substations. Out of total 411.36 acres of land required for the proposed 6 substations, 266.46 acres of land is Government land having no Project Affected persons (PAPs) and was transferred to POWERGRID without creating any adverse social issues. The balance 144.90 acres of private land required for proposed Pugalur HVDC terminals (for both ± 800 kV & ± 320 kV) was purchased through willing buyer- willing seller basis on negotiated rate without warranting involuntary acquisition.

Similarly during construction of transmission lines, efforts were made to avoid damage to standing crops and trees. However, in unavoidable cases, compensation was paid at market rate for damage to standing crops. Accordingly, in the instant project till Dec.'2017 a total of 1073 persons were issued notices for 259.68 ha. of crop area damaged and a total of Rs. 19.062 million (Rs.11.29 million during foundation and 7.77 million during erection) compensation was paid so far (refer **Table-2**).

In view of aforesaid, it may be noted that all possible measures have already been implemented to safeguard the interest of PAP. Moreover, in long run the instant investment for infrastructure development shall have a positive impact on several socio-economic indicators in the nearby community and will ward off any temporary offset faced due to said project.

R.K.SRIVASTAVA
General Manager (ESMD)

Plate 1: Health Check-up/Protection for Workers



Annexure -1: Sample Copy of Compensation Process

पावर ग्रिड कॉरपोरेशन ऑफ इण्डिया लिमिटेड

(भारत सरकार का उद्यम)

416 765 कि.वो. द्वि-परिपथ बीकानेर-मोगा पारेषण लाईन भाग-III

हनुमानगढ़

फार्म सं. .....

दिनांक : 27.10.17

सेवा में,

श्री/श्रीमती..... सूरज राम ..... पुत्र/पुत्री/पत्नी श्री..... पतराम .....

ग्राम.....6 RPM.....डाकघर..... पीलीबंगा .....पिनकोड.....तहसील..... नोहर जिला..... हनुमानगढ़

विषय : 765 कि.वो. द्वि-परिपथ बीकानेर-मोगा पारेषण लाईन (भाग-III के अर्न्तगत) के निर्माण से होनी वाली क्षतिग्रस्त फसल/वृक्ष के मुआवजे के विषय में।

महोदय/महोदया,

पावर ग्रिड कारपोरेशन ऑफ इंडिया लिमिटेड (भारत सरकार का उद्यम) द्वारा विद्युत अधिनियम 2003 एवं भारतीय टेलीग्राफ एक्ट 1885 के अंतर्गत आपको सूचित किया जाता है कि 765 कि.वो. द्वि-परिपथ बीकानेर-मोगा पारेषण लाईन भाग-II के बनाते समय उचित ध्यान रखा जायेगा कि फसल की कम से कम क्षति हो, फिर भी अपरिहार्य कारणों से उपरोक्त लाईन के निर्माण के समय नष्ट हुई आपकी क्षतिग्रस्त फसल की क्षतिपूर्ति, जो राजस्व विभाग या अन्य सक्षम सरकारी विभाग द्वारा उपलब्ध कराये गये आंकलन पर नियमानुसार निर्धारित की जायेगी, का भुगतान स्वामित्व सत्यापन के उपरांत किया जायेगा।

फसल का विवरण :-

क्रमांक	टावर संख्या	क्षतिग्रस्त फसल का विवरण	किल्ला/खसरा संख्या/ग्राम	अन्य विवरण
01.	50/0	तिल = 50×50 = 2500 m² ग्वार 50×30 = 1500 m² ग्वार 12×40 = 480 m² 4480 m²	ख. नं. 177/C0 9.9.12	

मैं / हम प्रमाणित करता हूँ / करते हैं कि :-

1. नुकसान हुए फसल/वृक्ष का केवल मैं / हम ही मालिक हूँ / है यदि अन्य कोई इस पर अपना स्वामित्व प्रमाणित करता है तो मैं उसके लिए मैं/हम स्वयं उत्तरदायी होंगे।
2. उपरोक्त दी गई सूचना सत्य एवं मान्य है।

देवीलाल (पुत्र)

फसल स्वामी के हस्ताक्षर.....

नाम : ..... प्रतिराम S/o पतराम .....

पता : ..... 6 RPM पीलीबंगा .....

मोबाईल नं. ..... 09772370712 .....

प्रमाणित किया जाता है कि श्री.....वास्तविक रूप से क्षतिग्रस्त फसल का मालिक है और भूमि श्री.....के नाम दर्ज है।

भूमि स्वामित्व सत्यापित

हस्ताक्षर राजस्व अधिकारी

हस्ताक्षर सरपंच/ग्राम प्रधान

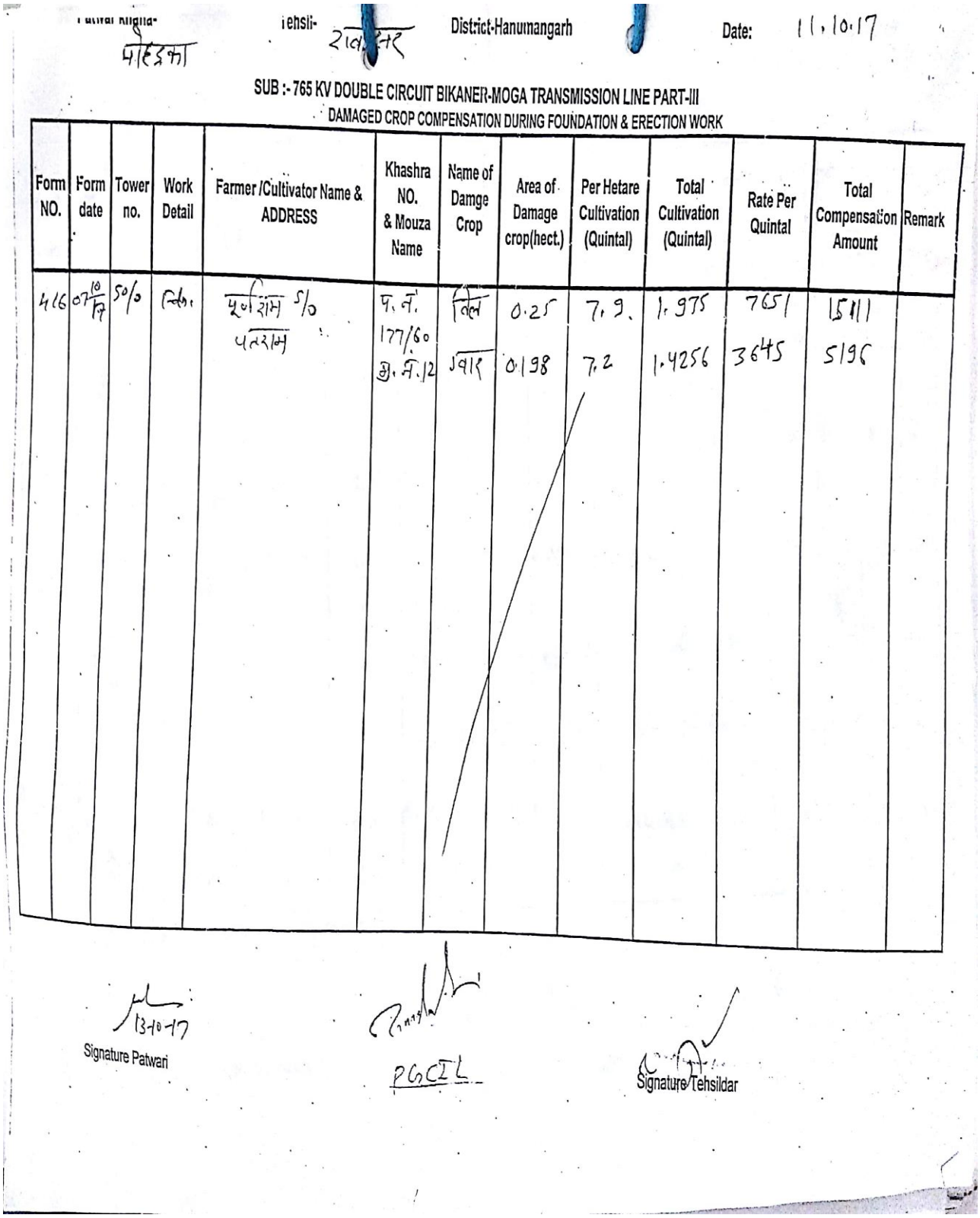
(फसल स्वामित्व सत्यापित)

(अमरीश सिंह)

कृते पावर ग्रिड कार्पोरेशन ऑफ इंडिया लिमिटेड

अवर अभियंता/सहायक अभियंता/अभियंता/वरिष्ठ अभियंता

Notice Served to Affected Person



Patwar Khalka- पटवार खाला Tehsil- रावतसर District-Hanumangarh Date: 11.10.17

SUB :- 765 KV DOUBLE CIRCUIT BIKANER-MOGA TRANSMISSION LINE PART-III

DAMAGED CROP COMPENSATION DURING FOUNDATION & ERECTION WORK

Form NO.	Form date	Tower no.	Work Detail	Farmer /Cultivator Name & ADDRESS	Khashra NO. & Mouza Name	Name of Damge Crop	Area of Damage crop(hect.)	Per Hetare Cultivation (Quintal)	Total Cultivation (Quintal)	Rate Per Quintal	Total Compensation Amount	Remark
416	07/10/17	50/0	Tow.	पूर्णराम S/O पतराम	प. नं. 177/60	तिल	0.25	7.9	1.975	765/	1511	
					ग्रा. नं. 12	ज्वार	0.198	7.2	1.4256	3645	5196	

13-10-17

Signature Patwari

PGCIL

Signature Tehsildar

Compensation Evaluation by Revenue Authority

email1736739429554139252.TXT

POWER GRID CORPORATI

B-4/184

CHITRAKOT SCHEME VAISHALI NAGAR

JAIPUR

Supplier's Name : PURAN RAM SO PATRAM

Supplier's Code : PURAA-0000000

Supplier's :

Client Ref No : 2400207632171101

Date : 29/01/2018

Bank Ref No : 825128100028

UTR No : N031180463164985

We have initiated your payment to RBI for the amount of 20307.00

for the services rendered through NEFT for the below mentioned details.

Page 1

Online Transfer of Compensation amount to Affected Person