INDIA
Rajasthan State Power Sector Restructuring Project
Environmental Guidelines for Planning, Construction
and
Maintenance of Transmission Lines
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Introduction

1. The government of Rajasthan has decided to restructure its power sector and create the conditions of sustainable development, improved efficiency and quality of electricity supply services in the state. These changes are set out in the recent Power Sector Reform Policy Statement. When the reform bill is passed, and receives assent from the President, government of India, the Rajasthan SEB will be converted into an autonomous corporation under the Indian Companies Act, 1956. New transmission lines and substations will be included in the loan, and the environmental issues related to these transmission lines are discussed below. Environmental analyses will be submitted for all subsequent projects as they are prepared. The loan will include a technical assistance component, as described herein.

Legal and Administration

Land Acquisition:

2. Under the Indian Telegraph Act, transmission towers can be erected on private land. The ownership of the land is not acquired by the transmission company.

3. RSEB follows the provisions of the Land Acquisition act of 1894 and the Rajasthan Land Acquisition Act, 1953. Section 6 of the Rajasthan Land Acquisition Act stipulates that the state government or any agency thereof (such as the Collector) can declare a certain track of private land is required for a public purpose. The RSEB may submit a request to the Collector for acquisition of land for substations. Section 4 of the same act requires the state government to publish a gazette notification regarding the acquisition of land. Under Section 5A of the same act, the interested or affected person is given the opportunity to record objection to the land acquisition within thirty days of the publication of the notice. The District Collector then would enquire into the matter and may give the award.

4. Under Section 5 of the Rajasthan Land Acquisition Act, the RSEB (or any public agency) must have the land to be acquired surveyed in the presence of the Collector or his nominee, and the owner of the land or the owner’s authorized representative. RSEB would also be required to make payment for damages. Under Section 11 of the Rajasthan Land Acquisition Act, such payment is at the market value of the land on the date of notification made under Section 4 (1). Section 16 of the Rajasthan Land Acquisition Act provides that the Collector may take possession of the land after he has made the award, and payment has been made.
5. In case of urgency, the state government can issue a Notification under Section 17 of the Rajasthan Land Acquisition Act, Subsection (1) and (4), to take over the land within 15 days of the notification under Section 9, irrespective of the compensation award. Compensation is decided subsequently by the Collector as described above; but tender payment of 80% of the compensation is to be made immediately.

Forest Clearance:

6. The Ministry of Environment and Forests (MOEF) has gazetted a statutory notification called the Forest (Conservation) Act, 1980. According to this act permission of MOEF is required for use of any forest land for construction of power lines. In case forest land is involved in a planned project, Rajasthan State Electricity Board (Rajasthan SEB) must show that the power line routing involves a minimum of forest land and that alternative routes have been considered. The application form for Forest Clearance (see annex 1) includes: project description; detailed map; alternatives and reasons for rejection of alternatives; population benefited; employment granted; details of flora and fauna in the area; density and other specific details of vegetation; status as wildlife sanctuary, biosphere reserve, national park, nature reserve; rare or endangered species; habitat for migrating fauna; vulnerability to erosion; number of displaced families; scheduled caste/scheduled tribes involved in displacement; rehabilitation plan; and details of the compensatory afforestation scheme. The application includes a detailed route marked on a Survey of India map. The concerned Executive Engineer of the Rajasthan SEB submits Forest Clearance applications to the concerned Divisional Forest Officer. The locations of reserved and protected forest are checked and marked on a map, and the Forest Clearance application in the required format is prepared jointly by RSEB and the Forest Department.

7. During the application review and approval process the review agencies comment on the application, and can return it to Rajasthan SEB for required modifications. After review, the application is forwarded to the Conservator of Forests, Government of Rajasthan. The application requires a detailed opinion of the Chief Conservator of Forests/Head of Forest Department with regard to: self sufficiency of the district in fuelwood and timber; the effect of the proposal on rural fuelwood supply, the economy and livelihood of tribal and backward communities; and a certification that all other alternatives for the purpose have been explored, and the demand for the required area is the minimum with respect to demand for forest land. Forest areas can be cleared and used only after payment for compensatory afforestation is made as detailed in the Forest Clearance, and final approval is obtained thereafter from the MOEF.

Aravali Range Environmental Notification:

8. The Ministry of Environment and Forests issued a Notification (May 7, 1992) restricting certain activities in specified areas of the Aravali Range (Alwar District of Rajasthan) which were deemed to be causing environmental degradation in the region. Among the activities restricted in the specified areas are electrification, "laying of new transmission lines." RSEB would apply to MOEF for clearance of any projects in the Aravali Range areas.
Crop Compensation:

9. RSEB pays compensation to farmers whose crops are damaged during transmission line construction. Normally, construction work on the line is done during the non-crop season; however, when a crop is in the ground and any damage is caused, compensation is paid to the farmer as decided by the revenue authorities of the government, such as Tehsildar. Compensation applications are requested from the farmers in the subdivisions where work has been carried out. The applications are verified by the Sarpanch or Patwari. The area of land where the crop has been damaged is calculated and checked by the Governmental Subdivision Officer in charge personally and the yield of the crop is calculated on the yield declared by the Agriculture Department. The monetary value of the crop is calculated from rates declared by the Market Committee, or the agency of the District, and compensation is paid to the farmers.

Indian Electricity Act and the Indian Telegraph Act:

10. On finalization of the transmission line route, a gazette notification is published in the state gazette concerning the right of way for the line, mentioning the revenue villages through which the line will pass. This notification is issued to meet the requirements of the Indian Electricity Act and the Indian Telegraph Act. Details of physical line clearances required under the Acts are given in paragraph 27.

Power Telecommunication Coordination Committee:

11. RSEB applies to the Power Telecommunication Coordination Committee to clear all transmission line projects. Interference through EMF effects could occur where the planned transmission lines would run in close proximity to telecommunications lines. The induced voltages on the communications circuits are limited to prescribed safe values. Telecommunications circuits are to be crossed at not less than a 60 degree angle, and guards are provided at the crossings of telecommunications and power lines of voltages of 33 KV and below. These approvals are issued only after the line survey work is completed.

Airport Authority:

12. RSEB would apply to the Airport Authority for clearance if any power lines are planned within 15 km of an existing airport; however, transmission lines are not routed in the vicinity of airports.

Railway Authority:

13. RSEB would apply to the Railway Authority for clearance should any power lines be planned that cross railways. In cases where planned lines would cross railways, detailed applications, including maps, showing tower locations on either side of the railway and vertical
clearances are submitted. Railway lines are crossed at right angles to the extent possible. All stipulations of the railway authorities are followed by RSEB, and the work is undertaken only after obtaining approval, and under supervision of the railway authority.

**Project Descriptions**

14. RSEB will prepare site-specific environmental reviews for all of the new transmission lines and substations.

15. Normally, tangent towers suitable for 2 degree angles are used for straight line locations and towers suitable for 15, 30 and 60 degree deviations are used at the angle points. Provisions for extensions are also kept, where required for adequate ground clearances. the average span of the towers is usually 330 meters. Tower foundations are cast to a depth of about 3 meters in the tower footprint that varies from 3 x 3 to 6 x 6 square meters. RSEB uses broad based lattice towers as conductor supports.

**Justification of the Projects:**

16. The transmission system has been planned for additional generating capacity. The transmission lines and substation projects are planned for evacuation of an additional 2380 MW generation capacity by the year 2002. The following generation projects which may yield benefit by 2002 are: Barsinghgar Linite project (2 x 250 MW), Kapurdi and Jalipa (2 x 300 MW), Solar project (100 MW), and small liquid fuel (780 MW).

**Project Planning:**

17. RSEB undertakes the planning of transmission line and substation projects in the following steps:

a) the Transmission Planning Department identifies requirements for transmission lines and substations, these are then approved by RSEB, Government of Rajasthan, and GOI;

b) these requirements are passed on to the Chief of Construction, and tentative route mapping is done on Survey of India topographic maps;

c) the routes are then walked by engineers, this is called the preliminary ground survey;

d) detailed route surveys are made, including profiles, control points, obstacle crossings and avoidance of forest areas, habitations, cultural landmarks, etc.;

e) the surveyed route is approved by the concerned engineer of RSEB, at this stage the applications are made for required clearances, such as forest and railway crossings,
technical compliance with the Electricity Act and Rules is reviewed and assured, and the design features of the towers are prepared;

f) procurement actions are taken on the basis of the project report of the scheme, simultaneously with the environmental evaluation;

g) materials are collected at convenient locations near to construction sites or stores;

h) the procurement section informs the construction department of materials availability;

i) the construction engineers draw materials and begin construction, the foundations for the towers are put in, and subsequent operations are carried out.

Environmental Issues and Mitigation Strategies

18. The issues below will be addressed during the conceptual design, and will be reassessed during detailed design and route selection:

Resettlement and rehabilitation:

19. There will be no resettlement, involving movement of homesteads, involved in the above projects. A separate resettlement and rehabilitation policy and impact assessment document has been prepared.

Transmission line rights of way and substation site impacts on land use: agricultural, forest areas, wetlands, wildlands:

20. Most of the projects do not involve any forest land. The topographically level areas of Rajasthan where the rights of way and substations are planned have been almost entirely cleared for agriculture. There are no wildlands involved in the transmission line routes. If any forest land is involved it would be such a small amount that habitat fragmentation and invasion of exotic vegetation species would not be an issue. Forest Clearance requires alternatives for least disturbance of forest areas be used. The applications for MOEF Clearances will be made once the proposed routes are finalized. MOEF can reject the application, or require modifications.

21. RSEB does not acquire any land for laying the lines at the tower locations, and RSEB allows cultivation beneath the towers and conductors. Should land owners register complaints, the land under the towers would be acquired, and compensation paid as per the procedures outlined above. The transmission line rights of way would not impact agricultural land uses since the transmission company does not acquire ownership of the rights of way; furthermore, compensation is paid for crop damages due to construction.
Access roads in remote areas, increase in hunting, exploitation of forest resources, induced development due to new access corridors, human settlement and more extensive clearing:

22. Existing roads are used by Rajasthan SEB for access, no new roads are built for this purpose.

Clearing (erosion, loss of habitat) and control of vegetation in rights of ways, including mechanical and chemical (herbicide) clearing operations. (chemical contamination of site and rainfall runoff):

23. Land use in the most of the areas of the transmission lines is agricultural. Use of the rights of way for agriculture is allowed. Chemical herbicides are not used in right-of-way maintenance.

Erosion during construction, and along access roads, substation and transmission tower sites:

24. The projects are normally located in the plain areas of Rajasthan, where slopes would not result in great erosion potential. Erosion is controlled by RSEB through the installation of retaining walls, stone pitching, and revegetation.

25. In river crossings and for streams with wide spans, extra high towers are used, so as to give adequate clearance from the highest flood levels. Tower footings are located on either bank at locations safe from bank erosion. For tower locations susceptible to floods or undercutting, adequate protection such as revetments or retaining walls are provided to protect the tower footings.

26. The following issues will be addressed during detailed route survey approval.

Potential electromagnetic frequency (EMF) radiation effects, radio noise and television interference, and audible noise along transmission line routes, exposure of substation operations personnel to potential EMF hazards:

27. GOI regulations (Electricity Act) call for minimum transmission line clearance distances to address EMF effects. The following table compares Indian and U.S. standard clearances for similar voltage lines:

<table>
<thead>
<tr>
<th>Indian Clearance Standards</th>
<th>U. S. Clearance Standards</th>
</tr>
</thead>
<tbody>
<tr>
<td>along roads, above 11,000 volts, 5.2 meters plus 0.3 meters for every</td>
<td>building roofs, balconeys or projections accessible to pedestrians</td>
</tr>
<tr>
<td>Voltage (kV)</td>
<td>Footage</td>
</tr>
<tr>
<td>------------</td>
<td>---------</td>
</tr>
<tr>
<td>33</td>
<td>17</td>
</tr>
<tr>
<td>66</td>
<td>18</td>
</tr>
<tr>
<td>132</td>
<td>21</td>
</tr>
<tr>
<td>220</td>
<td>24</td>
</tr>
</tbody>
</table>

Public access to substations, towers and other electrocution hazards:

28. Rajasthan SEB will effect restriction of public access, by fencing and security of substations. Towers have barbed wire anti-climbing devices and danger notices. Substations are fenced, and the fences are grounded. Distribution transformers are fenced, and the smaller installations are made on poles. All installations are made in accordance with the Electricity Act, and inspected on a regular basis. A consumer safety program is included in the technical assistance.

Analysis of Alternatives

29. Alternatives selected by Rajasthan SEB were based on criteria of energy conservation through improved efficiency of the transmission system, that is, reduction of system losses and increased reliability of the system. Load management will be addressed under the technical assistance. The transmission schemes chosen are double circuit lines, requiring narrower rights of way. Routes and substation sites are selected for minimum impact on forest resources (a statutory requirement), and minimal impact on crowded urban areas.

30. Alternatives for substation sites: Land search for an EHV grid substation is discussed with the local Patwari, Gram Panchayat and municipal authorities, as well as local influential people. Three or four alternative sites are selected. Prefered sites are waste land belonging to the government, or land that belongs to the Industry Department of Rajasthan or Local Self Departments (municipalities, corporations, etc.). In case these types of land are not available, proposals for acquiring private land are prepared and submitted to the revenue authorities (see above). The best alternative is selected according to the following criteria:

- proximity to an existing 33 KV substation;
- adequate distance from inhabited areas to permit easy and safe approach of high voltage overhead transmission lines;
- easy access to a public road to facilitate transport of plant and equipment, as well as proximity to a railway station;
- far away from municipal dumping grounds, low lying areas, burial grounds, tanneries, and other obnoxious areas;
- sufficient distance from firing ranges of police and military;
- sufficient distance from airports;
- proximity of school, hospital and drinking water.

31. RSEB has prescribed the following areas of land to be acquired for the construction of grid substations of various voltage ratings, along with the space for the construction of colonies. The residential complexes are generally constructed to accommodate the total complement of operations and maintenance staff.

<table>
<thead>
<tr>
<th>Substation voltage</th>
<th>Area of land for substation (acres)</th>
<th>Area of land for colony (acres)</th>
<th>Total area (acres)</th>
</tr>
</thead>
<tbody>
<tr>
<td>33 KV</td>
<td>2.5 - 3.75</td>
<td></td>
<td></td>
</tr>
<tr>
<td>132 KV</td>
<td>4.38</td>
<td>5.62</td>
<td>10</td>
</tr>
<tr>
<td>220 KV</td>
<td>17.5</td>
<td>12.5</td>
<td>30</td>
</tr>
<tr>
<td>40KV</td>
<td>26.25</td>
<td>28.13</td>
<td>54.38</td>
</tr>
</tbody>
</table>

32. Alternatives for transmission line routes: Three alternatives for each line are considered in the preliminary route planning by RSEB. When selecting the route for a line, the G. T. sheets of the Survey of India are used, and the route is tentatively chosen “as the crow flies” between the connecting substations. If this route would have adverse social or environmental impacts, two or three alternative routes are examined. To this end a preliminary survey of social and environmental conditions in the area to be traversed is carried out, avoiding lakes, reservoirs, erosion prone areas, forests, mountains, swamps and low lands subject to floods. Mounds of large boulders, irrigation well series, and protected areas are also avoided. Care is also taken to avoid inaccessible countryside, towns and villages, human habitations and cultural resources. Safe distances are kept from police and military firing ranges, game and bird sanctuaries. The preferred topography for the line routes is level land, where hills cannot be avoided, the route is selected through the valleys and along the sides of the hills, rather than over high points.

33. Based on the route marked on the G. T. sheet, the route is physically surveyed. A reconnaissance survey is made first, then a detailed survey is carried out by the RSEB technical personnel. During the detailed survey, care is taken to fix the turns and angles so that safe clearances are maintained from sensitive locations (such as buildings) as per the Indian Electricity Act and Indian Electricity Rules. After the detailed survey, levels are taken and the line profile is prepared for spotting of tower locations with the sag template.
Technical Assistance

34. A technical assistance component of the project will be provided. Under this technical assistance the environmental management capabilities of the proposed Rajasthan public power distribution utility will be developed. The objective of the technical assistance is to introduce environmental management systems throughout Rajasthan public power distribution utility, its suppliers, and its network of distributors. A draft terms of reference for the technical assistance is attached. Activities of the technical assistance will include:

a) Development of an organization and staffing plan for the environmental management unit (based on comparisons with similar utilities on an international basis, as well as industrial organizations operating within the environmental performance standards of GOI;

b) development of a staffing plan for hiring or retraining skilled environmental staff (which will include a salary survey of environmental professionals and technicians in the public and private sectors), together with the definition of services that could most cost-effectively be provided by consultants;

c) development of a financial plan for the environmental unit;

d) development of a corporate environmental policy, including target objectives for Rajasthan public power utility, its suppliers (generators), distributors and consumers, that can be monitored and audited;

e) ensure that contractual obligations or other measures are put into place on privatized generation and distribution to comply with Rajasthan public power distribution utilities's environmental policies;

f) development of systems to enable Rajasthan public power distribution utilities to meet the requirements of relevant Indian (and where appropriate international) environmental standards in a cost effective and efficient way;

g) development of systems to ensure that actions recommended by the environmental management unit are acted upon by corporate management in Rajasthan public power distribution utilities and by its suppliers and distributors, and define methods to evaluate and monitor performance with respect to project implementation;

h) development of an approach to consumer education in energy savings and a customer advisory service;

i) a co-ordinated in-country training program for staff of the environmental management unit of Rajasthan public power distribution utilities;
j) evaluation of alternative strategies for improving energy efficiency;

k) establish an educational program to improve consumer safety;

l) develop capabilities with respect to environmental auditing;

m) undertake a study tour to assess environmental management systems associated with international transmission and distribution systems;

n) support Rajasthan public power distribution utilities's planning capability for new transmission systems by developing environmental procedures (EIA) and establishing criteria for evaluating direct and indirect environmental and social impacts associated with new development proposals;

o) undertake EIA's of selected routes and standardize approaches adopted on issues such as land severance;

p) development of a system of energy audits and energy efficiency, and set targets based on demand side management.

Management of Polychlorinated Biphenyls (PCB's)

35. Prior to initiation of power system rehabilitation under the loan, when electrical equipment will be replaced, technical assistance will be provided to Rajasthan public power distribution utilities for the environmentally sound management of PCB electrical equipment. The technical assistance will cover identification of PCB electrical equipment, management and cleanup of transformer installations, discarded equipment, and the repair shops.

36. Various components of the existing power systems are up to 30 years old. Since the use of PCB's in electrical equipment was discontinued (in most countries) fairly recently, some of the existing power system electrical equipment probably contains PCB's. Electrical equipment is used until failure in RSEB transformer oil is reconditioned and reused; oil that cannot be reused is sold to reconditioning contractors. Discarded electrical equipment is broken up and auctioned. There is a separate disposal wing under the RSEB procurement section, in addition to the transformer shops.

37. The PCB management technical assistance will address the following:

i) development of environmental guidelines which review GOI regulations concerning the use, retrofitting, storage and disposal practices for PCB's and PCB electrical equipment.
ii) The environmental guidelines will state which of the existing system electrical equipment should be tested for PCB's;

iii) The environmental guidelines will detail how PCB electrical equipment and PCB's would be tested or otherwise identified;

iv) The environmental guidelines will detail an environmentally sound PCB management plan for safe storage and/or disposal of PCB's and PCB electrical equipment. The PCB management plan should include specifications for safe handling practices, including personnel protective equipment and clothing, and the environmental guidelines should provide details of safe transfer and secure storage areas.

**Monitoring**

38. The following monitoring plan will be adopted as a policy of Rajasthan public power distribution utilities to track the effectiveness of mitigation techniques, and address recognized problems in an appropriate and timely manner. Development of a system for bringing environmental problems to the attention of management is included in the technical assistance. Some of the items listed under the following monitoring program do not relate to the projects proposed; however, these issues may relate to other Rajasthan public power distribution utilities transmission lines. This regular scheduled monitoring program will consist chiefly of visual inspections during construction and operation for:

- erosion along access roads, substation and transmission tower foundations;
- encroachment of settlements within rights of ways, encroachment of settlements within protected areas via transmission line access roads, exploitation of forest resources in protected areas via access roads;
- vegetation clearances below transmission lines, and invasion of exotic species along right of ways;
- transformer fluid leakage and spills;
- safe storage and disposal of PCB's.
FORM

ANNEXURES - 1

Form for seeking prior approval under section 2 of the proposals by the State Governments and other authorities. (See rule 4)

1. Project details:
   (a) Short narrative of the proposal and project/scheme for which the forest land is required.
   (b) Map showing the required forest area, boundary of adjoining forest and item-wise break-up of the required forest area for different purposes (to be authenticated by an officer not below the rank of Deputy Conservator of Forests).
   (c) Total cost of the project.
   (d) Justification for locating the project in the forest area giving alternatives examined and reasons for their rejection.
   (e) Financial and social benefits.
   (f) Total population benefited.
   (g) Employment generated.

2. Location of the project/scheme:
   (i) State/Union Territory.
   (ii) District.
   (iii) Forest Division, Forest Block, compartment etc.

3. Item-wise break-up of the total land required for the project/scheme along with its existing land use.

4. Details of forest land involved:
   (a) Legal status of the forest (namely, reserve, protected/unclassed, etc.)
   (b) Details of flora and fauna existing in the area.
   (c) Density of vegetation.
   (d) Species-wise and diameter class-wise abstract of trees.
   (e) Vulnerability of the forest area to erosion, whether it forms a part of a seriously eroded area or not.
   (f) Whether it forms a part of national park, wildlife sanctuary, nature reserve, biosphere reserve, etc; and if so, details of the area involved. (Specific comments of the Chief Wildlife Warden to be annexed).
   (g) Item-wise break-up of the forest land required for the project/scheme for different purposes.
   (h) Rare/endangered species of flora and fauna found in the area.
   (i) Whether it is a habitat for migrating fauna or forms a breeding ground for them.
   (j) Any other significance of the area relevant to the proposal.
(i) Total number of families involved in displacement.

(ii) Number of Scheduled Caste/Scheduled Tribe families involved in displacement.

(iii) Detailed rehabilitation plan.

6. Details of compensatory afforestation scheme:

(i) Details of non-forest area/degraded forest area identified for compensatory
    afforestation, its distance from adjoining forest, number of patches, size of
    each patch.

(ii) Map showing non-forest/degraded forest area identified for compensatory
    afforestation and adjoining forest boundaries.

(iii) Detailed compensatory afforestation scheme including species to be planted,
    implementing agency, time schedule, cost structure etc.

(iv) Total financial outlay for compensatory afforestation scheme.

(v) Certificates from competent authority regarding suitability of area identified
    for compensatory afforestation and forest stand management point
    of view. (To be signed by an officer not below the rank of Deputy
    Conservator of Forests).

(vi) Certificate from the Chief Secretary regarding non-availability of the non-
    forest land for compensatory afforestation (if applicable).

7. Details regarding Transmission Lines (only for Transmission Line proposals):

(i) Total length of the Transmission Line.

(ii) Length passing through forest area.

(iii) Right of Way.

(iv) Number of Towers to be erected.

(v) Number of Towers to be erected in forest area.

(vi) Height of Transmission Towers.

8. Details of Irrigation Hydel Project (only for Irrigation /Hydel Projects):

(i) Total catchment area.

(ii) Total command area.

(iii) Full Reservoir Level.

(iv) High Flood Level.

(v) Minimum Drawal Level.

(vi) Break-up of area falling in catchment area of the project (forest land,
    cultivated land, pasture land, human cultivation, others).

(vii) Area of submergence at High Flood Level.

(viii) Area of submergence at Full Reservoir Level.
(ix) Area of submergence at 2 metre below Full Reservoir Level.

(x) Area of submergence at 4 metre below Full Reservoir Level (For medium and major projects only).

(xi) Area of submergence at Minimum Drawal Level.

(xii) Detailed catchment area treatment plan.

(xiii) Total financial outlays and details regarding availability of funds for Catchment Area Treatment Plan.

9. Details regarding Road/Railway Lines (only for Roads/Railway lines proposal):

(i) Length and width of the strip and forest area required.

(ii) Total length of the road.

(iii) Length of the road already constructed.

(iv) Length of the road passing through the forest.

10. Details regarding mining proposals (only for mining proposals):

(i) Total mining lease area and forest area required.

(ii) Period of mining lease proposed.

(iii) Estimated reserve of each mineral/ore in the forest area and in the non-forest area.

(iv) Annual estimated production of mineral/ore.

(v) Nature of mining operations (open cast/underground)

(vi) Phased reclamation plan.

(vii) Gradient of the area where mining would be undertaken.

(viii) Copy of the Lease Deed (to be attached only for renewal purposes).

(ix) Number of labourers to be employed.

(x) Area of forest land required for

(a) Mining.

(b) Storing mineral/ore.

(c) Dumping of overburden.

(d) Storing tools and machinery.

(e) Construction of building power stations, workshops, etc.

(f) Township/housing colony

(g) Construction of road/ropeway/railway lines.

(h) Full land use plan of forest area required.

(xi) Reasons why any of the activities, referred to in (a) to (h) above under the project for which forest land has been asked for cannot be undertaken/located outside forest area.

(xii) The extent of damage likely to be caused and the number of trees affected on account of mining and related activities.

(xiii) Distance of the mining area from perennial water courses, national and State highways, national parks, sanctuaries and biosphere reserves.

(xiv) Procedure for stocking of the topsoil for reuse.

(xv) Extent of subsidence expected in underground mining operations and its impact on water, forest and other vegetation.
11. Cost-benefit analysis.

12. Whether clearance from environmental angle is required (Yes/No). If yes, whether requisite details for the same have been furnished (Yes/No).

13. Whether any work in violation of the Act has been carried out (Yes/No). If yes,
   (i) Details of the same including date of commencement.
   (ii) Officers responsible for violation of the Act.
   (iii) Action taken/being taken against erring officers.
   (iv) Whether work in violation of the Act is still in progress.

14. Any other information....

15. Details of Certificates/documents enclosed.

16. Detailed opinion of the Chief Conservator of Forests/Head of the Forest Department concerned covering the following aspects, namely:
   (i) Out-turn of timber, fuelwood and other forest produce from the forest land involved.
   (ii) Whether the district is self-sufficient in timber and fuelwood, and
   (iii) The effect of the proposal on
      (a) Fuelwood supply to rural population
      (b) Economy and livelihood of the tribals and backward communities.
   (iv) Specific recommendations of the Chief Conservator of Forests/Head of the forest Department for acceptance or otherwise of the proposal with reasons thereof.

Certified that all other alternatives for the purpose have been explored and the demand for the required area is the minimum demand for forest land.

Signature of the authorised officer of the State Government/Authority

N.B.1. While furnishing details of flora and fauna, the species should be described by their scientific names.

N.B.2. If the space provided above is not sufficient to specify any information, please attach separate details/documents.

(No. 5-5186-1-C)
R. RAJAMANI, Secy.

Footnote:
The principal rules were notified vide Number G.S.R. 719 dated the 20th July, 1981 and subsequently amended vide
(1) G.S.R. 14, dated the 28th December, 1987.
(2) G.S.R. 640 (E), dated the 26th June, 1989.
The route plan of the 132 Kv Kishangarh Bas - Tijara Line from the 132 Kv substation at Kishangath Bas, to the proposed 132 Kv substation at Tijara, has been marked on the attached large scale map. Land use areas are shown in various colors and include: agricultural and uncultivated land, villages, roads, nallahs, hills, existing transmission lines and canals/drain. Most of the information discussed below is illustrated on the survey map of the route.

**Description of the route:**

The route of the line has been walked and surveyed by S. H. Bhawankhel, Junior Engineer (TDC.III: SD.II). The right of way passes through irrigated agricultural and barren government land of the Alwar District, and has been planned in such a way that no villages are crossed.

There are no airports, bird or wildlife sanctuaries within 100 km. The ROW does not pass through forest, wildlife or other protected areas; moreover, a certification has been obtained from MOEF that the line does not pass through areas delineated in the Aravali Range Notification (May 7, 1992). There are no areas of cultural importance along the route. The total length of this line is approximately 16 km.

**Environmental Issues and Mitigation Strategies:**

Concerning the Aravali Range environmental notification, RSEB has applied to the local revenue authorities concerning the planned transmission line project Kishangarh Bas - Tijara, and received a certificate that the transmission line project does not infringe on the protected areas. The MOEF Notification as well as the certificates received from the concerned revenue and forest officers are attached.

The Power Telecommunication Coordination Committee has determined that the Kishangarh Bas - Tijara line as planned would not interfere with existing telecommunications lines, and has issued a letter stating that no protective measures would be required on the parallel phone circuits (see attachments).

The issues below have been addressed during the conceptual design, and have been reassessed during detailed design and route survey:

<table>
<thead>
<tr>
<th>Environmental Issues</th>
<th>Mitigation Strategies</th>
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<tbody>
<tr>
<td>Resettlement and rehabilitation</td>
<td>There will be no displacement of homesteads.</td>
</tr>
<tr>
<td>Topic</td>
<td>Details</td>
</tr>
<tr>
<td>--------------------------------------------------------------------------------------------</td>
<td>---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Access roads in remote areas, increase in hunting, exploitation of forest resources, induced development due to new access corridors, human settlement and more extensive clearing</td>
<td>No new access roads will be built. There is no forest land or wildlife protection area along the ROW.</td>
</tr>
<tr>
<td>Transmission line rights of way and substation site impacts on land use: agricultural, forest areas, wetlands, wildlands</td>
<td>There is no wild life protection zone within 100 km of the ROW. The ROW is not the first transmission line in the area, and existing transmission lines in the area have given no problem to migratory birds during any part of the year. The horizontal struts of the towers are fitted with rough (sawtooth) strips to discourage birds from roosting near the transmission lines. The ROW passes through mostly agricultural land. The loss of land use will be the tower footings, which is very small. Cultivation is permitted under the towers and conductors.</td>
</tr>
<tr>
<td>Impacts on cultural resources</td>
<td>There are no cultural or aesthetic resources along the ROW. These places have, therefore, not been shown on the map. There will be no impact on cultural resources due to the ROW.</td>
</tr>
<tr>
<td>Erosion during construction, and along access roads, substation and transmission tower sites</td>
<td>The project is located in the topographically level areas of Rajasthan, where the terrain is flat. No access roads will be built.</td>
</tr>
<tr>
<td>Clearing (erosion, loss of habitat) and control of vegetation in rights of ways, including mechanical and chemical (herbicide) clearing operations, (chemical contamination of site and rainfall runoff)</td>
<td>No chemicals are used by the RSEB for removing the grass/plants/vegetation which will grow under the ROW. Clearing as needed is done manually. Any trees in the ROW are topped to comply with the Indian Electricity Rule vertical clearances. Any trees cut are replaced by an equivalent compensation nearby.</td>
</tr>
<tr>
<td>Potential electromagnetic frequency (EMF) radiation effects, radio noise and television interference, and audible noise along transmission line routes, exposure of substation operations personnel to potential</td>
<td>GOI regulations (Electricity Act) call for minimum transmission line clearance distances to address EMF effects. The ROW clearance from ground will be as per Electricity Rules, (attached).</td>
</tr>
<tr>
<td>EMF hazards</td>
<td></td>
</tr>
<tr>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>Public access to substations, towers and other electrocution hazards</td>
<td>Rajasthan SEB will restrict public access, by fencing and security of substations. Substation fences are grounded. Towers have barbed wire anti-climbing devices and danger notices. Distribution transformers are fenced, and the smaller installations are made on poles. All installations are made in accordance with the Electricity Act, and inspected on a regular basis. A consumer safety program is included in the technical assistance.</td>
</tr>
<tr>
<td>Hazards to aircraft</td>
<td>The nearest airport is 100 km from the ROW. The ROW will not present a hazard to aviation zones or approach routes to airports.</td>
</tr>
</tbody>
</table>
Copy of the letter No. 4390 dated 26.5.1993 from the D. Conservator of Forest, Social Forestry, Alwar addressed to the A.E. (TCD-I/II), RSB, Alwar.

Sub: Certificate for Forest non-involvement for laying 124 km Kishangarh-Tijara line.


Sir,

On the above context, it is to state that the proposed line is not passing through the forest area. The certificate in the regard is being issued. However, a No objection certificate regarding non-involvement of restricted specified areas as mentioned in the notification dated 7.5.92 of the Ministry of Environment and Forest, Government of India, is required to be obtained from the Revenue Department of the Government.
कार्यलय उप वा सरकार लाभालय वाणिज्य... अलवर

कृपया/विविध/उद्देश/4370 दिनांक 26·5·95

निम्नलिखित : सहायक अभियंता
इंडस्ट्री-3/सह-2, राजस्थान विद्युत आयुक्त, अलवर।

विषय:- 132 केबल विद्युत उपयोग वाला खान में वन जीवित के प्रभावित न होने बाबत प्रमाण पत्र जारी करने के संबंध में।

लेखन: आपका पत्रांक /सह/इंडस्ट्री-3/सह-2/अल/ प···स्वरूप/प्रैक्टिसर 15·5·95

महोदय,

विषयांशत कभी ये पक्ष आपके द्वारा उत्तान्तर आंशिक वाला काल में सीमा के बाहर से गुजरती है। इस अवस्थाय का प्रमाण पत्र भी जीवित न हो सके फिर भी केन्द्र सरकार के वन वर्ग परिवर्तन मंत्रालय द्वारा जारी अधिरुप का दिनांक 7·5·92 में वर्तमान निर्देश जीवित की अन्य किस्मों के संबंध में अनावर्त प्रमाण पत्र राजस्थान विभाग से प्राप्त कर लिया जाये।

भक्ति,

डॉ.-
उप वा सरकार
लाभालय वाणिज्य... अलवर
Copy of the letter No. 3200 dated 3.8.1995 from the office of the Tehsildar, (Land Acquisition), Kishangarhbas addressed to the AEn (TCD-III/SD-II), RSEB, Alwar.


On the subject cited above, it is to state that the proposed 132 KV Kishangarhbas - Tijara line does not pass through the restricted specified area as specified in the notification dated 7.5.92 of the Central Government. This information is based on the report of concerned Patwari of Bancha and Chamroda area made available through your Mr. R.K. Bhuvneshwar, JEn. This No objection certificate is issued to day on dated 3.8.95.
कार्यालय तहसीलदार श्री अं./ किशानगढ़वास
कार्यालय मंत्री/अं./1953/3200 दिनांक 3/8/75

निम्नलिखित सहयोगी अभियंता
मुद्दी-सीटी-3/सतदी-2, रारापिंडिल, अलवर।

पिछः- प्रस्तावित 132 केवल विलायत तिजारा लाइन के संबंध में अनापेत या वार्ड आपके पत्र 7 कक्षा 7/5/72 की अधिकतर केन्द्र सरकार।

प्रस्तुत:- आपके पत्र 32/अं/285 दिनांक 12/7/75

उपरोक्त प्रस्तावीत प्रारोप्त पत्र के संदर्भ में प्रस्तावित 132 केवल लाइन विलायत तिजारा के संबंध में आपके प्रतिनिधि श्री आरामो अधिकारी के साथ समन्वय पटवार दल भांजा सर्व पारम्परिक के अनुसार प्रस्तावित पत्रात्मक चाल का स्थल अध्याधिकार 7/5/72 केन्द्र सरकार द्वारा घोषित भूमि क्षेत्र में नहीं आता है। यह लाइन सड़क तिजारा विलायत वास के सदर वर्तमान प्रस्तावित है। यह अनापेत प्रमाण पत्र आज दिनांक 3/8/75 को जारी किया।

सदान-
तहसीलदार/श्री अं./किशानगढ़वास
MINISTRY OF ENVIRONMENT & FORESTS NOTIFICATION

New Delhi, the 7th May, 1992

(Under Section 3(1) and 3(2) (v) of the Environment Protection) Act, 1986 and rule 5(3) (d) of the Environment (Protection) Rules, 1986 restricting certain activities in specified area of Aravali Range which are causing Environmental Degradation in the Region.

S.O. 319(E) - Whereas a Notification under section 3(1) and section 3(2) (v) of the Environment (Protection) Act, 1986 (29 of 1986) inviting objections against restricting certain activities in specified area of Aravali Range which are causing Environmental Degradation in the Region was published in the Gazette of India, Part II-Section 3 Sub-section (ii) vide S.O. 25(E) dated 9th January, 1992;

And whereas all objections received have been duly considered by the Central Government;

Now, therefore, in exercise of the powers conferred by sub-section (1) and caluse (v) of sub-section (2), of section 3 or the Environment (Protection) Act, 1986 (29 of 1986), read with rule 5 of the Environment (Protection) Rules, 1986, the Central Government hereby prohibits the carrying on of the following processes and operations, except with its prior permission in the areas specified in the Table appended to this Notification:
1. Location of any new industry including pension modernisation;

ii. (a) All new mining operations including renewals of mining leases.

(b) Existing mining leases in sanctuaries national park and areas covered under Project Tiger and/or

(c) Mining is being done without permission of the competent authority.

iii. Cutting of trees;

iv. Construction of any clusters of dwelling units, farms houses, sheds, community country information centres and any other activity connected with such construction (including roads a part of any infrastructures relating thereto);

v. Electrification (laying of new transmission lines).

2. Any person who desires to undertake any of the above mentioned processes or operations in the said areas, shall submit an application to the Secretary, Ministry of Environment and Forests, New Delhi, in the attached application form (Annexure) specifying inter alia, details of the area and the proposed process or operation. He shall also furnish an Environment Impact Statement and an Environmental Management Plan along with the application and such other information as may be required by the Central Government for considering the application.

3. The Central Government in the Ministry of Environmental and Forests shall, having regard to the guidelines issued by it from time to time for giving effect to the provisions of the said Act, grant permission within a period of three months from the date of receipt of the application or where further information as been asked for from the applicant, within a period of three months from the date of the receipt of such information, or refuse
permission within the said time on the basis of the impact of the proposed process or operation on the environment in the said area.

4. For seeking permission under this Notification, an application in the prescribed form (see Annexure), duly filled in, may be submitted to the Secretary, Ministry of Environment and Forests, Paryavaran Bhavan, CGO Complex, Lodi Road, New Delhi.

R. RAJAMANI, Secy.

TABLE

Areas where carrying on the processes and operations without permission is prohibited:

i. all reserved forests, protected forests or any other area shown as "forest in the land record maintained by the State Government as on the date of this Notification in relation to Gurgaon District of the State of Haryana and the Alwar District of the State of Rajasthan.

ii. all areas shown as :-

a) Gair Mumkin Pahar, or
b) Gair Mumkin Rada, or
c) Gair Mumkin Behed, or
d) Banjad Beed, or
e) Rundh.

in the land records maintained by the State Government as on the date of this notification in
relation to Gurgaon district of the State of Haryana and the Alwar district of the State of Rajasthan.

iii. all areas covered by notifications issued under section 4 and 5 of the Punjab Land Preservation Act, 1900, as applicable to the State of Haryana in the district of Gurgaon upto the date of this Notification.

iv. all areas of Sariska National Park and Sariska Sanctuary notified under the Wildlife (Protection) Act, 1972 (53 of 1972).
1. The Central Government in the Ministry of Environment and Forests, having regard to the
judicial mandate issued by the Supreme Court in Case No. 433 of 2008, for gleaming 
fees to the provisions of the said Act, grant permission within a period of three months from the date of 
receipt of the application or where further information has been asked for from the applicant, within a period of 
three months from the date of the receipt of such information, or refused permission within the said time,
the basis of the impact of the proposed process or operation on the environment in the said area.

2. For seeking permission under this Notification, an application in the prescribed form (see Annexure)
 forwarded to the Ministry of Environment and Forests, Parivaravan Bhavan, COO, Complex, Lodi Road, New Delhi,
shall be submitted to the Secretary, Ministry of Environment and Forests, Parivaravan Bhavan, COO, Complex, Lodi Road, New Delhi.

R. RAJAMANI, Secy.

TABLE

Areas where carrying on of processes and operations without permission is prohibited

(i) all reserved forests, protected forests or any other area shown as 
"forest" in the land records maintained by the State Government, as on the date of this notification in relation 
to Gurgaon District of the State of Haryana and the Alwar District of the State of Rajasthan.

(ii) all areas shown as:

(a) Gair Munkin Pahar,
(b) Gair Munkin Rada,
(c) Gair Munkin Behed,
(d) Benjad Beed,
(e) Rundh.

in the land records maintained by the State Government as on the date of this notification in relation 
to Gurgaon District of the State of Haryana and the Alwar District of the State of Rajasthan.

(iii) all areas covered by notifications issued under section 4 and 5 of the Punjab Land Preservation Act, 1900, as applicable to the State of Haryana in the district of Gurgaon up to the date of this Notification.

(iv) all areas of Sariska National Park and Sariska Sanctuary notified under the Wildlife (Protection) Act, 1972 (53 of 1972).

ANNEXURE

APPLICATION FORM

(a) Name & address of the project proposed:
(b) Location of the project:
(c) Area of the land affected:
(d) Source of water supply:
(e) Nature & quantity of solid wastes generated:
(f) Solid waste disposal method:
(g) Noise & vibrations:

*Data may be obtained from Indian Meteorological Department and State Pollution Control Board.
**Ground water Board and the Irrigation Deptt. Deptt. may be contacted for data.

(e) Alternate site examined and the reason for
the site proposed:

2. Objectives of the project:

3. (a) Land Requirement:

Agriculture land:
Other, specify:

(b) (i) Topography of the area indicating gradient, aspect & altitude.

(ii) Level classification of the proposed land.

(c) Pollution sources existing within 10 km.

radius.

(d) Distance of the nearest National Park/Sanctuary/reserve Monuments/heritage site/Reserve Forest:

(e) Rehabilitation plan forQty
table

(f) Green belt plan.

(g) Compensatory afforestation plan.

4. Climate & Air Quality:

(a) Windrose at site:

(b) Max, Min, Mean annual temperature.

(c) Ambient air quality data.

(d) Nature & concentration of emission of SPM,

(e) Quality & Quantity of water to be released with treatment:

(f) (i) Quantum of waste water to be released with treatment details:

(ii) Quantum & Quality of water in the receiving water body:

(iii) Quantum of waste water to be released on land and the type of land.

6. Solid Wastes:

(a) Nature & quantity of solid wastes generated:

(b) Solid waste disposal method:

7. Noise & Vibrations:

(a) Sources of noise & vibrations:

"Data may be obtained from Indian Meteorological Department and State Pollution Control Board."

**Ground water Board and the Irrigation Deptt. Deptt. may be contacted for data."
MINISTRY OF ENVIRONMENT & FORESTS

NOTIFICATION

New Delhi, the 7th May, 1992

(Under Section 2(1) and 3(2) (v) of the Environment Protection Act, 1986 and rule 5(3), (d) of the Environment Protection Rules, 1986, restricting certain activities in specified area of Aravalli Range which are causing Environmental Degradation in the Region.

S.O. 319(E)—Whereas a Notification under section 3(1) and section 3(2) (v) of the Environment (Protection) Act, 1986 (29 of 1986) inviting objections against restricting certain activities in specified area of Aravalli Range which are causing Environmental Degradation in the Region was published in the Gazette of India, Part II—Section 3 Sub-section (ii) vide S.O. 25(E) dated 9th January, 1992;

And whereas all objections received have been duly considered by the Central Government;

Now, therefore, in exercise of the powers conferred by sub-section (1) and clause (v) of sub-section (2) of section 3 of the Environment (Protection) Act, 1986 (29 of 1986), read with rule 5 of the Environment Protection Rules, 1986, the Central Government hereby prohibits the carrying on or the following processes and operations, except with its prior permission, in the areas specified in the Table appended to this Notification:

1. Location of any new Industry including expansion/modernisation;
2. (a) All new mining operations including renewals of mining leases;
3. (b) Existing mining leases in sanctuaries national Parks and areas covered under Project Tiger and/or;
4. (c) Mining is being done without permission of the competent authority;
5. (ii) Cutting of trees;
6. (iv) Construction of any clusters of dwelling units, farms houses, sheds, community centres, Information centres and any other activity connected with such construction (including roads a part of any infrastructure relating thereto);
7. (v) Electrification (laying of new transmission lines).

2. Any person who desires to undertake any of the above mentioned processes or operations in the said areas, shall submit an application to the Secretary Ministry of Environment and Forests, New Delhi, in the attached application form (Annexure) specifying inter alia, details of the area and the proposed process or operation. He shall also furnish an Environment Impact Statement and an Environmental Management Plan along with the application on and such other information as may be required by the Central Government for considering the application.
(0) Proposal for diversion of forest land under Forest (Conservation) Act, 1980 including
Benefit Cost analysis

13. Recommendations of the State Pollution Control Board and/or the State Department of Environment 
& Forests.

Signature of the Applicant
Along with name, date and full Postal address.

N.B.:
A. Item Nos. 3(c), 4, 5, 6, 7, 8, 9, 10, 12(b) and 12(c) are not applicable to cutting of trees.

B. Item Nos. 3(c), 4, 7, 11 are not applicable to construction of clusters of dwelling units, farm sheds, 
community centre and any other activity connected with such construction including roads.

C. Item Nos. 3(b), 3(c), 3(e), 3(f), 4, 5, 6, 7, 9, 12(a) & 12(b) are not applicable to electrification.

D. All items to be furnished in case of mining, industry thermal power, transport projects

E. Notwithstanding the above, any item(s) considered not applicable may be so indicated along with reasons.

Power requirement indicating source of supply;
complete environmental details to be furnished separately, if captive power units proposed;

Total labour force to be deployed with details

Endemic health problems in the area.

Health care system proposed:

(a) Number of families and population to be displaced:

(b) Rehabilitation Master Plan:

Risk assessment report:

12. (a) Environmental Impact Assessment Report:

(b) Environmental Management Plan: Prepared as per Guidelines of MEF issued from time to time.

c) Detailed Feasibility Report:

Ambient noise level:

c) Noise & vibration control measures proposed:

d) Subsidence problem, if any, with control measures:
GOVERNMENT OF INDIA  
POWER TELECOM CO-ORDINATION COMMITTEE  

No.PTCC(T)/DV- 7233/ Raj-67 Dated 8.3.96  

CERTIFICATE OF APPROVAL TO THE ROUTE EXTRA HIGH TENSION POWER LINE/TELECOMMUNICATION LINE.  

Approval to the Power Telecommunication Co-ordination Committee is hereby conveyed to the route of:  
132KV S/C Kishangarh Bas- Tijara.  
E.H.T. line/Telecommunication line, particulars of which are given in the Appendix-I.  

The approval is for the route only and is subjected to the following conditions:  

1. The approval is based on the power system/telecom./system condition details as reported by the power supply authority/Telephone Authority at present. Any changes either to the transmission lines or the Power system of the paralleling telecommunications lines which are likely to alter the low frequency induction from the estimated at present should be reported to PTCC for its prior approval.  

2. The power & telecommunication authorities shall be required to adopt such measures as may be recommended by PTCC for counteracting any interference that might arise when the EHT line is in normal operating.  

3. Each crossing should satisfy the conditions be laid down in para 8 of PTCC Code of practice for crossings.  

4. The angle of crossings shall be 90 but in no case less than 60  

5. The power line shall be required with protective switch gear such that the duration of earth fault current should be as short as possible but never exceeding 0.5 seconds.  

6. The power line shall be energised within a mutually acceptable time after completing a certificate from concerned DOT and/or Railway Authority regarding completion of provision of all protective measures as recommended by PTCC and also under specific clearance from the DOT and/or Rly.
7. The telecom. line shall be commissioned within a mutually acceptable time after completing provision of all protective measures as recommended by PTCC and also after obtaining a specific clearance from Power Authority if certain measures as recommended by PTCC are to be carried out on power system.

8. The later entrant in the field shall bear entire cost of providing GD tubes and their fitting as recommended by PTCC including the spares and/or any other protecting measures as recommended by PTCC.

9. The route approval shall be subject to special conditions as laid down under Appendix-II.

10. The power Authorities will ensure that the provisions of code of practice for protection from EIR are taken care of.

Sd/-

(Hubasi Ram)

For & on behalf of Central PTCC
D.E.T. PTCC, NEW DELHI.
APPENDIX-I

1.a) Name of the power supply authority seeking approval: XEN(PTCC), RSEB, Jaipur.

b) Reference No. & date: RSEB/CE/T&C)/XEN(PTCC)/JPR F.448/560/ dt 22.6.91.

c) Probable date of energisation: -

2.a) Name of the power line: 132kV S/C Kishangarh-Bas-Tijara.

b) Route map No. & date: -

c) Operating voltage: 132 KV

d) Length of HT line: 18 Kms.

e) Number of circuit: Single circuit

3.a) Names of paralleling telecom. lines.

b) Length of parallelism: -

4) Average value of earth resistivity in the region: 8792 ohm-cm

5. Whether L.F. Test necessary: -

6. Fault current & induced voltages: -

<table>
<thead>
<tr>
<th>S.No.</th>
<th>Name of the telecom line/circuits</th>
<th>Length in miles/Kms.</th>
<th>M.C. in F.C. in</th>
<th>I.V. in parallelism</th>
<th>Ohms</th>
<th>Amps</th>
<th>Volts</th>
</tr>
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</table>

----------------------------------------
DET Alwar will make arrangements to provide G.D. tubes in the telecom alignment noted below. The G.D. tubes can be procured from CTS New Delhi, as per the allotment being issued separately by this office. The cost of the protection work will be borne by the power department.

TIJARA-KISHANGARH BAS ALIGNMENT:

i) One G.D. tube each on all wires at Kishangarh bas and Tijara terminals.

ii) One G.D. tube each on all wires at four places equally spaced between Kishangarh bas and Tijara terminals.

II. No coxial cable is involved in the route as intimated by SDE PTCC Jaipur vide his letter No. RAJ PTCC/95-96/ EHT/9/6/ dated 29.2.96.

III) No railway line is involved in the power route as intimated by XEN PTCC RSEB, Jaipur vide his letter No. RSEB/CE(T&C)/XEN(PTCC)/ JP/F. 448/D. 81 dated 5.2.96.
RAJASTHAN STATE ELECTRICITY BOARD

132 Kv Kuchera - Sanju Line

The route plan of the 132 Kv Kuchera - Sanju Line from the 132 Kv substation at Kuchera, to the proposed 132 Kv substation at Sanju, has been marked on the attached large scale map. Land use areas are shown in various colors and include: uncultivated government land, villages, roads, nallahs, hills, existing transmission lines and canals/drains. Most of the information discussed below is illustrated on the survey map of the route.

Description of the route:

The route of the line has been walked and surveyed by Sh. Cholaram, J. E. (TCC - III). The line passes through barren government land, as well as irrigated and non-irrigated agricultural land, and has been planned in such a way that no villages are crossed. The nearest airport is 120 km away, and the nearest bird or wildlife sanctuary is more than 200 km distant. The ROW does not pass through forest, wildlife or other protected areas. There are no areas of cultural importance along the route. The total length of this line is approximately 22 km.

Environmental Issues and Mitigation Strategies:

The Kuchera - Sanju line does not lie in the specified Aravali Range area.

The issues below have been addressed during the conceptual design, and have been reassessed during detailed design and route survey:

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<td>Access roads in remote areas, increase in hunting, exploitation of forest resources, induced development due to new access corridors, human settlement and more extensive clearing</td>
<td>No new access roads will be built. There is no forest land or wildlife protection area along the ROW.</td>
</tr>
<tr>
<td>Transmission line rights of way and substation site impacts on land use: agricultural, forest areas, wetlands, wildlands</td>
<td>There is no wildlife protection zone within 200 km of the ROW. The ROW is not the first transmission line in the area, and existing transmission lines in the area have given no problem to migratory birds during any part of the year.</td>
</tr>
</tbody>
</table>
The horizontal struts of the towers are fitted with rough (sawtooth) strips to discourage birds from roosting near the transmission lines.

The ROW passes through agricultural land. A minimum area is used for foundation footings of the towers, approximately 6 x 6 m. The extent of the land covered under the towers will total approximately 0.7 acres. Appropriate compensation will be paid if crop damage occurs during construction (see main text). After construction cultivation is allowed under the towers and conductors.

<table>
<thead>
<tr>
<th>Impacts on cultural resources</th>
<th>There are no cultural or aesthetic resources along the ROW. These places have, therefore, not been shown on the map. There will be no impact on cultural resources due to the ROW.</th>
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<tr>
<td>Erosion during construction, and along access roads, substation and transmission tower sites</td>
<td>The project is located in the topographically level areas of Rajasthan, where the terrain is flat.</td>
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<tr>
<td>Clearing (erosion, loss of habitat) and control of vegetation in rights of ways, including mechanical and chemical (herbicide) clearing operations, (chemical contamination of site and rainfall runoff)</td>
<td>No chemicals are used by the RSEB for removing the grass/plants/vegetation which will grow under the ROW. Clearing as needed is done manually. Any trees in the ROW are topped to comply with the Indian Electricity Rule vertical clearances. Any trees cut are replaced by an equivalent compensation nearby.</td>
</tr>
<tr>
<td>Potential electromagnetic frequency (EMF) radiation effects, radio noise and television interference, and audible noise along transmission line routes, exposure of substation operations personnel to potential EMF hazards</td>
<td>GOI regulations (Electricity Act) call for minimum transmission line clearance distances to address EMF effects. The ROW clearance from ground will be as per Electricity Rules, (attached).</td>
</tr>
<tr>
<td>Public access to substations, towers and other electrocution hazards</td>
<td>Rajasthan SEB will restrict public access, by fencing and security of substations. Towers have barbed wire anti-climbing devices and danger notices. Substations are fenced, and the fences are grounded. Distribution transformers are fenced, and the smaller</td>
</tr>
</tbody>
</table>
installations are made on poles. All installations are made in accordance with the Electricity Act, and inspected on a regular basis. A consumer safety program is included in the technical assistance.

| Hazards to aircraft | The nearest airport is 120 km from the ROW. The ROW will not present a hazard to aviation zones or approach routes to airports. |