DEDICATED FREIGHT CORRIDOR CORPORATION OF INDIA LIMITED

ENVIRONMENTAL ASSESSMENT (EA) & ENVIRONMENTAL MANAGEMENT FRAMEWORK

FOR

BHAUPUR - KHURJA SECTION

OF

PROPOSED EASTERN DEDICATED FREIGHT CORRIDOR

SECTION – II

ENVIRONMENTAL MANAGEMENT FRAMEWORK (FINAL)

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Chapter-1

INTRODUCTION

1.1 BACKGROUND

Dedicated Freight Corridor Corporation of India (DFCCIL) is a Special Purpose Vehicle set up under the administrative control of Ministry of Railways to undertake planning & development, mobilization of financial resources and construction, maintenance and operation of the Dedicated Freight Corridors. DFCCIL was incorporated in October 2006, under Indian Companies Act 1956.

The plan to construct dedicated freight corridors across the country marks a strategic inflexion point in the history of Indian Railways that has essentially run mixed traffic across its network. Once completed, the dedicated freight corridors will enable Indian Railways to improve its customer orientation and meet market needs more effectively. Creation of rail infrastructure on such a scale - unprecedented in independent India – is also expected to drive the establishment of industrial corridors and logistic parks along its alignment.

In the first phase, DFCCIL will be constructing two corridors – the Western DFC and Eastern DFC- spanning a total length of about 2800 route km. The Eastern Corridor, starting from Ludhiana, Punjab will pass through the states of Haryana, Uttar Pradesh and terminate at Son Nagar, Bihar. The Western Corridor will traverse the distance from Dadri to Mumbai, passing through the states of Delhi, Haryana, Rajasthan, Gujarat and Maharashtra. The present section deals with eastern corridor and environment management framework is prepared to deal with associated environmental issues, regulatory requirements, capacity building plan and institutional strengthening requirements for DFCC.

Past decade has seen a global increase in concerns regarding protection of the Environment and conservation of forest and forest reserves. Government of India (GoI), through Ministry of Environment and Forest, MoEF ensures the conservation of flora, fauna, forests and Wildlife, prevention & control of pollution, afforestation & regeneration of degraded areas and protection of environment, in the frame work of legislations. Central Pollution Control Board, CPCB an autonomous body of MoEF ensures the prevention and control of pollution, addresses the public grievances arising due to project intervention. To address/compile with the concerns/policies of the MoEF and other applicable agencies, a detailed analysis/reporting of environmental features and parameters need to be prepared for compiling with the statutory / legal requirements set forth by GoI. A detailed list of applicable clearance/approval in the works, along with their criteria for applicability is presented in Chapter-3. In view of the above the project planning is not complete without Environmental Impact Assessment (EIA) and the suitable Environment Management Plan (EMP).

All the major environmental impacts along with mitigation and management measures have been compiled in the form of EMF i.e Environmental Management Framework. Environmental Management Framework will be adopted as a policy document by DFCCIL for all present and future projects.

1.2 PURPOSE OF ENVIRONMENTAL MANAGEMENT FRAMEWORK, EMF

The first objective of the EMF is to develop a generic environmental management plan and framework to address environmental issues arising during planning, design, and construction and operation phase of any upcoming project. The EMF will be used to establish criteria to identify the level of EA required for the project and the processes involved, their sequence to conduct the EA studies for various components/phases of freight corridor projects including their legal requirements and implications. Comprehending the level of EA will help the DFCCIL in assessing the requirement of external agency in the form of consultancy services and also the stage of such requirement, like **Planning Consultant** at planning and design stage and **Construction Supervision Consultant, CSC** at construction stage. It is worth to mention here that any external agency or consultant can help DFCCIL in analyzing and reporting of environmental feature and parameters, filing the application for clearance and approval, but ultimately the responsibility lies with DFCCIL. Hence the need of institutional strengthening/capacity building plan is crucial as emphasized in next paragraph.

The EMF will also be used to suggest suitable mechanisms for the operationalisation/Implementation of EMP, appropriate institutional mechanisms and specific training / capacity building needs and environmental guidelines to prepare a work plan. For better understanding the Environmental Management Framework, EMF is divided into three sub sections

Part 1: Environmental Management Regulatory Procedure EMRP: The EMRP will be used to establish criteria to identify the level of environmental studies /environment related clearances required for the project and the processes involved, their sequence to conduct the studies for various components/phases of freight corridor projects including their legal requirements and implications. Comprehending the level of studies will help the DFCCIL in assessing the requirement of external agency in the form of consultancy services and also the stage of such requirement, like Planning Consultant at planning and design stage and Construction Supervision Consultant, CSC at construction stage etc.

Part 2: Capacity Building Plan, CBP: An important part of this capacity building is ensuring that people have the skills and training necessary to understand the linkages between freight corridor development and environmental consequences. The CBP will suggest suitable mechanisms for the operationalisation/implementation of EMP, appropriate institutional mechanisms and specific training/capacity building needs and environmental guidelines to prepare a work plan.

Part 3: Environmental Code of Conduct, ECoC: These guidelines have been prepared to provide an outlook and practical methods to counter the problems faced in environmental assessment and management by engineers in designing and executing the project components. Based on these generic guidelines/measures, a specific action plan needs to be worked out for the project such that any environmental issues arising due to the intervention can be countered.

1.3 ENVIRONMENT AND INTERNATIONAL COMMUNITY

In recent years, the international community has placed the environment at the top of the development agenda. As a result, international lending organizations, like the World Bank, have begun to tie the provision of development funding to a requirement to assess the environmental impacts of proposed projects. Many lending institutions and international environmental agencies have issued guidelines to ensure that proposed projects are designed and implemented in an environmentally and economically sound fashion.

International Funding Organizations with EA Requirements:

- World Bank
- Asian Development Bank (ADB)
- African Development Bank (ADB)
- Canadian International Development Agency (CIDA)
- Economic Commission for Europe
- European Economic Community
- European Investment Bank
- Inter-American Development Bank (IADB)
- United Nations Environmental Program (UNEP)
- United States Agency for International Development (USAID)

1.4 ENVIRONMENTAL AWARENESS

People in government and business need to know how to evaluate and mitigate the environmental impact of all development projects, starting from the time the projects are conceived. They need to take a precautionary, integrated and proactive approach to protecting the environment. Environmental Impact Assessment (EIA) can act as a catalyst to sustainable development by increasing environmental awareness and knowledge, and can serve as a starting point for implementing an Environmental Management regulatory procedure EMRP.

GENESIS OF DEDICATED FREIGHT CORRIDOR CORPORATION OF INDIA LTD. (DFCCIL) & EDFC PROJECT CYCLE

The Indian Railways' quadrilateral linking the four metropolitan cities of Delhi, Mumbai, Chennai and Howrah, commonly known as the Golden Quadrilateral and its two diagonals (Delhi-Chennai and Mumbai-Howrah), adding up to a total route length of 10,122 km carries more than 55% of revenue earning freight traffic of IR. The existing trunk routes of Howrah-Delhi on the Eastern Corridor and Mumbai-Delhi on the Western Corridor are highly saturated with line capacity utilization varying between 115% and 150%.

The rapid growth of Indian economy in the last few years has created demand for additional capacity of rail freight transportation, and this is likely to grow further in the future. This burgeoning demand led to the conception of the dedicated freight corridors along the Eastern and Western Routes. Hon'ble Minister for Railways, made this historic announcement on the floor of the House in the Parliament while presenting the Railway Budget for 2005-06.

In April 2005, the Project was discussed at the Japan-India Summit Meeting. It was included in the declaration of co-operation signed between the Hon'ble Prime Ministers of India and Japan for a feasibility study and possible funding of the dedicated rail freight corridors by Japanese Government. The feasibility study report was submitted to Ministry of Railways in October 2007.

In the meanwhile, Ministry of Railways initiated action to establish a Special Purpose Vehicle for construction, operation and maintenance of the dedicated freight corridors. This led to the establishment of “Dedicated Freight Corridor Corporation of India Limited (DFCC)”, to undertake planning & development mobilization of financial resources and construction, maintenance and operation of the dedicated freight corridors. DFCC was incorporated as a company under the Companies Act 1956 on 30th October 2006.

Corporation Governing Body consist of the following directors:-

- The Chairman, DFCCIL.
- The Managing Director, DFCCIL.
- Director (Finance), DFCCIL
- Director (Infrastructure), DFCCIL.
- Director (Project Planning), DFCCIL.
- Director (Operations & Business Development), DFCCIL.

The Governing Body will decide policy matters authorizing DFCCIL officers to implement the schemes, policies & review decisions taken from time to time.

2.1 OBJECTIVE & MISSION OF DFCCIL

- Reduce unit cost of transportation by speeding up freight train operations and higher productivity.
- Increase rail share and freight market by providing customized logistic services.
- Create additional rail infrastructure cater to high level transport demand.
- Segregate freight infrastructure for focused approach on both passenger and freight business of railways.
- Construct, maintain and operate the dedicated freight corridors as a profitable commercial entity.
- Provide a modern, quicker and safer freight transportation system.
- Maximise railways' share of freight transport business by leveraging quality and pricing of rail freight transport services.
- Leverage reduced emission of Green House Gases by encouraging a modal shift from road to rail.
- Institutionalise an organizational environment that breeds 'sincerity, speed and success.
- Environment protection and its commitment to integrate environmental protection and social development in its mandates, in a proactive manner, to contribute towards sustainable development

2.2 ORGANIZATION SETUP OF DFCCIL FOR EASTERN DEDICATED FREIGHT CORRIDOR

Managing Director: is over all responsible for successful implementation of the proposed DFCCIL project. Coordinate with the MoR, direct concern officials of DFCCIL about environment regulation, R & R,
Director(Project and Planning): Chief Executive of the project(EDFC) and is responsible for successful implementation of the various project components including environmental studies, environmental regulations, RAP, Ensure timely release of money to CPM offices for social component, Interact regularly with SMU staffs
General Manager(Eng. III): Interact with General Consultant, SEMU and CPM offices, synchronize construction schedule and progress made in environmental studies, related NOCs and Clearances, LA and R&R, report to Director(PP) about need of corrective measures to speed-up LA and R&R work,
General Manager (SEMU): Key officer in DFCCIL Coordinate with CPM offices and DFCCIL, report to Director(PP) about the progress on environmental studies, related NOCs and Clearances, forest clearances, LA and R&R, Participate in the State Level Meetings on LA and R&R,
Additional General Manager (SEMU): Coordinate with CPM office, report to GM (SEMU) about the progress, monitor the progress of EIA, LA and R&R under the project,
At CPM office level
Chief Project Manager: Key officer and chief executive of the unit, interact regularly with Dy CPM and APMs of the unit, Ensure timely release of budget to field offices, interact State and District level officials, report to Director (PP)
Dy Chief Project Manager: Report to CPM about EA, regulatory requirement, LA and R&R work, participate in District level meeting, coordinate with Competent Authority of concern project Districts
Asstt. Project Manager: In charge of the assigned corridor, ensure progress of environmental monitoring, field studies, LA and R&R, interact regularly with field staffs and

land acquisition offices.

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2.3 FINANCIAL MANAGEMENT

Funds Flow:

- Through budgetary allocation from Government of India.
- Loan assistance from International funding Agencies. Loan assistance is available from World Bank & JBIC and other overseas agencies.

2.4 NEED FOR ENVIRONMENTAL POLICY

The freight corridor projects taken up by DFCCIL are range from medium to large scale infrastructure projects. Such projects can have a potential of causing environmental and social impacts. The Railway projects may have negative impacts on some parameter of environment on short term basis but in long run it will have positive impact on environment. As an environmentally aware and socially responsible corporation, DFCCIL is cognizant to the need to mitigate and minimize the negative environmental and social impacts of projects in its portfolio and has adopted Environmental and Social Policy (ESP) and developed procedures that ensure minimization of such impacts.

2.5 ENVIRONMENTAL POLICY (EP) OF DFCCIL

The Environment Policy of DFCCIL is guided by its commitment to integrate environmental protection and social development in its mandates, in a proactive manner, to contribute towards sustainable development. To achieve the fine balance among developmental imperatives and environmental wellbeing, DFCCIL gives due importance to environmental considerations in adopting the projects to minimize adverse impacts and risks to the environment and people that may be affected. This policy statement emphasizes DFCCIL's sensitivity and concern to environmental issues, commitment towards compliance, and responsiveness towards environmental requirements of its projects. The Environment Policy is implemented through a well structured Environmental Management Framework (EMF).

2.6 OBJECTIVE OF ENVIRONMENTAL MANAGEMENT FRAMEWORK OF DFCCIL

The Environmental Management Framework addresses following key issues

- to avoid and to minimize adverse environmental impacts/risks due to project,
- to ensure that adverse environmental impacts/risks are well-mitigated/minimized to achieve applicable environmental standards and objectives,
- to comply with applicable GOI state laws and regulations, and environmental safeguards requirements of development partners,
- to provide guidance to its own staff in conducting subsequent monitoring & reporting, and in undertaking corrective actions;
- To develop and exercise mechanisms for effective supervision by DFCCIL during implementation.

- Guidelines for the DFCCIL in terms of for environmental regulations and its implementation for future projects.

2.7 PROJECT PLANNING

During this stage, reconnaissance surveys are carried out and two or three route alternatives are studied in detail. Field officers record all critical information such as rivers, hills, railway crossings, telephone, and power transmission lines. In addition to environmental and social details are also noted. Detailed Survey is carried out for forest areas and preliminary survey for the rest of the areas. DFCC employs modern survey tools such as GPS, aerial photography and satellite images to collect all relevant information.

The collected information is transferred to Geographical Information System (GIS) and the optimum route is selected ensuring that the alignment avoids forests and areas of significant natural resources. If this is unavoidable, DFCC endeavour to ensure that the route does not involve human habitation and areas of cultural importance and the use of forest is kept to a minimum.

The Introduction of GIS and GPS provide topographical and geo-technical details in route selection process. This helps in developing cost effective design alternatives related to local site conditions and planning for the mitigation measures.

After the finalisation of route, DFCC carries out the environmental assessment and formulates an Environmental Assessment and Management Plan (EAMP), which include the forest proposal. An attempt is made to select the route so that minimum forest area is involved. Acquisition of forest land is done by obtaining clearance from the State as well as MOEF with an undertaking to bear the cost of compensatory afforestation on degraded forest land double the area.

DFCC identifies potential substation sites based on data collected and a comprehensive analysis is carried out in terms of environment and social point of view and sensitive receptors near the sub-stations. The analysis considers various site specific parameters that includes infrastructure facilities such as access roads, railheads, type of land *viz*. Govt., revenue, private land, agricultural land; social impacts such as number of families getting affected; and cost of compensation and rehabilitation giving due weigh to each. An initial assessment of the selected site is done to ascertain the scope and extent of social assessment.

Land acquisition for the selected site is generally carried out only after the approval of the project by GOI. However, in case of urgency or to meet the project

schedule, special permission is obtained from competent authority for starting land acquisition process before GOI approval.

2.8 PROJECT APPROVALS

The project approval is being done through Railway Board.

2.9 PROJECT IMPLEMENTATION

The project will be implemented through Chief Project Manager as per the approved final alignment. However, minor changes may be done, if required, due to some field constraints. Construction of railway line, electric sub-station, erection, & stringing of towers and other facilities are then initiated. Due care is taken to minimise / mitigate environmental impacts. Health & Safety aspects are also given utmost importance. DFCC has a dedicated department to oversee environmental and social requirement both during construction as well as operation stage.

Chapter-3

POLICY, LEGAL AND REGULATORY FRAMEWORK

3.1 APPLICABLE REGULATIONS

The chapter presents a review of the legislations relevant to the project at the National and State level. The various statutory clearances from various state and central government authorities and the institutional and legal frameworks are discussed in the following paragraphs.

3.2 LEGAL FRAMEWORK

The Government of India has laid out various policy guidelines, acts and regulations pertaining to environment. The Environment (Protection) Act, 1986 provides umbrella legislation for the protection of environment. As per this Act, the responsibility to administer the legislation has been jointly entrusted to the Ministry of Environment and Forests (MoEF) and the Central Pollution Control Board (CPCB)/Uttar Pradesh Pollution Control Board (UPPCB) in the present context. More details on the legal framework of Government of India and State Government regulations and clearance procedures are envisaged in the following paragraphs.

3.3 KEY ENVIRONMENTAL LAWS AND REGULATIONS

Table 3.1 presents the environmental regulations and legislations relevant to freight corridor projects.

Table 3.1: Environmental Regulations and Legislations (National)

Sl. No.	Act / Rules	Purpose	Applicability to EDFC	Authority
1	Environment Protection Act-1986	To protect and improve overall environment	The project activities should maintain emission standards	MoEF. GoI; DoE, State Gov. CPCB; SPCB
2	Environmental Impact Assessment Notification- 14th Sep-2006 and its amendment till 2009	To provide environmental clearance to new development activities following environmental impact assessment	Railway projects are not included in the Notification	MoEF
3	Notification for use of fly ash	Reuse large quantity of fly ash discharged from thermal power plant to minimize land use for disposal	Possibility of use of fly ash shall be explored in engg. designs	MoEF
4	Coastal Regulation Zone(CRZ) Notification 1991 (2002)	Protection of fragile coastal belt	Not applicable in the project corridor	MoEF
5	National Environment Appellate Authority Act (NEAA) 1997	Address Grievances regarding the process of environmental clearance.	Not Applicable	NEAA
6	The Land Acquisition Act 1894, 1989	Set out rule for acquisition. of land by government	EDFC has been considered as special railway project. Procedure for land acquisition is explained in Para 3.2	Revenue Department State Government and Empowered Railway Officers.

Sl. No.	Act / Rules	Purpose	Applicability to EDFC	Authority
7	MoEF Circular on Marginal Land Acquisition and Bypasses 1999	Defining "marginal land' acquisition relating to the 1997 Notification	Not Applicable	MoEF
8	The Forest (Conservation) Act 1927 The Forest (Conservation) Act. 1980 The Forest (conversion) Rules 1981	To check deforestation by restricting conversion of forested areas into non- forested areas	Forest land is involved in the project.	Forest Department, Govt. UP (for land conversion below 5 hectare & 40 % density).
9	MoEF circular (1998) on linear Plantation on roadside, canals and railway lines modifying the applicability of provisions of forest (Conversation) Act, to linear Plantation	Protection / planting roadside strip as avenue/strip plantations as these are declared protected forest areas.	Applicability of Forest conservation act	MoEF
10	Wild Life Protection Act 1972	To protect wildlife through certain of National Parks and Sanctuaries	No wild life Sanctuary or National park is involved. Chambal WLS is bypassed with 12 Km distant from project corridor	Chief Conservator Wildlife, Wildlife Wing, Forest Department, GoUP
11	Air (Prevention and Control of Pollution) Act, 1981	To control air pollution	Emissions from construction machinery and vehicle should be checked time to time.	UPPCB
12	Water Prevention and Control of Pollution) Act1974	To control water pollution by controlling discharge of pollutants as per the prescribed standards	Various parameters in Effluents from construction sites and workshops are to be kept below the prescribed standards	UPPCB
13	Noise Pollution (Regulation and Control Act) 1990	The standards for noise for day and night have been promulgated by the MoEF for various land uses.	DG sets at construction sites and workshops should be provided with acoustics enclosures.	UPPCB
14	Ancient Monuments and Archaeological Sites and Remains Act 1958 and its amendment up to 1992	Conservation of cultural and historical remains found in India	The proposed corridor is passing within 100m from ASI protected monument "Budhiya ka Tal" near Athamadpur, Agra. NOC from ASI need to be taken as per the act.	Archaeological Dept GoI, Indian Heritage
15	Public Liability and Insurance Act 1991	Protection form hazardous materials and accidents.	Shall be taken as per requirements	UPPCB
16	Explosive Act 1984	Safe transportation, storage and use of explosive material	Respective Authorization shall be obtained from CCE	Chief Controller of Explosives

Sl. No.	Act / Rules	Purpose	Applicability to EDFC	Authority
17	Minor Mineral and concession Rules	For opening new quarry.	Quarry Licenses shall be obtained by Contractors.	District Collector
18	Central Motor Vehicle Act 1988 and Central Motor Vehicle Rules1989	To check vehicular air and noise pollution.	All vehicles in Use shall obtain Pollution Control Check certificates	Motor Vehicle Department
19	National Forest Policy1952 National Forest Policy (Revised) 1988	To maintain ecological stability through preservation and restoration of biological diversity.	Forest land is involved in the project.	Forest Department, GoI and GoUP
20	The Mining Act	The mining act has been notified for safe and sound mining activity.	Quarry Licenses shall be obtained by Contractors.	Department of mining, GoUP
21	Railway (Amendment) Act, 2008	Land acquisition for special railway project	Applicable for DFC	GoI

3.3.1 Environment

The Environment (protection) Act, 1986:

This triggers an unbiased examination of all infrastructure projects from the environmental angle. All environmental regulations were introduced under this Act. EA document should examine processes, materials and substances that has the potential to cause environmental degradation and or pollution. The EA shall assess if relevant standards will be breached, and confirms that relevant procedures and safeguards will be followed. The EA will have to identify Central and State Government standards set for the quality of the environment emission or discharge of environmental pollutants, procedures and safeguards for handling hazardous substances, and relevant restricted development areas. Document includes procedures and safeguards for the prevention of accidents, which may cause environmental pollution and remedial measures for such pollution. The EA identifies mechanisms to notify the relevant authority in the event of a discharge of pollution exceeding the standards set.

Applicable as the law extends to the whole of Indian Territory as an umbrella Act to protect and to preserve/conserve environment. This act is intended to provide protection and improvement of environment and for sustainable development.

3.3.2 EIA Documentation & Environmental Clearances (EC)

September 14, 2006 EIA notification on environmental clearances

According to this, latest gazette notification, there are two categories of projects, category A and Category B. Category A will be cleared by the Ministry of Environment and forests at central level (Expert Appraisal Committee or EAC constituted by MOEF)) and the category B project will be cleared by the State Environmental Impact Assessment Authority (SEIAA) constituted by MOEF at State level. If there is no State level authority constituted, all categories of projects in State would be dealt at central level if required. As earlier, the category 'A' projects would require public hearing in all project impacted districts. So far PCBs was instrumental in facilitation of EC clearances both at State and central level. While the responsibility of public hearing is still with PCB, the EC at State level will

be taken over by the SEIAA constituted by MOEF at State level. Railway projects are not included in this Notification.

3.3.3 Forest Land Acquisition and Clearances

Forest (Conservation) Act 1980

Under this law, DFCCIL must obtain administrative approval from the Forest Department to clear over 05 hectares of designated forestland. According to this although the land is under the control of State Government, due to its protected Status, approval of Central, Regional or State Government for using the land for freight corridor must be granted.

At the State level, Government was empowered to declare reserves and protected forest and was also given the authority to acquire land for extension and preservation of forests. In December 1996, a Supreme Court judgment further defined the types of forests to be protected. Depending on the size of the tract to be cleared, clearances are required from the following levels of Government.

If the forest exceeds 20 hectares then prior permission of Central Government is required. If the forest is between 5 to 20 hectares the regional Office of Chief conservator is empowered;

If the forest is below or equal to five hectares the State Government may give permission; and,

If the construction area is more than 40 % forest, permission to undertake any work is required from the Central Government, irrespective of the size of the area. The present project requires approximately 05 hectare of forest land, therefore, permission from Chief Conservator shall be obtained.

3.3.4 Ambient Noise Quality

Noise Pollution (Regulation & Control) Rules 2000

As a result of considering the deleterious and psychological effects of the noise pollution on the human well-being, MOEF has drawn up the above rules, which have come to force with effect from February 14, 2000. According to the provisions of the rules notified, a person might make a complaint to the designated 'Authority' in the event that the actual noise levels exceed the ambient noise standards by 10dB(A) or more as compared to the prescribed standards. The designated authority will take action against the violator in accordance with the provisions of these rules or other law in force.

- EA shall identify all 'industrial', 'commercial', 'residential' and 'silent' zones within the project study area.
- EA shall assess if the levels of noise generated by the project in any area exceeded the ambient air quality standards in respect of noise as specified in the Schedule of the Rules.
- EA shall describe noise pollution control measures to achieve compliance with the ambient air quality standards in respect of noise.

3.3.5 Ambient Air Quality

The Air (Prevention and control of Pollution) Act, 1981

This Act provides for the prevention, control and abatement of air pollution. It is triggered by air polluting activity in an air pollution control area or when emissions of any air pollutant into the atmosphere exceed the standards set by the Central and State Boards.

- EA shall identify air pollution control areas.
- EA shall identify all air polluting activities and sources associated with the project.
- EA to confirm that consent will be obtained for air pollution control area. Environmental report describes mechanisms requested for the operation of industrial equipment and to notify the State Board of an unforeseen release of air pollutants exceeding the standards. Remedial measures proposed to mitigate air pollution in air pollution control areas are to be described.

3.4 ENVIRONMENTAL REQUIREMENTS OF THE STATE

Unlike other states, in U.P. the freight corridor side plantation within the right of way comes under the authority of railway department. But for felling and transportation of Trees, permission has to be taken from forest department at DFO level.

3.5 OTHER APPLICABLE LEGISLATIONS

Environmental issues during freight corridor construction stage generally involve pollution, safety and public health issues. The freight corridor construction agencies require complying with laws of the land, which include *inter alia,* the following:

Workmen's Compensation Act 1923 (the Act provides for compensation in case of injury by accident arising out of and during the course of employment);

Payment of Gratuity Act, 1972 (gratuity is payable to an employee under the Act on satisfaction of certain conditions on separation if an employee has completed 5 years);

Employees PF and Miscellaneous Provision Act 1952 (the Act provides for monthly contributions by the employer plus workers);

Maternity Benefit Act, 1951 (the Act provides for leave and some other benefits to women employees in case of confinement or miscarriage, etc.);

Contact Labor (Regulation and Abolition) Act, 1970 (the Act provides for certain welfare measures to be provided by the contractor to contract labor);

Minimum Wages Act, 1948 (the employer is supposed to pay not less than the Minimum Wages fixed by appropriate Government as per provisions of the);

Payment of Wages Act, 1936 *(it* lays down as to by what date the wages are to be paid, when it will' be paid and what deductions can be made from the wages of the workers);

Equal Remuneration Act, 1979 (the Act provides for payment of equal wages for work of equal nature to Male and Female workers and not for making discrimination against Female employees);

Payment of Bonus Act, 1965 (the Act provides for payments of annual bonus subject to a minimum of 83.3% of wages and maximum of 20% of wages);

Industrial Disputes Act, 1947 (the Act lays down the machinery and procedure for resolution of industrial disputes, in what situations a strike or lock-out becomes illegal and what are the requirements for laying off or retrenching the employees or closing down the establishment);

Industrial Employment (Standing Orders) Act; 1946 (the Act provides for laying down rules governing the conditions of employment);

Trade Unions Act, 1926 (the Act lays down the procedure for registration of trade unions of workers and employers. The trade unions registered under the Act have been given certain immunities from civil and criminal liabilities);

Child Labor (Prohibition and Regulation) A; 1986 (the Act prohibits employment of children below 14 years of age in certain occupations and processes and provides for regulation of employment of children in all other occupations and processes. Employment of child labor is prohibited in Building and Construction Industry);

Inter-State Migrant Workmen's (Regulation of Employment and Conditions of Service) Act, 1979 (the inter-state migrant workers, in an establishment to which this Act becomes applicable, are required to be provided certain facilities such as housing, medical aid, travelling expenses from home to the establishment and back, etc.);

The Building and Other Construction Workers (Regulation of Employment and Conditions of Service) Act, 1996 and **the Cess Act of 1996** (all the establishments who carry on any building or other construction work and employs 10 or more workers are covered under this Act; the employer of the establishment is required to provide safety measures at the building or construction work and other welfare measures, such as canteens, first-aid facilities, ambulance, housing accommodation for Workers near the workplace, etc.);

The Factories Act, 1948 (the Act lays down the procedure for approval of plans before setting up a factory, health and safety provisions, welfare provisions, working hours and rendering information-regarding accidents or dangerous occurrences to designated authorities);

Hazardous Wastes (Management and Handling) Rules, 1989; (Occupiers generating hazardous wastes s given in the list shall take all practical steps to ensure that such wastes are properly handled, i.e. collection, reception, treatment, storage, and disposed of without any adverse effects to human health and environment (Rule 4).

Such occupier shall apply for authorization in prescribed format to the State Pollution Control Board)

Chemical Accidents (Emergency Planning, Preparedness and Response) Rules, 1996. (The Rules provide for mandatory preparation of On-Site Emergency Plans by the industry and Off-Site Plans by the district collector and the constitution of four tier crisis groups at the centre, district, and local levels for the management of chemical disaster.)

3.6 APPLICABILITY OF CLEARANCE

The applicability, if following key clearance, should be checked before taking up and construction activity.

Table 3.2: Environmental Clearance Requirements

Sl. No.	Type of Clearance	Applicability	Project Stage	Responsibility	Time Required
1.	Forest clearance for land diversion	For forest land acquisition	Pre construction	DFCCIL	6-8 months
2.	Tree felling permission under Forest Act	For tree cutting	Pre construction	DFCCIL	15 days
3.	NOC from Archaeological Survey of India as per Ancient Monuments and Archaeological Sites and Remains Act 1958 and its amendment up to 1992	DFC alignment passing within 100m from ASI protected monuments Budhiya ka Tal	Pre construction	DFCCIL	**2 years**
4.	NOC and consents under Air, Water & Environment Act and noise rules from SPCB	For establishment of construction camp	Pre construction	The Contractor	2-3 months
5.	NOC and consents under Air, Water & Environment Act and noise rules from SPCB	For operating construction plant, crusher, batching plant, ready mix concrete plant etc.	Construction stage (prior to initiation of any work)	The Contractor	1-2 months
6.	Explosive license from Chief Controller of Explosives	For storing fuel oil, lubricants, diesel etc. at construction camp	Construction stage (prior to initiation of any work)	The Contractor	2-3 months
7.	Permission for storage of hazardous chemical from CPCB	Manufacture storage and import of hazardous chemical	Construction stage (prior to initiation of any work)	The Contractor	2-3 months
8.	Quarry lease deed and quarry license from state Department of Mines and Geology	Quarry operation (for new quarry)	Construction stage (prior to initiation of any work)	The Contractor	2-3 months
9.	Permission for extraction of ground water for use in road construction activities from State Ground Water Board	Extraction of ground water	Construction stage (prior to initiation of any work)	The Contractor	2-3 months
10.	Permission for use of water for construction purpose from irrigation department	Use of surface water for construction	Construction stage (prior to initiation of any work)	The Contractor	2-3 months
11.	Labor license from labor commissioner office	Engagement of labor	Construction stage (prior to initiation of any work)	The Contractor	2-3 months

3.7 WORLD BANK REQUIREMENTS – OPERATIONAL/SAFEGUARD POLICIES

The World Bank has various safeguard policies; the details and applicability of the operational/safeguard policies to the Project freight corridor are provided in the **Table 3.3.**

Environmental requirements of the World Bank are specified in detail in its Operational Policy (OP) 4.01 and other related Operation Policies. In instances in which the procedural and regulatory requirements differ, the more stringent applies. The World Bank environmental requirements are based on a three-part classification system.

- *Category A*-requires a full Environmental Assessment (EA).
- *Category B*-projects require a lesser level of environmental investigation.
- *Category C*-projects require no environmental analysis.

Table 3.3: World Bank Safeguard Policies

World Bank Safeguard Policy	Subject Category	Reason for its Applicability
OP 4.01	Environmental assessment	Umbrella policy
OP 4.04	Natural habitats	Eco-sensitive-forestry and wildlife related issues
OP 4.36	Forestry	Forest land acquisition
OP 4.09	Pest management	Pest management
OP 4.30	Involuntary resettlement	Road widening may lead to loss of livelihoods, loss of land and buildings etc.
OP 4.20	Indigenous people	
OP 4.11	Cultural property	Declared cultural property
Guideline on Env. Health and Safety, April 30, 2007	Environment, Health and Safety Guidelines for Railways	Guidelines on rail operations and maintenance

3.8 APPLICABILITY OF REGULATIONS/POLICIES

The applicability of any of the national/state level regulation or World Bank safeguard policy need to be ascertain correctly as it involve legal implications. The Environmental Management Regulatory Procedure, EMRP as detailed in the following chapter will serve as a guiding document when read in accordance with the regulatory framework.

ENVIRONMENTAL MANAGEMENT REGULATORY PROCEDURE

4.1 INTRODUCTION

The Environmental Management Regulatory Procedure, EMRP establishes the criteria to identify the mandatory requirements related to environment and the processes involved, their sequence to conduct the EA studies for various components/phases of freight corridor projects including their legal requirements and implications. Comprehending the level of requirements will help the DFCCIL in assessing the requirement of external agency in the form of consultancy services and also the stage of such requirement, like Planning Consultant at pre alignment finalization stage and after finalization of alignment. Construction Supervision Consultant, (CSC) at construction stage, and DFCC at operation stage.

Once the need/justification of a project is finalized based on the engineering parameters (like traffic, economical and financial analysis), the process of Environmental Management Regulatory Procedure starts. First step in EMRP is screening of the project freight corridor to ascertain the category of Environmental Assessment / clearances required. The environmental management system for a project is described in Table 4.1.

Table 4.1: Environmental Management Regulatory Procedure for a Project

Sl. No.	Activities	Stage
1.	Site selection, environmental screening, initial assessment, scoping of significant issues	Pre-feasibility
2.	Detailed assessment of significant impacts, identification of mitigation needs, input to decision analysis	Feasibility
3.	Detailed design of mitigation and compensation measures	Design & Engineering
4.	Implementation of mitigation measures and environmental management strategy	Implementation
5.	Monitoring and post-auditing (lessons for future projects, EIA verification, compliance)	Monitoring and evaluation

4.2 MANDATORY REQUIREMENTS - ENVIRONMENT

4.2.1 ELECTRIC ACT 2003

This Act provides the framework for power sector development by measures conducive to the industry. But, the Act does not explicitly deal with environmental implications of activities related to power transmission, signals etc. However, DFCCIL integrates environment protection as a part of its project activities and its transmission schemes are planned in such a way that the power of eminent domain is exercised responsibly. The applicable legal provisions under the Act are:

- **Section 68(1) –** Sanction of the Ministry of Power (MOP) is a mandatory requirement for taking up any new transmission project. Such sanction authorizes DFCCIL to plan and coordinate activities to commission a new project.

- **Section 164(B) –** Under this section DFCCIL has all the powers that the telegraph authority possesses and can erect and construct towers without actually acquiring the land.

The main features of the Electricity Act 2003 are given in **Appendix-I.**

4.2.2 FOREST (CONSERVATION) ACT, 1980

This Act provides for the conservation of forests and regulating the diversion of forest lands to non-forestry purpose.

When any project falls within forest area, prior clearance is required from relevant authorities under the Forest (Conservation) Act 1980. State Governments cannot de-reserve any forestland or authorise its use for any non-forest purpose without approval from the Central Government. The flow chart for forest clearance as per this law is given in **Appendix -II**. The steps for forest clearance are briefly described below:

A) ROUTE ALIGNMENT

Preliminary route selection for railway lines is done by using tools such as the forest atlas and Survey of India maps. During route alignment, all possible efforts are made to avoid the forest area or to keep it to the barest minimum. Whenever it becomes unavoidable due to the geography of terrain or heavy cost involved in avoiding it, different alternative options are considered to minimize the requirement of forest area. Modern tools like GIS/GPS are used for finalization of route. For selection of optimum route, the following criteria are taken into consideration to the extent possible that:

(i) the proposed railway line detours human habitation;
(ii) no monuments of cultural or historical significance are directly affected
(iii) the proposed railway line does not adversely impact any local community assets such as playgrounds, schools, places of worship etc.
(iv) a railway line, especially in detour, avoids environmentally sensitive areas, eco-sensitive zones, forests, sanctuaries, national parks, tiger / biosphere reserves, and CRZ covered coastal areas
(v) the line route impacts minimally on natural resources.

To accomplish this, route selection of railway line is undertaken in close consultation with representatives of the State Forest, Environment and Revenue Departments. Site-specific alterations are made to avoid environmentally sensitive areas and settlements at execution stage**.** Alignments are generally sited away from major towns, whenever possible, to provide for future urban expansion.

B) RIGHT OF WAY

Right of Way (ROW) width depends on the line voltage. Both, a maximum width of ROW for railway lines on forest land and a minimum clearance between conductors and trees should be adhered to in route selection. The ROW requirement is 40 m in parallel alignment and 60 m in new alignment.

Trees on such ROW are felled but after stringing is complete and natural regeneration is allowed to specific heights and whenever required the tree plantation is taken. Forest department is requested to undertake felling, pollarding, and pruning of trees for electrical clearance, whenever necessary, under the advice of DFCCIL.

C) FORMULATION OF PROPOSAL

After finalization of route-alignment and ROW width, DFCCIL submits details in prescribed Performa (refer **Appendix III**) to the respective Nodal Officer (Forest) of concerned State Government. Nodal Officer forwards the details to the concerned Divisional Forest Officer (DFO) for formulation of proposal for processing of clearance under the Forest (Conservation) Act, 1980. The DFO then surveys the relevant forest area required for the construction of transmission line under the possible alternatives.

Forest authorities conduct a cost-benefit analysis to assess the loss of forest produce, loss to environment vis-à-vis benefits of project (**Appendix –IV**)**.**

Compensatory Afforestation (CA) scheme is prepared to compensate loss of vegetation and is an important part of the proposal. For CA, the forest authorities identify degraded forestland of twice the area of affected land. DFCCIL provides undertaking/ certificate to meet the cost of compensatory afforestation and the Net Present Value of forestland diverted. The NPV rate varies from Rs. 4.38 to Rs. 10.43 lakh per hectare depending upon the type of forest (as per Supreme Court order dt. 28.03.08 and 09.05.2008) and is payable to the "Compensatory Afforestation Fund Management and Planning Authority" (CAMPA). As per Supreme Court order, NPV for a wildlife sanctuary area shall be 5 times of normal forest and for a national park area; it will be 10 times of normal forest. If the forest is rich in wildlife, then the Chief Wildlife Warden also gets a detailed assessment

report prepared, including measures to protect the wildlife, which is submitted with the proposal.

D) APPROVAL OF PROPOSAL

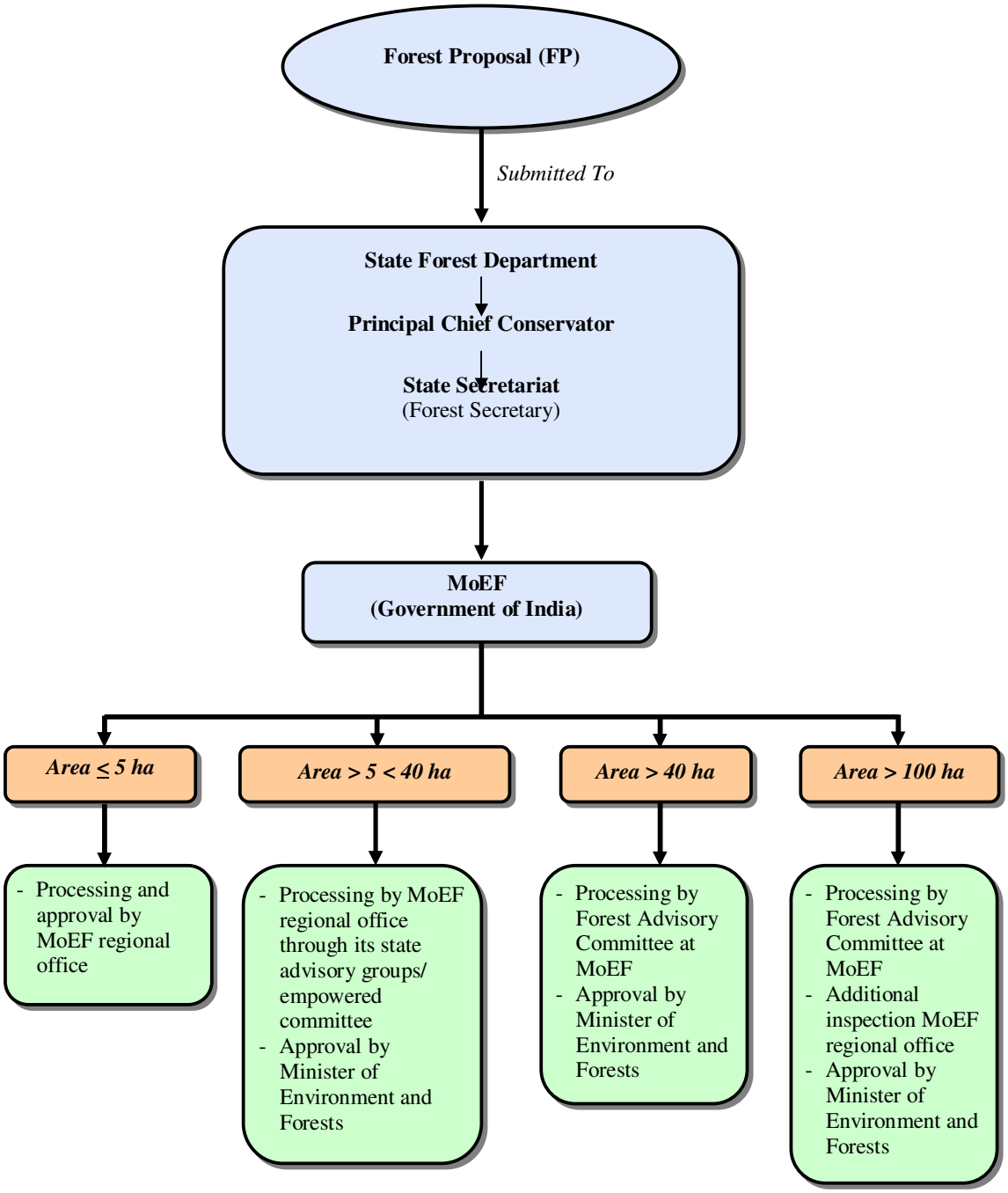
The proposal is submitted to the State Forest Department and then forwarded to the Principal Chief Conservator of Forests in the State and finally to the State Secretariat. The State Government recommends the proposal for further processing and approval to

a) Concerned Regional Office of the MoEF if the area involved is 40 hectares or less
b) MoEF, New Delhi, if the area is more than 40 hectares.

The approval process is illustrated in **Figure 4.1**.

To facilitate speedy approval of forest proposal involving lesser area, Ministry of Environment & Forests had established Regional Offices in each region for processing and approving these proposals **(Appendix -V).** The MoEF approves the proposal in two stages. In principle, or first stage, approval is accorded with certain conditions depending upon the case. Second stage, or final, approval is accorded by the MoEF after receiving the compliance report from State Government.

FIGURE 4.1: FOREST CLEARANCE APPROVAL PROCESS



4.2.3 ENVIRONMENT (PROTECTION) ACT, 1986

The Environment (Protection) Act 1986 was introduced as umbrella legislation for the protection and improvement of environment. The Act and the subsequent Rules require that environmental clearances be obtained (Appendix-VII) for specific types of new projects or expansion of existing projects (addressed under Environmental Impact Assessment Notifications, 1994 and 2006) and these also

require a submission of an environment statement to the State Pollution Control Board annually. Project categories specified under the schedule of the EIA notification is provided in **Appendix VI**. Environmental clearance is not applicable railway projects.

Since transmission line projects are non polluting in nature and do not involve any disposal of solid waste, effluents and hazardous substances on land, air and water, so limited requirements of Environment (Protection) Act 1986 are applicable**.**

DFCCIL undertakes environmental assessment for all projects as a standard management procedure, as laid down in the EMRP, and also functions within permissible standards of ambient air quality and noise levels as prescribed by national laws and international regulations.

The other relevant rules and regulations under the Environment (Protection) Act 1986 applicable to the operations of DFCCIL are described below:

A) BATTERIES (MANAGEMENT AND HANDLING) RULES, 2001

By notification dt. 16th May, 2001 under Sections 6, 8 and 25 of the Environment (Protection) Act 1986, the MoEF has put certain restrictions on the disposal and handling of used batteries. Thus, it is the responsibility of the bulk consumer (DFCCIL) to ensure that the used batteries are deposited with the dealer, manufacturer or registered recycler for handling and disposal. A half-yearly return is filed as per form-8 (**Appendix -VII***)* to the concerned State Pollution Control Board.

B) HAZARDOUS WASTES (MANAGEMENT AND HANDLING) AMENDMENT RULES, 2003

These rules classify used mineral oil as hazardous waste under the Hazardous Wastes (Management & Handling) Rules, 2003, that require proper handling and disposal. The requirements for disposal of used mineral oil as per the rules are:

- The used oil can be sent / sold for re-refining to registered recyclers; if it meets the specification in Schedule –5 (refer **Appendix VIII).**
- The waste oil which is not suitable for re-refining (i.e. does not meet the specifications listed in Schedule-5), can be used in furnaces if it meets the specifications laid down in Schedule –6 (refer **Appendix IX)**
- Any waste oil which does not meet the specifications in Schedule–6 shall not be auctioned or sold, but shall be disposed of in a hazardous waste incinerator.

Used mineral oil generated at the DFCCIL substations meets the requirements of Schedule 5 of the above mentioned Rules. DFCCIL seeks authorisation for disposal of hazardous waste from concerned State Pollution Control Boards (SPCB) as and when required. The oil can be auctioned to authorised/registered re-refiners and information to the respective SPCB is submitted in Form – 13 as per **Appendix X**.

C) OZONE DEPLETING SUBSTANCES (REGULATION AND CONTROL) RULES, 2000

By notification dt. 17th July, 2000 under Sections 6, 8 and 25 of the Environment (Protection) Act 1986, the MoEF has notified rules for the regulation/ control of Ozone Depleting Substances (ODS) under the **Montreal** Protocol. As per the notification, certain control and regulation has been imposed on manufacturing, import, export, and use of these compounds. DFCCIL is following the provisions of the notification and is phasing out all equipment, which uses these substances, and is aiming at CFC free organisation in the near future.

4.2.4 BIOLOGICAL DIVERSITY ACT, 2002

The Ministry of Environment and Forests has enacted the Biological Diversity Act, 2002, following the Convention on Biological Diversity signed at Rio de Janeiro in 1992, of which India is a party.

This Act is meant to "*provide for the conservation of biological diversity, sustainable use of its components, and fair and equitable sharing of the benefits arising out of the use of biological resources, knowledge and for matters connected therewith or incidental thereto*."

DFCCIL is fully conscious of the provisions of this enactment and will abide by the same as best as possible.

4.2.5 THE SCHEDULED TRIBES & OTHER TRADITIONAL FOREST DWELLERS (RECOGNITION OF FOREST RIGHTS) ACT, 2006

The Act recognizes and vests the forest rights and occupation in forest land in forest dwelling Scheduled Tribes and other traditional forest dwellers who have been residing in such forests for generations but whose rights could not be recorded, and provides for a framework for recording the forest rights so vested and the nature of evidence required for such recognition and vesting in respect of forest land.

The definitions of forest dwelling Schedule Tribes, forest land, forest rights, forest villages, etc. have been included in Section 2 of the Act. The Union Ministry of Tribal Affairs is the nodal agency for implementation of the Act. While field implementation is the responsibility of the government agencies, DFCCIL is

committed to abide by the provisions of the act, if any portion of a transmission line passes through any forest land to which the Act applies.

4.3 FUNDING AGENCIES REQUIREMENTS - ENVIRONMENT

The environmental requirements of the Funding Agencies pertinent to DFCCIL are: World Bank (WB) **Operational Policies (OP) 4.00** Piloting the Use of Borrower Systems to Address Environmental and Social Safeguard Issues in Bank-Supported Projects[1]; **Asian Development Bank (ADB) Operations Manuals (OM) FI/BP** and **Japan Bank for International Cooperation (JBIC) Environmental Guidelines.**

The funding agencies procedures for environmental assessment (EA) of different development projects are outlined in these guidelines. These guidelines classify development projects in three categories – A, B & C- based on possible environmental and social impacts. The WB & ADB have another category - FI - applicable only to projects involving a credit line through a financial intermediary. Brief description of three major categories is as under:

Category A: Projects having significant adverse environmental impacts that are sensitive, diverse, or unprecedented. These projects require a detailed EIA to address significant impacts.

Category B: Projects having some adverse impacts that are not as significant as of Category-A projects. These impacts are generally site specific and addressed through carefully designed mitigating measures. These projects do not require full EIA but would normally require an environmental review through Initial Environmental Assessment (WB) or Initial Environment Examination (ADB) guidelines.

Category C: Projects having minimal or no adverse environmental impacts. No EIA or environmental review is required for such projects.

Railway projects fall under Category-B, having limited impact, which are minimized through mitigation/ management measures and, therefore, require only an environmental review. However, due to the size of the investment, and its spread over to substantive portion of the country and its importance to the country, DFCCIL projects might be considered under category-A, and may be subjected to Environmental Assessment (EA).

EA is initiated as early as possible in project cycle and undertaken concurrently with economic, financial, institutional, social, and technical analysis of the project. Moreover, DFCCIL takes appropriate measures to prevent, minimize, mitigate, or

compensate for adverse impact and improve environmental performance. EA takes into account the natural environment, human health and safety, and social aspects and trans-boundary and global environmental aspects. During EA process, public is kept informed at every stage of project execution and their views are respected in decision-making.

4.4 PRESCRIPTIVE FRAMEWORK - ENVIRONMENT

The prescriptive framework involves applicable legislations, relevant policies, and the implementing agencies. The prescriptive framework also covers international treaties and conventions signed and ratified by India.

4.4.1 APPLICABLE LEGISLATIONS

A) POLLUTION PREVENTION AND CONTROL

India initiated legislation and set up pollution control institutions between late 1970s and early 1980s. As a result, air emission and water effluent standards for various activities were established. Pollution Control Boards (PCBs) were set up under these laws to control emissions, sewage, and industrial effluent by approving, rejecting, or conditioning applications for "*Consent to Establish*" and "*Consent to Operate*".

DFCCIL, by the very nature of its operations, is not involved with activities that are grossly polluting in nature. Even then, its approach is to aim for "*Zero Pollution*" in its projects, irrespective of a compliance requirement.

DFCCIL follows the rules and notifications under the Environment (Protection) Act 1986, which prescribes the Ambient Air Quality Standards with respect to noise and functions within permissible levels as prescribed by Indian and International standards.

B) CONSERVATION OF **NATURAL RESOURCES**

- DFCCIL is fully conscious of the need to conserve the natural resources and avoids ecologically sensitive areas, eco-sensitive zones, forests, sanctuaries, national parks, tiger / biosphere reserves, and CRZ covered coastal areas, as far as possible. In case traversing forest land is unavoidable, clearance from the forest authorities is obtained under the Forest (Conservation) Act, 1980. Other relevant laws and / or regulations relating to natural resources that have bearing on the working of DFCCIL are:

  - Indian Forest Act 1927;
  - Wildlife (Protection) Act, 1972.
  - Coastal Regulation Zone (CRZ) Notifications, 1991 & 2008
  - Regulatory Framework for Conservation of Wetlands, 2008 (Draft)

4.4.2 RELEVANT POLICIES

The policy framework is contained in the following:

- National Forest Policy, 1988,
- National Conservation Strategy and Policy Statement on Environment and Development, 1992,
- Policy Statement for Abatement of Pollution, 1992
- Wildlife Conservation Strategy 2002-15,
- National Environment Policy (NEP), 2006.

In addition, India is a Party to several International Treaties and Conventions relating to environment, as given in **Appendix X.** Some of these have trans-boundary implications.

DFCCIL is fully conscious of the above-mentioned policy framework, including trans-boundary issues, and will abide by the relevant requirements in its operations.

4.4.3 IMPLEMENTING AGENCIES

The nodal agency at the centre for planning, promoting, and coordinating environmental programmes is the Ministry of Environment and Forests (MoEF). DFCCIL interfaces with MoEF at central and regional levels. The Central Pollution Control Board has executive responsibilities for prevention and control of all forms of pollution. Correspondingly, there are Departments of Environment & Forests and State Pollution Control Boards to perform the above functions at the State level. As power transmission is inherently a non-polluting industry, interaction with these boards is not anticipated. Due to liberalisation, DFCCIL's activities may require international interface and would honour the international regimes as covenanted by the GoI.

4.5 HEALTH AND SAFETY REQUIREMENTS

DFCCIL maintains safety as a top priority, apart from various labor laws dealing with workers' health and safety, such as the Workmen's Compensation Act. DFCCIL has a dedicated unit to oversee all health and safety aspects of its projects under the Operation Service Department and has framed guidelines/ checklist for workers' safety based on prevailing international practices (including WBG EHS guidelines for Transmission and Distribution) as its personnel are exposed to live EHV apparatus and transmission lines. These guidelines include work permits and safety precautions for work on the railway line and associated facilities during construction and operation. See **Appendix XI** for detailed checklist.

4.5.1 EXPOSURE TO ELECTRO MAGNETIC FIELDS (EMF)

There have been some concerns about the possibility of an increased risk of cancer from exposure to electromagnetic radiation from overhead transmission lines. However, a review by the World Health Organization (WHO) held as part of the International EMF Project (1996), concluded that:

"From the current scientific literature there is no convincing evidence that exposure to radiation field shortens the life span of humans or induces or promotes cancer".

Currently no EMF exposure guidelines have been framed in the country. However, international guidelines in this regard are detailed below:

- State Transmission Lines Standards and Guidelines in the USA
- International Commission on Non-Ionizing Radiation Protection (ICNIRP)
- US National Council on Radiation
- American Conference on Government and Industrial Hygiene (ACGIH)

DFCCIL complies with international norms for field strength limits, which are certified by Power Technologies Inc**)**.

4.6 THE ANCIENT MONUMENTS AND ARCHAEOLOGICAL SITES & REMAINS ACT, 1958 & ITS AMENDMENTS TILL 1992

The Budhiya ka Tal falling within 100 m from the proposed detour alignment near Etmatpur. The monument has been declared to be of National Importance under the ancient monument and archaeological sites and remains Act, 1958 (24 of 1958). As per this act, whosever destroy, removes, injure, alters, defaces, imperials or misuse this monument, shall be punishable with imprisonment, which may extend to three months or with fine which may extend to five thousand rupees or both.

Further, under sub-rule 32 of the ancient monuments and archaeological sites and remain rules, 1959 and notification issued in 1992, area up to 100 m from the protected limits and further beyond it up to 200 m near and adjoining protected monument have been declared to be protected and regulated areas, respectively, for purpose of both mining operation and construction.

Any repair, addition or alternation and construction / reconstruction within these areas need prior approval of the Archaeological Survey of India.

The NOCs is required from ASI Department through Superintending Archaeologist, 22, Mall Road, Agra. The concerned application form is attached as **Appendix XII**.

4.7 ENVIRONMENT ASSESSMENT PROCEDURES

STEP 1: SCREENING

Screening is the process by which the appropriate level and type of EIA is determined for a given project on the basis of its likely environmental impacts. The methodology for screening includes Desk study, Reconnaissance survey and literature available.

Desk Study: To collect the secondary information and choking out the methodology for carrying out EA study and fixing of responsibilities of EA team members for preparing a complete, addressing all issues, Environmental Management Plan, EMP.

- Gathering and reviewing existing environmental data (Secondary Data) relevant to the proposed development, in the form of toposheets, physical maps, thematic maps showing details of soil type, geology, seismic activity, hydrology etc.
- Collect all the earlier carried out environmental and engineering studies in project influence area.

Reconnaissance survey: to collect the first hand information about the project area and develop a perspective of the entire team and revise the methodology and work programme.

- Verifying the data collected during desk study, assessing the likely impacts, identifying the major/main issues and preparing the methodology for detailed investigation.

Screening Statement: compiles the primary & secondary data thus collected, and checking with the legal framework of State and National level thus suggesting the requirement/category of Environmental Assessment Required. There are usually three possible outcomes (categories) of a screening process:

1. Where significant concerns exist or where there is a lot that is unknown about project impacts, a full EIA study is necessary.
2. If environmental impacts of a project are known and can be easily mitigated, a limited environmental study and mitigation plan may be all that is necessary.
3. If screening identifies no concerns, further environmental analysis is unnecessary, and the project may proceed without an EIA study.

The Environmental Assessment (EA) process will incorporates a number of key steps. A complete EA cycle in presented here, based on the categorization of EIA require, DFCC (with the assistance of Environmental Expert if desired) should finalized the Term of Reference.

4.8 STEP 2: ENVIRONMENTAL ASSESSMENT

The assessment process will constitute a systematic approach to the evaluation of a project in the context of the natural, regulatory and environment of the area in which development is proposed as illustrated in Figure 4.2.

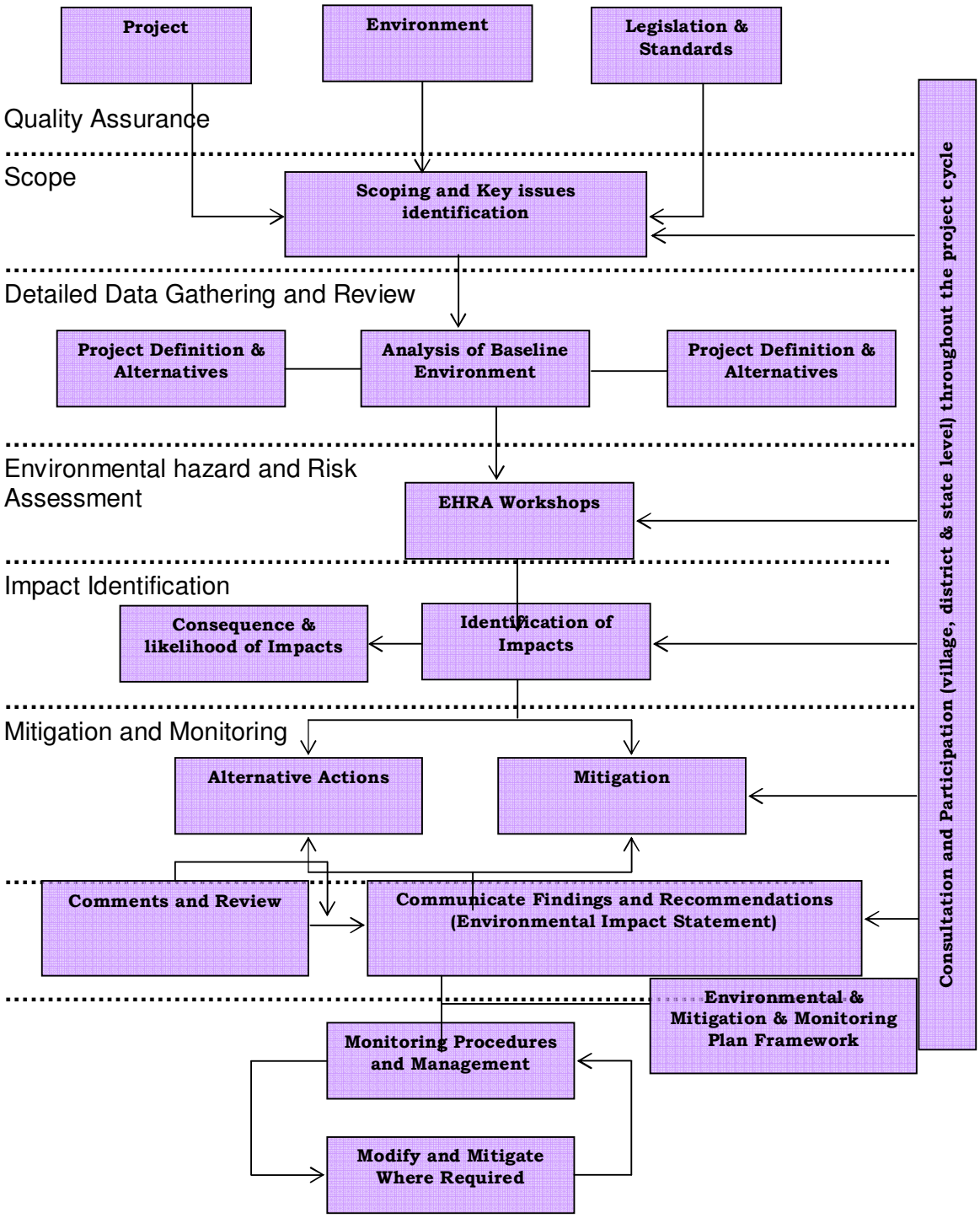


Figure 4.2: Environmental Assessment Process

4.8.1 Quality Assurance

Soon after the commencement of planning and design process, based on **desk study, reconnaissance survey and experience of earlier projects,** detailed methodology and schedule should be prepared for the effective and timely execution of the Environmental Assessment.

Desk Study: To collect the secondary information and choking out the methodology for carrying out EA study and fixing of responsibilities of EA team members for preparing a complete, addressing all issues, Environmental Management Plan, EMP.

Reconnaissance survey: to collect the first hand information about the project area and develop a perspective of the entire team and revise the methodology and work programme.

Experience Gained from Earlier Projects:

- **Focus on the main issues.** It is important that an EA does not try to cover too many topics in too much detail. Effective scoping can save both time and money by focusing EA studies on the key issues.

- **EA requires the formation of a multidisciplinary team and the leadership of a strong EA coordinator.** The range of effects considered in EAs requires the skills of a freight corridor mix of technical experts to be employed on an assessment team, lead by a Team Leader/EA coordinator. Already taken care of in RFP.

- **Involve the appropriate persons and groups in the EA study.** It is important to involve the right people (e.g., scientists, engineers, policy makers, government representatives, representatives of public interest groups and the local community) and agencies (e.g., the developer, the aid agency, regulatory authorities and politicians) in the EA process. Selection will be made through consultation at different stages.

- **Make maximum use of existing information before engaging in expensive field studies.** Already taken care of in RFP, submission of quality assurance in the form of Inception Plan.

- **It is important to consider effects not only at the project site but also in the area surrounding a site.** For this based on Reconnaissance survey and desk study, will finalize a Project influence area.

- **Present clear and appropriate options for mitigation of impacts and for sound environmental management.** Mitigation is an integral part of effects assessment. Application of appropriate mitigation can eliminate or reduce adverse effects, and improve the net overall environmental performance of a project. Hence public consent, practical viability will be considered in proposing the mitigation measures.

- **Post-EIA audits and monitoring programs are essential to ensuring that EA commitments are carried out and that future EAs improve.** An effective monitoring plan will proposed in consultation with client and World

Bank. Proper budgeting will be ensured for smooth functioning of monitoring plan proposed. Proposal for preparation of Environmental Management Framework (EMF) is covered in RFP, highlighting client's commitment to continue with the process of EA improvement.

- **To be effective, an EA process requires the support of a defined institutional framework and commitment to inter-agency cooperation.** A detailed capacity building plan will be prepared including institutional framework and training mechanism.

4.8.2 Scoping

The next step in the EA will be to define the proposed project activities and the natural, regulatory (i.e. legal) and environment of the area in which development will occur. This will be achieved through Scoping. Scoping will identifies which of the activities has a potential to interact with the environment. Scoping will be conducted early in the EA process so that a focus on the priority issues (i.e. those that have the greatest potential to affect the natural and/or environment) can be established for the rest of the EA process.

Key elements/inputs to the Scoping exercise will be as follows:

- Gathering and reviewing existing environmental data like Land Width, encroachment, congestion area, Bye-pass requirement, land use pattern along bypass and realignment, Drainage pattern, Major River and waterways, Cultural Heritage sites and Eco sensitive areas.

- Identifying project stakeholders; including PAP, Government and non government agencies (utilities) Forest Department, Irrigation Department, Pollution Control Board etc.

- Assemble and review relevant legislative requirements, environmental standards and guidelines (national and international) associated with the proposed development as well as World Bank's operational policies and standards.

- Gathering existing information sources and local knowledge;

- Informing stakeholders of the project and its objectives and get input on the EA;

- Identifying the key environmental concerns (community and scientific) related to a project and the relative importance of issues;

- Defining/preparing the EA work program, including a plan for public and stakeholder involvement;

- Carrying out monitoring of natural environment including air, water, soil, noise etc.

- Defining the range of project alternatives to be considered.

- Obtaining agreement/consensus on the methods and techniques to be used in EA studies and document preparation;

- Determining/freezing the spatial and temporal boundaries for the EA studies. Focus of Scoping will be on the collection and analysis of pertinent data and the assessment of significant environmental attributes. The end result will be a work program which is well focused and cost-effective. The following issues will be addressed through Scooping, but will not be limited to.

- To improve the quality of EA information by focusing scientific efforts and EA analysis on truly significant issues;
- To ensure environmental concerns identified and incorporated early in the project planning process, at the same time as cost and design factors are considered;

- To ensure research efforts are not wasted on insignificant issues, rather focused on core issues.

- Reducing the likelihood of overlooking important issues;

- Thinning the chance of prolonged delays and conflicts later in the EA process by engaging stakeholders in a constructive participatory process early in the EA process.

4.8.3 Environmental Impact Assessment

Following Scoping, assembled legislative requirements, engineering, environmental and socio-economic data will be assessed in greater detail to ensure that all of the proposed activities and their consequences/likely impacts are considered in full.

Existing environmental conditions

In order to identify any potential impact on and potential change to the natural and socioeconomic environments, the existing baseline environmental data are to be collected. Baseline will include but not limited to following:

- Primary data/monitoring to define characteristics of the existing Natural environment including soil, water, air, noise, land use, cultural properties and flora & fauna.
  - Monitoring to be carried at critical locations like
  - Identification of residential, commercial, industrial and forest areas for monitoring
  - Air and Noise Monitoring at Junctions, major settlements, school and hospitals etc.
  - Water Monitoring at river/streams/ponds and ground water sources near major settlements.
  - Soil Monitoring at major settlements, near surface water bodies.
  - Tree inventory to be carried out, in consultation with Forest Department.

- Inventory of Cultural Property Resources will be done along with measurements, details and photographs, consultation will be done for gathering public opinion.

- Secondary Data to define meteorological, geology, seismicity, quarries, borrow areas, disposal sites etc
  - Details of quarry and borrow areas to be used will be collected (Photographs, measurements and public opinion) and a comprehensive plan for extracting material will be prepared.
  - Meteorological data from IMD, toposheets and maps from Survey of India, geological and soil data from GoI, Seismic data from earthquake department.
- Social data including ownership pattern, identification of tribes, vulnerable social groups, land estimates etc.

Assessment of Policy and Regulations
Regulatory and administrative framework at the national and state level, applicable World Bank requirements are presented in **Chapter 3: Environmental Regulations and Legislations.**

Effect Prediction / likely impact
Effects prediction being the challenging and controversial stage of the EA process will be dealt with carefully. Reliable methods available for predicting some environmental parameters, e.g. air quality impacts should be used, whereas other predictions can be based more on professional judgment, e.g. impacts of construction activity on animals/cattle. For true effects prediction following questionnaire will be attempted to answer:

- How will a particular project activity give rise to an impact?
- How likely is it that an impact will occur?
- What will be the consequence of each impact?
- What will be the spatial and temporal extent of each impact?

Analysis of Alternatives
- With or without the project.
- Analysis criteria to include environmental, social, technical/design and economic options.
- Alignment options within existing RoW
- Alternatives of Bypass
- Other engineering alternatives.

Stakeholder Consultation at all stages of project
- Identification of stakeholders primary as well as secondary.
  - Primary stakeholders include people having direct impact.
  - Secondary Stakeholders includes village representatives, women's group, Voluntary organizations NGOs, field level officers and staff, other government officials.

- Structured Consultation
  - Consultation at Village Level
  - Consultation at District Level
  - Consultation at State level

- Consultation at Village Level
  - Along with preliminary inventory and survey information dissemination will be done along the alignment by one by one canvassing about the project. Date and venue for detailed consultation will be fixed.
  - Pictorial method (Pamphlet) will be adopted to explain proposed improvements and possible environmental impact in the concerned villages.
  - Public consensus would try to be arrived for and mitigation proposed.
  - Public suggestion and graveness will be addressed at appropriate level.

- Consultation at District Level
  - Consultation with officers of Revenue, Forest and line department
  - Consultation with the elected representatives and other stakeholders

- Consultation at state level
  - Consultation with senior department Officers, principal secretary and others to formalize the procedure and mechanism of regulatory clearance, utility shifting, land acquisition etc.

4.8.4 Environmental hazard and risk assessment (Integrating Environmental Issues with Social and Technical study)

Environmental Hazard and Risk Assessment (EHRA) is a process specifically useful for projects where the engineering, social and environment part are done by separate agencies. This calls for the joint evaluation of critical issues, which will /may crop up at different stages of EA process. Hence Environmental Hazard and Risk Management EHRM are critical so that selection of any alternative is done taking care of all the components. For the same reason DFCCIL has to ensure the following:-

- confirm its understanding of the project with the design engineers;
- identify to the design engineers areas of potential environmental concern; and
- Jointly develop alternatives so that potential impacts can be proactively mitigated.

Following the detailed data collection and review of environmental and socioeconomic conditions, a series of EHRA workshops will be conducted. These workshops will be held to identify the potential environmental hazards associated with each proposed activity/alternative. Participants include key personnel's from engineering, social and environmental agencies along with client and World Bank team.

Workshop will take input from all workshop participants in the identification of potential environmental hazards associated with the project activities and the evaluation of possible alternatives and options. Further, each will used to confirm the impact assessment team understands of the project design and as an opportunity to gather additional information on the project where necessary. The workshop process considered each activity that will, or may, occur during the project including:

- planned routine activities;
- planned but non-routine activities, and
- Unplanned or accidental activities.

This process culminated in the development of a list of activities and the identification of potential corresponding environmental impacts.. All such environmental hazards identified will be addressed and mitigation measures will be proposed to counter any adverse impact.

4.8.5 Environmental impacts identification

Identification of Environmental Impacts

Based on base line data collected along with engineering and social inputs, a comprehensive study will be taken to identify the possible impact on environmental attributes. The impacts will be defined in terms of their temporal and spatial implication.

An EIA document should typically include:

1. **Project Description**: describing about the existing as well as proposed scenario with a mention on right of way, freight corridor way improvements, cross drainage structures, community facilities, traffic projections etc.
2. **Environmental Regulatory Framework:** presents the legal and administrative framework of Government of India and Government of Uttar Pradesh. This section underlines various clearances applicable for the project corridor at the State / Central level.

3. **Baseline Environmental** Status, the existing environmental conditions along the corridor to be ascertained by conducting a recognizance survey along with collection of secondary information pertaining to the corridor. Primary data for various environmental parameters to be generated using suitable monitoring devises. The methodology to be strictly adhered to the Central Pollution Control Board's stipulated guidelines.

4. **Public Consultation** to be carried out in order to know the reactions of local population and the project affected people, PAP. Meetings to be held with the stake holders to record their views on the impacts caused and the suggested remedies to be adopted for the proposed project corridor.

5. **Analysis of Alternatives** to be presented carried out during feasibility stage, covered in Environmental Screening and Scooping report, and the approved alternative to be discussed in detail along with environmental attributes under impact.

6. **Environmental Impacts,** addressing all the anticipated impacts on the physical and social environment of the corridor. The quanta of all the impacts on Natural Environment and Social/Cultural environment are presented in Table 4.2 & 4.3 respectively.

Table 4.2: Possible Impacts on Physical Environment

Project Activity	Planning & Design Phase	Pre-construction Phase		Construction Phase					Operation	Indirect effect of operation of induced development
Env. Component affected	Land acquisition	Removal of structures	Removal of trees and vegetation	Earth works including quarrying	Laying of railway line	Vehicle & machine operation & maintenance	Concrete & crusher plants	Sanitation & waste (labor camps)	Project operation	
Air		Dust generation during dismantling	Reduced buffering of air and noise pollution, hotter, drier microclimate	Dust generation	Dust due to aggregates	Noise, dust pollution	Noise, soot, odour, dust pollution	Odour / smoke	Noise	Other pollution
Land	Loss of productive land	Generation of debris	Erosion and loss of top soil	Erosion and loss of top soil		Contamination by fuel and lubricants compaction	Contamination compaction of soil	Contamination from wastes	Spill from accidents deposition of lead	Change in land use
Water	Loss of water source	Siltation due to loose earth	siltation due to loose earth	Alternation of drainage break in continuity of ditches siltation, stagnant water pools in quarries	Reduction of ground water recharge area	Contamination by fuel and lubricants	Contamination by leakage or fuel	Contamination from wastes overuse	Spill contamination by fuel, lubricants	Increased contamination of ground water
Noise		Noise pollution	Noise pollution due to machinery	Noise pollution		Noise pollution	Noise pollution		Noise pollution	Noise pollution
Vibration		-	-	Vibration	-	-	-	-	Vibration level increase	May impact the surrounding structures
Flora		Loss of biomass		Lowered productivity loss of ground for vegetation		Removal vegetation	Lower productivity use as fuel wood	Felling trees for fuel	Impact of pollution on vegetation lowered productivity toxicity of vegetation	
Fauna			Disturbance habitat loss	Disturbance		Disturbance	Disturbance	Poaching	Collision with traffic	Distorted habitat

Table 4.3: Possible Impact on Social and Cultural Environment

Project activity	Planning and design phase	Pre-construction phase			Construction Phase					Operation	
Env. Component affected	**Design decision & implementation policies**	**Land acquisition**	**Removal of structures**	**Removal of trees & vegetation**	**Earth works including quarrying**	**Laying of pavement**	**Vehicle & machine operation & maintenance**	**Asphalt and crusher plants**	**Labor camps**	**Direct**	**Indirect induced development**
Agricultural land		Change in land prices	Loss of land economic value	Loss of standing crops	Loss of productive land			Dust on agricultural land reduce in productivity			Conversion of agricultural land
Buildings and built structures			Loss of structures, debris generation, noise and air pollution		Noise, vibration may cause damage structures		Noise, vibration may cause damage to structures	Dust accumulation on building and structures		Vibration and noise	Change in building use and characteristics
People and community	Anxiety and fear among community		Displacement of people psychological impact on people loss of livelihood	Loss of shade and community trees, loss of fuel wood and fodder, loss of income	Noise and air pollution	Odour and dust	Noise and air pollution, collision with pedestrians livestock and vehicles	Air and noise pollution and discomfort	Community clashes with migrant labor	Noise pollution, risk of accident	Induced pollution
Cultural assets			Displacement loss of structure from RoW	Loss of scared trees	Noise, vibration may cause damage to structure		Damage from vibration and air pollution	Dust accumulation		Damage from vibration and air pollution	
Utilities and amenities			Interruption in supply				Damage to utility and amenities	Dust accumulation on water bodies	Pressure on existing amenities		
Labor's health and safety					Increase of stagnant water and disease	Asphalt odour and dust	Collisions with vehicles, pedestrian and livestock	Impact on health due to inhale of dust	Increase in communicable diseases	Collisions pedestrians and livestock	

Determining degree of impact

Once all project environmental aspects will be identified, the level of impact that may result from each of the activity-receptor interactions will be assessed. In assessing the level of impact that an activity may cause, two key elements are considered namely:

- **Consequence:** the resultant effect (positive or negative) of an activity's interaction with the legal, natural and/or socio-economic environments; the categorization for consequence is presented in Table 4.4 below.

Table 4.4: Consequence Categories and Rankings

Consequence Category	Addressed
Catastrophic	Most sever, alternative will be proposed through EHRM
Major	Sever, alternative/avoidance will be proposed through EHRM
Moderate	Less severe, measures will be proposed to minimize impact
Minor	Lesser sever, mitigation measures will be proposed
Negligible	Less sever, mitigation and enhancement measures will be prepared
None	No impact, enhancement measures will be proposed
Positive	Positive impact

- **Likelihood:** the likelihood that an activity will occur. The categorization for likelihood is presented in Table 4.5 below.

Table 4.5: Likelihood Categories and Rankings

Likelihood Category	Definition
Certain	The activity will occur under normal operating conditions
Very likely	The activity is very likely to occur under normal operating condition
Likely	The activity is likely to occur at some time under normal operating condition
Unlikely	The activity is unlikely to but may occur at some time under normal operating condition
Very unlikely	The activity is very unlikely to occur under normal operating conditions but may occur in exceptional circumstances.

4.8.6 Mitigation and Monitoring Plan Mitigation Measures

Mitigation measures will be considered starting with Environmental Assessment process. Impacts identified severe in consequence category and or likelihood category will be further analyzed to identify additional mitigation measures that are potentially available to eliminate or reduce the predicted level of impact. Potential mitigation measures will include:

- habitat compensation program
- species specific management program
- engineering design solutions
- alternative approaches and methods to achieving an activity's objective
- Stakeholders participation in finalizing mitigation measures

- Construction practice, including labor welfare measures.
- operational control procedures
- management systems

Environmental Management Plan Proposal

If identified impacts "Physical/Social/Cultural", i.e. are significant and/or important, it is necessary to identify and implement mitigation measures. Mitigation measures are selected to reduce or eliminate the severity of any predicted adverse environmental effects and improve the overall environmental performance and acceptability of the project. Where mitigation is deemed appropriate, a proponent should strive to act upon effects, in the following **order of priority**, to:

1. Eliminate or avoid adverse effects, where reasonably achievable.
2. Reduce adverse effects to the lowest reasonably achievable level.
3. Regulate adverse effects to an acceptable level, or to an acceptable time period.
4. Create other beneficial effects to partially or fully substitute for, or counter balance, adverse effects. Mitigation is an integral part of impact evaluation. It looks for better ways of doing things so that the negative impacts of the proposal are eliminated or minimized and the benefits are enhanced. As soon as significant adverse impacts are identified, discussions should be held to see if they can be 'designed out' through changes in project design, location or operation. It is important therefore, that there is good integration between the EIA team and project design engineers.

Project specific environmental construction guidelines should be developed. These guidelines should specify precautions and mitigation measures for construction activities, and to be included with the EMP. Good Environmental Construction guidelines has been compiled in **Part C: Environmental Code of Conduct.**

The EMP should be developed so as to counter the impacts assessed during EIA process and also the likely impacts during the construction and operational phase. Based on the past experience a generic EMP has been presented in Table 4.6 below for reference. This can be used as a reference material for comprehending the scope of EMP.

Table 4.6 Generic Environmental Management Plan

Sl. No.	Environmental Parameter	Specification
A) Authorization / Approvals / NOCs to be secured by the complied by the Contractor		
1.	Explosives, lubricants, fuel, etc.	Authorization from explosive's directorate for storage and handling or fuel and lubricants
2.	Extraction of Ground and/or Surface water for the project activities	Approval/authorization under Water, Land and Trees Act, 2002 and/or competent authority
3.	Quarry Operations including stone, aggregates, and sand	Quarry lease from Mines & Geology Department for as per (Mineral Rights) Tax Act, 1975, if new quarries are expected to be opened

		Or Sourcing quarry material from authorized quarries, other than quarries located in national parks/Reserve Forests/Protected Areas
4.	Concrete mix plant	Consent to Establish and Operate for CMP Or Material shall be sourced from plants operating with valid UPPCB NOCs
5.	Wet Mix Macadam (if used)	Consent to Establish and Operate for WMM plant Or Material shall be sourced from plants operating with valid UPPCB NOCs
6.	Batching Plant (if relevant)	Consent to Establish and Operate for Batching plants Or Material shall be sourced from plants operating with valid UPPCB NOCs
7.	Crushers	Consent to Establish and Operate for crushers Or Material shall be sourced from plants operating with valid UPPCB NOCs
8.	Vehicular Emissions	Pollution control certificate
9.	Camp sites/Labor Camp	• Permit from land owner and/or local authorities / revenue department • Authorization from labor commissioner
10	Borrow Areas	Authorization from Mines & Geology Department for as per (Mineral Rights) Tax Act, 1975, and/or local authorities/revenue dept. if new borrow areas are expected to be opened Or Sourcing material from authorized borrow areas
B) Effective Implementation of Environmental Management Measures		
1. SOIL/Aggregate		
1.1	Disposal of Debris and other wastes	No-objection Certificate (NOC) from land owner / Revenue authorities as may be applicable **Disposal Areas** • No residential areas are located downwind side of these locations; • Dumping sites are located at least 1000 m away from sensitive locations such as all notified forest lands, all water bodies, and productive lands • Available waste lands are given preference. **Specifications for Waste Disposal** • In case of bituminous wastes, debris are to be disposed in a minimum 60cm thick clay lined pits so as to eliminate any chances of leaching and top layer shall be covered with soil/good earth so as to enable natural re-vegetation of the disposed area/site. Care should be taken not to dispose these wastes near farmland and water bodies. • In case of filling of low-lying areas with wastes, it needs to be ensured that the level matches with the surrounding areas. In this case care should be taken that these low lying areas are not used for rainwater storage • In case oil and grease are trapped for reuse in a minimum 60cm thick lined pit, care shall be taken to ensure that the pit should be located at the lowest end of the site and away from the residential areas.

		• All arrangements for transportation during construction including provision, maintenance, dismantling and clearing debris, where necessary will be planned and implemented as approved and directed by the Engineer.
1.2	Borrowing of Earth (in case of opening of new borrow areas)	**Borrow Area Selection** Borrowing within the Row is prohibited. However, earth available from excavation for railway side drains as per design, may be used as embankment material (if necessary and applicable), subject to approval of the Engineer, with respect to acceptability of material. Borrowing to be avoided on the following areas: • Lands close to toe line and within 0.5 km from toe line. • Irrigated agricultural lands (In case of necessity for borrowing from such lands, the topsoil shall be preserved in stockpiles. • Grazing land. • Lands within 1km of settlements. • Environmentally sensitive areas such as Reserve Forests, Protected Forests, Sanctuary, wetlands. Also, a distance of 500 m should be maintained from such areas. • Unstable side-hills. • Water-bodies (only if permitted by the local authority, and with specific pre approved re-development plans by the concerned authority and engineer-in-charge) • Streams and seepage areas. • Areas supporting rare plant/ animal species; **Documentation of Borrow Pit** The contractor must ensure that following data base must be documented for each identified borrow areas before commencing the borrowing activity that provide the basis of the redevelopment plan. • Chainage along with offset distance; • Area (Sq.m); • Photograph and plan of the borrow area from all sides; • Type of access/width/kutcha/pucca etc from the carriageway; • Soil type, Slope/drainage characteristics; • Water table of the area or identify from the nearest well, etc; • Existing land use, for example barren / agricultural / grazing land; • Location/name/population of the nearest settlement from borrow area; • Quantity excavated (likely and actual) and its use; • Copy of agreement with owner/government; and • Community facility in the vicinity of borrow pit. • Rehabilitation certificate from the land owner along with at least four photograph of the rehabilitated site from different angles
1.3	Contamination of Soil by Fuel and Lubricants	• Location of fuel storage and refilling areas at least 500m from all cross drainage structures and important water bodies and storing of fuel and

		lubricants on a sand flooring of at least 6" thick, done on brick edge flooring lined with polyethylene sheet
1.4	Quarry Operations and Management (if new quarries are opened)	• To minimize the adverse impact during excavation of material following measures are need to be undertaken: i. Adequate drainage system shall be provided to the excavated area ii. At the stockpiling locations, the Contractor shall construct sediment barriers to prevent the erosion of excavated material due to runoff. iii. Construction of offices, laboratory, workshop and rest places shall be done in the up-wind of the plant to minimize the adverse impact due to dust and noise. iv. The access road to the plant shall be constructed taking into consideration location of units and also slope of the ground to regulate the vehicle movement within the plant. v. In case of storage of blasting material, all precautions shall be taken as per The Explosive Rules, 1983. • The followings precautions shall be undertaken during quarry operations. i. Overburden shall be removed and disposed as per **B** 1.1 above. ii. During excavation slopes shall be flatter than 20 degrees to prevent their sliding. iii. In case of blasting, the procedure and safety measures shall be taken as per The Explosive Rules, 1983 iv. The Contractor shall ensure that all workers related safety measures shall be taken. v. The Contractor shall ensure maintenance of crushers regularly as per manufacturer's recommendation. vi. During transportation of the material, measures shall be taken to minimize the generation of dust and to prevent accidents.
2. Water		
2.1	Labor camp, sanitation and waste disposal in construction camps	• Construction labor camps shall be located at least 500m away from the nearest habitation complying all relevant provisions of the Factories Act, 1948 and the Building and other Construction Workers (Regulation of Employment and Conditions of Service) Act, 1996
3. Air Pollution		
3.1	Generation of Dust	a. All vehicles delivering materials should be provided with tail guard and shall be covered to avoid spillage of materials. b. No fugitive dust emission at settlement sites arising from maintenance activities shall be allowed. All such operation leading to dust pollution in settlement areas shall be performed with necessary dust suppression by adequate water sprinkling to keep the dust below visible limit. Such measures shall be taken to ensure no dust pollution arises from construction stock piles
3.2	Concrete mix plants and	a. CMP to be used at least 1000m from the nearest

	Batching plants	habitation in the cross wind direction. b. In case if new CMPs/Batching plants are set up, the conditions of UPPCB shall be strictly adhered
3.3	Odour from Construction Labor camps.	a. Construction laborers' camp shall be located at least 500 m away from the nearest habitation. b. The waste disposal and sewerage system for the camp shall be properly designed, built and operated so that no odour is generated. Compliance with the Factory Act, the Building and other construction workers (regulation of employment and conditions of service) Act, 1996 and all other relevant legislation shall be strictly adhered to.
3.4	Pollution from Crusher	a. All crushers used in construction shall confirm to relevant dust emissions control stipulated as per UPPCB's norms
4. Noise Pollution		
4.1	Noise from Vehicles, Plants and Equipment	a. Any activities related to road maintenance operations and/or associated facilities near settlements shall not be carried out during night time (10:00 PM to 6 AM). b. Workers in vicinity of strong noise, and workers working with or in crushing, compaction, batching or concrete mixing operations shall wear earplugs
5. Flora and Fauna		
5.1	Loss or Damage of Vegetation	a. All works shall be carried out in a fashion that ensures minimum damage or disruption to the flora. Prior tree felling permission under Forest Act will be obtained before felling any tree. Trees or shrubs will only be felled or removed that impinge directly on the permanent works or necessary temporary works with prior approval from the Engineer. b. The Engineer shall approve such felling; only when the proponent secures receives a "clearance" for such felling from the DoF, as applicable.
5.2	Loss, Damage or Disruption to Fauna	a. All works shall be carried out in a fashion to ensure minimum damage to the flaura. b. Construction workers shall be instructed to protect natural j resources and fauna, including wild animals and aquatic life, j Hunting and unauthorized fishing are prohibited.
6. Disruption to Users		
6.1	Loss of Access	a. At all times, the Contractor shall provide safe and convenient passage for vehicles, pedestrians and livestock to and from side roads and property accesses connecting the project corridor. Work that affects the use of side roads and existing accesses shall not be undertaken without providing adequate provisions to the prior satisfaction of the Engineer. b. The works shall not interfere unnecessarily or improperly with the convenience of public or the access to, use and occupation of public or private roads, railways and any other access footpaths to or of properties whether public or private.
6.2	Traffic Jams and Congestion in rail and road crossing areas	a. Detailed Traffic Management Plans shall be prepared and submitted to the Engineer for approval 5 days prior to commencement of maintenance works on any cross-section with road. The traffic control plans shall contain details of temporary diversions, details of arrangements for construction under traffic and details of traffic arrangements after

		cession of work each day. b. Temporary diversion for road traffic (including scheme of temporary and acquisition) will be constructed with the approval of the Engineer. c. Special consideration shall be given in the preparation of the traffic control plan to the safety of pedestrians and workers at night d. The contractor shall ensure that the running surface is always maintained within diversion guidelines, particularly during the monsoon so that the traffic flow is smooth at all times. e. The temporary traffic detours in settlement areas shall be kept free of dust by frequent application of water.
6.3	Traffic Control and safety	a. The Contractor shall take all necessary measures for the safety of traffic during construction and provide, erect and maintain such barricades, including signs, markings, flags, lights and flagmen as may be required by the Engineer for the information and protection of traffic approaching or passing through the cross section. b. All signs, barricades, pavement markings shall be as per railway specification.
7. WORKERS' ACCIDENT RISKS		
7.1	Risk from Operations	The Contractor is required to comply with all the precautions as required for the safety of the workmen as per the international labor organization (ILO) convention. The contractor shall supply all necessary safety appliances such as safety goggles, helmets, masks, books, etc., to the workers and staff. The contractor has to comply with all regulation regarding safe scaffolding, ladders, working platforms, gangway, stairwells, excavations, trenches and safe means of entry and egress.
7.2	Risk from Electrical Equipment	Adequate precautions will be taken to prevent danger from electrical equipment. No materials on any of the sites will be so stacked or placed as to cause danger or inconvenience to any person or the public. All necessary fencing and lights will be provided to protect the public. All machines to be used in the construction will conform to the relevant Indian Standards (IS) codes, will be free from patent defect, will be kept in good working order, will be regularly inspected and properly maintained as per IS provisions and to the satisfaction of the Engineer.
7.3	Risk at Hazardous Activity	a. All workers employed on mixing material, cement, lime mortars, concrete etc., will be provided with protective footwear and protective goggles. Workers, who are engaged in welding works, would be provided with welder's protective eye-shields. Stone-breakers will be provided with protective goggles and clothing and will be seated at sufficiently safe intervals. b. The use of any herbicide or other toxic chemical shall be strictly in accordance with the manufacturer's instructions. The Engineer shall be given at least 6 working days notice of the proposed use of any herbicide or toxic chemical. A register of all herbicides and other toxic chemicals delivered to the site shall be kept and maintained up to date by the Contractor. The register shall include the trade

		name, physical properties and characteristics, chemical ingredients, health and safety hazard information, safe handling and storage procedures, and emergency and first aid procedures for the product
7.4	Malarial Risk	The Contractor shall, at his own expense, conform to all anti-malarial instructions given to him by the Engineer and the EMU, including filling up any borrow pits which may have been dug by him.
8. WORKERS' RESIDENCE AND HEALTH CONCERNS		
8.1	First Aid	• Medical facilities shall be provided to the labor at the construction camp. Visits of doctor shall be arranged twice a month wherein routine checkups would be conducted for women and children. A separate room for medical checkups and keeping of first aid facilities should be built. Workplaces remote and far away from regular hospitals will have indoor health units with one bed for every 250 workers. Suitable transport will be provided to facilitate take injured or ill person(s) to the nearest approachable hospital. The site medical room should display awareness posters on safety facilitation hygiene and HIV/AIDS awareness. The medical office should also distribute condoms at regular intervals to laborers. • First Aid Box will be provided at every construction campsite and under the charge of a responsible person who shall always be readily available during working hours. He shall be adequately trained in administering first aid-treatment. Formal arrangement shall be prescribed to carry injured person or person suddenly taken ill to the nearest hospital. The first aid box shall contain the following. • small sterilized dressings • medium size sterilized dressings • large size sterilized dressings • large sterilized burns dressings • 1 (30 ml) bottle containing 2 % alcoholic solution of iodine • 1 (30 ml) bottle containing salvolatile • 1 snakebite lancet • 1 (30 gms) bottle of potassium permanganate crystals • 1 pair scissors • Ointment for burns • A bottle of suitable surgical antiseptic solution In case, the number of labor exceeds 50, the items in the first aid box shall be doubled.
8.2	Payment of Wages	• The payment of wages should be as per the Minimum Wages Act, Department of Labor, and Government of India for both male and female workers. • Display of the minimum wages board at camps and major construction sites should be done in local languages at the construction and labor camp sites. • Wages should be paid to the laborers only in the presence of DFCC staff;

		• Contractor is required to maintain register for payment of labor wages with entry of every labor working for him. Also, he has to produce it for verification if and when asked by the Engineer, EMU and/or the concerned DFCC staff/Engineer's representative. • In case there are sub-contractors, the main contractor shall be responsible for ensuring that the payment of wages to laborers is as per the Minimum Wages Act. Sub-contractor has to follow the same procedure as the main contractor.
8.3	Rehabilitation of labor and construction camp	At the completion of construction, all construction camp facilities shall be dismantled and removed from the site. The site shall be restored to a condition in no way inferior to the condition prior to commencement of the works. Various activities to be carried out for site rehabilitation include: • Oil and fuel contaminated soil shall be removed and transported and buried in waste disposal areas. • Soak pits, septic tanks shall be covered and effectively sealed off. • Debris (rejected material) should be disposed off suitably (Refer Guideline 10 on "Waste Management and Debris Disposal"). • Ramps created should be levelled. • Underground water tank in a barren/non-agricultural land can be covered. However, in an agricultural land, the tank shall be removed. • If the construction camp site is on an agricultural land, preserve top soil and good earth can be spread back for a minimum 30cm for faster rejuvenation of the land. • Proper documentation of rehabilitation site is necessary. This shall include the following: – Photograph of rehabilitated site; – Land owner consent letter for satisfaction in measures taken for rehabilitation of site; – Undertaking from contractor; and – Certification from Engineer in-charge of the PIC. In cases, where the construction camps site is located on a private land holding, the contractor would still have to restore the campsite as per this guideline. The rehabilitation is mandatory and should be include in the agreement with the landowner by the contractor. Also, he would have to obtain a certificate for satisfaction from the landowner.
9. DAMAGE AND LOSS OF CULTURAL PROPERTIES		
9.1	Conservation of Religious Structures and Shrines	a. All necessary and adequate care shall be taken to minimize impact on cultural properties which includes cultural sites and remains, places of worship including temples, mosques, churches and shrines, etc., graveyards, monuments and any other important structures as identified during design and all properties / sites / remains notified under the Ancient Sites and Remains Act). No work shall spill over to these properties, premises and precincts. The design options for cultural property relocation and enhancement need to be prepared. b. All conservation and protection measures will be

		taken up as per design. Access to such properties from the road shall be maintained clear and clean
9.2	Chance found Archaeological Property	a. During earth excavation, if any property is unearthed and seems to be culturally significant or likely to have archaeological significance, the same shall be intimated to the Engineer. Work shall be suspended until further orders from PIC. The State Archaeological Department shall be intimated of the chance find and the Engineer shall carry out a joint inspection with the department. Actions as appropriate shall be intimated to the Contractor along with the probable date for resuming the work. b. All fossils, coins, articles of value of antiquity and structures and other remains or things of geological or archaeological interest discovered on the site shall be the property of the Government, and shall be dealt with as per provisions of the relevant legislation. c. The contractor shall take reasonable precaution to prevent his workmen or any other persons from removing and damaging any such article or thing and shall, immediately upon discovery thereof and before removal acquaint the Engineer of such discover)' and carry out the Engineer's instructions for dealing with the same, awaiting which all work shall be stopped within 100m in all directions from the site of discovery. d. The Engineer shall seek direction from the Archaeological Survey of India (ASI) before instructing the Contractor to recommence work on the site.
10. ENVIRONMENTAL ENHANCEMENT		
10.1	DFCC Corridor Landscape	Protect all the trees, re-vegetation of DFCC corridor embankments and other slopes, edge treatment of water bodies shall be taken up as per either detailed design or typical design guidelines given as part of the Bid Documents.

4.8.7 Environmental issues related to electric sub-stations , TSS , SP ,SSP signals, Tower etc ,assessment and management procedure

Environmental issues arising from electric facilities for the project are discussed.

4.8.7.1 TRANSMISSION LINES

The Key environmental issues associated with installation of transmission lines are:

A) CLEARING OF TREES WITHIN RIGHT OF WAY

Right of Way (ROW) width for the electric line depends on the line voltage.

A width clearance of 3 m is presently allowed below each conductor for the movement of tension stringing equipment. Trees on such strips are felled, but after stringing is complete, natural regeneration is encouraged.

Lopping of trees is required to facilitate stringing and maintenance of ROW. Felling, pollarding, and pruning of trees for electric clearance, whenever necessary, are done with permission from the local forest officer. Lopping and felling of trees can open up forest canopy allowing more sun light into the under storey where it can lead to an edge effect and allow for proliferation of socio-phytic weeds.

B) CLEARING OF GROUND VEGETATION FOR MOVEMENT OF MACHINERY

Heavy machinery is used to for installation of transmission lines and towers and may require clearing of ground vegetation for its movement. This activity cause temporary disturbance to the forest, orchards, plantation and agriculture fields. DFCC, wherever possible uses the existing path / access roads for the movement of man and machinery. The existing roads that cannot support heavy machinery load are upgraded and thus the village infrastructure is improved. In areas where lines traverse agricultural land, compensation is paid to owners for any crop damage incurred as a result of construction activities. Agricultural activities are allowed to continue following the construction period. If bunds or other on-farm works are disturbed during construction or maintenance, they are restored to the owner's satisfaction following cessation of construction or maintenance activities. In the event that private trees are felled during construction or maintenance operations, compensation is paid to the owner as determined by the forest / horticulture departments.

4.8.8 SUBSTATION

The Key environmental issues with construction of substation are

A) **CLEARING OF GROUND VEGETATION:** A typical substation requires an area of 1.-2 hectares of land. The land is acquired and vegetation is cleared to enable construction activity.

B) **USED TRANSFORMER OIL:** As a part of routine maintenance, transformer oil changed every 10-15 years. The used transformer oil is categorised as hazardous wastes as per Hazardous waste (Management& Handling) Rules, 2003 and its unscientific disposal in environment may lead to soil and water contamination.

TABLE 4.7: ENVIRONMENTAL ISSUES

Project activity / Experience of management	Transmission Lines		Sub-Station		
	Tower Construction, Erection & Stringing	**O & M**	**Land Acquisition**	**Construction**	**O&M**
Time tested & Substantial	➢ Disturbance to crop of plantations & orchards ➢ Safety of tower in wetlands, riverbeds & coasts ➢ Opening up natural forests – Clearing of access roads – Disturbance due to – Construction activity	➢ Fires prevented by safety & maintenance protocols ➢ Lopping of trees along ROW to maintain ground clearance	Avoiding ➢ forests ➢ homestead ➢ wetlands ➢ orchards ➢ plantations		
Scope for Strengthening	➢ Tree felling in ROW			➢ Clearing of ground cover ➢ Alteration of minor drainage pattern	

4.8.9 ENVIRONMENTAL SCREENING AND SCOPING FOR ELECTRIC FACILITIES

- Objectives

a. To identify environmentally sensitive areas, issues, and possible management measures
b. To suggest alternative transmission line routes, if necessary
c. To outline scope of environmental assessment and management planning

- Process

i. The Environmental and Social Management Department (SEMU) through its "Bee" line survey (a desk review) on Survey of India topographic sheets (toposheets) and the Forest Atlas will examine various route options. SEMU will identify environmentally sensitive areas such as evergreen, semi evergreen, deciduous and scrub forests, riparian areas, wetlands, mountains, critical wildlife habitats and geologically sensitive areas.

ii. Field units will conduct spot verifications to confirm the information of Bee- Line survey, and identify possibilities of circumventing environmentally sensitive areas (not restricted to previously designated ones) and collect information on issues identified during desk review through studies of alternatives, at least 3 alternatives routes are studied in the process of environment assessment and after analysis of different parameters and significant economic benefit associated with the project and without the project, the most optimum route having minimum environment impact is selected for further investigation

iii. CPM office and Site office will consult state forest departments for transmission lines passing through forest areas. Revenue authorities will be consulted for their views on revenue lands. Based on the above process the scope for an Environmental Assessment and Management Plan (EAMP) is finalised.

- Output

i. Environmental screening and scoping document as part of feasibility report. This report provides details of environmentally sensitive areas, environmental issues and views of Forest Department, Revenue Department and an Initial Environment Assessment Report (IEAR).

4.8.10 Environmental Management process for a Typical Electric Facilities along the Railway Line

TABLE 4.8: ENVIRONMENT MANAGEMENT PROCESS

Milestones	Objectives	Process	Responsibility	Product/ Decision
I. Project Conceptualisation				
1. Environmental Screening & Scoping for Transmission Lines	➢ To identify environmentally sensitive areas, issues and management measures possible ➢ To suggest alternate transmission line routes, if necessary ➢ To outline the scope of Environmental Assessment (EA) Assessment (SA) studies	➢ Screen and scope Transmission Lines from an environmental perspective – desk Review – spot Verification – informal public consultation – consultation with Forest Departments & revenue Authorities	➢ SEMU ➢ Engg. Dept. ➢ Site office	➢ Environmental screening and scoping documents as part of feasibility report and Initial Environment Assessment report.
2. Environmental approval	➢ To obtain environmental approvals from the Internal Management, and FA	➢ Submit FR (with E&S screening & scoping details) to Internal Management ➢ Submit FR (with environmental screening and scoping details) with Internal Management approval for pre-appraisal by Funding Agencies	➢ Engg. Dept ➢ Corp. Plg. Dept. ➢ SEMU ➢ Corp. Plg. Dept. ➢ SEMU	➢ Internal Management Approval ➢ Concurrence of Funding Agencies
II. Project Planning				
1. Environmental Screening and Scoping for Substations	➢ To identify environmentally sensitive areas, issues and management measures possible ➢ To suggest alternate sub-station sites , if necessary ➢ To outline the scope of Environmental Assessment (EA) and Land Acquisition Assessment (LAA) Assessment (SA) studies	➢ Screen and scope Sub-Station sites from an environmental perspective – Desk Review – Spot Verification – consultation with potential PAPs, Forest Departments & Revenue Authorities	➢ SEMU ➢ Engg. Dept. ➢ Site office	➢ Environmental screening and scoping documents for sub-stations

Milestones	Objectives	Process	Responsibility	Product/ Decision
2. Environmental Assessment & Management Planning	➢ To prepare environmental assessment management plans for the project	➢ Transmission Lines a. Forest Areas – tree enumeration – cost-benefit analysis – Compensatory Afforestation b. Other Areas – Undertake environmental review and formulate appropriate management measures ➢ Sub-Stations – Undertake environmental review and formulate appropriate management measures ➢ Public Consultation – To inform/record public views for refinement / review if needed	➢ SEMU ➢ Site ➢ Auth. Agencies	➢ Environmental assessment management plan – Environmental review – Forest Proposal – Environmental management measures – Views of Public
3. Forest Clearance	➢ To obtain Forest Clearance	➢ Submit Forest Proposal to state Government ➢ Forest Proposal to MoEF for conditional approval ➢ Forward Compliance report by State Government to MoEF for Final Forest Clearance	➢ SEMU ➢ Site office	➢ Final Forest Clearance by MoEF
III. Project Approvals				
1. BoD Approvals	➢ To obtain financial approval from Board of Directors	➢ Submit FR (with EAMP screening and scoping details) to CoD/BoD for their review	➢ SEMU ➢ Corp. Plg. Dept. ➢ Engg. Dept.	➢ Approval of Board of Directors
2. Financial Agency's Acceptance	➢ To obtain acceptance from FA for environmental components of feasibility report	➢ Submit FR (with EAMP screening and scoping details) /IEAR to Funding Agencies for acceptance	➢ Corp. Plg. Dept. ➢ SEMU	➢ EAMP screening and scoping /IEAR approved by FA
IV. Detailed Design & Award				

Milestones	Objectives	Process	Responsibility	Product/ Decision
1. Social Assessment & Management Planning	➢ To appoint a suitable agency for SAMP, If required	➢ Select and appoint suitable agency for social assessment & management planning, If required	➢ SEMU ➢ Cont. Ser. Dept	➢ Agency appointed for SAMP
	➢ To prepare social assessment & management plan for transmission lines	➢ Transmission Lines – Negotiate compensation packages with Revenue Authorities and PAPs – Finalise and document compensation and other management measures	➢ SEMU ➢ Site office	➢ SAMP a. Transmission line – Social review – Compensation & other management measures
	➢ To prepare social assessment & management plan for sub-stations	➢ Sub-Stations – Finalise site for sub-station – Notify area under LAA – Undertake detailed LA Census – Final negotiations and documentation of agreements	➢ SEMU ➢ External Agency. ➢ Site	b. Sub-station – LAA – RAP/TPDP
2. Concurrence of FA for Social Assessment & Management Plan	➢ To obtain concurrence of FA for the social assessment & management plan (RAP/IPDP)	➢ Submit social assessment & management plan (with Internal Management approval) to FA for concurrence	➢ Corp. Plg. Dept. ➢ SEMU	➢ Concurrence of FA for SAMP
3. Consultation for Environmental Management work and	➢ To take help from authorised agencies for environmental management work	➢ Consult Authorised Agencies for environmental management work	➢ SEMU ➢ Site office	➢ Authorised Agencies Consulted to execute EM works
4. Award of Social Management work	➢ To award social management work to appropriate agencies, If necessary	➢ Award social management work to appropriate agencies through competitive bidding, if necessary	➢ SEMU. ➢ Cont. Ser. Dept	➢ Agencies appointed to execute SM works
V. Project Implementation				
1. Execution of Environmental	➢ To undertake environmental management work as prescribed	➢ Execute environmental management works	➢ SEMU ➢ Authorised	➢ Environmental management

Milestones	Objectives	Process	Responsibility	Product/ Decision
Management Works	in environmental assessment management plan	– Appropriate clearance for transmission line ROW, etc. – Compensatory Afforestation – Payment of tree/crop compensation	Agency ➢ Site office ➢ Contractors	measures executed
2. Execution of Social Management Works	➢ To undertake social management work as prescribed in social assessment management plan (RAP/ IPDP)	➢ Transmission lines – Pay compensation as agreed & documented in SAMP and execute other measures ➢ Sub-stations – Deposit compensation and take possession of land – Disbursement of RA prior to civil works – Execute RAP /TPDP measures as prescribed in the SAMP	➢ SEMU ➢ External Agency ➢ Site ➢ Contractor	➢ Social management measures executed
VI. Operation & Maintenance				
1. Environmental Monitoring	➢ To monitor work being undertaken as part of EAMP and SAMP	➢ Monitor EAMP measures – Maintenance of ROWs – Progress on compensatory afforestation ➢ Monitor SAMP measures – Appropriate compensation and other measures during maintenance of towers and lines – Progress on R&R measures to restore livelihood	➢ SEMU. ➢ SEMU	➢ Periodic monitoring reports
VII. Project Review				
1. External IMS Audit	➢ To verify status of compliance and implementation of IMS	➢ Appoint an external agency with appropriate expertise to conduct the	➢ SEMU/ QA&I	➢ IMS audit report from External Agency.

Milestones	Objectives	Process	Responsibility	Product/ Decision
2. Oversight and on-site Performance Audit /Review	➢ To verify / review implementation of EMRP	review/ audit of performance of implementation of IMS ➢ Performance audit to review compliance of EAMP, SAMP at project site / field by IRC.	➢ SEMU	➢ IRC on-site oversight / performance audit reports.
2. Annual Environmental Review	➢ To review annually the EAMP and the SAMP of transmission projects	➢ Appoints an external agency with appropriate expertise to conduct the review and report on environmental performance of project during construction operation and maintenance including IMS audit findings	➢ SEMU	➢ Annual environmental sustainability report

4.8.10 Bid Document

- Prepare cost estimates, to be incorporate in Bid Documents.
- Environmental Management Plan, EMP along with the good environmental construction guidelines to be incorporated in the Bid document's work requirements.
- Preparation of work requirement (addendum/corrigendum to Railway specifications) and
- Corrigendum / Addendum to Railway Specification as Special provisions to be incorporated in Bid Document. Penalty clauses for not complying with EMP requirements to be incorporated.
    - The contractor has to follow all traffic safety measures as defined in the Technical specification. Damage shall be levied at the rate Rs.2000/- per day per location for non – conformity of traffic safety measures as per the decision of the engineer.
    - The contractor has to follow all environmental mitigation measures as defined in the Technical specification read along with the Environmental Management Plan for the specific corridor. Damage shall be levied at the rate Rs. 2000/- per day per location for non-conformity of Environmental Management Plan measures as per the decision of the Engineer.
    - The contractor has to ensure that prior to every monsoon season, during the construction period; all the temporary and permanent cross drainage structures are free from debris as defined in the Technical Specifications read along with the Environmental Management Plan. Damage shall be levied at the rate of Rs 2000/- per day per location for non conformity as per the decision of the Engineer.
    - The contractor has to ensure that sufficient numbers and good quality Personnel Protective Equipments, should be provide to staff and labor all time as defined in the labor codes read along with the Environmental Management Plan (EMP). Damage shall be levied at the rate of Rs 500per day for non conformity as per the decision of the Engineer.

Monitoring Plan

The monitoring programme will be devised to ensure that the envisaged purpose of the project is achieved and results in the desired benefit to the target population. To ensure the effective implementation of the EMP, it is essential that an effective monitoring programme be designed and carried out. Freight corridor objectives of the monitoring programme will be:

- To evaluate the performance of mitigation measures proposed in the EMP
- To suggest improvements in the management plans, if required
- To satisfy the statutory and community obligations

The monitoring programme contains monitoring plan for all performance indicators, reporting formats and necessary budgetary provisions. Monitoring plan for performance indicators and reporting system is presented in the following sections.

Monitoring Parameters and Standards

The Environmental monitoring of the parameters involved and the threshold limits specified are discussed below:

- **Ambient Air Quality Monitoring (AAQM)**

The air quality parameters viz: Sulphur Dioxide (SO2), Oxides of Nitrogen (NOX), Carbon Monoxide (CO), Hydro-Carbons (HC), Suspended Particulate Matter (SPM), and Respirable Particulate Matter (RPM) shall be regularly monitored at identified locations from the start of the construction activity. The air quality parameters shall be monitored in accordance with the National Ambient Air Quality Standards as given in **Table 4.9.**

Table 4.9: Ambient Air Quality Standards (National)

Pollutant	Time Weighted Average	Concentration in Ambient Air (µg/m^3)			Methods of Measure
		Industrial Area	Residential & Rural Areas	Sensitive Areas	
1	2	3	4	5	6
Sulphur Dioxide (SO_2)	Annual Average	80	60	15	1. Improved West and Gaeke Method
	24 hrs.	120	80	30	2. Ultra fluorescence
Oxides of Nitrogen as NO_2	Annual Average	80	60	15	1. Jacob & Hochheiser modified (Na-Arsenic Method)
	24 hrs.	120	80	30	2. Gas Phase Chemiluminescence
Suspended Particulate Matter (SPM)	Annual Average	360	140	70	High Volume Sampling (Average flow sale not less than 1.1m^3 minute)
	24 hrs.	500	200	100	
Respirable Particulate Matter (size less than 10 µm) (RPM)	Annual Average	120	60	50	Respirable Particulate Matter Sampler
	24 hrs.	150	100	75	
Lead (Pb)	Annual Average	1.0	0.75	0.50	AAS Method (after sampling using EPM 2000 of equivalent Filter Paper)
	24 hrs.	1.5	1.00	0.75	
Carbon Monoxide (CO)	8 hrs.	5000	2000	1000	Non Dispersive Infrared Spectroscopy
	01 hr.	10000	4000	2000	

* Annual arithmetic mean of minimum 104 measurements in a year taken twice a week 24 hourly at uniform interval.

**24 hourly/8 hourly values should be met 98% of the time in a year. However, 2% of the time, it may exceed but not on two consecutive days.

Source: **Central Pollution Control Board, 1997 Gazette Notification dated 4/94, Part II Sec 3 (ii)**

- **Noise Quality Monitoring**

The noise levels shall be monitored at already designated locations in accordance with the Ambient Noise Quality standards given in **Table 4.10.**

Table 4.10: Ambient Noise Quality Standards (National)

Area Code	Category of Zones	Limits of Leq in dB(A) Day*	Night*
A	Industrial	75	70
B	Commercial	65	55
C	Residential	55	45
D	Silence zone**	50	40

** Silence zone is defined as area up to 100 meters around premises of hospitals, educational institutions and courts. Use of vehicles horns, loud speakers and bursting of cracking are banned in these zones.

- **Water Quality Monitoring**

Water quality parameters such as pH, BOD, COD, DO coliform count, total suspended solids, total dissolved solids, Iron, etc. shall be monitored at all identified locations during the construction stage as per standards prescribed by Central Pollution Control Board and Indian Standard Drinking water specifications IS 10500, 1991, presented in **Table 4.11.**

Table 4.11: National Standards of Water

Sl. No.	Parameters	IS:2296 (Class C)	Method to be Adopted
1.	pH	6.5-8.5	pH meter
2.	BOD (3 days 27 ^{0}C)	3.0	DO-Azide modification of Wrinkler's method
3.	Temperature (_C)	NS	Thermometer
4.	Dissolved oxygen	4	Azide Modification of Wrinkler's method
5.	Colour (Hazen)	300	Visual comparison method
6.	Fluorides (F)	1.5	SPANDS method
7.	Chlorides (Cl)	600	Agrentometric Titration
8.	Total Dissolved Solids	1500	Gravimetric Analysis
9.	Sulphates (SO_4)	400	Barium Chloride method
10.	Iron (Fe)	50	Phenanthrolin method
11.	Oil and Grease	0.1	Partition – Gravimetric method
12.	Nitrates	50	Chgromotropic acid
13.	Chromium (Cr^{6+})	0.05	Atomic Absorption Spectrophotometry
14.	Cadmium (Cd)	0.01	Atomic Absorption Spectrophotometry
15.	Lead (Pb)	0.1	Atomic Absorption Spectrophotometry
16.	Copper (cu)	1.5	Atomic Absorption Spectrophotometry
17.	Cyanide (CN)	0.05	Chloramines-T-method
18.	Selenium (Se)	0.05	Atomic Absorption Spectrophotometry
19.	Arsenic (As)	0.2	Atomic Absorption Spectrophotometry
20.	Phenols	0.005	Spectrophotometer
21.	Detergents	1.0	Spectrophotometer
22.	DDT	Absent	Spectrophotometer
23.	Total Coliform (MPN/100 ml)	5000	Multiple Tube Fermentation Technique

NS: Not specified; Brackets ([]) indicates extended limits. All the values in mg/l if otherwise mentioned.

Water Quality Criteria

Designated-Best-Use	Class of Water	Criteria
Drinking water source without conventional treatment but after disinfection	A	1. Total Coliforms Organism MPN/100ml shall be 50 or less 2. pH between 6.5 and 8.5 3. Dissolved Oxygen 6mg/l or more 4. Biochemical Oxygen Demand 5 days 20oC 2mg/l or less

Outdoor bathing (organized)	B	1. Total Coliforms Organism MPN/100ml shall be 500 or less 2. pH between 6.5 and 8.5 3. Dissolved Oxygen 5mg/l or more 4. Biochemical Oxygen Demand 5 days 20oC 3mg/l or less
Drinking water source after conventional treatment and disinfection	C	1. Total Coliforms Organism MPN/100ml shall be 5000 or less 2. pH between 6 to 9 3. Dissolved Oxygen 4mg/l or more 4. Biochemical Oxygen Demand 5 days 20oC 3mg/l or less
Propagation of Wild life and fisheries	D	1. pH between 6.5 to 8.5 2. Dissolved Oxygen 4mg/l or more 3. Free Ammonia (as N) 1.2 mg/l or less
Irrigation, industrial cooling, controlled waste disposal	E	1. pH between 6.0 to 8.5 2. Electrical Conductivity at 25oC micro mhos/cm Max.2250 3. Sodium absorption Ratio Max. 26 4. Boron Max. 2mg/l
	Below -E	Not Meeting A, B, C, D & E Criteria

4.8.11 Monitoring Plans for Environment Condition

For each of the environmental components, the monitoring plan specifies the parameters to be monitored; location of the monitoring sites and duration of monitoring. The monitoring plan also specifies the applicable standards, implementation and supervising responsibilities. The monitoring plan for the various environmental condition indicators of the project in construction and operation stages is presented in **Table 4.12.** Monitoring plan does not include the requirement of arising out of Regulation Provision such as obtaining NOC/ consent for plant site operation.

Table 4.12: Environmental Monitoring Plan

Attribute	Parameter	Special Guidance	Standards	Duration
Air	CO, NOx, SPM, RPM, and SO2	High volume sampler to be located 50 m from the plant in the downwind direction. Use method specified by CPCB for analysis	Air (prevention and Control of Pollution) Rules, CPCB, 1994	24 hours Sampling
Water	All essential characteristics and some of desirable characteristics as decided by the Environmental Specialist	Grab sample collected from source and analyse as per Standard Methods for Examination of Water and Wastewater	Indian Standards for Inland Surface Waters (IS: 2296, 1982)	Grab Sampling
Noise	Noise levels on dB (A) scale	Equivalent noise levels using an integrated noise level meter kept at a distance of 15 from edge of pavement Equivalent noise levels using an integrated noise level meter kept at a distance	MoEF Noise Rules, 2000	Leq in dB(A) of day time and night time

		of 15 from edge of pavement		
Soil	Monitoring of Pb, SAR and Oil & Grease	Sample of soil collected to acidified and analysed using absorption spectrophotometer	Threshold for each contaminant set by IRIS database of USEPA until national standards are promulgated	Grab Sampling

In addition of the critical locations selected during design stage, the environmental monitoring will also be done at the construction camp site and any other plant site during construction stage. List of critical locations for caring out monitoring should be presented in **EIA report.**

4.8.12 Implementation of EMP

The Environmental Management System, process does not stop once a project (planning and design) got approval for implementation. During implementation of a project DFCC, Construction Supervision Consultant, CSC (if any) and Contractor will be responsible for ensuring that the environmental commitments made to regulatory agencies, lending agencies and other stakeholders during the EIA process are met. To execute EMP is a cumulative responsibility of all three parties involved, indicative responsibility mechanisms have been presented, as developed for up gradation projects.

Table 4.13: Roles and Responsibilities of Officers

Role	Officer	Responsibility
Coordinating / Facilitating Agency	General Manager, SEMU	• Key officer in DFCCIL, coordinate with CPM offices • Report to the World Bank and funding agency for overall implementation of environmental rule and regulation, funding conditions
	Chief Project Manager	• Overview of the project implementation • Ensure timely budget for the EMP. • Coordination with different state level committee, to obtain regulatory clearances. • Participate in state level meetings • Monthly review of the progress.
	Deputy Chief Project Manager / Asst. Project Manager	• Overall responsible for EMP implementation • Reporting to various stakeholders (World Bank, Regulatory bodies) on status of EMP implementation • Coordination with PIU (Project Implementation Unit) Staff • Responsible for obtaining regulatory Clearances Review of the progress made by contractors • Ensure that BOQ items mentioned in EMP are executed as per Contract provisions.
	Environmental Officer (PIU)	• Assisting Project Manager in overall implementation of EMP • Review of periodic reports on EMP implementation and advising Project Director in taking corrective measure. • Conducting periodic field inspection of EMP implementation • Assisting Project Manager to reporting various stakeholders (World Bank, Regulatory bodies) on status of EMP implementation • **Directly report to G. M., SEMU** to comply World Bank requirements • Preparing environmental training program and conducting the same for field officers and engineers of contractor.
Implementing/ Monitoring Agency	Engineer-incharge (CSC if any)	• Act as an "Engineer" for supervising EMP implementation • Responsible for maintaining quality of EMP envisioned in detail Project Report • Maintaining progress reports on EMP implementation • Periodic reporting to PIU-DFCC about the status of EMP implementation • Work in close coordination with Chief Project Manager (package unit) and contractor.
	Chief Project Manager	• Conducting need-based site inspection and preparing compliance reports and forwarding the same to the Environmental Management

		Unit (EMU) • Programming necessary training program on environmental issues.
	Asst. Project Manager	• Working as site-representative of DFCC. • Conducting regular site inspection to all onsite and offsite works • Maintaining records of all necessary statutory compliance, to be obtained from contractor. • Maintaining records of EMP implementation including photographic records • Attending environmental training programs • Preparing periodic reports on EMP implementation and forwarding to EE
Executing Agency	Environmental & Safety Manager of Contractor	As detailed below For ensuring that EMP is implemented as per provision in the document, Contractor shall nominate a qualified and experienced manager from the commencement to completion of the project. (Minimum requirement (graduate in environmental engineering / science with minimum 05 years of experience in similar field)

The responsibilities of Environmental and Safety Manager of Contractor will also include but not limited to the following:

- Directly reporting to the Project Manager of the Contractor;
- Discussing various environmental/social issues and environmental/social mitigation, enhancement and monitoring actions with all concerned directly or indirectly;
- Prepare Contractor's Checklist, traffic management plan in cross sections with road and safety plan as part of their Work Program;
- Ensure Contractor's compliance with the EMP stipulations and conditions of statutory bodies;
- Assisting his project manager to ensure social and environmentally sound and safe construction practices;
- Conducting periodic environmental and safety training for contractor's engineers, supervisors and workers along with sensitization on social issues that may be arising during the construction stage of the project;
- Preparing
  registers for material sources, labor, pollution monitoring results (if required by DFCC), public complaint/grievance redressal and as may be directed by the Engineer;
- Assisting the DFCC on various environmental monitoring and control activities including pollution monitoring; and
- Preparing and submitting monthly/bio-monthly reports to DFCC on status of implementation safeguard measures.
- Will be responsible for getting and maintaining the approvals or clearance

4.8.13 Monitoring and Post Auditing

Construction monitoring, including field inspections and surveys, should be carried out by an environmental expert (to be hired by DFCC on regular or

contractual basis) to ensure that environmental protection requirements are being met. It is important to plan and budget for environmental construction monitoring as part of the project. If construction is to be contracted out, DFCC to reconfirm that specific environmental requirements during construction (as already specified) are built into construction bidding documents and contracts to ensure, they are met (e.g. requirements for local hiring, penalty for not adhering to EMP clause requirements etc).

Post construction Monitoring is used to identify environmental changes resulting from the implementation of the project. In the context of EIA, post construction monitoring programs are carried out to achieve the following results:

- to ensure that the facility is meeting all environmental regulatory requirements, and that commitments made in the EIA document and/or the conditions of approval are being met;
- to test impact hypotheses, and to verify the predictions and assessment of environmental effects, thus contributing to better assessments in the future;
- to evaluate the performance effectiveness of mitigation;
- to compare actual and predicted changes to the environment, so that immediate actions can be taken to mitigate unanticipated impacts;
- to strengthen confidence by both government and the public in the EIA process, the decisions made, the road design etc.

The monitoring programs to be carried out during the construction and operation of the undertaking are normally described in the EIA document.

4.9 INDICATIVE CHECKLIST OF INFORMATION TO BE COLLECTED/ COMPILED

(minimum requirement of Banks)

(Information to be prepared in the form of soft and hard copies by the DFCC)

A. Project Brief

1. Tile of the Project

2. Project Location (attach map to scale)

3. Project Development and Implementation Schedule (including details on current status)

a. Technical closure
b. Financial closure
c. Implementation commencement
d. Implementation completion

B. Environmental Settings, Regulatory Clearances, and Applicable World Bank Safeguard Policies

1. Brief on environmental settings of the project

2. Provide information if any of the following sensitive environmental features are present within the project site/corridor and an influence zone of about 10km, including a brief on the sensitive feature

S.No	Sensitive Environmental Features
1	Biosphere reserves
2	National park and wildlife sanctuaries and reserves (including tiger/elephant reserves, and turtle nesting grounds)
3	Natural lakes, swamps Seismic zones tribal Settlements
4	Notified areas of habitat for migratory birds
5	Areas of scientific and geological interests
6	Religious, heritage historic sites and cultural properties
7	Notified archaeological monuments/sites
8	Scenic areas, water bodies and areas of tourism importance
9	Hill resorts/mountains/ hills
10	Presence of resorts (Beach resorts, health resorts, etc.)
11	Coastal areas rich in corals, mangroves, breeding grounds of specific species, estuaries, CRZ areas, Gulf Areas
12	Defense installations, especially those of security importance and sensitive to pollution
13	Border areas (international), and international waterways

3 Regulatory Clearance Requirements and current status of the same (furnish copies of all clearances):

a. Is Environmental Clearance from Ministry of Environment and Forests, Government of India? If so, under what category
b. Does Project require any type of Forest Clearance? If so provide the details including current status and relevant documents
c. Status of No Objection Certificate (NOC) from the State Pollution Control Bard with supporting documents

d. What is the project arrangement (like contract provisions, concession arrangements, etc.) for required construction stage environmental permits/clearance (e.g. quarries, Borrow pits, Tube wells for construction water, Construction Camps etc.). Provide the current status

4 Which of the World Bank Safeguard Policies are applicable for the project and how does the project comply with these arrangements (refer www.worldbank.org/safeguard)

C. Environmental Assessment (EA) and Environmental Management Plans (EMP) (Provide all the documents**)**

1 Information on Detailed Environmental Assessment carried out for the proposed project:

a. EA is whose responsibility under the project agreements?
b. Information on Analysis of project alternatives (e.g. alternative project sites, alternative road alignments, bypasses, etc.) including no project scenario.
c. Details of public consultations conducted, at what stage, and how the public concerns are addressed.
d. If any of the "Sensitive Environmental Features" referred under B 2 are encountered in the project influence area, how the impact assessment has addressed related issues (provide substantial references in addressing the issues)
e. Are there any public protests about the project (provide all the details including any pending litigations, PILs, etc.)
f. Evidence of public disclosure of findings of EA, including EMP
g. Provide EMP budget details

2 Environmental Management Plan (EMP document, executed under the project agreements to be furnished):

a. EMP measures proposed to be implemented during construction phase of the project Provide specific reference to construction contracts, technical specifications, and BOQ items which includes EMP measures
b. What are the environmental enhancement measures proposed for implementation as part of the project implementation
c. What are the environmental management measures proposed during operational phase of the project (such measures should be provided with detailed account of measures to address operation phase impacts, especially in case of power, air and sea port projects) – Detailed documentation shall be provided.

3 What is the EMP implementation, supervision, and monitoring mechanism:

a. Detailed documentation on SPV institutional structure to implement EMP, including staffing (specific to environmental management) and organizational capacity
b. What is the third party (independent supervision or lender's engineer) arrangement for supervising implementation of EMP? (provide a details of staffing arrangements, including job responsibility details)

c. What is the environmental monitoring and reporting arrangement made by SPV to report the progress of implementation of EMP to lenders?
d. What is the grievance redressal mechanism established to address local environmental impacts (such as impacts on community assets, environmental nuisance during construction phase, etc.)?

4 What is the arrangement for compensatory afforestation and provide the necessary documentation on the same.

Chapter-5

INSTITUTIONAL FRAMEWORK

5.1 INTRODUCTION

Environmental Management Regulatory Procedure (EMRP) implementation requires an organization support structure in the form of organizational requirements, training needs and plan, and information management system. The following section captures these institutional arrangements for EMRP implementation by DFCCIL employees, their consultant and working contractors. Moreover, services of regionally dispersed NGOs and leading Environment/ Social Institutes may be utilized for environment / social assessment of projects. Independent experts, specializing in the relevant discipline, may also be engaged to deal with complex and technical issues like socio-economic survey, wildlife impact assessment etc. Compliance of EMRP provisions at field level is also monitored / reviewed regularly through Independent Review Committee (IRC).

5.2 ORGANISATIONAL REQUIREMENTS

To ensure quality and strengthen organizational systems to enable effective implementation of the EMRP, DFCCIL sets out procedures and provides an enabling work culture that encourages total involvement of all its personnel. A strategic environment has been adopted within the organizational structure that is marked by:

- A synchronized system of functioning coordinated by a Corporate Planning and Corporate Monitoring group, which monitors all activities in the organization
- An emphasis on intradepartmental approach to all projects, delineation of departmental responsibilities and the delegation and decentralization of authority resulting in a fast response and quick adjustment to change
- A commitment to provide at all times the best possible time bound quality service in all areas of its operations.

DFCCIL's commitment to the EMRP is evolved along these principles. To ensure effective implementation of its EMRP, DFCCIL will focus on:

- Strengthening the implementation of the EMRP by redeployment of appropriately trained personnel at key levels
- Reinforcing in-house capabilities by working with specialized external agencies

- Placing dedicated manpower with specialization in the respective field to deal with and manage the environment and social issues;
- Reviewing progress of the EMRP internally or through external agencies

5.3 ORGANISATIONAL STRUCTURE AND RESPONSIBILITIES

An organizational structure shall be developed at the corporate, regional and site level to aid effective implementation of the EMRP document. The organizational flowcharts are as per **Figure 5.1**.

At the corporate level, a Social and Environmental Management Unit (SEMU) has been formed. The key responsibilities of SEMU are;

- Coordinating environmental and social commitments and initiatives with various multilateral agencies, World Bank and regulatory authorities.
- Coordination of all environmental activities related to a project from conceptualisation to operation and maintenance.
- Advising and coordinating CPM office and Site offices to carry out environmental and social surveys for new projects.
- Assisting CPM office and Site offices to finalize routes of entire power transmission line considering environmental and social factors that could arise enroute
- Advising CPM office and Site offices to follow-up with the state forest offices and other state departments in expediting forest clearances and the land acquisition process of various ongoing and new projects
- Providing a focal point for interaction with the MoEF for expediting forest clearances and follow-ups with the Ministry of Railway on environmental and social issues
- Training of CPM office & Site officials on environment and social issues and their management plan
- Training of other departments (especially Engineering, Legal, Corporate Planning, Human Resources Management and Contract Services department) to familiarize them with the EMRP document

From time to time DFCCIL also deploys staff with requisite skill base to strengthen the in house capacity of SEMU. Some of the key areas considered are expertise in Rapid Appraisal techniques, social issues identification, negotiation skills, management and mitigation techniques and land acquisition assessment skills. These personnel after receiving appropriate training are absorbed in the functioning of SEMU.

At the regional level an Environmental and Social Management Cell (ESMC) has been created to provide a nodal point to manage environmental and social issues of projects under its jurisdiction and to coordinate between SEMU and the Site office. The key functions of ESMC are;

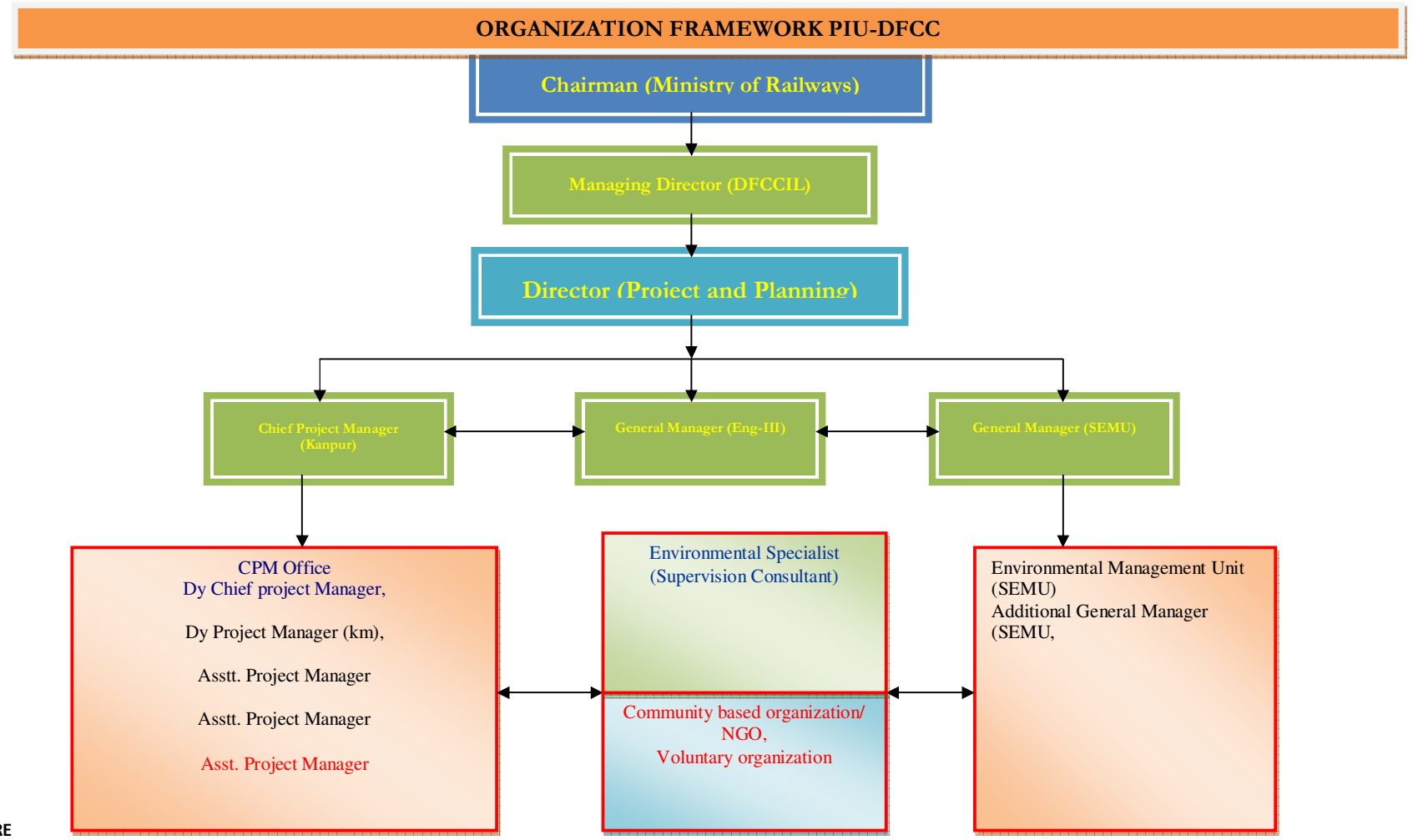
- Advising and coordinating with site offices to carry out environmental and social surveys for new projects envisioned in the corporate investment plan
- Assisting the SEMU and sites to finalize routes of power transmission lines considering the environmental and social factors that could arise enroute.
- Follow-up forest clearances and land acquisition processes with state forest offices and other state departments for various ongoing and new projects.
- Supervision and Monitoring of EAMP & SAMP implementation

At the site level the site in charge, after receiving appropriate training from the CPM office, is responsible for implementation of the requirements of this EMRP document. The site head will select and deploy personnel with relevant background, to form a core group called the Environmental and Social Management Team (ESMT). The key responsibilities of ESMT are;

- Conduct surveys on environmental and social aspects to finalize the route for the transmission lines
- Conduct surveys on sites being considered for land acquisition
- Interact with the Forest Departments to develop the forest proposal and follow up for MoEF clearance.
- Interact with Revenue Authorities for land acquisition and follow up with authorized agencies for implementation of SAMP.
- Implementation of EAMP and SAMP
- Monitoring of EAMP and SAMP and producing periodic reports.

A responsibility allocation matrix has been developed as per **Table 5.1**. This matrix captures the project activities, environmental and social management processes, key indicators to monitor progress, roles, and responsibilities of various stakeholders at different levels and involvement of external agencies.

FIGURE 5.1: SEMU STRUCTURE AT CORPORATE



CENTRE

TABLE 5.1: RESPONSIBILITY ALLOCATION FRAMEWORK FOR THE ENVIRONMENT MANAGEMENT PROCESS

MILESTONES	PROCESS	OUTPUT / INDICATORS	RESPONSIBILITY			
			INTERNAL			EXTERNAL
			PREPARATION /EXECUTION	REVIEW	APPROVAL	PREPARATION
I. Project Conceptualisation						
1. Environmental Screening and Scoping for Transmission Lines	➢ Screen and scope Transmission Lines from an environmental perspective	➢ ENVIRONMENT screening and scoping documents as part of FR	➢ RHQ ➢ Site office	➢ SEMU ➢ Engg. Dept.	➢ Internal Management Approval	➢ Initial Environment Assessment Report
2. Environmental approval	➢ Submit FR (with E&S Screening & scoping details) to Internal Management Approval ➢ Submit FR (with E&S Screening & scoping details) with Internal Management Approval for pre-appraisal by FA	➢ Internal Mgt. Approval ➢ Concurrence of funding agencies	➢ SEMU ➢ Corp.Plg. Dept. ➢ Corp. Plg. Dept ➢ SEMU	➢ SEMU ➢ Engg.Dept. ➢ Corp.Plg. Dept. ➢ Corp. Plg. Dept.	➢ Internal Management Approval ➢ Internal Management Approval	➢ Pre-appraisal by FA
II. Project Planning						
1. Environmental Screening and Scoping for Sub-stations	➢ Screen and scope Sub-stations sites from an environmental perspective ➢ Public Consultation	➢ ENVIRONMENT Screening and Scoping reports for Sub-station sties	➢ RHQ ➢ Site office	➢ SEMU ➢ Engg. Dept.	➢ Internal Management Approval	➢ Ext. Agency like revenue, forest dept etc. for social Screening & Scoping
2. Environmental Assessment & Management Planning	➢ To prepare an environmental management plan - Transmission Lines - Sub-Stations - Public Consultation	➢ Environmental assessment management plan	➢ RHQ ➢ Site	➢ SEMU	➢ Internal Management Approval	➢ State Forest Dept
3. Forest Clearance	➢ Submit Forest Proposal to	➢ Final Forest	➢ RHQ	➢ SEMU	➢ Internal	➢ RMoEF / MoEF

MILESTONES	PROCESS	OUTPUT / INDICATORS	RESPONSIBILITY			
			INTERNAL			EXTERNAL
			PREPARATION /EXECUTION	REVIEW	APPROVAL	PREPARATION
	state Government ➢ Forest Proposal to MoEF for conditional approval ➢ Forward FP to MoEF for Final Forest Clearance	Clearance by MoEF	➢ Site office	➢ FD	Management Approval	
III. Project Approvals						
1. GOI Authorities Approvals	➢ Submit FR (with ESMP and social Screening & Scoping reports) Planning Commission, Pre-PIB, PIB, CCEA & GOI for approvals	➢ EAMP and social Screening and scoping (Approved as part of FR) by GOI Authorities	➢ SEMU ➢ Corp. Plg. Dept. ➢ Engg. Dept.	➢ SEMU ➢ Corp. Plg. Dept. ➢ Engg. Dept.	➢ Internal Management Approval	
2. FA Acceptance	➢ Submit FR (with environmental assessment management plan and social screening and scoping details) to Funding Agencies for appraisal	➢ EAMP and social screening & scoping (concurred as part of feasibility report) by FA	➢ SEMU ➢ Corp. Plg. Dept.	➢ SEMU ➢ Corp. Plg. Dept.	➢ Internal Management Approval	➢ Detailed appraisal and concurrence
IV. Detailed Design & Award						
1. Social Assessment & Management Planning	➢ Select and appoint suitable agency for social assessment & management planning (if necessary)	➢ Agency appointed for SAMP (if necessary)	➢ SEMU ➢ Cont. Ser.	➢ SEMU ➢ Cont. Ser. ➢ Legal Dept.	➢ BOD	
	➢ To prepare a social assessment and management plan for	➢ Social assessment and management plan	➢ RHQ ➢ Site office	➢ SEMU	➢ Internal Management Approval	➢ Ex. Agency (if required) for detailed socio-

MILESTONES	PROCESS	OUTPUT / INDICATORS	RESPONSIBILITY			
			INTERNAL			EXTERNAL
			PREPARATION /EXECUTION	REVIEW	APPROVAL	PREPARATION
	– Transmission Lines – Sub-stations – Public Disclosure					economic survey.
2. Concurrence of FA for SAMP	➢ Submit SAMP (with BOD approval to FA for concurrence	➢ Concurrence of FA for SAMP	➢ SEMU ➢ Corp. Plg. Dept.	➢ Corp. Plg. Dept.	➢ Internal Management Approval	➢ Appraisal /review by FA
3. Consultation for EM works & Tendering & Award of EM & SM Contracts	➢ Consult authorised agencies (forest dept.)for environmental management work	➢ Authorised agencies consulted to execute environmental management works	➢ RHQ ➢ Site	➢ SEMU	➢ Internal Management Approval	
	➢ Select and award social management work to appropriate agencies through competitive bidding, if necessary	➢ Agencies appointed to execute social management works	➢ RHQ ➢ Site office ➢ Cont. Ser.	➢ SEMU ➢ Legal Dept.		
V. Project Implementation						
1. Execution of Environmental Management Works	➢ Execute environmental management works	➢ Environmental management measures executed	➢ RHQ ➢ Site office ➢ Authorised agency	➢ SEMU	➢ Internal Management Approval	
2. Execution of Social Management Works	➢ Execute social management works – Transmission lines – Sub-stations	➢ Social management measures executed	➢ RHQ ➢ Site office ➢ Ext. Agency (if required)	➢ SEMU ➢ RHQ	➢ Internal Management Approval	➢ Ex. Agency (if required) for SAMP implementation.
VI. Operation & Maintenance						
1. Environmental	➢ Monitor environmental	➢ Periodic	➢ SEMU	➢ SEMU	➢ Internal	

MILESTONES	PROCESS	OUTPUT / INDICATORS	RESPONSIBILITY			
			INTERNAL			EXTERNAL
			PREPARATION /EXECUTION	REVIEW	APPROVAL	PREPARATION
Monitoring	assessment management plan measures ➢ Monitor social assessment & management plan measures	monitoring reports ➢ Periodic monitoring reports	➢ RHQ ➢ Site office ➢ SEMU ➢ RHQ ➢ Site office	➢ SEMU	Management Approval ➢ Internal Management Approval	
VII. Project Review						
1. Annual Environmental Review	➢ Appointment of consultant ➢ Review and report on environmental and social performance of project during construction operation and maintenance	➢ Annual environmental and social review report	➢ SEMU		➢ Internal Management Approval	➢ Ex. Auditors (if required)

5.4 MONITORING

The success of DFCCIL may be attributed to vigorous and continuous monitoring of all its activities including environment and social issues. The Corporate Monitoring Group (CMG) is a dedicated department for monitoring entire project activities and reporting to the G.M. (SEMU). Regular monitoring of activities is carried out by different department at site and is being reviewed by the regional head on monthly basis. CMG takes quarterly review of each region separately through Project Review Meeting (PRM). CMD and Directors also take regular review of ongoing project activities including environment and social issues and corrective measures if required are implemented at site.

For environmental and social components of a project, environmental and social monitoring plan is developed, based on baseline data and impacts predicted during the environmental and social assessment process. The concerned forest department staffs, as part of their duties monitor impacts on ecological resources through which the transmission line traverses. DFCCIL appoints concerned officials for timely implementation various activities such as compensatory afforestation, ROW maintenance, prevention of fire hazards, natural regeneration of vegetation etc. The environmental and social monitoring plan for each project will be integrated with construction, operation and maintenance and shall be monitored by the SEMU on a monthly basis in association with the corporate monitoring group. The higher management is apprised through a monthly report. Table 5.2 shows the monitoring framework for the project.

TABLE 5.2: MONITORING FRAMEWORK

SN	Project Activity / Stage	Monitoring Indicator	Frequency	Responsibility
1	Pre-Construction	Construction location and Line alignment w.r.t. Distances from; a. Set back from nearest dwellings or social institutions b. Water bodies c. Agricultural land d. Ecological protected area e. Reserved forests f. Flood Zone	Once - at time of detailed siting and alignment survey and design	DFCCIL
		Exclusion of PCB in transformer	Once – As part of tender specification	DFCCIL
		Exclusion of CFC in electrical or other equipment	Once – As part of tender specification	DFCCIL
		EMF strength	Once – part of detailed alignment survey	DFCCIL
		Noise level from substation	Once – built in design criteria and specified in tender	DFCCIL
		Noise during construction	Once – during construction machinery specification	DFCCIL and assigned contractor
		Compensation for temporary or permanent loss of productive land, trees. Monitoring of; a) RAP b) Crop compensation plan c) Tree compensation plan	Once a quarter – Based on consultation with PAP	DFCCIL
2.	Construction	Government Clearances	Once for each subproject	DFCCIL

SN	Project Activity / Stage	Monitoring Indicator	Frequency	Responsibility
		Oil spill containment and spill cleanup	Once – Built in product specification	DFCCIL
		Sewage disposal system	Once – in tender specification	DFCCIL
		Fire prevention and fire protection equipment monitoring	Once – in tender specification	DFCCIL
		Crop disturbance during construction	Periodically when required	DFCCIL assigned contractor
		Air borne dust emissions during construction	Every two weeks	DFCCIL assigned contractor
		Vegetation marking and clearance	Every two weeks – strictly limited to target vegetation	DFCCIL assigned contractor
		Trimming and cutting of trees in ROW	Once per site – Identification of presence of target species with height following vegetation clearance plan	DFCCIL assigned contractor
		Disposal of cleared vegetation	Once per site – as approved by statutory authorities	DFCCIL assigned contractor
		Disposal of excavated soil	Every 2 weeks	DFCCIL assigned contractor
3	Operation and Maintenance	Effectiveness of Training programs and plan	Once a year	DFCCIL
		Compliance with transmission tower setback conditions	Once in quarter	DFCCIL
		Maintenance of ground clearance to comply with limits of EMF	Once	DFCCIL
		Noise levels at boundary nearest to substations	Once a year	DFCCIL

DFCCIL is not involved in activities that are polluting in nature. However, environmental monitoring programme for air, water, soil, noise and vibration shall be followed.

Chapter-6

CAPACITY BUILDING PLAN

6.1 CAPACITY BUILDING

Since the effectiveness of DFCC's Environmental Assessment & implementation depends considerably on the understanding and preparedness of their Engineers and in particular their Environmental Team (Consisting of Environmental Officer, EO & Forest Officer, FO). It is important that DFCC makes effort to sensitize the Engineers and Environmental Team on management of environmental issues, provides guidance, and encourages them to build requisite capacities. Capacity building can be achieved by two prong strategy.

- training programme for existing staff
- Technical Assistance: Recruitment of additional staff /knowledge sharing with consultants, having requisite expertise.

6.1.1 Training Programme

Purpose of training

All the issues discussed in previous chapters, will at some stage require a certain element of training in the process of developing capacity within the DFCC. A number of the identified issues will be new to the existing environmental team and their staff members. It is therefore vital that a major programme of training is developed and implemented by DFCC.

Before commencing any training, there are a number of activities which needs to be completed. The first step is to ensure that all procedures in the environmental management system have been properly worked out. As part of this process, there is a need to closely evaluate the existing organizations both at central and local level in relation to their suitability and current capacity to take on the new responsibilities. This exercise needs to clearly identify the performance requirements of the various officials involved. Duties and responsibilities need to be clearly defined for the institutions as a whole and individually for each category of staff. It is only on this basis that the new staff performance requirements can be established, and the training required for existing and new staff can be determined.

When developing a training programme of this nature, it is important to acknowledge that this is not a one-time event. It is rather the start of a long term training service which not only strengthens capacity, but also contributes to sustain this capacity within the organization.

Training Strategy

A key concept in training programmes for DFCC /any organization is to provide training through a combination of formal classroom training and practical on-the-job sessions. Technical assistance should be made available to provide training, guidance and advisory support in all aspects of works implementation in order that the key players (Environmental as well as technical team) become fully conversant with, and capable of carrying out their respective duties.

Training for the various categories of staff needs to be carried out with varying duration and through different approaches, such as on-site and classroom training, workshops, seminars and practical on-the-job training.

Concept of Training

Training is always an effective up-front quality assurance measure. Experience shows that there is a great demand for training in technical subjects for the government staff in charge of work supervision. Effective training programmes involve both the introduction of new technology as well as in-depth studies of the particular skills required in each position in the works organization. As the training content for these reasons relate to practical hands-on skills, the training often consists of dissemination of best practices and work methods which have been proved most effective in projects with similar tasks and working conditions (i.e. neighbouring provinces, pilot projects, etc).

Training Methods

The most effective way of addressing such training needs is by carrying out the training in an environment which to the extent possible resembles the real situation in which the trainees will eventually operate.

Classroom Sessions although training needs to focus on practical skills, which are best taught in the field, there is always a demand for a certain theoretical foundation on which the practical skills are placed. For example, experience shows that it is useful to review basic methodology and regulations, which in turn is explained in the context of environmental management system in railway works. Also for technical subjects such as impact categorization, selection of mitigation measures, EMP as part of bidding document and others, there is a demand for an introduction to the subjects in a class-room environment, during which (i) the theory is reviewed, and (ii) a general briefing of the field exercises is conducted, before the field sessions commence.

After the initial classroom training and skills development sessions, further practical training should be carried out in a full-scale demonstration situation. This includes establishing training/demonstration sites fully equipped with the same type of tools and equipment that contractors will be using.

On-the-job Training It has been proved that on-the-job training is the most effective method of training most categories of government staff. This involves the extensive use of practical demonstrations and skill training at full-scale training sites. This approach is very effective for the training of managers, engineers and supervisors with the on-site training being supported by classroom components tailored for the various categories of staff.

Short Courses and Workshops Intensive refresher courses for periods of one to three days are useful for addressing specific problem areas. Such courses or workshops are organized to supplement on-the-job training for some of the technical and administrative staff. Short courses can either be arranged through the provision of technical assistance, an in-house training facility, or by contracting other training institutions within the country.

Seminars: Seminars are useful as a means for disseminating data and information, in particular for senior government officials at central and local level, as well as representatives of other government agencies. Seminars can be an

effective platform for policy makers, planners and administrators to review the importance of an Environmental Management System. Equally important, this type of seminar is important in terms of creating awareness of the potential of utilising new organisational arrangements, work methods, and involvement of the private sector, beyond the boundaries of a particular programme.

Training Module Details

A comprehensive training programme should be planned for the project by PIU intended to address all components of the project. Developing a comprehensive idea about the Environmental requirements, DFCC/PIU will fix the role/responsibility to effectively manage the environment components involved. As discussed earlier DFCC/PIU may or may not take the services of external agency. In general the training programme is proposed by the planning consultant, during the design stage of project.

The programme should be intended for all Contractors, Construction Supervision Consultants (if any) and the Package Unit -DFCC. As and when found necessary PIU in consultation with EMU will select appropriate modules for the training of contractors and for the training of engineers responsible for supervision and maintenance work. List of appropriate training modules and their time frames is discussed in subsequent paragraphs

The training components may be broadly divided into the following categories:

- Principles and policies for (natural and social) environmental mitigation in development projects;
- Legal and institutional aspects; project mandates;
- Probable (natural and social) environmental impacts and losses in road strengthening and widening projects;
- The EMP in DFCC consisting of
  i) The construction stage environmental concerns;
  ii) The environmental designs and implementation plans;
  iii) The project entitlement framework;
  iv) Types and aspects of vulnerability of the EPs;
  v) Counselling and grievance redressal methods and mechanisms and
  vi) Financial control mechanisms;
- Monitoring, evaluation and reporting methods and mechanisms and,
- Inter-sectoral and inter-agency collaboration, etc.

Table 6.1: Training Programme for the DFCC

Training Sessions	Training Components
Module I Initiation	• Principles and policies for (natural and social) environmental mitigation in development projects; • Legal and institutional aspects; project mandates including the WB operational policies; • Introduction to the designs, implementation schedule for DFCC.

Module II Project Specifics	• Probable (natural and social) environmental impacts and losses in road strengthening and widening projects; • Basic features of the EMP and the RAP in DFCC.
Module III EMP	• Construction stage environmental concerns including hot-spot mitigation matrices • Environmental designs and implementation plans; Location-wise and class-wise; • Project entitlement framework including group, individual or community entitlements; the verification procedure; conditions/circumstances under which additional persons may be considered affected/entitled; • Vulnerability of the EPs; special measures or additional supports proposed in the entitlement framework to assist vulnerable groups to protect their livelihood; • Counselling for each category of entitled persons, households or groups; method and scope of counselling; Completion and distribution of entitlement photo identity cards; • grievance redressal methods and mechanisms; market value assessment method and mechanisms proposed in DFCC • Financial control mechanisms including disbursement of compensation/assistance payments in a transparent method.
Module IV construction stage issues	• Laws and other statutes associated with the proposed project such as the Labor Laws, the various pollution control acts, Environmental (Protection) Act, Mining Act, Hazardous Materials (Handling) Act, Forest (Conservation) Act, Land Acquisition Act, Draft National Rehabilitation Policy, etc; • Efficient construction activity monitoring; compliance monitoring; • Environmental clauses in DFCC contract documents and their implications.
Module V operation stage issues	• Monitoring requirements; monitoring techniques; • Environmental evaluation techniques; • Reporting requirements and mechanisms for DFCC.
Module VI long term issues	• environmental surveys including ambient air, noise, biological and water quality surveys; • social surveys, survey questionnaire design, sampling techniques; • data storage, analysis and retrieval; • contract documents and incorporation of environmental clauses; • community consultation and participatory technology generation methods; • legal or statutory requirements for environmental, social and forestry clearance of road projects and, • contingency planning and management, etc.

The above are the major areas of training and discussion. The additional areas of training, in order to develop long term capacity in the DFCC can also be arranged.

6.1.2 Technical Assistance: Additional Staff/collaboration with experts

Once the system has been developed, and staff has received initial training, technical assistance is useful for providing support to establishing the system and ensuring that it becomes fully operational. Also, technical assistance is useful for designing and assisting in the conduct of the training programmes required to equip government staff with the specific skills needed to manage and operate the system.

Through the provision of technical assistance, it is possible to establish a useful yardstick for quality and control during initial works implementation. In a start-up phase, it is useful to provide the programme with external assistance in order to achieve full levels of control and monitoring.

Following agencies could be helpful in the process on Environmental Management System, EMRP. DFCC understanding/comprehending the environmental requirement of the project may involve independent experts or agency during the various stages of project. Its shears on the requirement understand by DFCC to involve the following expertise.

a) The Task Force

Given the complexity, diversity, and interdepartmental nature of its responsibilities, it is desirable for the EMU to benefit from a wide range of senior advisors. That need is particularly important because the EMU have relatively little exposure and knowledge of the changing applicable Environmental laws.

A Force, staffed by the General Manager (SEMU) of the DFCC, the Supervision consultant; and the Project Director, need to be created. It is anticipated that the Task Force will usually react to requests for advice or assistance from the EMU but it may, from time to time, take proactive initiatives.

b) Special External Advisors

Special External Advisors can assist the EMU periodically over the first two years of its operation with experience in mitigating and monitoring biophysical and social impacts, including resettlement and rehabilitation. The advisors will assist in activating the EMU, including developing its operational procedures, and in coordinating training programmes for its staff. As per the requirement of the project the T.o.R. for the external advisor can be fixed by DFCC.

c) Grievance Redressal Committees:

GRCs can be created in each District to recommend solutions to problems experienced by EPs or persons who believe that they should be recognized as EPs. As per the requirement of the project (in view of PCB and MoEF requirements) the Committees for Grievance Redressal can be formed by DFCC.

d) Market Value Assessment Committees

MVACs can be created at state level collecting data from all districts in order to recommend the value of material and services that will be required for the purposes of the Project. The Committees for Market Value Assessment can be formed by DFCC.

e) Non-Government Organization(s)

A number of responsibilities, especially with respect to the implementation of the RAP rest with NGOs, which can be procured by the DFCC. Details of the role responsibility of these NGOs are to be described in Resettlement Action Plan (RAP)**.** The RAP needs to be developed by DFCC through planning consultant.

f) External Monitoring Agency

The construction and post-construction monitoring should be contracted to external agencies, which will report directly to the Environmental Management Unit (EMU). The external monitoring agency can be fixed by DFCC as per the statutory requirements.

APPENDIX - I

SALIENT FEATURES OF THE ELECTRICITY ACT, 2003

Objective: An Act to consolidate the laws relating to generation, transmission, distribution, trading and use of electricity and generally for taking measures conducive to development of electricity industry, promoting competition therein, protecting interest of consumers and supply of electricity to all areas, rationalization of electricity tariff, ensuring transparent policies regarding subsidies, promotion of efficient and environmentally benign policies, constitution of Central Electricity Authority, Regulatory Commissions and establishment of Appellate Tribunal and for matters connected therewith or incidental thereto

PART-I: This part deals with the jurisdiction of the law and important definitions

PART-II: This part deals about National Policy and Plan to be prepared by Central Govt. in consultation with state Govt. National Policy and National Electricity plan needs to be published in Gazette / News paper once in 5 years.

PART-III: This part deals about generation of electricity

- Generating company and requirement for setting up of generating station
- Hydro-electric generation
- Captive generation
- Duties of generating companies
- Directions to generating companies

PART-IV: This part deals licensing for transmission of electricity, distribution and undertaking trading in electricity.

- Authorised persons to transmit, supply, etc. electricity
- Power to exempt
- Grant of license
- Procedure for grant of license
- Conditions of license
- Licensee not to do certain things
- Amendment lf license
- Revocation of license
- Sale of utilities of licensees
- Vesting of utility in purchaser
- Provisions where no purchase takes place
- Directions to licensees

- Suspension of distribution license and sale of utility

PART V: This part deals transmission of electricity including inter-state, regional and inter-regional transmission system.

- Inter-State, regional and inter-regional transmission
- National Load Despatch Centre
- Constitution of Regional Load Despatch Centre
- Functions of Regional Load Despatch Centre
- Compliance of directions
- Intra-State transmission
- Transmission within a State
- Constitution of State Load Despatch Centres
- Functions of State Load Despatch Centres
- Compliance of directions
- Grid Standards
- Intervening transmission facilities
- Charges for intervening transmission facilities
- Directions by Appropriate Government
- Central Transmission Utility and functions
- State Transmission Utility and functions
- Duties of transmission licensees
- Other business of transmission licensee

PART-VI: This deals with provisions of distribution of electricity with respect to distribution licensee

- Duties of distribution licensee and open access
- Duty to supply on request
- Exceptions from duty to supply electricity
- Power to recover charges
- Power to recover expenditure
- Power to require security
- Additional terms of supply
- Agreements with respect to supply or purchase of electricity
- The Electricity Supply Code
- Other businesses of distribution licensees
- Provisions with respect to electricity trader
- Control of transmission and use of electricity
- Use, etc. of meters

- Disconnection of supply in default of payment
- Standards of performance of licensee
- Different standards of performance by licensee
- Information with respect to levels of performance
- Market domination

PART-VII: This chapter deals about terms and conditions for the determination of tariff.

- Tariff regulations
- Determination of tariff
- Determination of tariff by bidding process
- Procedure for tariff order
- Provision of subsidy by State Government
- Development of market

PART-VIII: This part deals work of licensees includes provision as to opening up of streets, railways etc., overhead lines, notice to telegraph authority.

- Provision as to opening up of streets, railways, etc
- Overhead lines
- Notice to telegraph authority

PART-IX: This part deals about constitution and functions of Central Electricity Authority

PART-X: This part deals about Regulatory Commissions and its constitution, power and functions of central commission

PART-XI: This part deals about appellate tribunal for electricity

PART XII: This part deals about investigation, enforcement of assessment for electricity consumed by consumer by State Govt. or board or licensee.

PART XIII: This part deals about reorganization of Electricity Board

PART XIV: This part deals mainly about offences and penalties for misusing/theft of electricity.

PART XV: This part deals constitution of special courts for the purpose of providing speedy trial of offences referred to in sections 135 to 139

PART XVI: This part deals mainly resolution of dispute by arbitration under this Act.

PART XVII: This part deals mainly protection of railways, highways, airports and canals, docks, wharfs and piers, protection of telegraphic, telephonic and electric signalling lines, amendment of sections 40 and 41 of Act 1 of 1894

PART XVIII: This part mainly deals miscellaneous matter includes following:

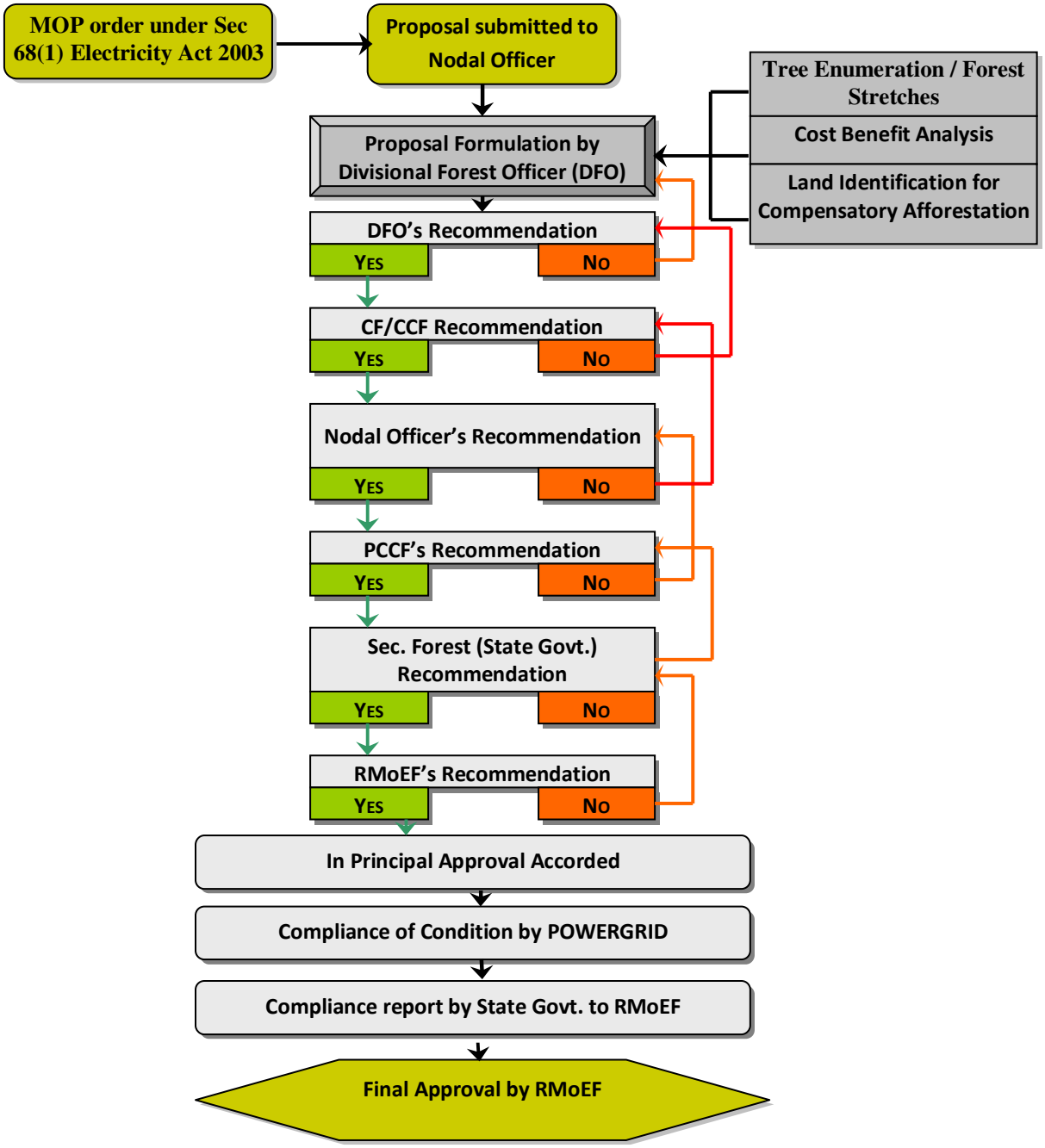
- Coordination Forum
- Exemption of electric lines or electrical plants from attachment in certain cases
- Protection of action taken in good faith

- Members, officers, etc., of Appellate Tribunal, Appropriate Commission to be public servants
- Recovery of penalty payable under this Act
- Services of notices, orders or documents
- Transitional provisions
- Inconsistency in laws
- Act to have overriding effect
- Provisions of this Act to be in addition to and not in derogation of other laws
- Power of Central Government to make rules
- Powers of Authority to make regulations
- Powers of Central Commission to make regulations
- Rules and regulations to be laid before Parliament
- Powers of State Governments to make rules
- Powers of State Commissions to make regulations
- Rules and regulations to be laid before State Legislature
- Power to remove difficulties
- Provisions of Act not to apply in certain cases
- Repeal and saving

The Electricity Act, 2003 does not explicitly deal with environmental implications of activities related to power transmission other than 164 (B) to avail benefits of eminent domain provided under the Indian Telegraph Act, 1885, which provide all the powers that the telegraph authority possesses. Accordingly, POWERGRID can erect and construct towers without actually acquiring the land and after paying compensation towards all the damages.

APPENDIX-II

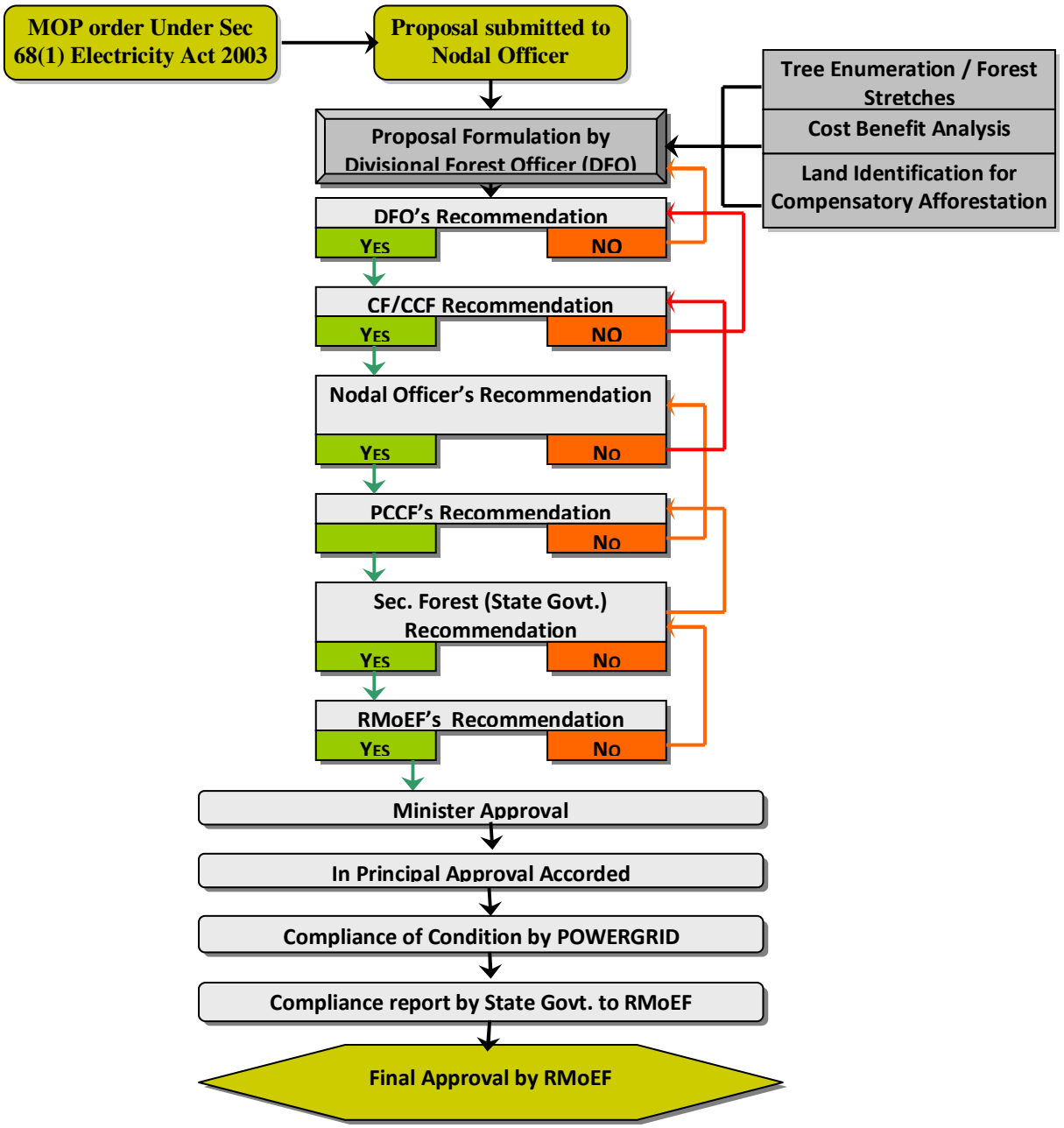
FOREST CLEARANCE FLOW CHART (FOREST AREA UP TO 5 HECTARE)



Note: For any clarification sought at any level case is referred back to utility through proper channel

As per MoEF notification dt.3.2.04 specific time limit has been fixed for processing of forest proposal w.e.f. its submission. A total of 210 days has been allocated for state Govt. to process and recommendation of case to concerned RMoEF. RMoEF has been allotted 45 days for approval involving forest area up to 5ha.

FOREST CLEARANCE FLOW CHART (FOREST AREA MORE THAN 5 HECTARE UP TO 40 HECTARE)

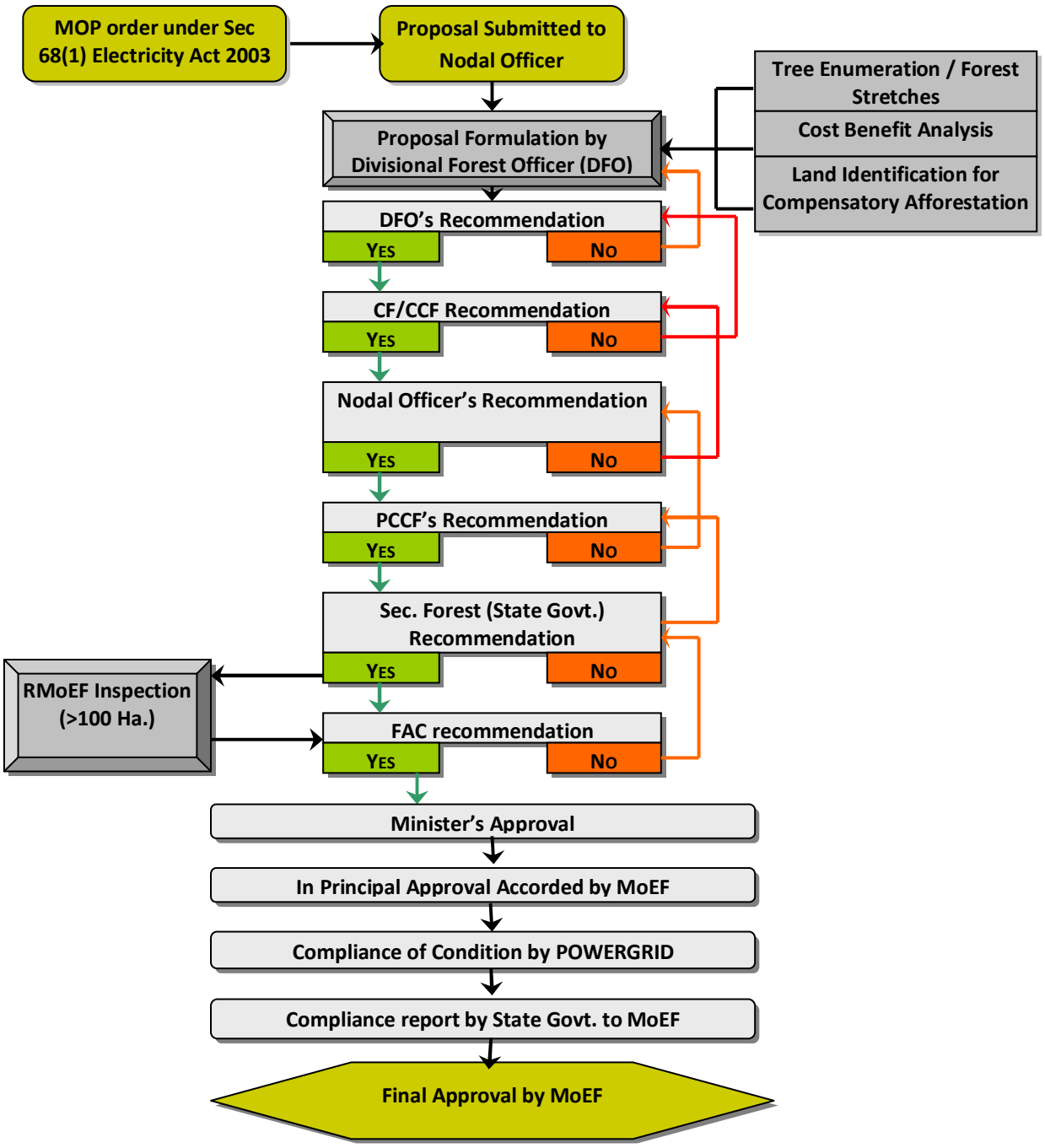


Note: For any clarification sought at any level case is referred back to utility through proper channel

As per MoEF notification dt.3.2.04 specific time limit has been fixed for processing of forest proposal w.e.f. its submission. A total of 210 days has been allocated for state Govt. to process and recommendation of case to RMoEF depending upon the area involved. RMoEF has been allotted 45 days for processing of cases involving forest area up to 40 ha and submission to MoEF for obtaining sanction of MoEF.

APPENDIX-II (CONTD)

FOREST CLEARANCE FLOW CHART (FOREST AREA MORE THAN 40 HECTARES)



Note: For any clarification sought at any level case is referred back to utility through proper channel

As per MoEF notification dt.3.2.04 specific time limit has been fixed for processing of forest proposal w.e.f. its submission. A total of 210 days has been allocated for state Govt. to process and recommendation of case to MoEF. MoEF has been allotted 90 days for processing of case to obtain sanction of central Govt. and issue of In-principle approval/ rejection.

APPENDIX-III

FORMAT FOR FORMULATION OF FOREST PROPOSAL

FORM – 'A'
PART – I
(To be filled by the user agency)

1. Projects details:

   i) Short narrative of the proposal and project/scheme for which the forest land is required
   ii) Map showing the required forest land, boundary of adjoining forest on a 1:50,000 scale map
   iii) Cost of the project
   iv) Justification for locating the project in forest area
   v) Cost benefit analysis (to be enclosed)
   vi) Employment likely to be generated

2. Purpose-wise break-up of the total land required:
3. Details of displacement of people due to the project if any :
   i) Number of families
   ii) Number of Scheduled Castes/Scheduled Tribe families
   iii) Rehabilitation plan (to be enclosed)
4. Whether clearance under Environment (Protection) Act, 1986 required? (Yes/No)

5. Undertaking to bear the cost of raising and maintenance of compensatory afforestation and/or penal compensatory afforestation as well as cost for protection and regeneration of Safety Zone etc. as per the scheme prepared by the State Government (undertaking to be enclosed)

6. Details of certificates/documents enclosed as required under the instructions.

Signature
(Name in Block letters)
Designation
Address (of User Agency)

Date:_____

Place:_____

State serial No. of proposal_____
(To be filled up by the Nodal Officer with date of receipt)

PART – II

(To be filled by the concerned Deputy Conservator of Forests)

State serial No. of proposal_____

Location of the project/Scheme:

7. Location of the project/ scheme :
   i) State/Union Territory
   ii) District
   iii) Forest Division
   iv) Area of forest land proposed for diversion (in ha.)
   v) Legal status of forest
   vi) Density of vegetation
   vii) Species-wise (scientific names) and diameter class-wise enumeration of trees (to be enclosed, in case of irrigation/ hydel projects enumeration at FRL, FRL-2 meter & FRL-4 meter also to be enclosed.
   viii) Brief note on vulnerability of the forest area to erosion
   ix) Approx. distance of proposed site for diversion from boundary of forest
   x) Whether forms part of National Park, wildlife sanctuary, biosphere reserve, tiger reserve, elephant corridor, etc. (if so the details of the area and comments of the Chief Wildlife Warden to be annexed).
   xi) Whether any rare/endangered/unique species of flora and fauna found in the area- if so details thereof
   xii) Whether any protected archaeological/heritage site/defence establishment or any other important monument is located in the area. If so the details thereof with NOC from competent authority, if required

8. Whether the requirement of forest land as proposed by the user agency in col.2 of Part-I is unavoidable and barest minimum for the project. If no recommended area item-wise with details of alternatives examined.

9. Whether any work in violation of the Act has been carried out (Yes/No). If yes details of the same including period of work done, action taken on erring officials. Whether work in violation is still in progress

10. 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 from management point of view (To be signed by the concerned Deputy Conservator of Forests)

11. Site inspection report of the DCF (to be enclosed) especially highlighting facts asked in col.7 (xi, xii), 8 and 9 above.

12. Division/District profile:
    i) Geographical area of the district
    ii) Forest area of the district
    iii) Total forest area diverted since 1980 with number of cases
    iv) Total compensatory afforestation stipulated in the district/division since 1980 on (a) forest land including penal compensatory afforestation
    v) Progress of compensatory afforestation as on (date)_____ on
        a) forest land
        b) non-forest land

13. Specific recommendations of the DCF for acceptance of otherwise of the proposal with reasons

Signature

Name_____ Official Seal Date:_____ Place:_____

PART – III
(To be filled by the concerned Conservator of Forests)

14. Whether site, where the forest land involved is located has been inspected by concerned Conservator of Forests (Yes/No). If yes, the date of inspection & observations made in form of inspection note to be enclosed

15. Whether the concerned Conservator of Forests agree with the information given in Part-B and the recommendations of Deputy Conservator of Forests.

16. Specific recommendations of concerned Conservator of Forests for acceptance or otherwise of the proposal with detailed reasons.

Signature

Name

Date : _____ Official Seal Place;_____

PART – IV

(To be filled in by the Nodal Officer or Principal Chief Conservator of Forests or Head of Forest Department)

17. Detailed opinion and specific recommendations of the State Forest Department for acceptance of otherwise of the proposal with remarks (While giving opinion, the adverse comments made by concerned Conservator of Forests or Deputy Conservator of Forests should be categorically reviewed and critically commented upon).

Signature
Name
Designation
(Official Seal)
Date:

Place:

PART-V

(To be filled in by the Secretary in charge of Forest Department or by any other authorized officer of the State Government not below the rank of the Under Secretary)

18. Recommendation of the State Government (Adverse comments made by any officer or authority in Part-B or Part-C or Part-D above should be specifically commented upon)

Signature
Name
Designation
(Official Seal)

Date: _____

Place: _____

APPENDIX –IV

APPLICABILITY AND PARAMETERS FOR COST- BENEFIT ANALYSIS

Category of Proposals for which Cost-Benefit Analysis Applicable

SN	Nature of Proposal	Applicable/ Not applicable	Remarks
1.	All categories of proposals involving forest land up to 20 hectares in plains and up to 5 hectares in hills	Applicable/ Not applicable	These proposals are to be considered on case by case basis and value judgement
2.	All other proposals involving forest land more than 20 hectares in plains and more than 5 ha. in hills including roads, transmission lines, minor, medium and major irrigation projects, hydel projects mining activity, railway lines, location specific installations like microwave stations, auto repeater centres, T.V. towers etc.	Applicable	These are cases where a cost-benefit analysis is necessary to determine when diverting the forest land to non-forest use is in the overall public interests

Parameters for Evaluation of Loss of Forest

SN	Parameters	Roads, Transmission lines & Railway lines
1.	Loss of value of timber, fuel wood and minor forest produce on an annual basis, including loss of man-hours per annum of people who derived livelihood and wages from the harvest of these commodities	To be quantified & expressed in monetary terms
2.	Loss of animal husbandry productivity, including loss of fodder	-do-
3.	Cost of human resettlement	To be quantified & expressed in monetary terms
4.	Loss of public facilities and administrative infrastructure (Roads, buildings, schools, dispensaries, electric lines, railways etc.) on	To be quantified & expressed in monetary terms

	forest land, or which would require forest land if these facilities were diverted due to the project	

Parameters for Evaluation of Social Assessment

SN	Parameters	Roads, Transmission lines & Railway lines
1.	Increase in productivity attributable to the specific project	To be quantified & expressed in monetary terms
2.	Benefits to economy	Value judgement
3.	No. of population benefited	-do-
4.	Employment potential	-do-
5.	Cost of acquisition of facility on non forest land wherever feasible	To be quantified & expressed in monetary terms
6.	Loss of (a) agricultural & (b) animal husbandry production due to diversion of forest land	-do-
7.	Cost of rehabilitating the displaced persons as different from compensatory amounts given for displacement	To be quantified & expressed in monetary terms
8.	Cost of supply of free fuel-wood to workers residing in or near forest area during the period of construction	-do-

APPENDIX - V

LIST OF REGIONAL OFFICE UNDER THE MINISTRY OF ENVIRONMENT & FORESTS

ZONAL OFFICES	JURISDICTION-STATE
Chief Conservator of Forest (Central) Southern Zone **BANGALORE**	Kerala, Tamil Nadu, Andhra Pradesh, Karnataka, Pondicherry, Lakshwadeep & Goa
Chief Conservator of Forest (Central) Western Zone **BHOPAL**	Gujarat, Madhya Pradesh, Chattisgarh, Maharashtra, D&N Haveli & Daman & Diu
Chief Conservator of Forest (Central) Eastern Zone **BHUBANESWAR**	Bihar, Jharkhand, West Bengal, Orissa, A&N Island & Sikkim
Conservator of Forest (Central) Northern Zone **CHANDIGARH**	Haryana, Punjab, Himachal Pradesh and Jammu & Kashmir
Chief Conservator of Forest (Central) Central Zone **LUCKNOW**	Uttar Pradesh, Uttaranchal, Delhi & Rajasthan
Chief Conservator of Forest (Central) North-Eastern Region **SHILLONG**	Assam, Tripura, Mizoram, Manipur, Meghalaya, Arunachal Pradesh & Nagaland

APPENDIX –VI

SPECIFIED PROJECT CATEGORIES AS LISTED IN SCHEDULE OF ENVIRONMENT IMPACT ASSESSMENT NOTIFICATION, 2006 (MOEF) REQUIRE PRIOR ENVIRONMENTAL CLEARANCE

Project or Activity		Category with threshold limit		Conditions if any
		A	**B**	
1		**Mining, extraction of natural resources and power generation (for a specified production capacity)**		
(a) (1)	(2)	(3)	(4)	(5)
1 1(a)	Mining of minerals	≥ 50 ha. of mining lease area Asbestos mining irrespective of mining area	<50 ha ≥ 5 ha .of mining lease area.	General Condition shall apply Note Mineral prospecting (not involving drilling) are exempted provided the concession areas have got previous clearance for physical survey
1(b)	Offshore and onshore oil and gas exploration, development & production	All projects		Note Exploration Surveys (not involving drilling) are exempted provided the concession areas have got previous clearance for physical survey
1(c)	River Valley projects	(i) ≥ 50 MW hydroelectric power generation; (ii) ≥ 10,000 ha. of culturable command area	(i) < 50 MW ≥ 25 MW hydroelectric power generation; (ii) < 10,000 ha. of culturable command area	General Condition shall apply
1(d)	Thermal Power Plants	≥ 500 MW (coal/lignite/naphta & gas based); ≥ 50 MW (Pet coke diesel and all other fuels -)	< 500 MW (coal/lignite/naptha & gas based); <50 MW ≥ 5MW (Pet coke ,diesel and all other fuels)	General Condition shall apply
1(e)	Nuclear power projects and processing of nuclear fuel	All projects	-	

2		**Primary Processing**		
2(a)	Coal washeries	≥ 1 million ton/annum throughput of coal	<1million ton/annum throughput of coal	General Condition shall apply (If located within mining area the proposal shall be appraised together with the mining proposal)
2 (b)	Mineral beneficiation	≥ 0.1million ton/annum mineral throughput	< 0.1million ton/annum mineral throughput	General Condition shall apply (Mining proposal with Mineral beneficiation shall be appraised together for grant of clearance)
3		**Materials Production**		
3(a)	Metallurgical industries (ferrous & non ferrous)	a)Primary metallurgical industry All projects b) Sponge iron manufacturing ≥ 200TPD c)Secondary metallurgical processing industry All toxic and heavy metal producing units ≥ 20,000 tonnes /annum -	Sponge iron manufacturing <200TPD Secondary metallurgical processing industry i.)All toxic and heavymetal producing units <20,000 tonnes /annum ii.)All other non –toxic secondary metallurgical processing industries >5000 tonnes/annum	General Condition shall apply for Sponge iron manufacturing
3(b)	Cement plants	≥ 1.0 million tonnes/annum production capacity	<1.0 million tonnes/annum production capacity. All Stand alone grinding units	General Condition shall apply
4		**Materials Processing**		
(1)	(2)	(3)	(4)	(5)
4(a)	Petroleum refining industry	All projects	-	-
4(b)	Coke oven plants	≥2,50,000 tonnes/annum	<2,50,000 & ≥25,000 tonnes/annum	-
4(c)	Asbestos milling and asbestos based	All projects	-	-

	products			
4(d)	Chlor-alkali industry	≥300 TPD production capacity or a unit located outside the notified industrial area/ estate	<300 TPD production capacity and located within a notified industrial area/ estate	Specific Condition shall apply No new Mercury Cell based plants will be permitted and existing units converting to membrane cell technology are exempted from this Notification
4(e)	Soda ash Industry	All projects	-	-
4(f)	Leather/skin/hide processing industry	New projects outside the industrial area or expansion of existing units outside the industrial area	All new or expansion of projects located within a notified industrial area/ estate	Specific condition shall apply
5		**Manufacturing/Fabrication**		
5(a)	Chemical fertilizers	All projects	-	-
5(b)	Pesticides industry and pesticide specific intermediates (excluding formulations)	All units producing technical grade pesticides	-	-
5(c)	Petro-chemical complexes (industries based on processing of petroleum fractions & natural gas and/or reforming to aromatics)	All projects -	-	-
5(d)	Manmade fibres manufacturing	Rayon	Others	General Condition shall apply
5(e)	Petrochemical based processing (processes other than cracking & reformation and not covered under the complexes)	Located outside the notified industrial area/ estate -	Located in a notified industrial area/ estate	Specific Condition shall apply
5(f)	Synthetic organic chemicals industry (dyes & dye intermediates; bulk	Located outside the notified industrial area/ estate	Located in a notified industrial area/ estate	Specific Condition shall apply

	drugs and intermediates excluding drug formulations; synthetic rubbers; basic organic chemicals, other synthetic organic chemicals and chemical intermediates)			
5(g)	Distilleries	(i)All Molasses based distilleries (ii) All Cane juice/ non-molasses based distilleries ≥30 KLD	All Cane juice/non-molasses based distilleries – <30 KLD	General Condition shall apply
5(h)	Integrated paint industry	-	All projects	General Condition shall apply
5(i)	Pulp & paper industry excluding manufacturing of paper from waste paper and manufacture of paper from ready pulp without bleaching	Pulp manufacturing and Pulp& Paper manufacturing industry -	Paper manufacturing industry without pulp manufacturing	General Condition shall apply
5(j)	Sugar Industry	- -	≥ 5000 tcd cane crushing capacity	General Condition shall apply
5(k)	Induction/arc furnaces/cupola furnaces 5TPH or more	- -	All projects	General Condition shall apply
6		**Service Sectors**		
6(a)	Oil & gas transportation pipe line (crude and refinery/ petrochemical products), passing through national parks /sanctuaries/coral reefs /ecologically sensitive areas including LNG Terminal	All projects		-
6(b)	Isolated storage &	-	All projects	General Condition shall

	handling of hazardous chemicals (As per threshold planning quantity indicated in column 3 of schedule 2 & 3 of MSIHC Rules 1989 amended 2000)			apply
7		**Physical Infrastructure including Environmental Services**		
7(a)	Air ports	All projects	-	-
7(b)	All ship breaking yards including ship breaking units	All projects	-	-
7(c)	Industrial estates/ parks/ complexes/ areas, export processing Zones (EPZs), Special Economic Zones (SEZs), Biotech Parks, Leather Complexes.	If at least one industry in the proposed industrial estate falls under the Category A, entire industrial area shall be treated as Category A, irrespective of the area. Industrial estates with area greater than 500 ha. and housing at least one Category B industry.	-Industrial estates housing at least one Category B industry and area <500 ha. Industrial estates of area> 500 ha. and not housing any industry belonging to Category A or B.	Special condition shall apply Note: Industrial Estate of area below 500 ha. and not housing any industry of category A or B does not require clearance.
7(d)	Common hazardous waste treatment, storage and disposal facilities (TSDFs)	All integrated facilities having incineration &landfill or incineration alone	All facilities having land fill only	General Condition shall apply
7(e)	Ports, Harbours	≥ 5 million TPA of cargo handling capacity (excluding fishing harbours)	< 5 million TPA of cargo handling capacity and/or ports/ harbours ≥10,000 TPA of fish handling capacity	General Condition shall apply

7(f)	Highways	i) New National High ways; and ii) Expansion of National High ways greater than 30 KM, involving additional right of way greater than 20m involving land acquisition and passing through more than one State.	i) New State High ways; and ii) Expansion of National / State Highways greater than 30 km involving additional right of way greater than 20m involving land acquisition.	General Condition shall apply
7(g)	Aerial ropeways		All projects	General Condition shall apply
7(h)	Common Effluent Treatment Plants (CETPs)		All projects	General Condition shall apply
7(i)	Common Municipal Solid Waste Management Facility (CMSWMF)		All projects	General Condition shall apply
8		**Building /Construction projects/Area Development projects and Townships**		
8(a)	Building and Construction projects		≥20000 sq.mtrs and <1,50,000 sq.mtrs. of built-up area#	#(built up area for covered construction; in the case of facilities open to the sky, it will be the activity area)
8(b)	Townships and Area Development projects.		Covering an area ≥ 50 ha and or built up area ≥1,50,000 sq .mtrs ++	++All projects under Item 8(b) shall be appraised as Category B1

Projects requiring Site Clearance from MoEF:

Site clearance from the MoEF is to be obtained in case of the following projects:

- Mining;
- Pit-Head thermal power stations;
- Hydropower, major irrigation projects and/or their combination including flood control;
- Ports and harbours (excluding minor ports);
- Prospecting and exploration of major minerals in areas more that 500 hectares.
- Industrial Estate

For obtaining site clearance, application is to be submitted giving the location of the project along with requisite details, to the MoEF. MoEF will convey its decision about the suitability of the proposed site within a maximum period of 30 days.

APPENDIX-VII

FORM –8 FOR DISPOSAL OF BATTERIES

MINISTRY OF ENVIRONMENT AND FORESTS
NOTIFICATION
New Delhi, the 16th May, 2001

FORM – VIII

[see rule 10 (2)(ii)]

FORM FOR FILING RETURNS BY RECYCLERS OF USED BATTERIES

[To be submitted by the bulk consumer to the State Board by 30th June (for the period October-March) and 31st December (for the period April-September) every year]

1.	Name and address of the bulk consumer	
2.	Name of the Authorised person and full address with telephone and fax number	
3.	Number of new batteries of different categories purchased from the manufacturer / importer / dealer or any other agency during October-March and April-September Category : Automotive four wheeler two wheeler Industrial UPS Motive Power Stand-by Others	(i) No. of Batteries (ii) Approximate weight (in Metric Tonnes)
4.	Number or used batteries of categories mentioned in Sl. No. 3 and Tonnage of scrap sent to manufacturer / dealer / importer / registered recycler / or any other agency to whom the used batteries scrap was sent	

Place _____ Signature of the authorised person

Date _____

* *Enclose list of manufacture / dealer / importer / registered recyclers / or any other agency to whom the used batteries scrap was sent.*

APPENDIX – VIII

SPECIFICATIONS OF USED OIL FOR REFINING AND WASTE OIL FOR RECYCLING

Schedule-5

Specifications for Used oil Suitable for Re-refining

SN	Parameter	Maximum Permissible Limit
1.	Colour	8 hazen units
2.	Water	15%
3.	Density	0.85 to 0.95
4.	Kinematic Viscosity cSt at 100˚C	1.0 to 32
5.	Dilutents	15% vol.
6.	Neutralisation No.	3.5 mg KOH/g
7.	Saponification value	18 mg KOH/g
8.	Total halogens	4000 ppm
9.	Polychlorinated biphenyls (PCBs)	Below detection limit
10.	Lead	100 ppm
11.	Arsenic	5 ppm
12.	Cadmium+Chromium+Nickle	500 ppm
13.	Polyaromatic hydrocarbons (PAH)	6%

Schedule-6

Specifications for Waste Oil Suitable for Recycling

SN	Parameter	Limit
1.	Sediment	5% (maximum)
2.	Heavy Metals (cadmium+chromium+nickel+lead+arsenic)	605 ppm maximum
3.	Polyaromatic hydrocarbons (PAH)	6% maximum
4.	Total halogens	4000 ppm maximum
5.	Polychlorinated biphenyls (PCBs)	Below Detection Limit

APPENDIX - IX

FORM – 13 FOR DISPOSAL OF REFUSED OIL

MINISTRY OF ENVIRONMENT AND FORESTS

NOTIFICATION

NEW DELHI, THE 20th May , 2003

Form - 13
[*See* rule 20 (5)]

Form for Filling Returns of Auction/ Sale of Non-Ferrous Metal Wastes/ Used Oil/Waste Oil

[To be submitted by waste generators / auctioneers to the concerned State Pollution Control Board / Committee by 31st January of every year]

1.	Name and address of the waste generator/auctioneer	
2.	Total quantity of wastes auctioned / sold during the period	Non-ferrous Metal Wastes [indicate type and quantity in metric tonnes along with the name(s)/address(s) of registered recycler(s)]: Used oil/waste oil [indicate type and quantity in metric tonnes along with the name(s)/ address(s) of registered recycler(s) /re-refiner(s)]

*delete whichever is not applicable
Signature:

Designation: …….".

Place : ….....

Date : ….....

APPENDIX - X

INTERNATIONAL TREATIES, CONVENTIONS AND DECLARATIONS ON ENVIRONMENT CONSERVATION TO WHICH INDIA IS A PARTY

International Plant Protection Convention, 1952

Plant Protection Agreement for the Asia and the Pacific Region, 1956

Convention Concerning the Protection of the World Culture and Natural Heritage – 1972

Convention on International Trade in Endangered Species of wild Flora and Fauna (CITIES), 1976

International Whaling Commission, 1981

Convention on Wetlands of International Importance especially as Waterfowl Habitat (Ramsar Convention), 1982

Convention on Conservation of Migratory Species of Wild Animals, 1983

Convention for the Protection of the Ozone Layer (Vienna Convention), 1988

The Montreal Protocol on Substances that Deplete the Ozone Layer, 1989

Convention on the Control of Trans boundary Movements of Hazardous Wastes and their Disposal (Basel Convention), 1992

Male Declaration on Control and Prevention of Air Pollution and its Likely Trans boundary Effects for South Asia, 1992

Rio Declaration and Agenda-21 on Sustainable Development, 1992

Convention on Biological Diversity, 1992

United Nations Framework Convention on Climate Change (UNFCCC), 1993

United Nations Convention to Combat Desertification (UNCCD), 1996

International Treaty on Plant Genetic Resources for Food and Agriculture, 2001

Kyoto Protocol, 2002

APPENDIX - XI

HEALTH AND SAFETY CHECKLIST

Safety Related Check List during Construction of Railway Lines and Associate Facilities

Region : ..... Name of DHQ/GHQ: ..... Date of Safety Audit:.....

Name of facilities: .....……

Loc. No: .....……Voltage Level: .....

Name of Contractor: .....……

Name of Sub Contractor: .....……

A. DURING TOWER FOUNDATION :

SN	Description of Activity	Feed back	Remarks
I) EXCAVATION :			
1.	Dumping of Excavated soil. (Minimum 1.5 Mts. or half the depth of the pit whichever is more)	Yes / No.	
2.	Whether angle of repose of soil as per design in the foundation is maintained or not.	Yes / No.	
3.	De watering arrangement is available (If necessary)	Yes / No.	
4.	Working area has been protected properly to avoid against fall of passerby or animal in the excavated pit.	Yes / No.	
5	Shoring & Shuttering to protect the loose rock / soil against fall exists.	Yes / No.	
6	Arrangement of illumination at construction site is available. (if required)	Yes / No.	
7	Check proper/adequate arrangement is made for extension of electric supply. (Proper size of cable, Use of fuse, No loose connection for De-watering Pumps/ Illumination / Electric compressors etc. if applicable).	Yes / No.	
8	Check for damage / Uneven settlement of foundation.	Yes / No.	
9	Ensure Life saver arrangements have been made during construction of well foundation in river bed. (Where necessary)	Yes / No.	
10	Check that the adequate arrangement is made for the storage of blasting material at safe place. (if required)	Yes / No.	
11	Check that the blasting materials is handled with due care at site. (If required)	Yes / No.	

SN	Description of Activity	Feed back	Remarks
12	Check that during blasting operation, Labor / Workmen / Passerby are at safe places and arrangement is made to inform public by caution markings (Red Flag) / Public Notices.	Yes / No.	
13	Check that the Blaster is holding the proper license issued by the appropriate authority. As per the Indian Explosive Act.	Yes / No.	
14	Check that the length of the fuse wire used during blasting operation is adequate.	Yes / No.	
15	Ensure Laying of temporary cable used for operation of Machines used during construction should not cause any danger for electrocution of workmen.	Yes / No.	
16	Check that PPEs i.e. Safety helmets, Safety Shoes, is used by blaster and their gang members during blasting.	Yes / No.	
17	Ensure that Shuttering and timbering has been made as detailed in I:S: 3764.	Yes / No.	
18	Ensure that before undertaking excavation, the soil has been tested and in case of availability of any explosive / dangerous gas, necessary arrangement must be made to remove / dilute such gases.	Yes / No.	
19	The positions of underground installations such as sewers, water pipes and electrical cables have been verified and in case of their existence, they must be isolated.	Yes / No.	
20	Arrangement shall be made to prevent external vibrations due to rail / road traffic (If required).	Yes / No.	
21	Safety is ensured during the construction of Tr. Lines for buildings, structures etc. which are coming in the vicinity of the excavated area from collapse. (If required)	Yes / No.	
22	Check that sufficient strong ladder of suitable length is available for ingress / outgress of persons in the pit	Yes / No.	
23	Lone worker should not be allowed to work in the excavated area beyond shoulder level.	Yes / No.	
24	Check for any possibility of seepage of water from nearby pond / river should be estimated and taken care of.	Yes / No.	
25	After excavation the work has been completed speedily and back filling done at the earliest.	Yes / No.	
II) CASTING OF FOUNDATION / CONCRETING :			
1	Check construction materials are stacked at safe place and also does not cause any danger. (Away from pit by 1.5 Mtrs. Or half the depth of pit, whichever is more.)	Yes / No.	
2	Check arrangement of illumination at Construction Site. (If required).	Yes / No.	
3	Ensure life saver arrangements have been made during construction of Well foundation in River Bed.	Yes / No.	

SN	Description of Activity	Feed back	Remarks
4	Check that the Concreting Mixer machine is placed at a safe place. (Not very near to pit.)	Yes / No.	
5	Check proper / adequate arrangement is made for extension of electric supply. (Proper size of cable, Use of fuse, No loose connection for De watering Pumps / Illumination / Electric compressors etc. if applicable).	Yes / No.	
6	Check that laying of temporary cables used during construction activities should not cause any danger for electrocution to workmen.	Yes / No.	
7	Inspection of excavations shall be made by a Competent Person every day. In case, possible cave in or slide is apparent, all working in the excavation shall be seized until the necessary precautions have been taken to safeguard the possible cave in or slide.	Yes / No.	
8	Jacks and vertical supports shall be positioned in such a manner that the vertical loads are distributed equally and do not exceed the capacity of the jacks and the jacks are placed away from pit edge etc.	Yes / No.	
9	Proper Jacking arrangement is made to take the entire load of template.	Yes / No.	
10	In case of long template in stub setting, more jacks have been provided and check that the Jacks are placed on levelled and hard surface to avoid the unbalancing and fallen.	Yes / No.	
11	Wire mesh rolls shall be secured in order to prevent dangerous recoiling action.	Yes / No.	
12	Lone worker should not be allowed to work in the excavated area.	Yes / No.	
13	Check that sufficient strong ladder of suitable length is available for ingress / outgress of persons in the pit	Yes / No.	

B. SINGAL / TOWER ERECTION :

SN	Description of Activity	Feed back	Remarks
1	Check proper communication facility is available at site during Tower erection. (If required)	Yes / No.	
2.	Check damages or uneven settlement of foundation.	Yes / No.	
3.	Ensure the derrick used before tower erection has been checked for adequate strength/ size. Ensure for copy of test certificate for all the lifting machines and tackles.	Yes / No.	
4.	Ensure that the pulleys used before tower erection has been checked for adequate strength / proper size (diameter). Also in case of open type pulleys proper locking arrangements like providing of Safety Pin is made. Ensure for copy of test certificate for all the lifting machines and tackles.	Yes / No.	
5.	Ensure that the ropes used before tower erection has been checked		

SN	Description of Activity	Feed back	Remarks
	for adequate strength / physical condition (Free from break of strands and knots etc.	Yes / No.	
6.	Check that the lifting tools and tackles i.e. Winch Machine, Chain Pulley Block, Trifor, D - Shackle etc. are in healthy condition and has been tested periodically. (Attach copy of test certificate).	Yes / No.	
7.	Ensure that permission has been obtained from Aviation Authority for erection of special towers. (Where necessary).	Yes / No.	
8.	Ensure that permission has been obtained from Aviation Authority for erection of towers which comes in the vicinity of flying zone. (Where necessary)	Yes / No.	
9.	Check that the safety measures has been taken before undertaking for the Road / Rail / River Xing jobs involving likewise stretches.	Yes / No.	
10.	For rail or road crossing check whether written working plan is available at site with specific reference to safety e.g. local earthing, skilled & experience manpower, proper T&P, strength and height of scaffolding to maintain the required clearance etc.	Yes / No.	
11.	Ensure that all the members and proper size of Nuts and Bolts of lower section are fitted properly before erection of the upper section of tower is taken up.	Yes / No.	
12.	Check that the anti climbing devices are provided in the tower after erection job.	Yes / No.	
13.	Check that the danger plates have been provided.	Yes / No.	
14.	Check that only erection team members are allowed to stand near the tower while erection is in process and should wear the safety helmet / Safety Shoes.	Yes / No.	
15.	Working area of the tower has been demarcated during erection.	Yes / No.	
16	Check that proper guying arrangement has been made. And also to see that proper size of the crow bars has been used which has been fixed at hard surface in case of sandy soil or loose soil.	Yes / No.	
17	Check that proper arrangement is made while lifting the tower members and fixing them at height i.e. Proper size and strength of the hook used for lifting the tower members.	Yes / No.	
18	Check sufficient numbers of guys are made while lifting the assembled cross arm and also avoiding use of single sheave pulleys while lifting the assembled cross arm / heavy load.	Yes / No.	

C. CONDUCTOR STRINGING:

SN	Description of Activity	Feed back	Remarks
1.	All drivers and plant operators are holding the valid driving license.	Yes / No.	
2.	Check that the permit has been obtained from the Competent Authority for stringing of conductor while crossing through Road / Rail / River / Venerable areas etc. (Where necessary)	Yes / No.	
3.	Check that required painting has been made on tower falling in the		

SN	Description of Activity	Feed back	Remarks
	vicinity of aviation zones. (Where necessary.)	Yes / No.	
4.	Check that all safety measures have been taken during stringing of conductor crossing the EHV / HV / LT lines (Earthing of existing lines etc.)	Yes / No.	
5.	Ensure that proper size of Nuts and Bolts is rigidly tightened and punching / tacking / tack welding is done in towers before undertaking stringing job.	Yes / No.	
6.	Ensure that proper scaffolding arrangements made during stringing of conductor (While Road Xing / Power Line Xing etc.	Yes / No.	
7.	Ensure that all members are fitted in tower before undertaking conductor stringing work.	Yes / No.	
8.	Check that the back filling of the foundation has been done as per specification.	Yes / No.	
9.	Ensure that the discharge rod is electrically tested before use.	Yes / No.	
10.	Stringing Machine / Tension pullor Machine are properly earthed.	Yes / No.	
11.	Check the brake arrangement of the TSE Machines is working.	Yes / No.	
12.	Ensure that the pulleys used before conductor stringing has been checked for adequate strength / proper size (diameter), also in case of open type pulleys proper locking arrangements like providing of Safety Pin is made Ensure for copy of test certificate for all the lifting machines and tackles.	Yes / No.	
13.	Ensure the ropes used before conductor stringing has been checked for adequate strength / physical condition (Free from break of strands and knots etc.	Yes / No.	
14.	Check that the lifting tools and tackles i.e. Winch Machine, Chain Pulley Block, Trifor, D - Shackle etc. are in healthy condition and has been tested periodically. (Attach copy of test certificate).	Yes / No.	
15.	Check for the brake arrangement of the Drum reel of conductor during laying / paying out of conductor.	Yes / No.	
16.	Check that proper communication facility is available at site during of stringing of conductor (If required)	Yes / No.	
17.	Whether the tower has been permanently earthed.	Yes / No.	
18.	Check that Sag Board is provided at two locations.	Yes / No.	
19.	Check that the Sag Board arrangement is made by the experienced / trained persons.	Yes / No.	
20.	Check approved Sag tension chart is available and followed at site.	Yes / No.	
21.	While clamping of conductor / EW to be done, check for earthing.	Yes / No.	
22.	Ensure sending signal to puller to stop when last layer of conductor / EW being pulled.	Yes / No.	
23.	Check tension applied on the dynamo meter dial and check values with approved data.	Yes / No.	
24.	Before stringing starts check that the villagers do not come underneath the job of the concerned section.	Yes / No.	

SN	Description of Activity	Feed back	Remarks
25.	Only nylon or polypropylene ropes should be used during conductor stringing in vicinity of live overhead lines.	Yes / No.	
26.	Ensure that PTW has been taken from the concerned authority.	Yes / No.	
27.	Ensure that Winch, Pulleys etc. are properly earthed.	Yes / No.	
28.	For LT lines, whether special persons are posted at each point of isolation till return of permit (PTW).	Yes / No.	
29.	Whether the network of LT lines has been thoroughly checked and precautions taken Against inadvertent charging.	Yes / No.	
30.	Check that proper arrangement is made / available for development and use of a Portable Earthing and Short – Circuiting Devices which can be engaged and disengaged to and from the LT lines, keeping away from the LT lines, until all operations on the same are completed and all men and materials are removed from LT lines.	Yes / No.	
31.	Check the provision and proper positioning for the guying and back staying (Where necessary).	Yes / No.	
32.	Check demarcation of feeder is done for D/c Line.	Yes / No.	
33.	Ensure that all the insulator strings are thoroughly checked for availability and proper fixing of cotter / split pins before hoisting the same.	Yes / No.	

General Points common for all activities during Excavation, and Casting of Foundation

A. ERECTION OF TOWER AND STRINGING OF CONDUCTOR :

SN	Description of Activity	Feed back	Remarks
1.	Check whether the contractor had procured required quantity of PPEs considering maximum numbers of erection gangs deployed at one time.	Yes / No.	
2.	Supervisors/ Workmen have been provided with required healthy PPEs, like Safety helmet / Safety Belts / Safety Shoes / Gum Boot etc. as applicable.	Yes / No.	
3.	Availability of First Aid Box with required medicines at site.	Yes / No.	
4.	Instruction register is available at site.	Yes / No.	
5.	Ensure that Supervisor / Gang Leader always issues instruction to the Workmen before start of work.	Yes / No.	
6.	Ensure that supervisory staff from Power Grid is available at site during construction.	Yes / No.	
7.	All driver and plant operators are holding valid driving license.	Yes / No.	
8.	Check the vehicle for rescue is available at site.	Yes / No.	
9.	Ensure engaged labor are aware of the job.	Yes / No.	
10.	Check that the unskilled laborers are not engaged in skilled job.	Yes / No.	
11.	Ensure that supervisor / workmen engaged in the field are aware of First Aid Techniques (Such as in case of Electric Shock, Fall from the height, Snake bite and the person rescued from buried under the debris etc.	Yes / No.	
12.	Check for nearby Hospital / Doctor in case of emergencies arises.	Yes / No.	
13.	While transporting heavy consignment of conductor / EW drums from central store to site by the use of Cranes, Truck, and Tractor. The safety aspect for construction and failure of brake system of moving machinery is to be checked.	Yes / No.	
14.	At least one dry powder type of portable fire extinguisher shall be provided especially where explosive or blasting agents are used for excavation.	Yes / No.	
15.	Check the competence (Qualification / Experience) of supervisor / gang leader of contractor.	Yes / No.	

REMARKS IF ANY:

Signature Name :	Signature	Signature

Designation : Representative of Contractor	Name : Designation: Power Grid Rep. from Site.	Name : Designation: Power Grid Rep. from RHQ.

Safety Related Check List during Construction of Sub - Station

Region: .....…. Name of DHQ / GHQ: ..... Date of Safety Audit:.....

Name of Sub Stn. / Switching Stn.: .....……

Name of Contractor: .....…….

Contractor License / Registration No.:…….....Validity.....…….....

Name of Sub Contractor : .....…….

A. SUBSTATION CIVIL WORKS :

SN	Description of Activity	Feed back	Remarks
I): SAFETY DURING EXCAVATION :			
1.	Check Substation area has been protected by constructing boundary wall all around the substation to avoid entry of passerby / unauthorized person or animal in the substation.	Yes / No.	
2.	De watering arrangement is available (If necessary)	Yes / No.	
3.	Check proper / adequate arrangement is made for extension of electric supply. (Proper size of cable, Use of fuse, No loose connection and no naked wire connection to Pumps / Illumination / Electric compressors etc. if applicable).	Yes / No.	
4.	Check arrangement of illumination at construction site is available.	Yes / No.	
5.	Check dumping of Excavated soil (Minimum 1.5 Mts. Or half the depth of the pit whichever is more from the edge of the pit.)	Yes / No.	
6.	Check Shoring & Shuttering to protect the loose rock / soil against fall. (If required).	Yes / No.	
7.	Check lone worker is not allowed to work in the excavated area.	Yes / No.	
8.	Ensure Laying of temporary cables used for operation of Machines used during construction should not cause any danger for electrocution of persons / animals.	Yes / No.	
9.	Ensure that before undertaking excavation, the soil has been tested and in case of availability of any explosive / dangerous gas, necessary arrangement must be made to remove / dilute such gases.	Yes / No.	
10.	The positions of underground installations such as sewers, water pipes and electrical cables has been verified and in case of their existence, they must be isolated before further excavation works to	Yes / No.	

SN	Description of Activity	Feed back	Remarks
	ensure Human Safety.		
11.	Check that the scaffolds are not overloaded in any case. Scaffolds are to be erected and supported properly.	Yes / No.	
12.	Stability of the soil of the excavated pit for safe working is to be checked and certified by a competent person daily before start of work. A register at site is maintained where competent person can certify accordingly. No manhole should remain uncovered during night & off days.	Yes / No.	
13.	Check the provision of sufficient strong ladder of suitable length is available near the working place during excavation.	Yes / No.	
14.	Check if any permission is required from local statutory body before excavation.	Yes / No.	
15.	Check for No undercutting / toe cutting in soil.	Yes / No.	
16.	Check after excavation the work should be speedily completed without delay and back filling done at the earliest.	Yes / No.	
17.	Check for any possibility of seepage of water from nearby pond / river has been estimated and taken care of.	Yes / No	
18.	Check to avoid slide / collapse of side walls of excavated pit, the excavation is to be done in trapezoidal cross – section.	Yes / No.	
II): SAFETY PRECAUTION DURING STORAGE, HANDLING AND USE OF BLASTING MATERIAL:			
1	Check that the adequate arrangement is made for the storage of blasting material at safe place. (Temporary Magazine is to be installed observing all norms) as per Indian Explosive Act.	Yes / No.	
2.	Check that the blasting materials is handled by licensed blaster with due care at site. (If applicable)	Yes / No.	
3.	Check smoking is prohibited in the vehicle carrying explosives.	Yes / No.	
4.	Check that the Blaster is holding proper license issued by the appropriate authority. As per Indian Explosive Act.	Yes / No.	
5.	Check that the length of the fuse wire used during blasting operation is adequate.	Yes / No.	
6.	Check while transportation, no unauthorized person is allowed in vehicle carrying explosives.	Yes / No.	
7.	Check that the loading and unloading of explosives is being done carefully.	Yes / No.	
8.	Check explosives and detonators or blasting caps is not being transported in the same vehicle.	Yes / No.	
9.	Check while transportation the detonators and explosives are not carried loose or mixed with other materials.	Yes / No.	
10	Check surplus explosives shall not be stacked near working area during loading / unloading.	Yes / No.	
11.	Check explosives shall not be held in hands when lightening the fuse.	Yes / No.	

SN	Description of Activity	Feed back	Remarks
12.	Check that blasting in the open has been carried out during the fixed hours every day or on fixed days in the week so that the public at large should know about this.	Yes / No.	
13.	Check that arrangement has been made to display sufficient warnings / sign board to enable the people to get out of the blasting area to get off the danger zone	Yes / No.	
14.	Check that the danger zone has been suitably cordoned off.	Yes / No.	
15.	Check during blasting operations begin / after the firing of explosives shall follow the loud siren.	Yes / No.	
16.	Check that during blasting operation, Labor / Workmen / Passerby are at safe places and arrangement is made to inform public by caution markings (Red Flag) / Public Notices etc.	Yes / No.	
17.	Check that PPEs i.e. Safety helmets, Safety Shoes, is used by blaster and their gang members during blasting and also the persons supervising the blasting operations.	Yes / No.	
18.	For covered blasting ensure placement of cover plates of proper thickness and sufficient numbers of sand filled bags.	Yes / No.	
19.	Ensure that permission for blasting has been obtained from the appropriate authority.	Yes / No.	
III) SAFETY DURING CASTING OF FOUNDATION / CONCRETING :			
1.	Check construction materials are stacked at safe place and also does not cause any danger. (Away from pit) i.e. 1.5 Mtrs. or half the depth of the pit whichever is more.)	Yes / No.	
2.	Check proper arrangement of illumination at Construction Site of Substation is available.	Yes / No.	
3.	Check that the Concreting Mixer/ Vibrator machines etc are placed at a safe place (Not very near to any pit at least 1.5 Mtr. from the edge of the pit) to avoid transfer of vibrations and should be operated by skilled persons.	Yes / No.	
4.	Check proper / adequate arrangement is made for extension of electric supply. (Proper size of cable, Use of fuse, No loose connection for De watering Pumps / Illumination / Electric compressors etc. if applicable).	Yes / No.	
5.	Check for laying of temporary cables used during construction activities should not cause any danger for electrocution to persons / animals.	Yes / No.	
6.	All bracing, struts and shuttering in excavations shall be adequately secured so as to prevent their accidental displacement.	Yes / No.	
7.	Ensure Shuttering and timbering has been made as detailed in I:S: 3764 for protecting the loose rock / soil against fall.	Yes / No.	
8.	Check for proper placing of Hydraulic jacks with stability and constant watch of these instruments (which are continuously loaded) to avoid any danger of displacement causing sever	Yes / No.	

SN	Description of Activity	Feed back	Remarks
	accident.		

B. SAFETY DURING STRUCTURE, EQUIPMENT ERECTION & CABLE LAYING ETC. :

SN	Description of Activity	Feedback	Remarks
1.	Check Back filling done prior to erection activity.	Yes / No.	
2.	Check the derrick used before structure erection has been checked for adequate strength / size and no joints are permitted.	Yes / No.	Test certificate is required apart from visual inspection.
3.	Check that the pulleys used before structure erection / Equipment Erection has been checked for adequate strength / proper size (diameter), also in case of open type pulleys proper locking arrangements like providing of Safety Pin is made Safe working load should be punched.	Yes / No.	Test certificate is required apart from visual inspection.
4.	Check the ropes used before structure erection / Equipment Erection has been checked for adequate strength / physical condition (free from break of strands and knots etc.	Yes / No.	Test certificate is required apart from visual inspection.
5.	Check that the lifting tools and tackles are in healthy condition and has been tested periodically.	Yes / No.	Test certificate is required apart from visual inspection.
6.	Check permission has been obtained from Aviation Authority for erection of Lightning Mast which comes in the vicinity of flying zone. (Where necessary)	Yes / No.	
7.	Check that all Nuts and Bolts are fitted in the structure before undertaking the job of other section of the structure and are tightened.	Yes / No.	
8.	Check area has been cordoned off to prevent injuries to unauthorized persons from hitting against structural component or falling in the excavated pits.	Yes / No.	
9.	Check that danger plates are available on all the equipment & structures in the switchyard.	Yes / No.	
10.	Check demarcation of feeder is done for Double Circuit Line.	Yes / No.	
11.	Check only erection team members are allowed to stand near the structure / Equipment while erection is in process and should wear the safety helmet / Safety Shoes.	Yes / No.	
12.	Check proper guying arrangement has been made while lifting structure / Equipment, if necessary.	Yes / No.	
13.	Check that proper arrangement is made while lifting the structure members and fixing them at height i.e. Proper size and strength of the hook used for lifting the structure	Yes / No.	

SN	Description of Activity	Feedback	Remarks
	members.		
14.	Check sufficient numbers of guys are made while lifting the assembled structure / heavy loads and also avoiding use of single sheave pulleys while lifting the assembled structure / heavy load.	Yes / No.	
15.	Check arrangement has been made for equipment identification.	Yes / No.	
16.	Check that required painting made on tower falling in the vicinity of aviation zones. (Where necessary.)	Yes / No.	
17	Check no live wires nearby. Take shut down if necessary.	Yes / No.	
18.	Check the structure has been permanently earthed.	Yes / No.	
19.	Check crane are preferably be used for erection of pipe structure in the substation building works (if required.)	Yes / No.	
20.	Check all safety procedures for erection work like use of safety helmets, Safety belts, use of guy wires, lowering / lifting of tools by rope etc. are strictly adhered to during structure erection works is in progress in the switchyard.	Yes / No.	
21.	Check that correct size of spanner (Box or ring type) as well as DE spanners is being used.	Yes / No.	
22.	Check working area of the structure has been demarcated during erection.	Yes / No.	
23.	Check heavy structures are lifted with crane with proper safety.	Yes / No.	
24.	Only polypropylene ropes are to be used to tie the aluminium tube / Bus bar since this is soft material and will not damage aluminium tube / Bus bar during erection.	Yes / No.	
25.	Ensure that R clips in insulator caps are fixed properly to avoid disconnection of insulator discs.	Yes / No.	
26.	Ensure that all the necessary security pins (split pins) are fixed.	Yes / No.	
27.	Check all nuts of jumper fittings are properly tightened and live metal clearance have been maintained as per POWERGRID specification.	Yes / No.	
28.	In case of tension fitting dead end joint dimensions before & after the compression are checked and recorded.	Yes / No.	
29.	No damaged component of any hardware fitting should be used on works.	Yes / No.	
30.	Length of jumpers has been measured properly to give it a parabolic shape. No sharp bend should exist.	Yes / No.	
31.	Check surge counter erection facilitates proper reading and that earthing is done with minimum bends.	Yes / No.	
32.	Check Surge monitor has been earthed by connecting it to		

SN	Description of Activity	Feedback	Remarks
	main earth mat with (G I Flat 75 x 12 mm) and earth pit separately as per drawing.	Yes / No.	
33.	Check the alignment of earth switch with isolator, earth switch of isolator is put into operation and the contacts are cleaned. After completion of pre commissioning checks and formats are dully filled and signed.	Yes / No.	
34.	Ensure that the rubber beadings are kept in good condition.	Yes / No.	
35.	Check CT has been placed on the support structure very carefully and all nuts have been tightened. Earthing is done as per drawing.	Yes / No.	
36.	Ensure the lattice structure of CT has been earthed at two points.	Yes / No.	
37.	Check the marshalling box in the switchyard has proper illumination arrangement.	Yes / No.	
38.	Check the capacitor unit is short circuited & earthed, until erection and commissioning works are being done on CVT. (The capacitor get charged by the electrical fields in the vicinity and they keep these charges for a long time, which can be dangerous to human life. Hence the shorting of capacitor unit is necessary). It should be removed before tests / use.	Yes / No.	
39.	Check Fuses in the marshalling box are OK.	Yes / No.	
40.	Check proper earthing of CVT tank has been done.	Yes / No.	
41.	Check all housing accessories, mounting stools including bolts / Nuts for fixing Line Trap and insulators are of non magnetic material.	Yes / No.	
42.	Check H.F. point of CVTs on which the coupling device is not mounted has been earthed.	Yes / No.	
43.	Check the remaining CVTs have been earthed thro' coupling device.	Yes / No.	
44.	Cable drums after visual inspection should be stored preferably in the covered area. Cable ends should be clamped.	Yes / No.	
45.	Ensure each cable and conduit run should be tagged with cable identity numbering as per the approved that appear in the cable and conduit schedule.	Yes / No.	
46.	The tag should be of aluminium plate with ID number punched on it and securely attached to the cable conduit by not less than two turns. Cable tags should of rectangular shape for power cables and of circular shape for control cables.	Yes / No.	
47.	Check underground cable markers should project 150 mm above ground and spaced at an interval of 30 Mts. They shall be located on both sides of road and drain crossing and	Yes / No.	

SN	Description of Activity	Feedback	Remarks
	also at every change in direction.		
48.	Check cable tags should be provided inside the switchgear, motor control centres, control and relay panels etc. wherever required for cable identification, where a number of cables enter together through a gland plate.	Yes / No.	
49.	The cable (power and control) between LT stations, Control room, DG set building and fire fighting pump house should be laid in the buried cable trenches. In addition to the above, for lighting purpose also, buried cable trench can be used in outdoor area.(as per Technical specification of specific contract)	Yes / No.	
50.	Cable route and joint markers and RCC warning covers should be provided wherever required. The voltage grade of cables should be engraved on the marker.	Yes / No.	
51.	Tray Identification Number on each run of trays at an interval of 10 Mtrs should be painted.	Yes / No.	
52.	In case the outer sheath of a cable is damaged during handling / installation, the same should be repaired to the satisfaction of the site. In case any other part of a cable is damaged, the same should be replaced by a healthy cable. Power cables should be at the top most layers. The armour of control cable is to be earthed.	Yes / No.	
53.	All cable termination should be appropriately tightened to ensure secure and reliable connections. All the exposed parts of cable lugs should be covered with tape, sleeve or paint.	Yes / No.	
54.	Power and control cables are laid on separate cable trays	Yes / No.	
55.	Co-axial cable is laid separately from power cable.	Yes / No.	
56.	All cable trays, racks and metallic ducts have been grounded by connecting each to earth / mat. (As per Scheme)	Yes / No.	
57.	Check sections of cable trays have been bridged by copper jumpers/ G I to retain continuity of earthing. (As per Scheme)	Yes / No.	
58.	Check earthing of panel is done by the erection contractor for connecting it with switchyard earth mat. (As per Scheme)	Yes / No.	
59.	Auxiliary bus wiring for AC and DC supplies, Voltage Transformer circuits, annunciation circuits and other common services is provided near the top of the panels running throughout the entire length of the panels.	Yes / No.	
60.	All internal wiring to be connected to external equipment is terminated on terminal blocks, preferably vertically mounted on the side of each panel.	Yes / No.	
61.	Check whether Mimic Diagram is available preferably made of anodized aluminium or plastic of approved fast colour material and screwed on to the panel that can be easily	Yes / No.	

SN	Description of Activity	Feedback	Remarks
	cleaned.		
62.	Check the panels all equipment mounted on front and rear side as well as equipment mounted inside are provided with individual name plates with equipment designated engraved.	Yes / No.	
63.	Check on top of each panel on front as well as rear side, large and bold name plates are provided for circuit / feeder designation.	Yes / No.	
64.	Check all front mounted equipments are provided at the rear with individual name plates engraved with tag numbers corresponding to panel internal wiring to facilitate easy tracing of the wiring.	Yes / No.	
65.	Check the name plates mounted directly by the side of the respective equipments should not be hidden by equipment wiring.	Yes / No.	
66.	Check availability of 240V single phase 50 HZ, AC socket with switch suitable to accept 5 Amps and !5 Amps pin round standard plug, is provided in the interior of each cubicle with ON-OFF switch for connection of hand lamps.	Yes / No.	
67.	Check that panels are provided with a fluorescent lighting fixture rated with 240 Volts single phase, 50 Hz supply for the interior illumination of the panel during maintenance. The fittings are complete with switch fuse unit and switching of the lighting is controlled by the respective panel door switch. Adequate lighting with fuse unit is also provided for the corridor in control panels.	Yes / No.	
68.	Check control panels are provided with necessary arrangements for receiving, distributing, isolating and fusing of DC and AC supplies for various control, signalling, lighting and space heater circuits. The incoming and sub circuits are separately with switch fuse units.	Yes / No.	
69.	Check panels are provided with a space heater rated for 240 V, single phase, 50 Hz, AC supply for the internal heating of the panel to prevent condensation of moisture.	Yes / No.	
70.	Check all panels are equipped with an earth bus securely fixed	Yes / No.	
71.	Check when several panels are mounted adjoining each other, the earth bus is made continuous with necessary connectors and clamps for this purpose.	Yes / No.	
72.	Check provision is made for extending the earth bus bars to adjoining panels on either side.	Yes / No.	
73.	Check provision is made on each bus bar of the end panels for connecting earthing grid.	Yes / No.	
74.	Check all metallic cases of relays, instruments and panel mounted equipment including gland plates are connected to the earth bus by copper wires of specified size.	Yes / No.	

SN	Description of Activity	Feedback	Remarks
75.	Check the colour code of the earthing wire is green.	Yes / No.	
76.	Check that earthing made with equipment is with Nuts and Bolts i.e. For such connection lugs should be pressed and tightened to the terminals through Nuts and Bolts.	Yes / No.	
77.	Check that no equipment is mounted on the panel doors.	Yes / No.	
78.	Check each switch should bear clear inscription identifying its function.	Yes / No.	
79.	Check those who have sufficient knowledge of steel structural job have been employed in steel structural works only.	Yes / No.	
80.	Check necessary instruction has been communicated by supervisor before start of the day's works to workmen under his control.	Yes / No.	
81.	Storing of equipments is to be made properly to avoid any accident during handling.	Yes / No.	
82.	Check all Nuts and bolts are properly raised or lowered preferably using closed loop pulleys and gully bags / hand bags tied at the end for carrying nuts and bolts.	Yes / No.	
83.	Check that Fire resistant sheets are used before entrance of control cable in control room.	Yes / No.	
84.	Check air compressor tubing properly tightened.	Yes / No.	
85.	Check all carrying connectors / clamps properly tightened.	Yes / No.	

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C. CONDUCTOR LAYOUT DURING CONSTRUCTION STAGE :

SN	Description of Activity	Feed back	Remarks
1.	Check all members are fixed in structure and ensure proper size of Nuts and Bolts are rigidly tightened and punching / tacking / tack welding is done in towers / structures before undertaking conductor laying job.	Yes / No.	
2.	Ensure proper scaffolding arrangements made during laying of conductor (While Power Line crossing etc).	Yes / No.	
3.	Ensure that all members are fitted in structure before undertaking conductor laying work.	Yes / No.	
4.	Ensure that the discharge rod is electrically tested before use.	Yes / No.	
5.	Ensure whether the structure is properly earthed.	Yes / No.	
6.	Only nylon or polypropylene ropes should be used during conductor laying in vicinity of live overhead lines.	Yes / No.	
7.	Ensure that PTW has been taken from the concerned authority when extension of existing substation is under execution.	Yes / No.	

SN	Description of Activity	Feed back	Remarks
8.	Ensure that Winch, Pulleys etc. are properly earthed.	Yes / No.	
9.	For LT lines, check whether special persons are posted at each point of isolation till return of permit (PTW) if positioning of person is not possible then it is to be seen that all the point of isolation has been kept in the locked position till the work is in progress.	Yes / No.	
10.	Whether the network of LT lines has been thoroughly checked and precautions taken against inadvertent charging.	Yes / No.	
11.	Check that proper arrangement is made / available for grounding LT lines coming across during conductor laying. (This can be done by way of portable earthing and short circuiting devices which can be engaged to and disengaged from LT lines, keeping away from the LT lines until all operations on the same are completed and all man and materials are removed from the LT lines).	Yes / No.	
12.	Check the provision and proper positioning for the guying and back staying (Where necessary).	Yes / No.	
13.	Check working of hydraulic crimping machine.	Yes / No.	
14.	Check before and after crimping, dimensional changes in clamps and are in accordance with the drawings and specifications.	Yes / No.	

D SWITCHYARD EARTHING DURING CONSTRUCTION STAGE:

SN	Description of Activity	Feed back	Remarks
1.	Check that while earthing conductor crossing the road is laid 300 mm below the road or at greater depth depending upon the site conditions.	Yes / No.	
2.	Check that while laying the Earthing conductor in outside area is buried at least 600 mm below the furnished ground level.	Yes / No.	
3.	Check that the earthing pads have been provided for the apparatus / equipments at accessible position.	Yes / No.	
4.	Check all steel columns, metallic stairs are connected to nearby earthing grid conductor by two earthing leads.	Yes / No.	
5.	Check of earthing of lightening fixtures, receptacles switches, junction boxes lighting conduits has been done by a separate earthing conductor.	Yes / No.	
6.	Check that the railway tracks within switchyard area has been earthed at a spacing of 30 Mts. / specified distance and also at both ends.	Yes / No.	
7.	Check cable trays has been connected to earthing flat of 50X6 mm / specified sized earthing flat at intervals specified in approved drawing.	Yes / No.	

SN	Description of Activity	Feed back	Remarks
8.	Check that this earthed flat is earthed at about 30 Mts. distance.	Yes / No.	
9.	All accessories in transformer and reactor like radiators tank, cooling banks etc are connected to the earthing grid at minimum two points.	Yes / No.	
10.	Check metallic conduits are not used as earth continuity conductor.	Yes / No.	
11.	Check flexible earthing connectors should be provided for the moving parts.	Yes / No.	
12.	Check sheath and armour of single core power cable is earthed at switchgear end and equipment side.	Yes / No.	
13.	Check contact surface of earthing pads for jointing free from scale, paint, enamel, grease, rust or dust.	Yes / No.	
14.	Check that light poles, junction boxes on the poles, cable and cable boxes / glands, lockout switches etc. are connected to the earthing conductor running along with the supply cable which intern is connected to the earthing grid conductor at a minimum two points.	Yes / No.	
15.	Check earthing conductor which is generally buried 2000 mm outside the switchyard fence. All the gates and every alternate post of the fence are to be connected to earthing grid.	Yes / No.	
16.	Check megger used for measuring soil resistivity is calibrated with desired accuracy.	Yes / No.	
17.	The earth resistivity has been measured in dry weather condition.	Yes / No.	
18.	Check the earthing of Transformers and Shunt reactor, earth pits are constructed as per relevant standard / approved drawing.	Yes / No.	
19.	Check that the measured value of combined earth resistance should be less than 1 Ohm.	Yes / No.	
20.	Check that for earth electrode and individual earth pits, this value should not be more than one Ohm.	Yes / No.	
21.	Check all non current carrying metal parts shall be effectively earthed by two separate and distinct earth connections (Indian Electricity Rule 61,67)	Yes / No.	
22.	Check that all pylon supports in the Fire Fighting HVSW system has been earthed to the earthmat.	Yes / No.	

E: GENERAL POINTS COMMON FOR ALL ACTIVITIES DURING EXCAVATION, CASTING OF FOUNDATION

Erection of structures, laying of Conductor, storage and transportation of material:

SN	Description of Activity	Feed back	Remarks
1.	Check Supervisors / Workmen have been provided with required healthy PPEs. Like (Safety helmet / Safety Belts / Safety Shoes /	Yes / No.	

SN	Description of Activity	Feed back	Remarks
	Gum Boot etc. as applicable)		
2.	Check availability of First Aid Box with required medicines at site.	Yes / No.	
3.	Check Site Instruction register is available at site.	Yes / No.	
4.	Ensure Supervisor / Gang Leader always issues instruction to the Workmen including contractor labor before start of work.	Yes / No.	
5.	Ensure supervisory staff from Power Grid is available at site during construction.	Yes / No.	
6.	Check all driver and plant operators are holding valid driving license.	Yes / No.	
7.	Check the vehicle for rescue is available at site.	Yes / No.	
8.	Ensure engaged labor are aware of the job.	Yes / No	
9.	Ensure supervisor / workmen engaged in the field are aware of First Aid Techniques (Such as in case of Electric Shock, Fall from the height, Snake bite and the person rescued from buried under the debris, rescue of person from drowning etc.	Yes / No.	
10.	Check for availability and to keep a record of nearby Hospital / Doctor in case of emergencies arises.	Yes / No.	
11.	While transporting heavy consignment of conductor / EW drums from central store to site by the use of Cranes, Truck, Tractor. The safety aspect for construction and failure of brake system of moving machinery is to be checked.	Yes / No.	
12.	At least one dry powder type of portable fire extinguisher shall be provided especially where explosive or blasting agents are used for excavation. (If applicable)	Yes / No.	
13.	Check the competence (Qualification / experience) of supervisor / gang leader of contractor.	Yes / No.	
14.	Wire mesh rolls shall be secured in order to prevent dangerous recoiling action.	Yes / No.	
15.	Proper unloading arrangement has been made at site (Preferably with crane) to unload the material.	Yes / No.	
16.	After unloading the material visual inspection of the materials has been carried out along with the erection contractor to check that the material has not been damaged or not (Galvanizing is proper or not) As per approved Field Quality Plan etc.	Yes / No.	
17.	While transporting the heavy laden equipment like transformer / Reactor by road from Rly Stn to Substation check whether for all safety precaution taken. Like safe lifting capacity of crane, safe load on culvert / Bridge / Nala / Drain etc. and working plan is available at site with specific reference to safety e.g. local earthing, skilled & experience manpower, proper T&P, strength and LT wires / HT wires interrupting the height of equipment and the required clearance maintained etc. Permission to be obtained from concerned authority if required. “Impact recorder on the	Yes / No.	

SN	Description of Activity	Feed back	Remarks
	equipment like Reactor / Transformer must be installed during transportation"		
18.	Check that the adequate and safe means of access and aggress has been provided for all work places as far as reasonably practicable and is being used by the workers.	Yes / No.	
19.	Check proper illumination is provided at the work places and their approaches including passage ways.	Yes / No.	
20.	Check that the lamps have been protected by suitable guards where necessary to prevent danger, in case the lamp breaks.	Yes / No.	
21.	Check loose materials which are not required for use shall not be placed or left so as dangerously to obstruct work places or passage ways.	Yes / No.	
22.	Check all projected nails has been removed or bent over to prevent injury.	Yes / No.	
23.	Check scrap, waste and rubbish has not been allowed to accommodate on the site or the scrap materials has been stored at the isolated place.	Yes / No.	
24.	Check that the worker while working at height scaffold materials, waste materials and tools are not being thrown by them to cause injury to any person.	Yes / No.	
25.	Check whether contractor has procured required quantity of PPE considering maximum number of erection gangs deployed at one time. Check the quantity of PPEs.	Yes / No.	
26.	Check that the PPEs required by the workmen are being utilized by them always.	Yes / No.	
27.	Check the worker is under constant surveillance by the other person while working at height.	Yes / No.	
28.	Check construction site has been barricaded for unauthorized persons / animals.	Yes / No.	
29.	Check that lifting appliances and machines and vehicles used on the construction site is of sound material and good quality and is free from patent defects and is strong enough to with safely the load and stresses to which they will be subjected.	Yes / No.	
30.	Check structures and equipment is being used only for the purpose for which they were intended.	Yes / No.	
31.	Check equipment has been operated by the competent person.	Yes / No.	
32.	Check portable ladders shall not exceed 9 Mts. in length, otherwise may cause danger while climbing of person and back legs shall be equally braced.	Yes / No.	
33.	Check unskilled labor are not utilized for skilled jobs and only experience persons are deployed for erection.	Yes / No.	
34.	Check a well planed and documented procedure for the entire Construction works of Substation shall be prepared by contractor	Yes / No.	

SN	Description of Activity	Feed back	Remarks
	and get approved from Power Grid for distribution to Contractors' field staff and Power Grid for follow up.		
35.	Check no metallic measuring tapes are being used during expansion of charged bays.	Yes / No.	
36.	Check metal ladders are not being used in the vicinity of exposed live electrical equipment.	Yes / No.	
37.	Check one bore well is available for water supply in case Municipal Construction supply is not available	Yes / No.	
38.	Check charged area of a yard should be properly fenced off.	Yes / No.	
39.	Check ladders / lengthy articles / lengthy equipments etc. should always be carried in horizontal position.	Yes / No.	
40.	Check insurance by contractor for the labor to provide adequate coverage for any accident etc.	Yes / No.	

REMARKS IF ANY:

Signature Name : Designation: Power Grid Rep.	Signature Name : Designation: Rep. from Contractor	Signature Name : Designation : Rep. from

FORM I

Application for permission for construction/mining
Operation within a protected area.
(See rule 10)

1. Name and address of applicant[1]

2. Name of the protected area within which construction/mining operation is proposed.

Locality **District** **State**

3. Nature and details of the proposed construction/mining operation in respect of which permission is sought.

(In the case of construction, a site-plan in triplicate showing in red outline the location of the building in relation to the protected area and the plan and elevation of the building should be attached; and the colour, external appearance and method of the screening of the building and the depth down to which the soil will be excavated for the appurtenances of the building should be specified.

In the case of mining operation, a site-plan in triplicate showing in red outline the extent of the operation in relation to the protected area should be attached; and details, regarding the depth down to which the operation is to be carried out, the mode of the operation, the method of the muffling of sound, the kind and charge of blasting material and the depth and number of blast-holes to be fired at a time should be specified.)

4. Purpose of the proposed construction/mining operation.

5. Approximate duration and date of commencement of the proposed construction/mining operation.

I declare that the above information is correct. I also undertake to observe the provisions of the Ancient Monuments and Archaeological Sites and Remains Act, 1958, and rules made thereunder.

Station

Seal of the organization

Date

Signature of the applicant[2]

[1] If the application is on behalf of an organisation, the name thereof should be given

[2] If the application is on behalf of an organization, the signature should be that of the head of the department.