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## **PREFACE**

Dedicated Freight Corridor Corporation of India Ltd. (DFCCIL) has been given a mandate to construct, maintain and operate Dedicated Rail Freight Corridors across the country. To begin with, the Government of India has entrusted DFCCIL with construction, maintenance and operation of Eastern Corridor between Sanehwal near Ludhiana to Dankuni in West Bengal and Western Corridor connecting Dadri in Uttar Pradesh to Jawaharlal Nehru Port (JNPT) in Mumbai.

The Corporate Plan, akin to the construction of DFCs, is a “work-in-progress”. It includes the business plan, which itself is in dynamic state and therefore, subject to constant updation and modification, as DFCCIL undertakes the challenge of building one of the largest rail transport infrastructure initiatives post-independence. While the role and scope of DFCCIL is clear. The rules of engagement between Ministry of Railways and DFCCIL are detailed in the concession agreement.

The Corporate Plan is an effort to pin point our sense of direction so that there is organizational alignment and focus and clarity about the job at hand.

# CHAPTER - I

## INTRODUCTION

**1.0** Indian Railway is a life line of Indian economy, traversing length and breadth of country with total route length of approx. 66680 Kms.

The Indian Railways carried a whopping 1108.79 million tonnes in 2016-17. What Indian Railways achieved from 1950-51 to 2000-01 from 73.2 million tonnes to 473.5 million tonnes, a net increase of 400 million tonnes. Greater achievement was accomplished in next 17 years from 2000-01 to 2016-2017 from 473.5 million tonnes to 1108.79 million tonnes, an increase of 635.29 million tonnes. Going forward, Railways has an ambitious plan of achieving the freight volumes to the tune of 2165 million tonnes by 2020. This is achievable as given elasticity of the rail transport demand with GDP growth rates being in the vicinity of 1.1 to 1.2.

However, there are serious challenges and constraints. Many of the key arteries and routes of Indian Railways, particularly those on the Golden Quadrilateral are now bursting at their seams and operating far in excess of their capacity. Today the Indian Railways have mixed corridor where both Mail/Express/Passenger trains share the same track with the freight trains and although, it is the freight traffic which is the bread and butter, the Mail/Express/Passenger trains invariably takes precedence over the freight trains. As a result, the average speed of freight trains is relatively low. The average speed of the freight trains on Indian Railways is approx. 23.8 Kmph, and this has an adverse impact on Indian Railway's performance and competitiveness. It is a fact that freight tariff on the Indian Railway is also one of the highest in the world. This translates into higher supply chain costs which in turn results in loss of competitiveness of Railway in the market. Therefore, it is imperative to augment rail capacity so that increased demand for freight transport with growth in economy is met. Indian Railways considered following three options:

- Augment the existing network by laying quadrupled lines
- Create a separate Dedicated Passenger Corridor
- Create a separate Dedicated Freight Corridor

The large scale augmentation of capacity of the existing network was not considered practical as it would have led to large scale dislocation to the running traffic, as well as land acquisition issues, particularly in and around urban centres. More so, it would have remained a mixed corridor with track structure unsuitable for carriage of higher axle load traffic and also restricted schedule of dimensions of the fixed structures like Road Over Bridges and others. It was not considered prudent to go in for a new Dedicated Passenger Corridor on account of the fact that it would have been prohibitively expensive because it had to pass through the urban/city centres to cater to the passenger need and would have required grade separation in terms of longer and higher flyovers due to paucity of space, not only from the existing rail network but also through the congested road network in the urban/city centres. Passenger tariff, being relatively low in India, would have made the proposal financially unviable. Moreover, the limitation of lower axle load and restrictions on account of schedule of dimensions of fixed infrastructure would have remained with the freight operation.

Taking above factors into consideration and recognizing the need for a quantum leap in the Railways' transportation capacity to meet transport requirement for sustainable growth in the national economy, the Ministry of Railways has embarked upon a long-

term strategic plan to construct high-capacity, high-speed Dedicated Freight Corridors along the golden quadrilateral and its diagonals. It will not be out of place to mention that the Golden Quadrilateral and its diagonals constituting 10122 Km is, in fact, back bone of the Indian Railways total Kms because this is contributing more than 60 % of the freight traffic and 52 % of the passenger traffic carried by IR. These routes serve the core sectors of the Indian economy by carrying raw materials to the plants and finished products to centres of consumption, manufacturing and trade. If this DFC is not made then the achieving of the projected GDP growth would not be possible.

In order to implement the Dedicated Freight Corridor project and thereafter to operate and maintain the Dedicated Freight Corridors (DFCs), the Ministry of Railways decided to set up a SPV and accordingly the Dedicated Freight Corridor Corporation of India Ltd. (DFCCIL), a fully owned company of Ministry of Railways under the Companies Act, 1956 has been set up on 30<sup>th</sup> Oct 2006. The Dedicated Freight Corridor is the most ambitious and biggest project ever undertaken in the railway infrastructure sector in the country.

With the Dedicated Freight Corridors, the Indian Railways aim to bring about a paradigm shift in freight operation with prime objective of reduction in unit cost of transportation with higher speed of freight trains, better turnaround of wagons and thereby much improved wagon productivity in terms of improved ton-km per wagon day, increased payload to tare ratio by introduction of higher axle load wagons on the rail network, improved locomotive utilization and improved specific fuel consumption. The ultimate objective is to reduce the Operation and Maintenance Cost (O&M Cost) significantly and in penultimate analysis; the benefit is passed on to the customer in the form of lower transport Logistics Cost.

#### **Why Eastern and Western Corridor?**

The existing trunk routes of Howrah-Delhi on the Eastern Corridor and Mumbai-Delhi on the Western Corridor are highly saturated, line capacity utilization varying between 115% to 150%, and is also primarily passenger service dominated routes. These also represent high demand freight traffic corridors between the Eastern coal belt of Sonnagar-Garhwa Road-Patratu area with the existing and upcoming Thermal Power Houses in the northern region of Uttar Pradesh, Haryana, Punjab and Rajasthan; and the ports of Maharashtra and Gujarat like Jawaharlal Nehru Port, Mumbai Port, Kandla, Mundra, Pipavav etc. the container hubs at one end and the NCR of Delhi, Haryana and Punjab in the northern region on the other.

### **1.1 DEDICATED FREIGHT CORRIDOR:**

#### **❖ Vision**

To create a partnership with IR for retaining and expanding the market share of rail through efficient and reliable service with customer focus.

#### **❖ Mission**

As the dedicated agency to make the vision into reality, DFCCIL's mission is

- i. To build a corridor with appropriate technology that enables Indian Railways to regain its market share of freight transport by creating additional capacity and guaranteeing efficient, reliable, safe and cheaper options for mobility to its customers.
- ii. To support the Government's initiatives toward ecological sustainability by encouraging users to adopt Railways as the most environment friendly mode for their transport requirements.

❖ **Motto**  
**Sincerity, Speed and Success**

❖ **Objectives**

The main objectives of DFCCIL are:

- (a) **Project Delivery:** To construct the dedicated freight corridor network to the highest quality standards, within the budgeted timelines and costs.
- (b) **Operation and Maintenance**
  - (i) **Additional line Capacity:** To make additional line capacity available to IR for running freight trains and assure safe and reliable train operations.
  - (ii) **Reduction in cost of operations:** Achieve significant reduction in the cost of operations by adopting international best practices including long haul/heavy haul operations.

## 1.2 Concession Agreement and Track Access Agreement

DFCCIL is a special purpose vehicle established by the MOR as a Non-Government Railway to implement the Project and operate and maintain the New Railway consistent with the Project Objectives and is a railway administration under the Railway Act, 1989. The Concession Agreement has been signed between Ministry of Railway (MOR) and DFCCIL on 28/2/2014 after necessary reviews from Railway Board, duly incorporating the suggestions of DEA and points emanating from joint discussions with Planning Commission with the approvals from DFCCIL BOD. The Track Access Agreement is a part of the Concession agreement and has been signed as Annexure A of the Concession agreement itself. The concession Agreement mainly covers the general representations, warranties, undertakings and obligations by the Concessionaire (DFCCIL) and the Concessions Authority (MOR) and the areas of services, design, delivery, construction, subcontracting, variation, completion timelines, operation and maintenance, Access arrangements, Blocks, intellectual property, risks, insurance, accounting, reporting, termination, handover, etc.

With the timely signing of this agreement, DFCCIL has now been fully empowered to go ahead with the Project construction, operation & Maintenance in a clear legal and rightful manner defining the obligations of the Concessionaire, DFCCIL, and that of the Concessions Authority, the Ministry of Railway (MOR) and actions to be taken for the success of the DFCCIL project ahead.

One of the basic condition under Schedule 1 of the Concession Agreement was the “Condition Precedent” to the Concession agreement which was to be mandatorily fulfilled prior to the execution of this Agreement. The same has been successfully fulfilled on 25.6.2014 to the satisfaction of MOR and with this fulfilment of the “Condition Precedent”, the Concession Agreement is fully operational.

Following are the salient features of Concession Agreement:

- (1) MOR grants to DFCCIL for the Concession Period the right to implement the Project. MOR and DFCCIL shall, at the end of each period of 5 years of the Concession Period, review the performance of DFCCIL of its rights and obligations under the Project Documents having regard to the Project Objectives and any other matters as agreed between MOR and DFCCIL.
- (2) MOR shall grant MOR License in respect of all land required for the Project and associated Railway Infrastructure, as agreed by the MOR and DFCCIL, and at the time required to comply with the Construction Programme.

- (3) MOR will assist DFCCIL to obtain financing on attractive terms from external credit providers (including multilateral agencies) to facilitate the funding of the Project including obtaining relevant Tax exemptions and waivers.
- (4) MOR acknowledges and agrees that DFCCIL shall have autonomy and independence from MOR in relation to its management of the implementation of the Project and the performance of its obligations and exercise of its rights under the Project Documents.
- (5) The MOR accepts certain risks and obligations, including in relation to:
  - (a) A delay in its funding of the MOR Loans and other funding to be made available by it to DFCCIL and any corresponding rise in costs;
  - (b) A delay in giving, or a failure to give, within a reasonable period any Approval required from MOR (subject to DFCCIL having complied with all applicable conditions for the grant of such Approvals);
  - (c) Failure to grant MOR License for all the land required for the Project at the time such land is required to comply with the Construction Programme;
  - (d) Pre-Existing Contamination and MOR Subsequent Contamination;
  - (e) Damage to the New Railway caused by defective trains run by Authorised Rail Users; (the protocol for establishing the cause/cost of damage, etc. shall be unambiguously stated in the disaster management manual or appropriate manual issued by DFCCIL with the approval of MOR);
  - (f) Loss of traffic or inability to carry traffic as a result of corresponding MOR Improvements not being completed as planned.
- (6) MOR shall utilize the DFCCIL network and in return shall pay Track Access Charge (TAC) as per Track Access Agreement. TAC so paid shall be deposited in an Escrow Account to be opened by DFCCIL. TAC Liability shall be worked out by MOR and provisions shall be made under demand under separate Head.
- (7) Subject to fulfilment of DFCCIL's obligations by DFCCIL, MOR will transfer at least 70% of Traffic Due on to the New Railway in each of the years of the Concession Period.
- (8) To the extent reasonable and permissible under the Laws, the MOR shall make all Reasonable endeavours to ensure that any third parties in relation to whom it has the authority or a contractual right to request or direct (in connection with the Project), provide reasonable assistance to, cooperate with, and do not unnecessarily or unreasonably prevent, hinder, disrupt, delay or otherwise interfere with DFCCIL and its Associates in undertaking the Project as contemplated by this Agreement. MOR shall ensure that each Zonal Railway with geographical jurisdiction adjacent to any section of the New Corridor or New Railway co-operates with DFCCIL and the Construction Companies in the implementation of the Project in accordance with the terms of mutually agreed program.
- (9) MOR and DFCCIL acknowledge and agree that at present it is intended that DFCCIL shall not own any rolling stock for the purpose of the implementation of the Project and that all such rolling stock used on the New Railway shall be owned or leased by the Authorised Rail Users (with the exception of rolling stock used for construction or maintenance or restoration related purposes).

### **1.3 Western Corridor:**

Western Corridor comprising of 1502 km of a double line electrified track from JNPT to Dadri via Vadodara-Sanand-Palanpur-Phulera-Rewari. Alignment has been generally kept parallel to existing lines except provision of detours and entirely on a new alignment from Rewari to Dadri and also from Sanand to Vadodara. This new line portion of DFC is designed to connect with existing New Delhi - Mathura line at Asaoti railway station from Pirthala station of DFC. Moreover, the Western DFC is proposed to join Eastern

Corridor near Dadri.

<b>Western DFC (1502 KMs)</b>	
Haryana	191
Rajasthan	559
Gujarat	552
Maharashtra	183
Uttar Pradesh	17
Total	1502

The traffic on the Western Corridor mainly comprises of ISO containers from JNPT and Mumbai Port in Maharashtra and ports of Pipavav, Mundra and Kandla in Gujarat destined for ICDs located in northern India, especially at Tughlakabad, Dadri and Dandharikalan. Besides Containers, other commodities moving on the Western DFC are POL, Fertilizers, Foodgrains, Salt, Coal, Iron & Steel and Cement. Further, owing to its faster growth as compared to other commodities, the share of container traffic is expected to progressively increase and reach a level of about 59.2 million tonne in 2021-22. The maximum number of trains in the section is projected as 180 trains (both in UP and DN) trains each way in Ajmer-Palanpur section.

Network diagram of Western Corridor is given below: -

## Network Diagram – Western DFC

### DEDICATED FREIGHT CORRIDOR (WESTERN)





### 1.3.2 Eastern Corridor:

The Eastern Corridor with a route length of **1856** km, consist of the following distinct segments:

- i. An electrified single line segment of 401 km between Ludhiana and Khurja.
- ii. An electrified double line segment of 46km between Khurja and Dadri.
- iii. An electrified double line segment of 343 km between Khurja and Kanpur
- iv. An electrified double line segment of 402 km between Kanpur and Mughalsarai
- v. An electrified double line segment of 126 km between Mughalsarai and Sonnagar.
- vi. An electrified double line segment of 538km between Sonnagar to Dankuni.

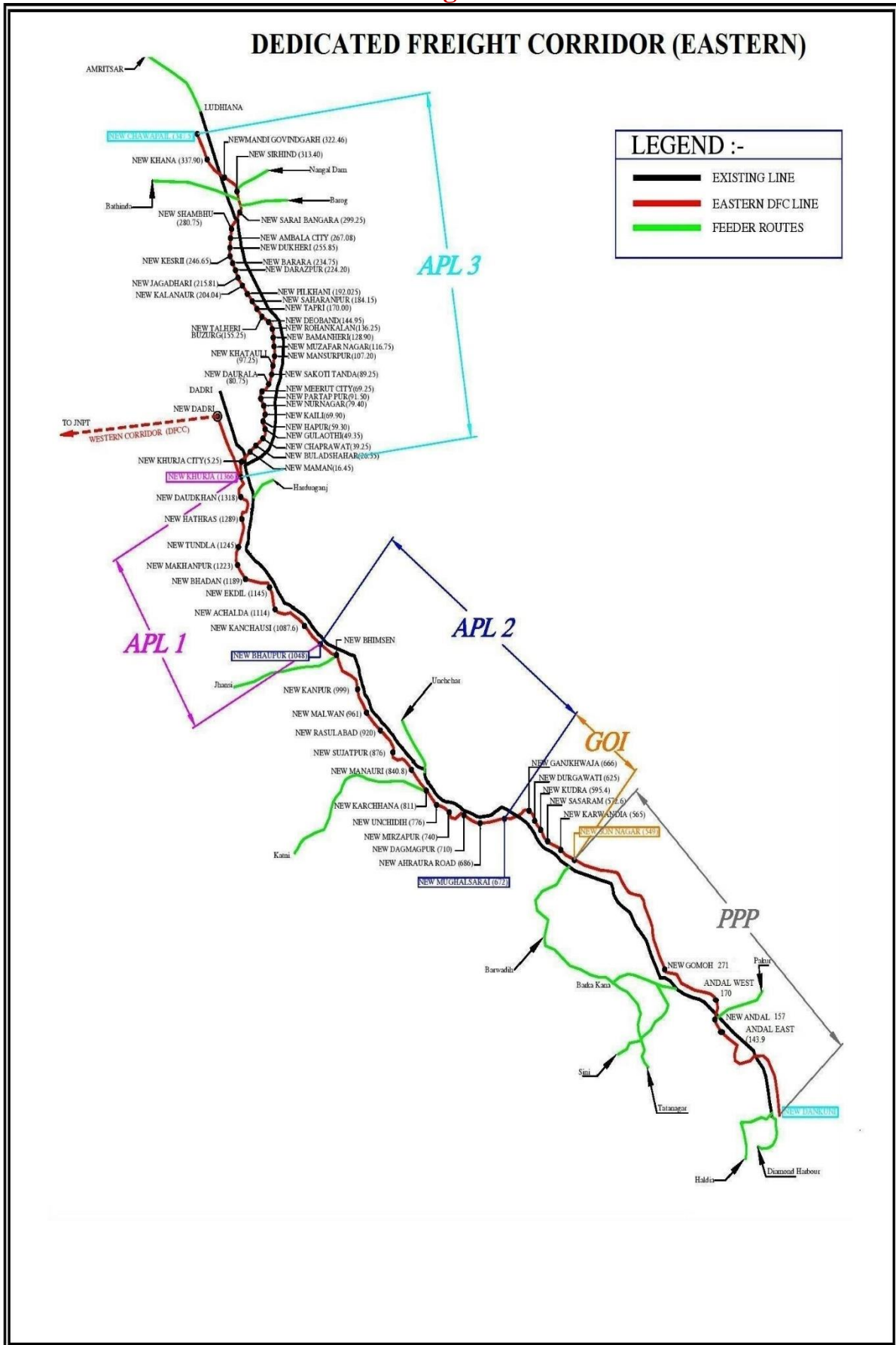
Due to non-availability of space along the existing corridor particularly near important city centres and industrial townships, the alignment of the corridor will take detour at several locations. Since the origin and destination of sizable volume of traffic do not necessarily fall on the DFC, a number of junction arrangements have been planned to transfer traffic from the existing Indian Railway corridor to the DFC and vice versa. The junctions on the Eastern Corridor are planned at Chawapail, Sirhind, Sambhu, Kalanaur, Pilkhani, Boraki, Khurja, Dadri(E), Daudkhan, Tundla, Bhaupur, Bhimsen, Kanpur, Karchchna, Ahraura Road, Mughalsarai, Ganjkhwaja, Sonnagar, Chirailapatu, Gomoh, Andal(W), Andal, Andal(E), Khana and Dankuni. For phase-I opening of the section, temporary junctions are planned at Karwandiya, Sasaram and Durgawati.

<b>Eastern DFC (1840 KMs)</b>	
States	KMs
Punjab	<b>88</b>
Haryana	<b>72</b>
Uttar Pradesh	<b>1058</b>
Bihar	<b>239</b>
Jharkhand	<b>196</b>
West Bengal	<b>203</b>
<b>Total</b>	<b>1856</b>

The traffic on the Eastern Corridor mainly comprises of coal for the power plants in the northern region of U.P, Delhi, Haryana, Punjab and parts of Rajasthan from the coal fields situated in Eastern part of the country, finished steel, food grains, cement, fertilizers, lime stone to steel plants and general goods. The total traffic in UP direction is projected to go up to 111 million tonnes and in DN direction, the traffic level has been projected to increase to 86 million tonnes in 2021-22. The number of trains with 25 tonne axle load works out to a maximum of about 132 trains in both UP and DN direction in Sonnagar-Mughalsarai section of the Eastern Corridor.

Network diagram of Eastern Corridor is given below: -

# Network Diagram -Eastern DFC



## 1.4 FUTURE DEDICATED FREIGHT CORRIDOR

Hon'ble MR has announced in his speech Budget in 2016 to take over the three new Dedicated Freight Corridors. These are: -

1. East –West Corridor (Kolkata – Mumbai) approx. **2328 Km.**
2. North – South Corridor (Delhi – Chennai) approx. **2327Km.**
3. East Coast Corridor (Kharagpur – Vijayawada) approx. **1114 Km**  
and
4. Apart of above three Corridors, one more Freight Corridor i.e. Southern Corridor from Chennai to Madgaon (Goa), approx. **892 Km**, is in the pipeline.

Preliminary Engineering cum Traffic Survey of these Dedicated Freight Corridors have been done by M/s RITES and these reports are with Railway Board for Cabinet approval. Main features of these Corridors are as under: -

### 1.4.1 East –West Corridor (Kolkata – Mumbai)

The proposed East – West DFC between Kolkata (Andal/Dankuni) – Mumbai (Palghar), with an approximate length of **2328.02 Km.** passes through five states of the Union of India namely West Bengal, Jharkhand, Orissa, Chhattisgarh and Maharashtra. It also traverses Four Zonal Railways namely Eastern Railway, South Eastern Railway, South East Central Railway and Central Railway.

#### Alignment

It starts from Palghar station of Western DFC and after taking off, the proposed alignment takes detour and moves towards Nasik. From Palghar to Odha (227.38 Km.) it is a new alignment and is on detour. From Odha onward it runs along to existing IR track via Manmad-Bhusawal-Wardha-Nagpur-Durg-Raipur-Bilaspur-Jharsuguda-Chakradharpur up to Rajkharsawan. After Rajkharsawan East West DFC has two legs, one towards Andal and the other toward via Kharagpur (to connect the East Coast Corridor with East-West DFC at Hijli near Kharagpur) and ends at Kamarkundu (near Howrah).

#### Connectivity with other DFCs

This Corridor is proposed to construct by connecting the **Western DFC at New Palghar Jn.** and the **Eastern DFC at two points Andal and Kamarkundu** with Rajkharsawan as Junction point between the two legs leading to Andal and Kamarkundu. It has been planned to connect East-West DFC with **East Coast DFC** at New Hijli Jn. near Kharagpur.

### 1.4.2 North –South Corridor (Delhi – Chennai)

The approximate length of proposed North – South Dedicated Freight Corridor (North-South DFC) is **2327.64 Km.** This corridor passes through seven states of India (Haryana, Uttar Pradesh, Rajasthan, Madhya Pradesh, Maharashtra, Andhra Pradesh and Tamilnadu), 6 Railway Zones (Northern Railway, North Central Railway, West Central Railway, Central Railway, South Central Railway and South Railway) and 8 divisions (Delhi, Agra, Jhansi, Bhopal, Nagpur, Secunderabad and Guntur, and Chennai).

#### Alignment

The alignment starts from Palwal (near Delhi) and runs parallel to existing IR line via Agra-Jhansi-Bhopal-Nagpur-Warangal-Kazipet-Vijayawada-Guntur-Salvayapuram and proposed IR BG line Gundalakamma-Venkatagiri and from Venkatagiri it again runs parallel to existing main line via Venkatagiri-Renigunta ends at Arakkonam.

## **End Terminals**

Both Delhi and Chennai, the end points of the North-South DFC, have highly developed and prosperous hinterland commanding a very high level of rail traffic, surrounding by industrialized area and also congested cities. The end locations requires large tract of land which is not possible near these metropolis. After surveying these cities and discussion with railway officials, M/s RITES have proposed suitable locations near **Palwal** as **North Terminal** and near **Arakkonam Junction** as **South Terminal**.

## **Connectivity with other DFCs -**

- A. With Western DFC** – New Palwal Jn. is proposed as north terminal of this corridor which is the most suitable location to connect the N-S Corridor with Western DFC. A New Prithala Yard West has been proposed with seamless connections through Rail flyovers with North-South DFC. Connectivity with New Prithala Jn. (Western DFC) has also been provided. Traffic terminating at Delhi division, to power houses at Bikaner, Ambala and Firozpur Divisions via Jhakhal, will be served by this terminal.
- B. With Eastern DFC** – A seamless connection with Eastern DFC has been proposed from New Agra Jn. (North-South DFC) to New Tundla Jn. (E-DFC) for exchange of traffic between these two DFCs.
- C. With East-West DFC** – Connections have been planned from New Sindi South Jn. to (North-South DFC) to New Sindi Jn. and New Sindi West Jn. (East-West DFC) near Wardha for exchange of traffic between these two corridors seamlessly.
- D. With East Coast DFC** – The connection between these two DFCs has been proposed near Vijayawada. Seamless connections have been planned to connect New Vijayawada Central (East Coast DFC) with New Vijayawada North (East-West DFC) for exchange of traffic.

### **1.4.3 East Coast Corridor (Kharagpur - Vijayawada)**

The proposed East Coast Corridor (Kharagpur – Vijayawada) has an approximate length of 1114 Km and passing through three states of Union of India namely West Bengal, Orissa and Andhra Pradesh. It also traverses over 3 Zonal Railways (SER, ECoR and SCR) and 4 divisions (Kharagpur, Khurda Road, Waltair and Vijayawada).

## **Alignment**

The proposed East Coast Corridor starts near Hijli station of IR near Kharagpur and ends near north of Vijayawada Station of IR. The DFC alignment has been planned considering to avoid infringement with existing passenger facilities of IR which are mostly on east side of exiting track and to avoid sea side. This route connects the ports of Paradeep, Vishakhapatanam, Dharma and Gangavaram.

## **Terminals**

The ECDFC will not have full-fledged terminals as the locations where this DFC is joining the East-West DFC and North – South DFC. The terminal in the north (New Hijli) is proposed south of Kharagpur and that in the south (New Vijayawada Central) near Vijayawada, and these are so located as to interchange traffic seamlessly with the other two DFCs for both directions i.e. towards Kolkatta and Tatanagar in case of EWDFC and towards Chennai and Delhi in case of NSDFC.

## **Connectivity with East-West DFC**

New Hijli Jn. Station has been planned as combined yard for East-West and East-Coast DFCs both. Provisions of traffic interchange among East Coast DFC, East West DFC and IR with seamless connections to Nimpura and Hijli stations of IR have been proposed.

### **Connectivity with North-South DFC**

EC DFC meets NSDFC at Vijayawada New Vijayawada Central yard will function as the south terminal of ECDFC, where its traffic will merge into NSDFC. In addition to exchanging traffic between the two DFCs, New Vijayawada Central will also facilitate interchange of traffic between the DFCs and S C Railway.

#### **1.4.4 Southern DFC (Chennai-Goa)**

The proposed Chennai-Goa Corridor has length of about 892.96 km. It passes through the States of Tamil Nadu, Andhra Pradesh, Karnataka and Goa which are richly endowed with iron ore and other mineral resources and are industrially developed, catering to a number of steel (including sponge iron), cement and power plants. This route also carries food grains, fertilizers and other general goods, including containers.

This corridor passes through the four Railway Zones (SR-134.8 KM, SCR- 357.2 Km, SWR-410 Km and Konkan-90 Km) and four divisions (Chennai, Guntakal, Hubli, and Karwar). This corridor connects the ports of Goa (Western coast) and Chennai/Ennore (Eastern coast) of the country.

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## CHAPTER - II

### ASSET DESIGN PARAMETERS

#### 2.0 Introduction

The Dedicated Freight Corridor (DFC), a Greenfield network meant exclusively for freight train operations and having planned interface with the existing IR network, provides an excellent opportunity for the adoption of international best practices and innovation in terms of technology, systems design, operation & maintenance and business processes. Dedicated Freight Corridor has been designed for 32.5 tonne loading standard for Bridges & Formation, Track structure of 25 tonne to start with and larger Maximum Moving Dimensions (MMD) as compared to IR. Following are the key area of improvement in DFC over Indian Railways.

#### 2.1 High Axle Load

The Payload to Tare ratio for existing IR Wagons compares very poorly with that of wagons of advanced railway systems which have achieved a ratio generally between 3.5 and 5 even with standard gauge (1435mm) and cape gauge (1067 mm). This is one of the major reasons for poor throughput on the Indian Railways despite a broader gauge. The Table No.2.1 illustrates that the Pay load to Tare Ratio shows considerable increase with increase in axle load. This is because the tare weight of wagon does not go-up in the same proportion as the axle load and thereby giving significant advantage in terms of pay load.

From the economic perspective, Axle load is a vital parameter for increasing the payload in wagons leading to reduction in unit cost of operations and thereby lower freight tariff for the customer. From the Railways point of view, higher axle load would result in lower capital cost in terms of number of rolling stock and reduced operating expenses as compared to normal axle load situation. However, at the same time, it increases the sub and super-structure track costs (track, bridges, formation etc.) and also increases the track maintenance and related equipment cost. But the advantages of heavy haul operation normally outweigh the slight increase in track infrastructure and its maintenance.

The impact on throughput on account of high axle load and Track Loading Density (TLD) is illustrated in the Table No.2.1.

TABLE - 2.1

(Weight in metric tonnes)

Wagon Type	Axle Load	TLD in T/m	Tare	Payload of Wagon	Payload to Tare Ratio	No. of wagons in a rake	Gross Train Load	Payload per rake
BOXN	20.32	7.59	22.5	58.8	2.61	58	4714	3410
BOXN with CC + 9	22.9	8.55	22.5	69.1	3.07	58	5313	4008
BOX NS	25.0	9.33	19.95	80.15	4.94	59	5900	4728
Container – BCS (A) / BCS (B)	25.0 / 25.0	6.89 / 7.6	19.1 / 18.0	80.9 / 82.0	4.24 / 4.56	45	4500	3670

#### 2.2 Maximum Moving Dimension (MMD):

One of the reasons for low productivity in terms of throughput despite broader gauge as compared to other countries is due to adoption of restrictive moving dimensions on the Indian Railways. For example, the MMD of IR is 26.5% less than that of the MMD adopted by AAR. The full benefit of increase in axle load cannot be realized within the IR's broad gauge primarily based on maximum moving dimensions of 1929 which is

highly restrictive. The ratio of maximum height from rail level to gauge and ratio of maximum width to gauge are 2.45 and 1.90 respectively. Therefore, in order to get the maximum benefits, MMD requires revision in respect of both maximum height and width. This is required not only for conventional traffic but for new types of commodity-specific wagons such as Ro-Ro traffic, tri-level auto-rack wagons etc, which may come up as future requirements after the dedicated freight corridor is established.

### **2.3 Double-Stack Container Operation**

It has been decided that, in view of container trains forming a major share of freight traffic on the western DFC, the system productivity can be enhanced by double stack container train operation. Trial runs for double-stack operations on flat type wagons under electrified lines have been undertaken by the Indian Railways in collaboration with the JICA Team to check the stability of such double stack containers particularly on curves and high speed and it has been cleared for a maximum of 75 Km/h.

Ministry of Railways has mandated that double stack container train operation on the western DFC will be on flat type of wagons. The impact of double-stack operation on total number of trains on the route has, therefore, been assessed for flat wagon stock with 100% increase in throughput per train. On the contrary, Double-stack operation on Well type wagons, as is the standard practice world over, would have allowed an increase in throughput only to the extent of 42% as compared to the single-stack operation. However, it may not be practicable to run all container trains as double-stack; the possibility can be applied to only such pair of O-D points which have regular and sufficient traffic. This is so because it may not be practicable to hold back traffic at ports or at ICDs for more than a day to form double-stack trains. In the light of these considerations, container trains running between Jawaharlal Nehru / Mundra / Pipavav / Hazira Ports and ICDs in NCR of Delhi / Ludhiana alone have been considered suitable for double-stack operations.

### **2.4 Higher Speed**

The track structure and geometry of the DFC would permit higher speed as compared to that of the Indian Railways. The average speed of the freight trains on the existing Indian Railways network is about 25 Km/h. This is so because of the fact that the freight trains are given low preference over the Mail/Express/Passenger Trains and they are stopped quite often during their run to give precedence to the Mail/Express/Passenger Trains coupled with the fact that there are higher degree curvature and ruling gradient of the existing infrastructure, which also imposes speed restriction on freight trains. Since the corridor being designed is exclusively for freight trains only, there is no question of any train taking precedence over the other and all trains are supposed to move in a convoy. The ruling gradient of the project has been kept at 1 in 200 and the maximum degree of curvature will not exceed 2.5 degrees. Thus, the corridor is being designed for a maximum permissible speed of 100 Km/h.

### **2.5 Deployment of High Horse Power Locomotive**

It is proposed to deploy high Horse Power locomotive of 9000 hp and 12000 hp on the Dedicated Freight Corridor so as to haul the heavier train at the designed speed of 100 Km/h. This is in contrast to the low horse power locomotive, which has currently been deployed by the Indian Railways. The maximum horse power locomotive on the IR network is 6000 HP in case of electric locomotive and 4000 HP in case of diesel locomotive.

### **2.6 Modern Signalling and Telecommunication**

The DFC network will have modern signalling system with Automatic Signals at 2 Km interspacing, stations would be provided with Electronic Interlocking and the Mobile Train Radio Communication is proposed to be provided for meeting the communication

needs. The implementation of such modern system will facilitate optimum exploitation of the rail infrastructure capacity and would require least maintenance.

## 2.7 Railway Maintenance Practices

Railway infrastructure maintenance practice in general, and particularly for intensively used lines like DFC, is moving away from traditional reactive maintenance to a positive “predict and prevent” approach, using high-output mechanized techniques as far as possible and seeking to minimize human intervention on the track. In the case of a newly build railway, such as DFC that also extends to design and construction for low maintenance.

The capital investment decisions have been based on a trade-off between initial cost and optimum life-cycle cost. Taking a far-sighted view, the Ministry of Railways (MOR) has adopted superior asset standards compared to the existing IR standards, like higher axle load, higher capacity rolling stock, more efficient locomotives and traction systems, advance telecommunication system, etc., that would ensure longer asset lives, require less maintenance, less manpower and, therefore, be more efficient and economical. The fundamental design parameters laid down by the ministry for the DFC are:

### Fundamental Design Parameters

Parameter	Specifications
Axle Load	32.5 tonne loading standard for Bridges and Formation. Track structure shall be of 25 tonne to start with.
Traction	Electric, 2x25 kv, 50 hz single phase AC
Maximum Permissible Speed	100 kmph, Average speed 60-65 Kmph.
Rolling Stock	Locomotives: 9000 HP and 12000 HP Wagons: 25 ton axle load
Double stack trains	Double-stack container train operation on the Western Corridor
Track	60 kg/m, UIC/90 UTS rails, PSC sleepers, 1660 nos./km density.
Points and Crossings	60 kg rail, 1 in 12 thick web switches
Ballast	300/ 350 mm cushion
Ruling Gradient	1 in 200 (compensated)
Curves	Maximum degree of curvature of 2.5° (700m radius) to ensure sustained speed potential of 100kmph; curve compensation @ 0.04% per degree of curvature.
Formation	Formation width : Double-line – 13.5 m, Single Line – 7.6 m; Side slope of embankment to be maintained at 2:1 ; blanket thickness as per RDSO GE :0014 specification
Moving Dimensions	Vertical MMD of 7.1 m on Western Corridor and 5.1 m on Eastern Corridor
Track Centres	6.0 m on DFC and min.6.0, Recommended 7.925 m between existing IR tracks and DFC;
Bridges	Standard of loading of 32.5 tonne axle load; 12 tonne/m trailing load
Loop Length	Normal loop length 750m with facilities for running Long haul trains through nominated loops of 1500m length at Junction Stations.
Signalling	Double Line: Automatic Block, with Multiple Aspect Colour Light Signalling (MACLS)except Rewari-Dadri which will be with Absolute Block System.



<b>Parameter</b>	<b>Specifications</b>
	Single line: Absolute Block, with around 10 km station spacing and Multiple aspect colour-light signalling.
Station Spacing	40 km apart on double line and 10 km on single line
Junction Stations	<ul style="list-style-type: none"> <li>• <b>Western DFC:</b> 17 Junction Stations</li> <li>• <b>Eastern DFC:</b> 25 Junction Stations</li> </ul>

DFCCIL is committed for delivering the project within least time and cost while maintaining the high quality standards envisaged for this unique project. Under the Concession Agreement signed with MOR, DFCCIL has been adequately empowered to innovate and deliver by taking its own decisions with regard to detailed design, contracting and implementation, within the above-mentioned boundary conditions of MOR.

To achieve the above DFCCIL intends to apply the part of the process of World Bank loan for engaging a consultant for Heavy Haul Railway Transport in India for DFCCIL. The objective of appointing a consultant is to recommend strategy and a long term implementation plan for Heavy Haul Freight operations that will maximize the utilization of additional capacity for freight transport and the financial benefits of Heavy Haul Business. Also, to develop a comprehensive and integrated long term plan up to 2030 which will guide India's Railway Planners and Service Providers to improve the capacity, quality, competitiveness and utilization of India's Railway Freight Transport Services in general and Heavy Haul Services in particular.

## **2.8 Outcome**

### **2.8.1 Much needed Rail Transport Capacity**

The commissioning of 3358 Km of Eastern and Western Corridor would provide Industry and rail customers the relief in terms of additional capacity to run more and more freight trains, which is more efficient mode of transport as compared to road, much more environmental friendly and suitable for bulk transportation.

### **2.8.2 Increase in Rail share**

The rail share, which has come down from 80% in the 1950s to less than 30% now, would increase and by the year 2021-22, the rail share is expected to go up from the present level to 40-45% in the total transport sector.

### **2.8.3 Reduction in O & M Cost**

With the commissioning of the state-of-the-art rail infrastructure for the Dedicated Freight Corridor Project and the low cost maintenance regime, it would be possible to reduce the Operation and Maintenance Cost (O & M Cost) drastically to level of 60% of the existing Indian Railway cost. This will give substantial benefits in terms of savings in cost and help in reducing the unit cost of transportation, which is the ultimate objective for creation of DFC infrastructure. It would, then be possible to pass on the benefit in terms of lower tariff for the services delivered to the customers.

### **2.8.4 Bring in additional Value-added services**

Since it would not be a mixed corridor but exclusively for freight trains, it should be possible to run time-tabled trains with guaranteed transit time. Last mile connectivity in terms of door-to-door services can be provided to the customers by DFCCIL by tying up with Truck operators. The DFC network would attract setting up of Multimodal Logistics parks along the corridor to facilitate all kinds of value addition from packaging, retailing, labelling, pelletizing etc. The commissioning of DFC will open new vistas in the rail transport logistics.

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## **CHAPTER – III**

### **BUSINESS PLAN**

#### **3.0 Introduction**

A detailed Business Plan for DFCCIL was prepared through consultant taking into consideration the Concession agreement and financial arrangement between DFCCIL and Ministry of Railways. The Business Plan has been formulated keeping the following factors in mind.

- i. The relationship between Indian Railways and DFCCIL will be that of a concessioner and concessionaire respectively and will be governed by a Concession Agreement between the two parties for a period of thirty years commencing from the date of operations.
- ii. Indian Railways is the sole owner and, for the present, only customer of DFCCIL.
- iii. DFCCIL has been entrusted with the responsibility of constructing, maintaining and operating two corridors – Eastern Corridor from Ludhiana to Dankuni and Western Corridor from Dadri to Jawaharlal Nehru Port - along with all attendant infrastructures, to enable Indian Railways to run freight trains on them. DFCCIL's role will primarily be that of the infrastructure provider with responsibility of construction, operation and maintenance.
- iv. The DFCCIL will accept freight trains on its system operate them on the DFC and then hand them back to Indian Railways and other qualified operators at the other end. DFCCIL will not own any rolling stock.
- v. DFCCIL will receive from Indian Railways a user charge called Track Access Charge (TAC) in return for its services. However, since Indian Railways is the single buyer, TAC is sought to be fixed in a manner that all costs of DFCCIL get covered. At the same time the structure of TAC will be such so as to incentivize DFCCIL towards better performance.
- vi. Project phasing has been assumed based on loan sanctions, fund availability and estimated progress of construction during the construction period.
- vii. Project completion cost consists of escalated construction cost, soft costs like insurance, interest during construction contingency etc. Land will be acquired by Indian Railways under Railway Amendment Act 2008 and leased to DFCCIL. Hence, the cost of land has not been included in DFCCIL's financial estimates.
- viii. The project is being financed through loan from External bilateral/multilateral funds received via Ministry of Railways and equity contribution from Ministry of Railways. Loan from external funding agencies consist of loans from World Bank and Japanese International Co-operation Agency (JICA). These loans received by Ministry of Finance in the first instance is extended on back-to back basis to the MoR as General Budgetary Support.
- ix. Indian Railways will provide Equity to the extent of shortfall between the Project Cost and loan from World Bank & JICA.
- x. In respect of Equity from Indian Railways, dividend payment will be decided by the Board of Directors of DFCCIL from time to time.

- xi. Since DFCCIL is a corporation registered under the Companies Act, 2013, depreciation has been provided in accordance with Schedule II of the Companies Act. Both depreciation and renewals have not been taken on Sonnagar-Dankuni section as it is proposed to be awarded on Public Private Partnership (PPP) basis. In calculating the financial returns, the cost of Sonnagar-Dankuni section has not been taken.
- xii. All traffic moving over two or more consecutive junctions on the existing route will be assigned to the Dedicated Freight Corridor known as Two Junction Principle.
- xiii. Sonnagar-Dankuni section is proposed to be done on Public Private Partnership (PPP) basis and TAC does not include payments to be made to the private operator. A separate payment mechanism would be worked out for the same for example: sharing of freight traffic with Indian Railways.

### 3.1 Freight Train projections: Eastern and Western Corridors

The total traffic which can move on the Eastern DFC is estimated to grow from 101192 million NTKM in 2018 to 178054 million NTKM in 2022 while on the Western DFC it is expected to grow from 93178 million NTKM in 2018 to 128064 million NTKM in 2022.

#### 3.1.1 Traffic Flows on Eastern Corridor and Western Corridor

The DFCCIL has carried out detailed, section-wise, traffic assignment exercise to estimate potential traffic expected to move on the DFC routes up to 2021-22. The forecasted number of trains on Eastern and Western DFC corridors in the different reference years is presented below. Traffic in both up and down direction for all reference years in respect of Eastern DFC is given in terms of 25 tonnes axle load wagons. On Western DFC containerized traffic has been estimated considering 25t axle load wagons and partial double stack container train operations.

M/s CDM Smith India Private Limited, in their traffic study, projected traffic in terms of Million Tonne Per Annum (MTPA) for E-DFC and W-DFC are given as under: -

#### Eastern Corridor

(In MTPA)

Commodity	2018	2019	2020	2021	2022
Container	6.17	6.68	7.24	7.84	8.49
Coal	102.15	106.24	110.49	114.90	119.50
Food Grains	13.77	14.15	14.55	14.95	15.37
Fertilizer	5.21	5.42	5.64	5.86	6.10
Cement	9.31	10.04	10.82	11.67	12.58
Steel	11.79	12.71	13.70	14.77	15.92
POL	4.05	4.14	4.22	4.31	4.41
MISC	21.30	21.94	22.60	23.27	23.97
<b>Total</b>	<b>173.75</b>	<b>181.31</b>	<b>189.25</b>	<b>197.58</b>	<b>206.34</b>
Modal Shift form Road	10.89	11.43	12.01	12.61	13.24
AKIC Traffic	0	0	0	0	0
<b>Grand Total</b>	<b>184.64</b>	<b>192.75</b>	<b>201.26</b>	<b>210.19</b>	<b>219.57</b>
<b>CAGR</b>	<b>6.5%</b>	<b>6.3%</b>	<b>6.2%</b>	<b>6.1%</b>	<b>4.4%</b>

## Western Corridor

(In MTPA)

Commodity	2018	2019	2020	2021	2022
Container	45.6	49.8	54.3	59.2	64.6
Coal	21.5	22.4	23.3	24.2	25.2
Food Grains	8.1	8.4	8.6	8.8	9.1
Fertilizer	11.5	11.9	12.4	12.9	13.4
Cement	6.3	6.8	7.3	7.9	8.5
Steel	1.6	1.7	1.9	2.0	2.2
POL	6.7	6.9	7.0	7.2	7.3
MISC	6.6	6.8	7.0	7.2	7.4
<b>Total</b>	<b>108.0</b>	<b>114.6</b>	<b>121.8</b>	<b>129.4</b>	<b>137.7</b>
Modal Shift form Road	12.7	13.3	14.0	14.7	15.4
DMIC Traffic	4.6	6.1	8.0	10.6	14.0
<b>Grand Total</b>	<b>125.3</b>	<b>134.1</b>	<b>143.8</b>	<b>154.8</b>	<b>167.1</b>
<b>CAGR</b>	<b>11.2%</b>	<b>11.4%</b>	<b>11.7%</b>	<b>12.0%</b>	<b>7.5%</b>

### 3.1.2 Traffic on Eastern Freight Corridor

The Eastern Freight Corridor originates from Dankuni and via Sonnagar, Mughalsarai, Bhaupur and Khurja extends up to Ludhiana consisting of 1856 Kms out of which 1455 Kms is double line and 401 Kms is Single Line.

The Delhi-Howrah route is heavily loaded with passenger as well as freight services. A number of capacity enhancement works including provision of 3rd and 4th lines on certain sections, electrification and signalling improvements, etc. have been taken up during the recent past. However, on most parts of the route, the growth of traffic has exceeded the capacity created.

#### 3.1.2.1 Commodities moved on the route.

The commodities that are transported on this route at present, grouped as principal and others, are as follows:

##### Principal Commodities

##### (a) Up direction:

- (i) **Coal:** On the EDFC, coal constitute the dominant commodity. On this route, coal is moved to the Powerhouses, Fertiliser Plants and for Public use to the places located in the States of Uttar Pradesh, Haryana and Punjab mainly from the various Coal Fields of Coal India Ltd. (CIL) which are situated on Eastern Region. These fields are: Eastern Coalfields Ltd. (ECL), Bharat Coking Coal Ltd. (BCCL), Central Coalfields Ltd. (CCL), South East Central Coalfields Ltd. (SECL), Northern Coalfields Ltd. (NCL), and North Eastern Coalfields Ltd (NECL).
- (ii) **Iron & Steel:** At present, Iron and steel to the points on the route moves from Bokaro, Rourkela, Durgapur, IISCO and Tata Steel and some small units on SER and ER via Mughalsarai and from Bhilai and some small units on SECR Via New Katni

##### (b) Down Direction

- i. **Food grains:** In the down direction, the major commodity transported by rail is food grains which can be transferred to the corridor as it is long distance traffic. On Northern Railway, there are 59 stations from which food grains

are dispatched to the various destinations on Eastern and Southern parts of the country and to the Ports, when export is permitted.

- ii. **Fertilisers:** The major fertilizer plants located on the route or on connected routes are in **Punjab, Haryana, Uttar Pradesh, Maddhya Pradesh, Gujrat, Orissa** and some fertilizers imported through Kolkata and **Haldia ports**.
- iii. **Cement:** Most of the cement plants in India are located in clusters. Along this route, cement produced at the cluster of plants in Satna area serves destinations on ECR, ER and NER. Cement is also moved from this cluster to the points on Kanpur-Ghaziabad section of the NCR and on Saharnapur-Dhandarikalan section of NR. Cement to this area also moves from the Plants on the North Western and Western Railways.
- iv. **Limestone to the Steel Plants:** India has limited reserves of steel grade limestone (SMS limestone). Limestone from the Jaisalmer/Gotan region of Rajasthan and the Katni region of Madhya Pradesh moves on the Delhi-Howrah route only to Bokaro, Durgapur, IISCO and Tata Steel Plants.

### **Other Commodities**

There are other commodities, which move in small quantities. These include

- Coal to the captive power plants
- Containers
- POL traffic
- Fertilisers in up direction
- Onions
- General goods

### **3.1.3 Traffic on Western DFC**

Container traffic will form the major portion of the traffic moving on WDFC .

#### **3.1.3.1 Increase in Rail share in Port based Container Traffic:**

Containerized EXIM traffic is and will continue to be the principal traffic stream on the Western DFC route. In 2007-08, the level of containerization of general traffic was less than 50% and rail share in containers handled at ports in the region was about 22%. Since the construction of the Western DFC will not only generate immense additional line capacity on IR network, but also reduce transit times, increase throughput per train (through long haul double-stack container train operation) and enable DFCCIL to offer scheduled freight services between ports and logistics terminals in northern India, the rail share in port-based container traffic is expected to increase to 35-40%. With a higher level of Containerization of general traffic, as is the trend the world over, significant growth in domestic containerized traffic is expected.

The recommendation of National Transport Policy Development Committee in the “Report on Ports & Shippings-2013” gives projections of container traffic growth for all ports with the CAGR 8.1 % in 2015-18 to 8.3 % in 2019-23.

#### **3.1.3.2 Fertilizer:**

The movement of fertilizers in India is largely from plants located in Gujarat, Maharashtra, Uttar Pradesh, Andhra Pradesh, Punjab and Haryana and from various ports to consumption centres throughout the country. In so far as the Western DFC route is concerned, major flows of fertilizes traffic emanate from plants in Gujarat (IFFCO, Kandla and Khodiyar; KRIBHCO, Hazira; GNFC, Bharuch; and GSFC, Vadodara and Moti Khavdi), and Maharashtra (RCF, Trombay and Thal), besides imported fertilizers from ports located in the western region. Though supplies from

these sources are made up to the farthest destinations throughout the country, major flows are to the northern states of Punjab, Haryana and Uttar Pradesh. Due to stagnation in fertilizers production in the country, imports have registered a sharp increase during the recent years.

#### **3.1.3.3. POL:**

India has to depend upon import of both crude oil and finished products. Major ports in Western India which have facilities for handling import and export of crude oil and petroleum projects are Kandla, Mumbai, Mundra, Pipavav and Hazira. On WDFC, POL is expected to move in both UP and DN directions. The principal supply points for movement in the Dn direction are the Hindustan Petroleum and Bharat Petroleum Refineries located in Mumbai region, the Bajwa Refinery near Vadodara and Essar & Reliance refineries based in Jamnagar area of, Gujarat.

#### **3.1.3.4. Food Grains:**

Food grains are primarily transported from the states of Punjab, Haryana and UP in the north to the whole country and, at times, to ports for export. On the Western DFC, food grains will enter the DFC at Rewari (from Hissar, Delhi and Dadri sides) and travel towards the western region, mainly comprising the states of Rajasthan, Gujarat and Maharashtra. Apart from this, certain quantities of food grains will also enter the DFC at various junction points like Phulera, Vadodara and Sabarmati.

#### **3.1.3.5. Modal Shift in Container Traffic from Road to Rail:**

By leveraging transportation capacity and other benefits of the DFC, on one hand, and induction of multiple agencies into Container train operations on the other, IR and DFCCIL will attract a larger share of container traffic, particularly for distances beyond 500 km. IR has already opened up the sector to as many as 17 licensed operators, whose endeavors will increase Railway's share in container traffic.

- Additional container movement by rail on this account has been estimated at 10% from 2016-17 onwards, over and above the rail share indicated in the foregoing table.
- DFCCIL will take the following measures towards increasing its market share in container traffic:
  - Expeditiously set up the proposed MMLPs, which will not only augment inland handling capacity (the existing facilities being inadequate for the anticipated levels of traffic), but serve as effective staging and destination points for EXIM traffic and consolidation points for domestic traffic; and
  - Encourage improvement in functional efficiency at ports and inland terminals through greater use of IT and close monitoring of handling operations.

#### **3.1.3.6. Creation of New Markets:**

In addition to transporting traditional commodities, the Western DFC also offers an opportunity for railways to develop a market in areas where its share has hitherto been negligible, for example, transportation of Automobiles and Ro-Ro traffic. These new market segments have been identified as follows:

**3.1.3.6.1 Growth in Domestic Container Movement:** Whilst the use of containers for EXIM traffic is growing rapidly, the level of containerization for domestic movement is still minimal. Going forward, with greater industrialization, such as the development of the Delhi Mumbai Industrial Corridor (DMIC), domestic container movement would also become a significant market. The DMIC project is expected to have an enormous traffic generation potential, which, in turn, will bring additional traffic to the Western DFC over and above the normal growth of traffic.

**3.1.3.6.2 Automobile Traffic:** Out of the five main automobile clusters in the country, NCR based northern cluster and Pune-based western cluster are the most relevant to the Western DFC. As most exports from the northern cluster are channelized through ports in the western region, and the western and northern regions of India also comprise key domestic demand centers, the DFC has a unique opportunity to garner this traffic to rail. In case the Railways capture a reasonable share in EXIM as well as domestic automobile traffic generated in the catchment of the DFC, it will be a huge revenue generating and highly profitable business opportunity.

**3.1.3.6.3 RO-RO:**

RORO traffic will be an additional traffic on WDFC in sizeable numbers resulting in reduced road congestion apart from avoiding accidents on roads due to considerable reduction in transit times. These can also be exploited for non-bulk traffic particularly at short lead to avoid cost of transshipment and other costs in handling such non bulk traffic.

**3.2 Operation & Maintenance Plan**

**3.2.1 Operation & Maintenance Strategy**

The main objective of implementing the DFCCIL through the SPV route is to derive cost efficiencies in operation and maintenance of the DFC. DFCCIL aims to achieve this through:

- i. Improved systems & processes – consisting of modern maintenance philosophies, higher level of mechanization,
- ii. Greater degree of centralized control in operations and greater reliance on information technology. This will lead to a leaner organizational structure and higher productivity per employee as compared to the current IR set-up;
- iii. Improved asset utilization in respect of locomotives and wagons due to higher average speeds (65-70 kmph) on the DFC as compared to the existing IR network (about 25 kmph) and improved payload to tare ratio, complemented by more efficient cargo
- iv. Efficient handling at terminals and logistics parks with logistics support; and, DFCCIL efforts would be to outsource some of the maintenance activities, resulting in reduction in fixed operations and maintenance costs.

**3.2.2 Maintenance:**

Permanent Way including embankment and bridges form a backbone of any Railway transportation system. For efficient operation, it is necessary to not only keep these assets in safe and sound condition but to also evolve a maintenance system which is cost effective and economical on life cycle basis. Standards of construction are expected to be higher and most modern technology will be used in constructing the DFC. The maintenance practices will also depend on the type of track tolerances permitted for maintenance. It is felt that the track tolerances for DFC can be different from what exists today on IR as the traffic to be carried is only freight and the attempt would be to optimize the cost of maintenance. The tolerances laid presently are based on passenger comfort criteria. The track tolerances are to be evolved duly monitoring the impact/effect of permitting higher tolerances. To start with the tolerances as existing today on IR could be adopted. Therefore, the maintenance system on DFC will be different than what it exists today on IR.

**3.3 Operation & Maintenance (O&M) Expenditure**

O & M expenses have been estimated based on a 'bottom up' approach to estimate the cost associated with operation and maintenance. Costs are derived by estimating the manpower and materials required for individual tasks and electric power cost is

calculated based on the power required to move the estimated traffic. Overheads and miscellaneous operating costs are then added to arrive at the estimate of O&M costs.

For traction power it has been assumed that the power consumption will be **7 units per 1000 GTKM** of traffic moved and the cost of power has been taken at ` **5.16 per unit**. The O&M costs have been separately estimated for the Eastern and Western corridors. The costs at five yearly interval commencing from the year of operation up to 2023 are given in Table below:

#### O&M Costs

*(Rs. in crore; as per IL & FS figure)*

2018	2023	Year Ending on March 31	2018	2023
<b>Eastern DFC</b>			<b>Western DFC</b>	
186	298	Material	171	274
811	1312	Traction	781	1437
194	346	Staff	166	296
20	27	Miscellaneous Op. Cost	12	16
60	98	Overheads (5%)	56	100
<b>1270</b>	<b>2081</b>	<b>Total</b>	<b>1186</b>	<b>2123</b>

#### Combined O&M Costs

*(Rs. in crore; as per IL & FS figure)*

Year Ending on March 31	2018	2023
Total O&M Costs	2456	4204

\*The figures are based on IL&FS study done in year 2012.

### 3.4 Revenue Projections as per Business Plan

DFCCIL revenue will consist mostly of Track Access Charges realized from Indian Railways. After examining the practices followed by different railways of the world where ownership of infrastructure has been separated from the user of the infrastructure, it has been decided to adopt a two part tariff for computing the Track Access Charges (TAC) payable by Indian Railways to DFCCIL. The two part tariff will consist of a fixed component and a variable component. The fixed component will be payable irrespective of volume of traffic and the variable component will be payable based on volume of traffic in terms of 000 GTKM moved over the system. The separation into fixed and variable components of TAC has been done on the basis of fixed and variable elements of costs. No statistics exists to separate present Indian Railways costs into fixed and variable.

#### 3.4.1 Proposed Principles for setting up TAC for DFCCIL

(1) Concession Agreement and Track Access Agreement (CA& TAA) signed between Ministry of Railways (MOR) and Dedicated Freight Corridor Corporation of India Ltd (DFCCIL) provides for payment of access charges by MOR for use of DFC infrastructure for transportation of freight trains. To implement the provision of Concession agreement regarding TAC, Railway Board has constituted a committee comprising of ED/PP, Advisor FX, EDF(B) , Railway Board and Director (OP & BD)/DFCCIL for developing methodology for establishing Track Access Charges for MOR and its systems .

(2) A no. of meetings of the TAC committee has been held. The TAC committee has also taken into account the reports of core consultancy service for developing Business Plan for DFCCIL developed by M/s IL&FS and M/s



KPMG - engaged under Technical assistance ( TA ) component of World Bank with the assigned job of suggesting Track Access Charge regime for initial period and for non-discriminatory access and methodology based upon the best international practices along with track capacity allocation, licensing, safety and transitional issues for DFCCIL.

(3) TAC committee submitted its recommendations on 31.03.2017. The broad principles regarding TAC recommended by TAC committee are as follows:-

- a. The recommended approach is based on achieving full cost recovery through a TAC regime that incorporates fixed and variable costs. Variable costs may be allocated on a per GTKM basis reflecting the marginal costs incurred by each service and fixed costs are allocated on a per train-path basis, with MOR bearing the cost of unused train paths in the ramp-up period between scheme opening and full capacity utilization.
- b. In view of advantages of ‘Regulated Asset Base’ (RAB) approach, a dynamic model which takes into account the investment and capital recovery, the committee is in favour of RAB approach. This model will ensure an arm length relationship of MOR with the DFCCIL and will ensure that the method of setting Track Access Charge is transparent even during the scenario when non-discriminatory access is permitted by MOR on DFC network.
- c. Track Access Charges each year will cover efficient costs of operation. This revenue requirement includes:
  - i. Cost of capital.
  - ii. Operating costs.
  - iii. Depreciation.

Where:

- Cost of capital includes interest on loans, return on equity and interest on working capital.
- Operating costs include operating and maintenance expenditure.
- Depreciation to be used to pay down the principal of the loan and maintain the value of equity by part-funding renewals.

### 3.4.2 TAC and Revenue Streams in Future years with no change in tariff

(In crore)

Particulars	Units	2021	2022	2023
<b>Total TAC</b>	INR	11,897	12,533	13,020
<b>Apportioned revenue due to DFC</b>				
<b>Revenues with DFC (Moderate Scenario)</b>	INR	31,224	33,416	35,607
<i>The figures are based on PWC study (2017)</i>				

### 3.5 Business development

While the major revenue generation for DFC will be agreed Track Access charge between DFC and IR initially, the imperative need for adopting models for additional business can't be ruled out. The development of catchment areas around major junctions and the upcoming industries around the major business districts will provide adequate business opportunity for DFC. These are shortlisted presently as development of MMLPs/Freight terminals, development of User Facilities at Station buildings, Advertisements on Railway Assets and development of Theme

Parks near major industrial hubs and attracting non-conventional traffic such as Ro-Ro, Automobiles etc.

### **3.5.1 Multimodal Logistics Parks/Freight terminals along side DFC.**

The freight traffic on Indian Railways is being handled at goods sheds, private railway sidings, container terminals, rail-side Warehouses, bulk terminals etc. In the wake of high growth of freight traffic near major production /consumption centres, a need has been felt to have multi user, multi-facility and multi-commodity transportation hubs serving major centres of economic activity which would be helpful in reducing total logistic cost to customers. Such transportation hubs are also known as Multi-Modal Logistics Parks. Multi-Modal Logistics Park is defined as a rail-based inter-modal traffic handling complex comprising of container terminals, bulk/break-bulk cargo terminals, warehouses, inter-modal transfers, sorting/grading, cold chain, and aggregation/dis-aggregation with facilities for mechanized handling along with other support services.

DFCC aims to develop Multi Modal Logistics Parks (MMLP) along with its alignment which would yield sizable volume of traffic for the DFC by consolidation of cargo. The objective is to enhance the presence and share of rail transport in the overall transport chain and attain increased rail freight volumes by offering integrated, efficient and cost effective logistics and warehousing options to users. The proposed MMLPs shall serve to increase global competitiveness of domestic users and promote further economic activities by facilitating efficient access to business sources and markets.

#### **Benefits of Logistics Park**

- i. Excellent transport links compare to “stand alone” distribution centre with easy access to long haul rail network as well as to delivery points in the catchment areas by trucking.
- ii. Custom clearance facilities where ever required.
- iii. Round the clock service, being generally located away from congested urban settlement areas,
- iv. Cost saving as all the facilities are provided at one location,
- v. Enhance security systems
- vi. Availability of more options for selection of competitive and reliable logistics service providers.

### **3.5.2 Other Opportunities**

The needs of the customers arriving at and leaving from Station premises are growing more towards convenience and ease in terms of time saving, etc. Stations being centrally located in the cities, they assume commercial significance with increasing population growth and business dynamics.

Hence, there are ample opportunities to develop the station premises and the business locations for additional revenue .

These may include development of **theme Parks** near major industrial hubs, development of Serviced **and virtual Office Centres**, facilitations for **Advertisement Gateway & Business Event Hubs** etc. by incurring least investment for constant commercial source earning apart from reaping benefits of customer facility and their satisfaction derivatives.

### **3.6 Consultancy for Technical Assistance under World Bank**

Four Consultancy Studies have since been awarded to different International Consultancy Service Agencies who will be studying the respective areas allotted to them for enhancement of technical, institutional, commercial and other allied aspects to strengthen and enhance the capacity of DFCCIL to derive investment benefits as a game changer in the transport logistics.

Four areas have been selected and these are as under:

## **1 - Institutional Strengthening Module of DFCCIL (ISMD)**

The primary objective of this module is to review the management and organizational structure, control system, processes and procedures, HR system, MIS, and make recommendations for DFCCIL to make it an efficient, commercially oriented provider of infrastructure services. The module will therefore review and recommend, capacity building, skill development, process re-engineering and system improvement in areas such as organization and corporate governance of the company, including management and organization structure, human resource planning and development, staff training/study tours, financial management, social and environmental systems, governance systems etc.

Consultancy Contract for Engagement of Consultant for Consultancy Services for Institutional Strengthening Module of DFCCIL (ISMD) was awarded to M/s CPCS Transcom International Limited Barbados in a Joint Venture with CPCS Transcom Limited (Canada). Subject Report/Strategy Report have been submitted which are under approval.

## **2 - Development of Marketing and Commercial Strategies for DFCCIL and its Catchment Areas (DMCSD)**

The main objective of the assignment is to develop a long term marketing and commercial strategy and devise step wise plan including policy framework to maximize commercial value of the project and to achieve higher modal share for railways in freight traffic market. This is to be based on, operational strategy, proposed allied infrastructure including freight terminals & logistics parks and induction of special purpose rolling stock for DFCCIL & IR taking into account the traffic in catchment areas along the two corridors being built and on/through the feeder routes of Indian Railways covering followings:

- (i) To validate the demand forecast for different horizon years on DFC up to 2030 supported by secondary data as applicable.
- (ii) To identify potential of additional freight traffic in catchment areas of DFCCIL for increasing modal share of rail using relevant experiences of international freight market with a view to enhance profitability of DFCCIL.
- (iii) To develop costing and pricing strategy for promoting modal shift of traffic in favour of railways.
- (iv) To suggest possible heavy haul DFC network including feeder routes embedded with existing IR network taking into account operational feasibility and associated commercial issues.
- (v) Identify need for special purpose wagons for selected commodities and main technical parameters along with financial justification for the same.
- (vi) Propose operational parameters and operational standards covering train length, speed, service quality, enhanced services and improvements in infrastructure.

The plan, inter alia, should include tangible, actionable and time bound monitorable measures for DFCCIL and IR

Consultancy Contract for Engagement of Consultant for Consultancy Services for Development of Marketing and Commercial Strategies for DFCCIL and its Catchment Areas (DMCSD) was awarded to M/s Pricewaterhouse Coopers Private Limited in Joint Venture with M/s PWC Strategy & (India) Pvt. Ltd., M/s Hamburg Port Consulting GmbH, Germany and M/s UNICONSULT Universal Transport Consulting GmbH, Germany. Consultant has submitted subject reports in three parts as per TOR. First two parts of the subject report have been approved and third part is under approval.

### **3 - Heavy Haul Rail Capacity Development in India (HHRCDI)**

The overall objective of the Heavy Haul Research & Development Program will be to increase the technical capacity of India's railways to implement heavy-haul freight initiatives that will improve the safety, transport capacity, quality, competitiveness and share of India's rail freight transport services and to prepare concrete proposals of an effective and cost-efficient heavy-haul freight Research, and capacity Development Program including plans for establishment in India of a world class Heavy-haul Research Institute (HHRI). This will include detailed program for development and research capabilities identifying the major areas of the heavy haul Cost drivers viz productivity enhancements through increased axle loads, reduced wagon requirement, higher pay load to tare weight ratio, energy saving technologies, reduced human resource requirement & desired skill enhancements.

Consultancy Contract for Engagement of Consultant for Consultancy Services for Heavy Haul Rail Capacity Development in India (HHRCDI) was awarded to M/s Deloitte Touch Tohmatsu India Private Limited. Final Report was submitted on 01.12.2016 and accepted on 24.03.2017.

### **4- Consultancy Services for Non-discriminatory Access for DFCCIL (CSNDAD)**

The objectives of the study are to

- (i) consider options for institutional arrangement for providing non-discriminatory access for rail freight train operations;
- (ii) analyse international experience with non-discriminatory access for freight train operations and suggest a practical system(s) suitable for application in the Indian context,
- (iii) establish a detailed methodology for setting track access charges at start up, and
- (iv) Identify how the institutional arrangements for licensing, regulation of traffic, capacity allocation and safety, including the methodology for calculating track access charges, would need to change to accommodate multiple users.

Consultancy Contract for Engagement of Consultant for Consultancy Services for Non-discriminatory Access for DFCCIL (CSNDAD) was awarded to M/s KPMG Advisory Services Private Limited (INDIA) in Joint Venture with M/s JSC KPMG (KPMG Russia) and M/s KPMG (KPMG UK). Final Report submitted in March'2017 which is under approval.

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## CHAPTER - IV

### ORGANIZATIONAL STRUCTURE AND TRAINING

- 4.0** DFCCIL has planned a lean manpower organization, with staff and managers having functional rather than linear responsibilities. During the project delivery phase, DFCCIL plans to limit the size of the establishment by using the services of consultants for preliminary design, and project management and supervision, as far as possible. During the operation phase, DFCCIL will resort to automization & mechanization to optimize staff costs, to the extent possible. To this end international practices like risk based maintenance regime combined with intensive monitoring of assets and mechanized maintenance of the infrastructure has been planned.

DFCCIL has planned separate staffing structures for the construction and operational phases of the project, reflecting the different skill-set requirements of each phase. The project delivery organization has a predominance of staff with the requisite engineering and related backgrounds, conversant with design, tendering, procurement and supervision of works, land acquisition processes, etc. These along with the senior management staff are based in the DFCCIL headquarters at Delhi. DFCCIL has outsourced work packages to General Consultants responsible for the planning, design, tendering, systems integration, and supervision of contractors and progress monitoring, under the oversight of DFCCIL officers. DFCCIL staffs are also engaged in critical activities like planning, prioritization and integration of different activities/construction packages, estimation, budget control, MIS reporting, coordination with the Ministry of Railways and other concerned Government authorities, etc. functions that can be best performed in-house given the public utility character of the project. In the field there are 14 Chief Project Manager (CPM) offices at suitable locations, to deal with land acquisition, yard planning, liaison with government authorities etc. The CPM will also do overall monitoring of the work being done at site by construction contractors and the General Consultants.

At the operational stage, DFCCIL will consist of Corporate Headquarters at NOIDA, Eastern and Western Corridor Headquarters at Allahabad and Ahmedabad respectively, a Training School, keeping in view the centrality of operational requirement even in scheduled train path running, DFCCIL has planned Operation Control Centres (OCCs) on the two corridors i.e. at Allahabad on EDFC and at Ahmedabad on WDFC. Apart from these there will be a provision for replica control at Corporate Office of DFC to take over and monitor during exigencies/breakdowns as a part of Disaster Management Plan. In the Corridors there will be field offices including Integrated Maintenance Depots and Sub-Depots, Track Machines and Ballast Depots at suitable locations. The Corporate Headquarters will have the senior managers and staff of different disciplines of Engineering, Traffic, Finance, HR and Administration. Maintenance staff will be stationed at integrated maintenance depots located 160 kms apart on the DFCCIL as well as at sub depots located 80 kms apart. There will be one control office for each corridor for planning and controlling the movement of trains. Operating staff will be located at stations and control offices. Day to day working of the maintenance and operation work as well as liaison with Zonal Railways and local agencies will be done by the Eastern and Western Corridor Headquarters. Eastern and Western Corridors will be headed by Executive Directors, who will report to Top Management. Both corridors would be independent cost and revenue centres. Policy matters, finance, budget, HR, design changes, security, purchases, etc will be managed

in the Corporate Headquarters. The Corporate Office will also do Business development, coordination with Railway Board and other Government Departments.

#### 4.1 TRAINING:

Technical trainings have been planned for professional up gradation of staff and officers of DFCCIL.

**Training of DFCCIL is broadly divided into 4 groups:**

- (a) Induction Training for direct recruits
- (b) Induction Training for absorbees
- (c) World Bank Approved Trainings
- (d) Other Professional Trainings

##### Training:

##### i) Hi-tech Organization:

- DFCCIL will use state of the art technology for construction of advanced heavy haul track system, OHE, signalling and telecommunication system for the project.
- It will follow modern international system and practices best suited for Indian conditions for the maintenance of its assets to deliver safe and reliable Rail freight corridors.

##### ii) Assessment of training needs and development of training plans:

- Initially, a comprehensive identification of skills, knowledge and attitudes required at each level will be undertaken.
- Thereafter, periodic assessment would be made of the gap between existing capabilities/skills/knowledge/competencies and those required keeping in view present and future technological up-gradations/ organizational growth/ environmental changes.
- This would be followed by identification of the needs that require training.
- Assessment would utilize the HRIS, employee and user group feedback, performance indicators and evaluations, internal and external environmental factors as also training audit. Based on these, customized cost effective strategic Training Plans would be developed for identified target groups.

##### a) Training delivery (Internal):

###### Short-term

- The internal plan would involve 'on the job training' in the desired areas.
- A system of continuous assessment and evaluation method will also be put in place so as to plan for sharpening the skills and capabilities of the employees.
- As the setting up of the specialized training institute with its teaching faculty and other infrastructure facilities will take time, the basic training during the construction phase will be imparted to the employees by making suitable arrangements with the specialized training institute of Indian Railways in discipline like Civil, Electrical, S&T, etc.
- Arrangements will also be made with these institutes to design short duration modular training courses in specific areas as per the specific needs.

###### Long-term

- Since DFCCIL will adopt state of the art technology and modern international system of maintenance, a *specialized training institute* will be set up.
- The institute will provide induction training to new recruits as well as refresher training at periodical intervals to the managerial, supervisory and artisan staff.
- The training institute will be located at National Capital Region of Delhi.

- The institute will have dedicated Principal, Vice Principal, Sr.Instructors and Instructors of specialized disciplines besides other staff.
- b) Training delivery(External):**
- The external plan would involve exposure to world class technology, practices and corporate culture through specialized training programs to be imparted in the training institutes or through seminar, conferences, workshop, etc.
  - Talent exchange programme with the leading national and international organizations engaged in Heavy Haul Freight Railways.
  - Employee exchange programme with other organization engaged in heavy haul freight movement.
- c) Mentor programs:- Mentor programs will be put in place.**  
On boarding programs for new entrants  
 All the new entrants will be provided on boarding orientation training at the time of joining the organization.
- d) Training Audit:**  
 This would aim at assessment and evaluation of the training needs; ensuring compatibility between training need and design, identification of non-training issues influencing performance. It would utilize questionnaires, interviews, tests, trainee, trainer and stakeholder/user group feedback.

## **DFCCIL's CORPORATE SOCIAL RESPONSIBILITY AND SUSTAINABILITY POLICY**

### **4.2 Introduction**

Corporate Social Responsibility (CSR), also called corporate conscience, corporate citizenship, social performance, or sustainable responsible business) is a form of corporate self-regulation integrated into a business model. It is the continuing commitment by business to perform ethically and contribute to economic development while improving the quality of life of the workforce and their families as well as of the local community and society at large. CSR policy functions as a built-in, self-regulating mechanism whereby business monitors and ensures its active compliance with the spirit of the law, ethical standards, and international norms.

The Government of India enacted the Companies Act 2013 in August 2013 Section 135 of the Companies Act 2013 (hereinafter referred to as 'the Act') deals with the subject of Corporate Social Responsibility (CSR). It lays down the qualifying criteria based on net worth, turnover, and net profit for companies which are required to undertake CSR activities and, inter-alia, specifies the broad modalities of selection, implementation and monitoring of the CSR activities by the Boards of Directors of companies.

#### **DFCCIL's CSR Vision**

At DFCCIL, Corporate Social Responsibility is envisaged as a commitment to meet its social obligations by playing an active role to improve the quality of life of the communities and stakeholders on a sustainable basis, preferably in the project areas where it is operating.

#### **DFCCIL's CSR Policy Statement**

DFCCIL's Corporate Social Responsibility Policy is "To remain a responsible corporate entity mindful of its social responsibilities to all stakeholders including shareholder, employees, local community and society at large".

## **Key results area to be covered under Corporate Social Responsibility**

Generally the underprivileged and backward communities/areas where DFCCIL has its business operations would be covered under the policy. The focus is to address the basic needs of the deprived, under privileged, neglected and weaker sections of the society which comprise of SC,ST, OBC, minorities, BPL families old and aged, women/ girl child, physically challenged etc.

## **Implementation of CSR**

### **Partnership Approach**

As per the requirement, DFCCIL may carry out the identified activities on their own or engage specialized agencies/NGOs Trusts/ Missions/ Government/ Semi-Government/ autonomous organizations/ contracted agencies for work etc, which have requisite expertise of carrying out the identified activities. The agency/organization will be appointed to work singly or in collaboration with other agencies. DFCCIL will monitor and ensure delivery of services as planned in accordance with the needs of the community. The activities would be taken up in a project mode with milestone and deadlines.

### **Broad guidelines and parameters:**

- a. Discussion and interactions with Central and State Govt. officials be held to identify the areas for undertaking CSR activities to avoid duplicity of the same with the programmes run by Central, State and Local Government. Initiatives of Government and Self Help Groups (SHGs) etc. would be dovetailed / synergized with initiatives taken by DFCCIL.
- b. While identifying the CSR activities, emphasis is on the areas related to the business of DFCCIL. The target beneficiaries, the local authorities, institution etc. involved in similar activities if need be, may be consulted in the process of planning and implementation of CSR programme.
- c. Assign the CSR projects to NGOs/specialized agencies under a MoU/Agreement reflecting the mutual terms and conditions.

### **Allocation of funds:**

- a. As per the Companies Act and the DPE Guidelines it is mandatory for all profit making CPSEs to undertake CSR activities. Even the CPSEs which are not covered under the eligible criteria based on threshold limits of net worth, turnover, or net profit as specified by Section 135(1) of the Company Act, but which make profit in any particular year, would also be required to take up CSR activities within the provisions of the Act, the CSR Rules, and the Guidelines. Such CPSEs are expected to spend at least 2% of the profit made in the previous year on CSR activities. Accordingly, funds may be allocated amounting to at least 2% of the average net profit of the company made during the three immediately preceding financial years or MoU target whichever is higher.
- b. Allocation to CSR Fund can be increased with the approval of CSR Committee and would require subsequent ratification by Board of Directors.

## **Monitoring and Evaluation**

- a) The impact of the CSR activities undertaken should be quantified to the extent possible with reference to baseline data, to be created before the start of any project.



Therefore, Base-line surveys would be an integral part of CSR programme so that progress can be measured. Photographic record may be maintained wherever possible.

- b) For proper and periodic monitoring of CSR activities, if considered necessary, the programmes undertaken under CSR may be evaluated through a suitable independent external agency and the evaluation should be both concurrent and final.

**Reporting of CSR Activities**

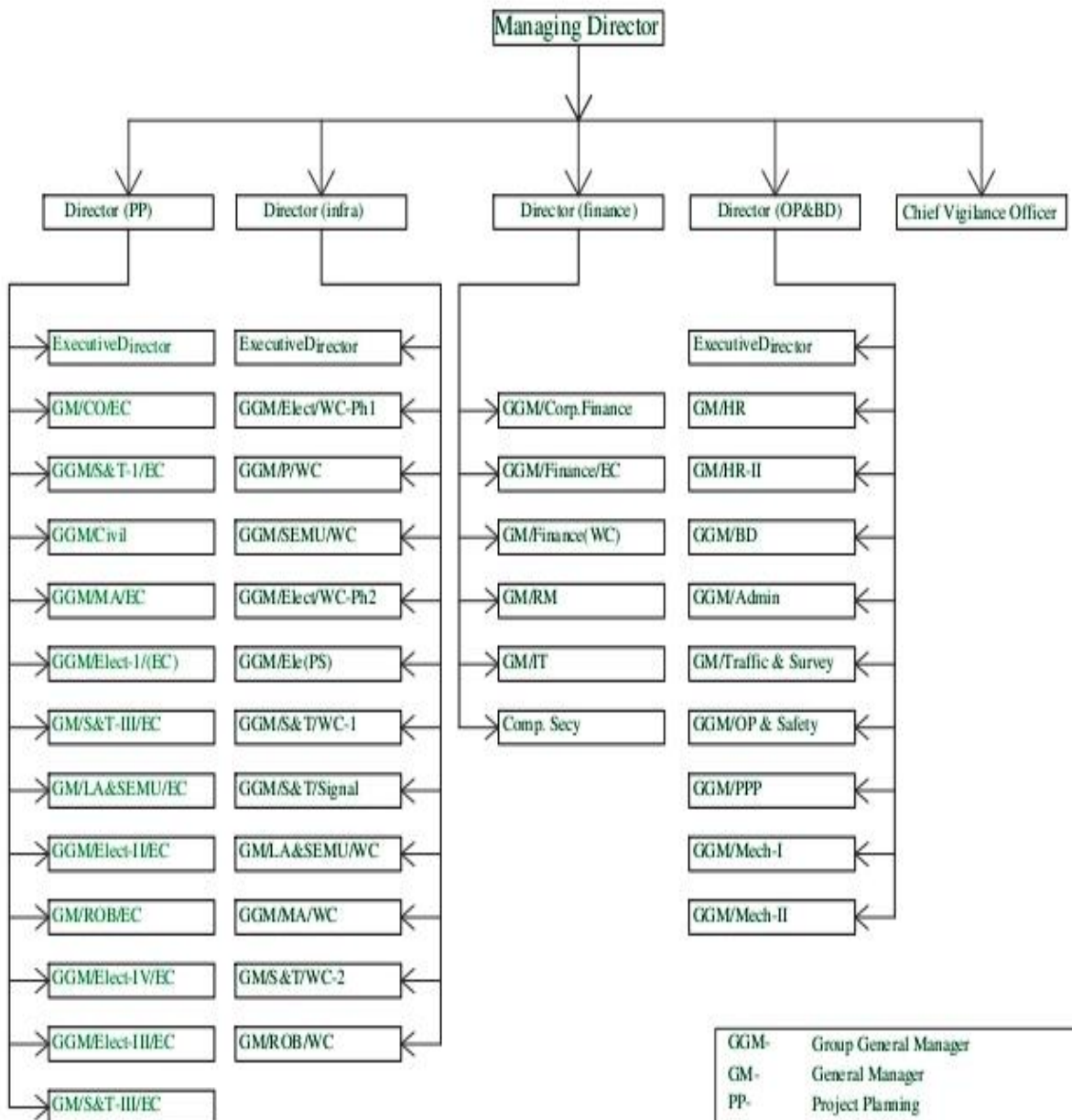
The CSR activities will also be reflected in the Annual accounts of DFCCIL under the head 'Expenditure under CSR Activities'.

**Display of CSR activities on DFCCIL website**

The CSR policy of DFCCIL, duly approved by the BOD shall be displayed on the company's website.

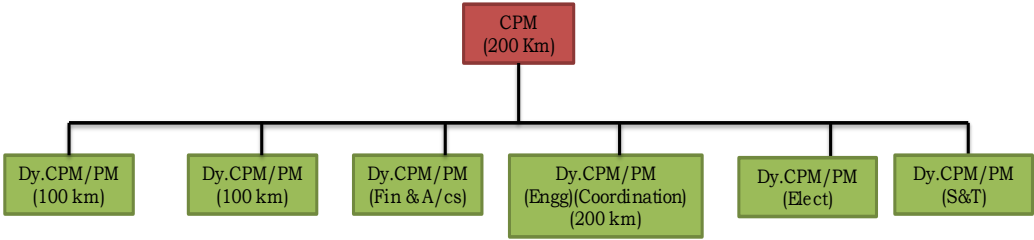
**Organisational Chart of the Corporate Office of DFCCIL is given below: -**

# ORGANISATION CHART CORPORATE OFFICE (DFCCIL)

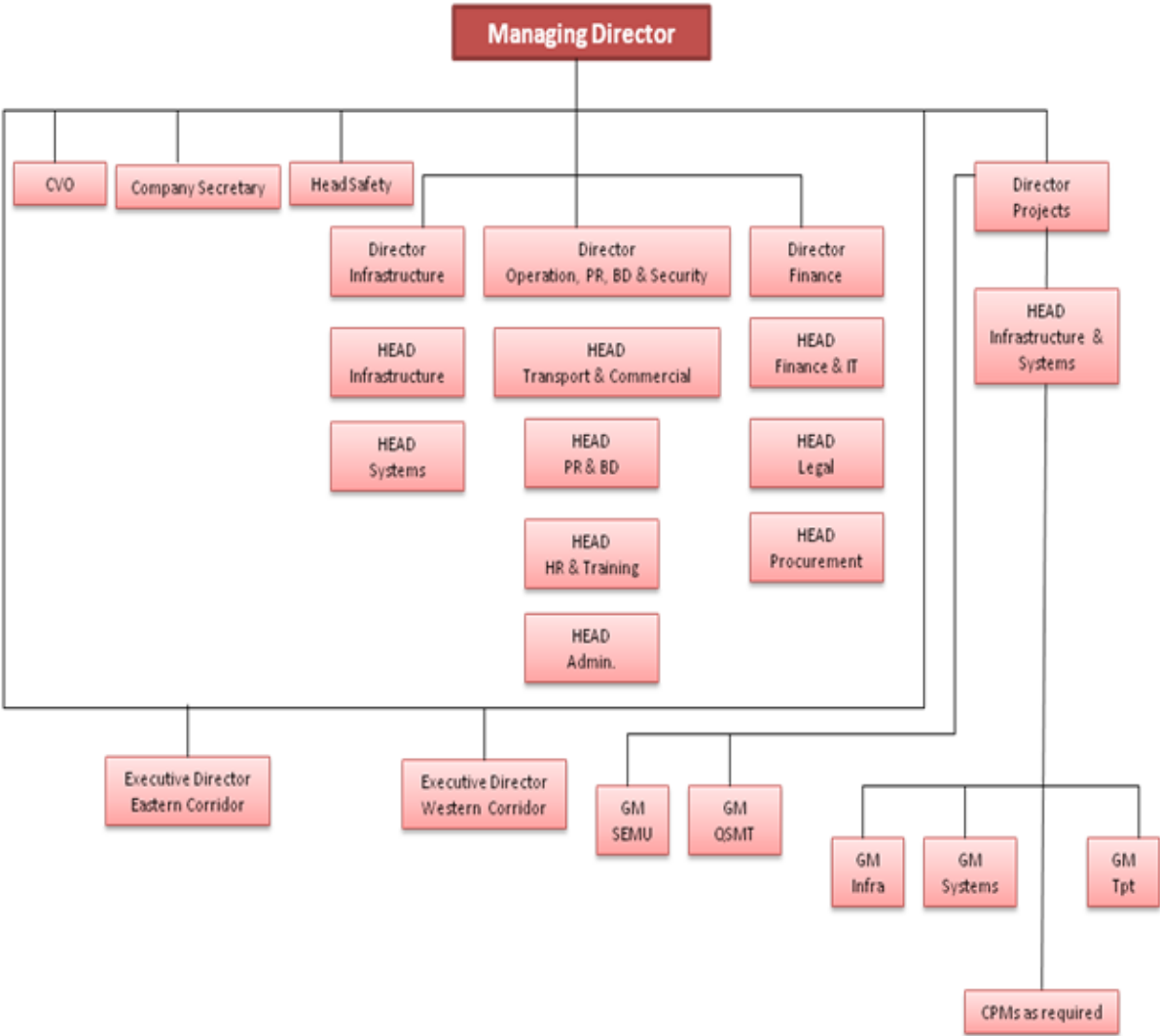


- GGM- Group General Manager
- GM- General Manager
- PP- Project Planning
- OP & BD- Operation & Business Development
- IT- Information Technology
- HR- Human Resources
- S&T- Signal and Tele communication
- SEM U- Social and environment Management Unit
- WC- Western Corridor
- EC- Eastern Corridor
- INFA- Infrastructure
- ADMIN- Administration
- MA- Multi Agency

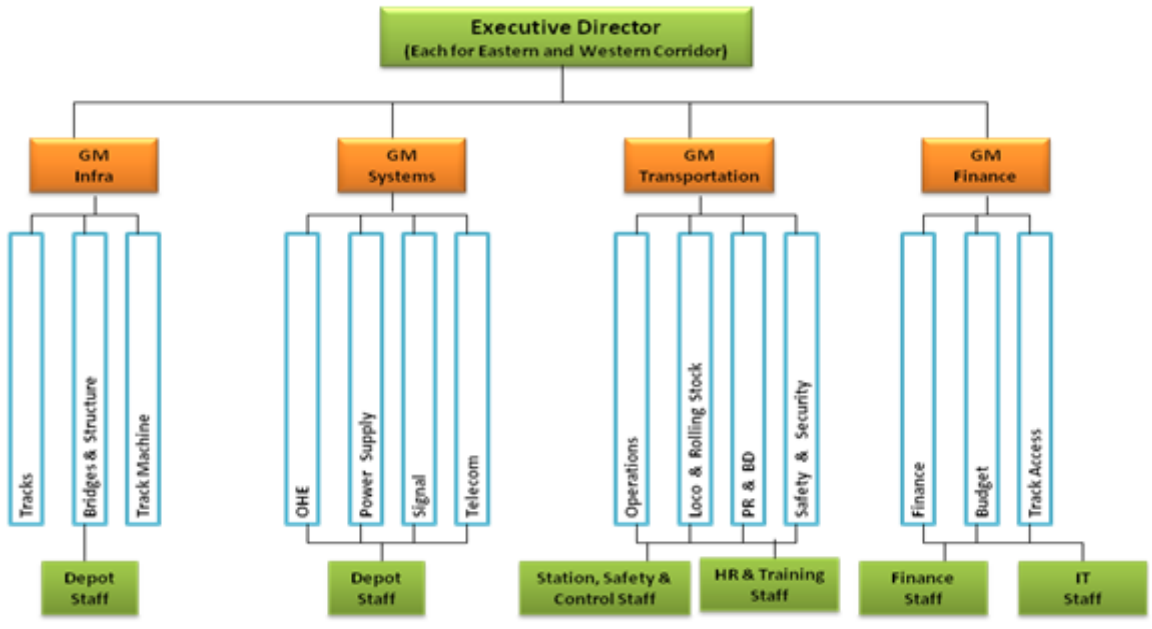
**Construction Phase – Field Units  
(Eastern and Western Corridor)**



**Operational Phase – Corporate Office**



Operational Phase – Regional Office



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## CHAPTER - V

### CONSTRUCTION PLANNING

#### 5.0 The Construction Model

Design-Build Lump-sum Contract strategy is being used for construction of the two corridors. The selection of contractors is through open bid, Prequalification, Post qualification and Bidding process. Project Management Consultants engaged as Engineer for overall supervision of the work. The Civil Contracts is followed by System Contracts including Signalling & Telecommunication and Electrical OHE Equipment. The size of packages is decided based on cost and availability of agencies to achieve good competition and also manageability of contracts from contractors as well as supervision point of views. In addition, the market appetite is considered to ensure there is price discovery through open competition. For the Western Corridor, the entire length is divided into packages having a length of about 110 to 350 km. Electrification as well as S&T Contracts are undertaken for longer stretches.

On the Eastern Corridor, the length between Ludhiana and Mughalsarai has been divided into three Adaptable Program Lending (APL) packages. APL-1 covers Khurja-Bhaupur (342km), EDFC-2 covers Bhaupur- Mughalsarai (391 km) and EDFC-3 is Ludhiana-Khurja-Dadri (400 km. S/L + 46 Km D/L). Civil work is undertaken separately for these APLs, followed by system Electrification & S&T Works.

Road Over Bridges has been sanctioned by Ministry of Railways on cost sharing basis as per available procedure and funded through Road Safety Fund/other funding.

#### 5.1 Progress

The Project is now in advance phase of Construction. All Works and Consultancy Contract for WDFC awarded. In EDFC on contract for Civil Work from Khurja- Pilkhani (CP 303) and system contract for Khurja- Dadri and Khurja- Sahnewal Section yet to be awarded. These contracts are also likely to be awarded during 2017-2018.

##### 5.1.1 Land Acquisition:

Land is being acquired by DFCCIL on behalf of Central Government, Ministry of Railways (MoR) through the nominated Competent Authorities (CA) who are mainly Revenue Officers of the State Government. DFC project has been declared as a Special Railway Project by MoR and land acquisition is being done as per Railway Amendment Act, 2008. DFC alignment passes through 68 districts of 9 states in both the corridors and involving 11652 hectares of land (EC-5652 ha & WC-6000 ha) covering 3358 Km.

Project Description	Total Scope	
	Length (Km.)	Area (Ha.)
EDFC (without Sonnagar-Dankuni)	1318	4589
Sonnagar-Dankuni	538	1063
WDFC	1502	6000
<b>Total of EDFC &amp; WDFC</b>	<b>3358</b>	<b>11652</b>

The detailed procedure for land acquisition for DFC project is provided in RAA 2008, highlights are mainly as under:

- i. Appointment of Competent Authority through Gazette notification.
- ii. Preparation of land plans
- iii. Gazette notification u/s 20A of RAA 2008 i.e. Intention to acquire land for public purpose.
- iv. Publication of 20A notification in local newspapers in vernacular language
- v. Hearing of objections received from land losers by Competent Authority
- vi. Submission of report u/s 20E(1) by the CA
- vii. Gazette notification u/s 20E i.e. Land vested with the Central Government free from all encumbrances
- viii. Declaration of award u/s 20F i.e. Land compensation
- ix. Payment of compensation to land losers

Land acquisition in DFCCIL is being done in most transparent manner by conducting Social Impact Assessment (SIA) prior to land acquisition to ascertain the socio-economic condition of the Project Affected People (PAPs). As per section 20-O of the Railway (Amendment) Act, 2008, the ‘National Rehabilitation and Resettlement Policy, 2007’ is to be adopted. A robust Entitlement Matrix duly approved by MoR has been prepared encompassing all categories of beneficiaries incorporating various benefits under National Rehabilitation and Resettlement Policy 2007. With the passage of “the Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation & Resettlement Act, 2013 followed by the Amendment Ordinance, the provisions of the new act with regard to compensation & R&R are applicable to all acquisition being undertaken by DFCC from 01.01.2015. A new Entitlement Matrix has been issued by Railway Board as per the provisions of the new Act and has come into force from 01.01.2015. The same has been made available on DFCCIL web site, all the CPM office, Public places in affected villages for the public information.

Due care has been taken to avoid or minimize land acquisition and involuntary resettlement impacts by exploring all viable alternatives and to ensure adequate rehabilitation package and expeditious implementation of rehabilitation process. DFC has a well formulated Resettlement Policy Framework (RPF)<sup>1</sup> to take appropriate resettlement and rehabilitation measures for persons / household adversely affected due to implementation of DFC project. Social Impact Assessment studies have been conducted for EDFC & WDFC to meet the World Bank & JICA Social safeguard policies.

A Resettlement Action Plan (RAP) detailing the road map for resettlement of PAPs has also been prepared in consultation with the Multilateral funding agency. DFC has also hired NGOs for smooth implementation of RAP to facilitate the PAPs in the resettlement process. An independent consultant for Social and Environmental Monitoring has also been put in place. DFC is the first project in the country to implement NRRP 2007 by including it in the act itself.

Land is being acquired under RAA 2008. Progress as on July 2017 is as under:

<b>Project Description</b>	<b>Land to be Acquired (Ha.)</b>	<b>20A issued (Ha)</b>	<b>20E issued (Ha)</b>	<b>20F Award declared (Ha)</b>
Eastern DFC (without Sonnagar-Dankuni)	4589	4589	4456	4388
Western DFC	6000	6000	5998	5811
Sonnagar-Dankuni	1063	1055	723	595
<b>Total</b>	<b>11652</b>	<b>11644</b>	<b>11177</b>	<b>10794</b>

## **5.1.2 Procurement Plan & Progress**

**5.1.2.1 Eastern DFC** - The Eastern DFC is being executed in a phased manner. The World Bank funding finalized in three tranches for Ludhiana – Mughalsarai Section. Phase -1 of Loan was sanctioned for Khurja – Kanpur Section for USD 975 Million. 2nd Phase from Kanpur to Mughalsarai was sanctioned for USD 1100 Million. Phase – 3 for Khurja – Ludhiana Section is sanctioned for USD 650 Million. Khurja – Dadri Section has been added in Phase -1 of the Loan through restructuring. Loan Agreement for EDFC – 1, 2 & 3 already signed. Due to favourable currency position and competitive bidding there was saving in requirement of loan and loan amount of EDFC-1 & 2 has been reduced to 800 million USD and 910 million USD.

### **5.1.2.1.1 Eastern Dedicated Freight Corridor Project – 1 (EDFC- 1)**

For EDFC – 1 (Khurja – Bhaupur Section (342km): World Bank Loan amount Agreement for USD 975 million was signed in October 2011. Loan No. is 8066 – IN. 3 Civil, Structure and Track Works Contract Packages of approx... 115km each has been awarded in January, 2013 to TATA – ALDESA JV System Work involving Electrification, Signalling and Telecommunication Works was awarded to ALSTOM Consortium in July 2015. Construction work for Civil and System Work is in progress. Civil Works for Khurja – Dadri Section awarded to GIL- TPL JV during June 2016. System Work for Khurja – Dadri Section pre-qualification process completed and First stage Technical proposal invited. Bhaupur- Khurja Section is targeted for commission by August 2018.

### **5.1.2.1.2 Eastern Dedicated Freight Corridor Project – 2 (EDFC – 2)**

For EDFC – 2 (Bhaupur – Mughalsarai section (402km): World Bank Loan amount for USD1100 million signed in September 2013. Loan No. 8318 IN. Civil, Structure and Track Works Contract awarded in March 2015 to GIL – SIL JV. S&T and Electrical Works Contract awarded in June 2016 to Beijing National Railway Research and Design Institute of Signal & Communication Group Co. Ltd., China and L&T – INABENSA JV. Civil & System Works are in progress and section is targeted for commissioning in April 2019.

### **5.1.2.1.3 Eastern Dedicated Freight Corridor Project – 3 (EDFC – 3)**

EDFC – 3 for Civil, Structure and Track Works Section has been divided in 2 parts. CST Works for Pilkhani – Sahnawal Section has been awarded to GIL – TPL JV in June 2016. For Khurja – Pilkhani Section Financial bids received on 22.06.2017 and are under evaluation. System Works contract, Prequalification process completed and First stage technical bid invited/being invited. All balance tenders are likely to be awarded during 2017-18.

### **5.1.2.1.4 Mughalsarai – Sonnagar section (123km)**

This section is being constructed through Railway Funding. The section will be constructed and commissioned in two segments; Durgawati to Sasaram approximately 56 KMs, work on this section is already completed and is ready for opening. Target for commissioning of Sasaram – Karwandi (9 Km) is March'2018. Target for commissioning of the remaining portion of the section i.e. Mughalsarai to Durgawati and Sasaram to Sonnagar is June'2019.

### **5.1.2.1.5 Sonnagar - Dankuni section (534km) through PPP**

It has been decided to implement Sonnagar - Dankuni section under PPP mode. As the size of the project is substantial, based on investor feedback it has been decided

to split the project into two phases viz Dankuni – Gomoh section, Phase-I and Gomoh – Sonnagar section, Phase-II. The total land acquisition involved in this section is approximate 1063Ha. The land acquisition is in advance stage. The legal consultant and Financial Consultant and Transaction Advisor for Phase-I has been appointed and the work is under progress.

#### **5.1.2.2 Western DFC**

##### **5.1.2.2.1 JICA Funded Section: Phase-1 (Rewari - Vadodra, 953 km)**

The Loan Agreement for the first tranche for a total of 90,262,000,000 JPY (Ninety Billion Two Hundred Sixty Two Million JPY) has been signed on 31st March 2010. The Loan Agreement for the second tranche for a total of 103,664,000,000 JPY (One Hundred Three Billion Six Hundred Sixty Four Million JPY) has been signed on 31st March 2016. The construction works of Phase-1 project will be carried out in seven contract packages namely: Civil Packages: CTP-1, 2 & 3, Special Steel Bridge Packages: CTP-3AR, Electrical: EMP-4, Signalling & Telecom: STP - 5&5A, & Procurement of Track/OHE Machines: PE-6. All contract package except PE-6, have been awarded. All the civil and system works are in various stages of progress.

##### **5.1.2.2.2 JICA Funded Section: Phase 2 (Vadodra - JNPT & Rewari - Dadri, 551km)**

The Loan Agreement for the first tranche for a total of 136,119,000,000 JPY (One Hundred Thirty Six Billion one Hundred Nineteen Million JPY) has been signed on 28th March, 2013. The Construction works of Phase-2 project will be carried out in nine contract packages namely: Civil Packages: CTP-11, 12 & 13, Integrated Packages: CTP-14 & Special Steel Bridge Packages: CTP-15A, 15B & 15C, Electrical: EMP-16, Signalling& Telecom: STP-17. All the contract packages have been awarded and work is in progress.

**5.1.2.2.3 Bridge Construction (Railway Funded)** Contract for Construction of 54 Important and major Bridges between Vaitarna and Surat on WDFC are in progress as a part of separate contracts. Works on 27 bridges are complete. Work is in progress for remaining bridges.

**5.1.2.2.4 Road over Bridges (Railway Funded):** 118 Level Crossing on WDFC are to be converted to ROBs and are being executed by various agencies as per mutual agreed and terms with State Govt. 11 ROBs are already completed and awarded for 65 ROBs.

"On EDFC there are 146 ROBs from Sahnewal to Sonnagar, out of which 34 ROBs have been completed. Work is in progress at 24 ROBs. Remaining ROBs are at various stages of planning."

#### **5.1.3 Time line for completion of DFC**

DFC would be operationalised in phases starting from the year 2018-19. For a massive project of this size and complexity, it is natural to consider phased implementation and start driving benefits by early commencement of operation.

The projected phase of the DFC plan comprises of construction of Dedicated Freight Corridor (DFC) spanning the Mumbai-Delhi (Western DFC) and Ludhiana



Delhi-Kolkata (Eastern DFC) legs of the golden quadrilateral, covering a total length of 3,342 km. Plan for commissioning of sections is as under:-

**Eastern DFC**

Bhaupur/Kanpur –Khurja	: 343 Km.	:	August, 2018
Bhaupur/Kanpur-Mughalsarai	: 402 Km.	:	April, 2019
Dadri-Khurja-Ludhiana	: 447 Km.	:	September, 2020
Mughalsarai-Sonnagar	: 126 Km.	:	June 2019,
Sonnagar-Dankuni	: 534 Km	:	Based on finalization of PPP contract

**Western DFC**

**Phase-1**

Rewari- Palanpur	: (638Km.)	:	February, 2019
Palanpur – Makarpura	: (308 Km)	:	June, 2020

**Phase-2**

Makarpura - Vaitarna	: (313Km.)	:	November, 2019
Vaitarna – JNPT	: (116 Km)	:	December, 2020
Rewari-Dadri	: (127 Km)	:	December, 2020

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# CHAPTER - VI

## Information Technology

**6.0** DFCCIL embarked on a journey to create and deploy a World Class Enterprise-wide Integrated IT System which will completely automate its Core Organizational business functions and provide each employee with an environment to conduct its regular office activities more efficiently and effectively. DFCCIL is in the process of implementing SAP-ERP System. The Project aims at the Centralized implementation of a Software Solution integrating Financial Management, Human Resource Management, Project Management, Enterprise Asset Management, Land Acquisition Information Management, Geographical Information Management, Portal and Document Management System. The ERP solution would be utilized for managing the most critical functions of the organization. The system is both horizontally and vertically scalable. The solution would provide Dashboard and GIS based reporting, enabling effective decision making by senior management.

### **6.1 Envisaged Benefits**

The proposed IT system will help DFCCIL to preserve important artefacts (plans, drawings, notes, documents, reports etc.) in a secure and manageable environment in digitized format. The envisaged system would expedite decision making, ensure better planning and co-ordination between different functions, better data management, effective reporting, knowledge management, etc. Time lost in accessing information will be reduced. State-of-the-art processes will be established to ensure that best practices are followed. The IT Solution will provide senior management with critical information related to various contracts, activities and funds in the form of Management Dashboards with inbuilt triggers to ensure timely decision making. The Integrated IT system would thus, at any point of time capture a complete picture of what is going on in the organization. It would be a very powerful tool to drive important business decisions based on various business parameters. Not only decision making, it would also be a tool to measure outcomes of the decisions taken on real-time basis.

### **6.2 IT Related Developments**

A state of the art Data centre has been set up at DFCCIL. This Data Centre has been connected with all the 14 CPMs locations by using MPLS (Multi-Protocol Label Switching) based WAN (wide area network) and CPM Sub-Offices are connected through VPN. Thus all CPM offices in both Eastern and Western corridor are connected to the DFCCIL's data centre.

To improve Network availability and access speed redundant MPLS connectivity between Corporate Office Data Centre and CPM Offices is under implementation. DFCCIL is considering shifting Data Center to a spacious location along with its capacity augmentation. Also Disaster Recovery Data Center proposal has been initiated.

User Acceptance Testing (UAT) for the system has been completed for all modules. Operational Acceptance phase is under process. Partial Acceptance has already been issued for four Modules i.e. Land Acquisition Information System Module, Geographical Information System Module, Portal and Document Management System. Operational Acceptance testing of Human Resource Management System Module has been completed by HR Department and they are working regularly through SAP. Finance Module is also under advanced stage of Testing & Development. All the payments (except Major Contracts) are being made through ERP system.

DFCCIL is now undergoing the final stage of ERP implementation. Almost all the work is being done in the ERP system at Corporate Office. In CPM Offices all Modules are being used except for PMS Module which is in the process of being implemented. DFCCIL's Payroll is being generated from the ERP system since Feb, 2014.

Almost all DFCCIL employees have been provided SAP License with ESS (Employee Self Service) rights. Thus through the Portal each employee can access his pay slip, apply for leave and access various user manuals and other information as well. Employees can file their property returns online. All posting and transfer orders are generated through the SAP-ERP System.

The Project Contractors and Project Management Consultants are also accessing the SAP-ERP System through VPN for online submission of bills. Since SAP implementation is a dynamic process, any future requirements will be taken care with the help of users.

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## CHAPTER-VII

### Risk Management

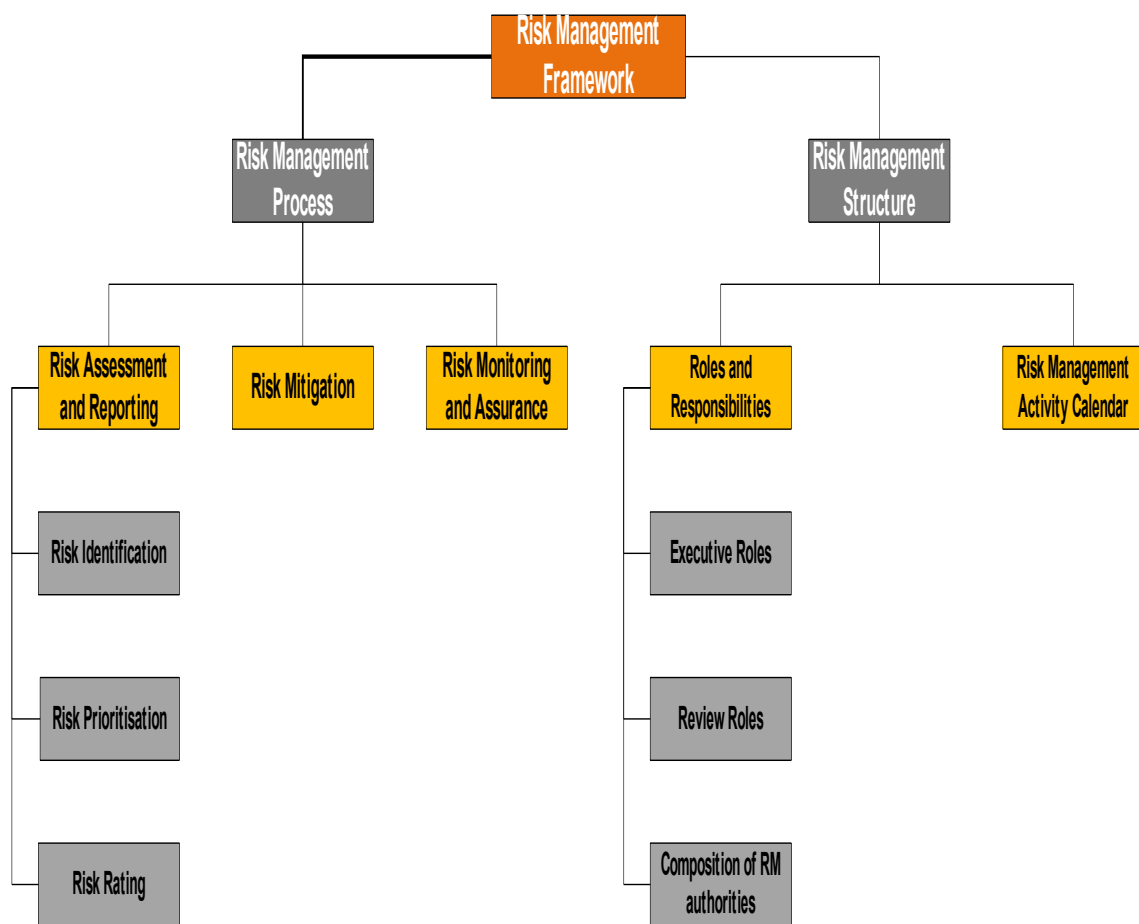
#### 7.0 Risk Management

7.1 A key factor for an organization's capacity to create sustainable value is the risks that the organization is willing to take at the strategic and operational levels and its ability to manage them promptly and efficiently. An organization's capability to identify and manage the risks in a competent manner is a critical aspect of corporate governance. Risk management is a structured process which enables an organization to address the risks existing in its various activities with the goal of achieving desired benefit from these activities. It increases the probability of success and reduces both the probability of failure and the uncertainty of achieving the organization's overall objective.

7.2 A mammoth project at the scale of DFCCIL requires a robust risk management framework to mitigate various risks involved during Planning, Construction and Operation stages. DFCCIL in its mission statement aims to build a corridor that enables Indian railways to regain its market share of freight transport by creating additional capacity and guaranteeing efficient, reliable, safe and cheaper options for mobility to its customers. Thus, the objective of risk management in DFCCIL is to maintain smooth operations as well as an environment that enables optimum utilization of resources and thereby, ensuring best transportation services at reasonable prices. Recognizing the need to have a robust Enterprise Risk Management Framework for DFCCIL, which aligns to leading standards and applicable regulations, integrates with DFCCIL strategic plans & business initiatives and builds capability, the colossal task of development of 'Risk management framework' has been taken up by the Finance & Accounts team of DFCCIL under the able leadership of Director- Finance. A core group has been formed for the development of the risk management framework and GGM-Risk Management has been assigned the responsibility to head the core group. The task was outsourced to worldwide leading consultancy firm in this field namely M/s Ernst & Young LLP.

#### 7.3 Risk management framework (RMF)

Ernst & Young LLP after detailed discussion with various stake holders prepared a draft of Enterprise Risk Management Framework for DFCCIL, which had been approved by the Audit Committee of Board of DFCCIL and finalized in consultation with competent authorities of DFCCIL and process of Implementation of Risk Management Framework within the DFCCIL has already been started from 01.10.2015. In this regard, 2 resources for the post of RMCO taken from Ernst & Young LLP to implement the said RMF within the DFCCIL which is as under:



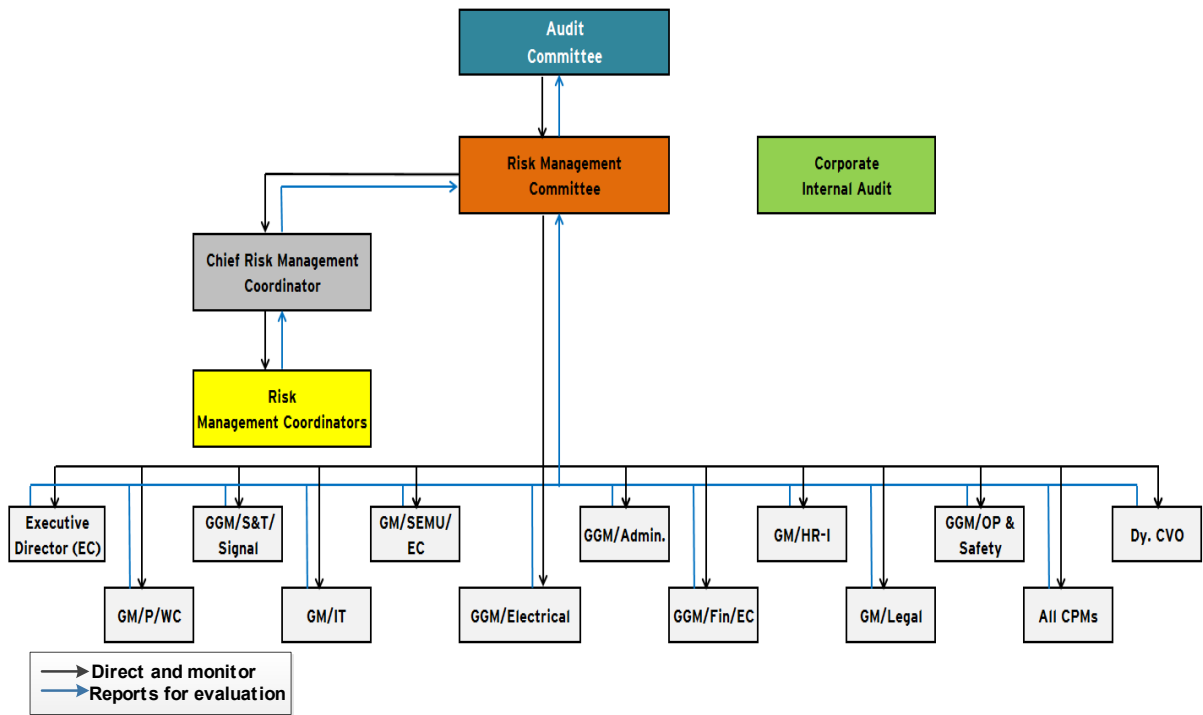
A robust risk management framework assists DFCCIL in:

- Early assessment of risks/challenges likely to affect various activities of DFCCIL
- Viewpoint of major vs minor risks, enabling the organization to identify key risks on which organization resources can be used to ensure minimization of their materialization
- A monitoring framework to develop and implement mitigation plans to counter the impact of possible risks
- Forum for senior management to keep track of organization risk profile and their mitigation plans

and it also assist DFCCIL in systematic review to better understand the level of risk embedded within the organization strategy, processes and activities. This allow DFCCIL to recognize and prioritize significant risks and identify the weakest critical controls that may exist, and develop-implement-monitor mitigation plans for them.

#### 7.4 Risk Management Structure

The Risk Management Structure is basically the organization structure of the risk Management within DFCCIL and inter-alia defines the responsibilities of various department / executives for identifying, prioritization and mitigating the risks. The organization's Risk Management Structure at present, is as under:



### 7.5 Composition of Risk Management Authorities

Authority	Composition
Risk Management Committee	GM/Fin./RM (Convenor), GM/CO/WC, GGM/CIVIL
Risk and Mitigation Plan Owners	Corridor-wise functional heads- GGMs/ GMs and CPMs
Corporate Internal Audit	DFCCIL internal auditors
Chief Risk Management Coordinator	AGM/Fin-II
Risk Management Coordinators (RMCO)*	The role of RMCOs are being performed by one DGM , against the three personnel from risk management department (responsible for both the corridors) RMCO 1: Civil, Electrical, S&T RMCO 2: SEMU, Operations & BD, HR, Admin RMCO 3: Finance, IT, Legal, Vigilance

### 7.6 Risk Management Process

- (i) Risk Management Process is the process through which Risks are identified, its prioritization and mitigation is done and reporting through structured MIS is achieved. During the Concurrent Risk Assessment Phase of Risk Management Process, DFCCIL has identified and prioritized Top 20 risks for Planning & Construction stage based on deliberation with various stake holders and Senior Management of the DFCCIL and now in the process of Self-Assessment of Implementation of Mitigation Plans and Status for those top 20 -risks. Top 20 risks identified and prioritized as per the Concurrent Risk Assessment Phase are as under:

## Top 20 risk: Planning & Construction Stage

1	Inadequate management of procurement of goods/services/works (Issues related to Procurement)
2	Possible increase in scope of work of contractors
3	Delayed construction of corridors
4	Delay/ difficulty in construction of RUBs/ROBs (Issues pertaining to construction of RUBs/ ROBs)
5	Resettlement and Rehabilitation Policy (RRP) benefit distribution
6	Non-compliance to applicable laws/regulations (Legal Risks other than statutory)
7	Problems in dovetailing of IR assets at junction and relocating of IR assets
8	Limited clarity on roles and responsibilities
9	Increased cost/ budget overrun in DFCCIL
10	Ineffective IT infrastructure (IT related issues)
11	Delayed in handing over of encumbrance free ROW to contractors
12	Possible Conflict with IR on select issues
13	Damage to the environment
14	Inadequate management of contractors (Issues related to contract management)
15	Delay/ inability to obtain clearances/ approvals from various authorities
16	Non-compliance of the statutory requirements
17	Inadequate management of accounting & taxation matters within DFCCIL (Accounting and Taxation related risks)
18	Delay in implementation of SAP-ERP
19	Risk owing to natural calamities
20	Inadequate internal controls within DFCCIL process & procedures

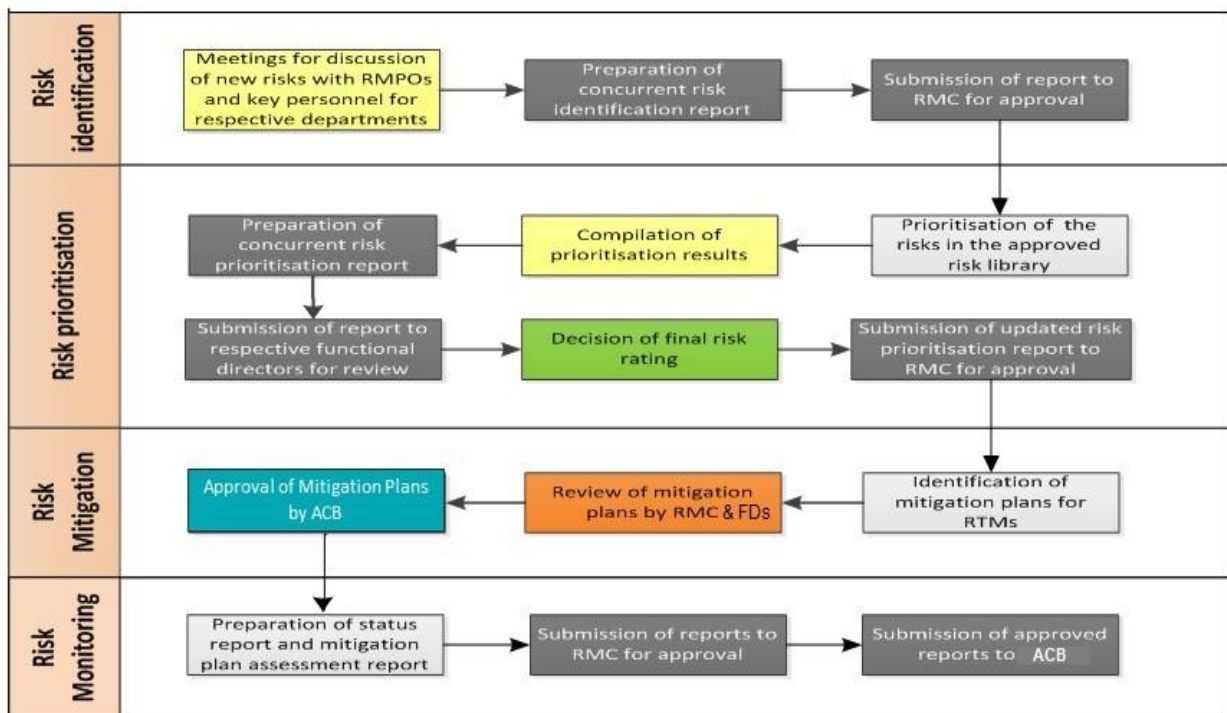
- (ii) At the starting point DFCCIL, had identified Top 20 risks for Operation Stage also, based on deliberation with various stake holders and Senior Management of the DFCCIL and detailed out the Mitigation Plan for those top 20 -risks. Top 20 risks identified for Operation Stage, as per the framework, are as under:

## Top 20 risk: Operation stage

1	Possible Conflict with IR on select issues
2	Accidents and Mishaps
3	Poor public image of DFCCIL
4	Inefficient departmental working hampering smooth operations
5	Inadequate human resources management (Issues pertaining to HR)
6	Inability to retain customer base
7	Non achievability of revenue targets

8	Delay in redressal of complaints
9	Fraud
10	Inadequate control over asset/stock (Theft, damage etc.)
11	Inadequate maintenance of KPIs
12	Inadequate technological infrastructure (Technological risks)
13	Inadequate internal controls within DFCCIL process & procedures
14	Inadequate management of external funds (Funding risks)
15	Delay in procurement/ shortage of maintenance materials/ equipment
16	Noncompliance to applicable laws/regulations (Legal Risks)
17	Inadequate management of accounting & taxation matters within DFCCIL (Accounting and Taxation related risks)
18	Delay in updation of operating policies and manuals
19	Limited clarity on roles and responsibilities within DFCCIL
20	Difficulty in booking traffic

(iii) After the risks have been identified & prioritized mitigation plans have to be implemented to mitigate such risks. This should be done once in a year and a review undertaken on half yearly basis to ensure that the risk is relevant and the mitigation plan is actually implemented and is effective. In this regard, DFCCIL has completed the ground work for Risk Assessment and Reporting through the Concurrent Risk Identification (meeting mode) and Concurrent Risk Prioritization (meeting mode) and at present in the process of Self-Assessment of Implementation of Mitigation Plans and Status. Concurrent Risk Assessment and Reporting process is as under:





Key	Activities performed/Document prepared by
	Risk Management Coordinator (RMCO)
	Risk Mitigation Plan owner (RMPO)
	Chief Risk Management Coordinator (CRMCO)
	Risk Management Committee (RMC)
	Functional Directors(FD)
	Audit Committee of Board(ACB)

## 7.7 Periodic Review of the Risk Management Framework

The status of Risk Management Framework is being regularly coordinated by the AGM/Fin -II (CRMCO) in association with the Risk Management Coordinators (RMCOs) which is further reviewed by the Risk Management Committee (RMC) and the Audit Committee at regular intervals. The summary of review and Risk Management Committee meetings held till date is as under:

- a. Five review meetings have been held till date at CRMCO level on 16<sup>th</sup> September 2015, 16<sup>th</sup> October 2015, on 21<sup>st</sup> January 2016, on 27<sup>th</sup> January 2016 and on 16<sup>th</sup> March 2016 respectively.
- b. Four RMC meetings have been held till date on 16<sup>th</sup> May 2016 , 24<sup>th</sup> May 2016, 03 nov,2016 ,30 March , 2017 and 8<sup>th</sup> September ,2017 respectively.
- c. To enhance the ability of the Risk and Mitigation Plan Owners (RMPOs) two half days Knowledge Transfer Sessions were held on 09<sup>th</sup> February 2016 and 26<sup>th</sup> February 2016 and two full days Knowledge Transfer Sessions conducted on 27<sup>th</sup> June 2016 and 28<sup>th</sup> June 2016 for the officials reporting to RMPOs.
- d. In the light of Audit Committee's directives vide minutes of the 32<sup>nd</sup> Audit Committee a review of the progress made till date was presented before the 33<sup>rd</sup> Audit Committee meeting held on 18<sup>th</sup> July 2016 in the form of presentation. Audit Committee further directed to put up the status before the Board and the same was also presented before the Board in the Board of Directors' meeting held on 26<sup>th</sup> July 2016.
- e. Risk Management Committee also decided that after completion of award by the E & Y, the work would now be done 'in house' as a regular DGM/RM has already been posted in DFCCIL.
- f. Risk Management Committee also decided that the calendar for the year 2016-17 (starting from 01-10-2016 to 30-09-2017) would be quarterly one i.e. at the end of each quarter and generated in the month of December, March, June and September.

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## CHAPTER – VIII

### SOCIAL AND ENVIRONMENTAL MANAGEMENT

**8.1** As per provisions of National Rehabilitation and Resettlement Policy (NRRP) -2007, The Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement Act (RFCT-LARR) – 2013 and Operation Policies of the World Bank and JICA, Social Impact Assessment (SIA) and Environment Impact Assessment (EIA) is required to be carried out to reduce and manage project technical risk and to ensure that social issues are thoroughly evaluated in decision making. SIA provides a platform for the participation of stakeholders in project design/planning and have been an important instrument for building ownership among local populations, which put forward the likely impacts and mitigation measures. The objective of social management is to apprise project proponent about the policies, to prevent and mitigate undue harm to people in the development process. SIA study is being conducted with the following objectives:

- i. To minimize involuntary resettlement, exploring all viable project alternatives;
- ii. Where involuntary resettlement is unavoidable, assess the magnitude of adverse social impacts and propose mitigation measures;
- iii. Hold consultations with the project stakeholders and ensure that the outcome of these consultations are assimilated in social management framework;
- iv. To ensure adequate R&R package and expeditious implementation of rehabilitation process, with the active participation of affected families.
- v. Develop institutional mechanism for planning, implementing and monitoring the process and the R&R activities;
- vi. Address other social issues (resulting from the proposed project interventions) related to vulnerable groups (including tribal population)
- vii. To provide better standard of living and providing sustainable income to PAPs.
- viii. Special drive to educate PAPs regarding Grievance Redressal Mechanism.

#### **8.2 Identification of Impact**

The census and baseline socio economic survey establishes likely social impacts of projects. Some key aspects to be included in the survey are size of land holding, economic well-being including annual income, employment/livelihood, indebtedness, educational status of the school going population, living conditions including type and side of housing, fixed and movable assets, problems arising among the affected population (declining crop yields, high incidence of disease, and decline in family income) requiring remedial action.

Key indicators for measuring the impact of land acquisition and physical relocation includes health and welfare of affected population and the effectiveness of impact mitigation measures, including livelihood restoration and development initiatives. In addition to these quantitative indicators, impact monitoring will involve the use of qualitative indicators to assess the satisfaction of PAPs with LA and R&R process and the adequacy of these initiatives, especially with functioning of the grievance redressal mechanism, consultation and people's participation, transparency and accountability in the LA and R&R process, information dissemination and communication with the affected population.

#### **8.3 Land Acquisition, Compensation and Rehabilitation & Resettlement benefits**

Land is being acquired by DFCCIL on behalf of Indian Railways (Government of India). IR is the custodian of land and all facilitating work is being done by DFCCIL. The land shall be given to DFCCIL on lease terms as per Concession agreement.

- a. Land is being acquired by Competent Authority (CA), who is generally State Government Revenue officer, nominated by MoR through Gazette notification.
- b. Notification under various sections of RAA 2008 for land acquisitions are being done by MoR.
- c. Land compensation is prepared by the Competent Authority (CA) based on the provisions of RFCT-LARR 2013 supplemented by Entitlement Matrix approved by MoR.
- d. Market value of land is determined as per the RAA 2008. With the passage of “The Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation & Resettlement Act, 2013 followed by the Amendment Ordinance, the provisions of the new act with regard to compensation & R&R are applicable to all acquisition being undertaken by DFCC from 01.01.2015. A new Entitlement Matrix has been issued by Railway Board as per the provisions of the new Act and has come into force from 01.01.2015.
- e. Any person interested in the land may, within the period of 30 days from the date of publication of the 20A notification for declaration of intention of land acquisition, can object to the acquisition of land.
- f. Market value of the building and other immovable property or assets, trees, plants and standing crops attached to the land or building which are to be acquired are determined by specialist persons with their respective fields, who generally happen to be Govt. Functionaries.
- g. Award is declared within one year period from date of notification u/s 20E of RAA 2008. In case of unavoidable circumstances it can be extended by 6 months. Provided further that where an award is made within extended period, the entitled person shall be paid an additional compensation for the delay in making of the award, every month for the period so extended, at the rate of not less than 5% of the value of the award, for each month of such delay.
- h. As per NRRP-2007, in addition to compensation, an ex-gratia amount not less than ₹20000 is being given to each khaddar’s whose land is being acquired.
- i. As per NRRP-2007, PAPs who’re rendered landless or reduced to the status of small or marginal farmer due to land acquisition shall be entitlement to rehabilitation grant equivalent to 750 days of minimum agricultural wages.
- j. As per RFCT-LARR 2013, choice of annuity will be provided to affected family wherein they can opt for annuity that shall pay not less than ₹ 2,000 per month per family for twenty years (with appropriate indexation to the Consumer Price Index for agricultural labourer) or one time financial assistance of ₹ 5,00,000 per affected family.
- k. As per RFCT-LARR 2013, one time financial assistance of not less than ₹ 25,000 will be granted to artisan, small traders, and certain others. Each affected family will also be granted one time resettlement allowance of ₹ 50,000 and transportation allowance of ₹ 50,000.
- l. The CA may take inputs from the independent evaluator before deciding the compensation for the land who can assist to assess the replacement cost of land as follows and provide inputs to the CA:
  - (i) Appraise recent sales and transfer of title deeds and registration certificates for similar type of land in the village or urban area and vicinity.
  - (ii) Appraise circle rate in urban and rural area and vicinity.
  - (iii) Appraise agricultural productivity rate for land - 20 years yield.
  - (iv) The compensation for houses, buildings and other immovable properties are being determined on the basis of replacement cost by referring to relevant Basic Schedule of Rates (BSR) as on date without depreciation. While considering the BSR, the independent evaluator registered with the Govt. will

use the latest BSR for the residential and commercial structures in the urban and rural areas of the region, and in consultation with the owner.

- (v) Institution of Ombudsman and Arbitrators have been put in place to adjudicate upon R&R benefits and land compensation respectively in case these institutions are approved by PAPs.

#### **8.4 Special R&R benefits to Schedule Tribes and BPL**

As per World Bank Operation Policy 4.10, a separate tribal development plan has to be prepared after having separate consultations with the affected tribal community. Each affected ST family shall get an additional one time financial assistance equivalent to five hundred days minimum agricultural wages for loss of customary rights or usage of forest produce. Each BPL family shall get an additional one time financial assistance equivalent to 300 days minimum wage.

#### **8.5 Monitoring and Evaluation**

M&E will focus on effective implementation of Resettlement Action Plan (RAP), physical progress of land acquisition, disbursement of compensation, public consultations and participation activities, sustainable income restoration and other development activities. The objective of monitoring is to provide feedback on RAP implementation and to identify problems and provide suitable solution as early as possible in order to allow smooth implementation arrangements of RAP. For these reasons, monitoring and evaluation of LA, R&R activities have been delineated in the RAP and will be integrated into the overall project management process. The monitoring plan identifies organizational responsibilities, methodology, and schedule for monitoring and reporting. Three components of monitoring plan include: Performance monitoring, impact monitoring and end term evaluation or completion audit. For this purpose Social & Environmental Safeguard Monitoring & Review Consultant (SESMRC) shall be taken.

#### **8.6 Completion Audit/End Evaluation**

DFCCIL will undertake a mid-term evaluation by an independent third party after two years of commencement of the project and end evaluation in the final year of project to assess whether the outcome of the RAP complies with the involuntary resettlement policy. The key objective of this external evaluation, or completion audit, will be to determine whether the efforts made to restore the living standards of the affected population have been properly conceived and executed. The audit will verify how far the physical inputs committed in the RAP have been delivered and the services have been provided. In addition, the audit will evaluate whether the mitigation actions prescribed in the RAP have had the desired effect. The socioeconomic status of the affected population will be measured against the baseline conditions of the population before displacement, established through the census and socioeconomic studies. This evaluation will be undertaken after all RAP inputs including payment of compensation and R&R assistance have been paid and other supplementary development initiatives have been completed prior to project closure. This evaluation will enable DFCCIL to undertake corrective actions, if any, as recommended by evaluation before the project is complete. The third party impact assessment will be carried out at least twice during the project cycle including the end term evaluation.

#### **8.7 Resettlement Policy Framework**

There is a Resettlement Policy Framework (RPF) providing guidelines for identification and managing social impacts. The LA and R&R Policy including Entitlement Matrix and the implementation arrangements has been elaborated in the RPF, which will apply to the mitigation of any additional impacts identified during the implementation, that may be

assessed in advance of undertaking civil work for that activity as per the terms of references adopted for carrying out social impact assessment for preparing this RAP. This procedure will also be applicable for any new or associated activities linked to this project.

## **8.8 Corporate Environment Policy.**

DFCCIL has adopted a Corporate Environmental Policy to adopt not only an environment friendly mode of transport system but also takes initiatives in each aspect of it working to foster growth and sustenance of healthy environment. The corporation is thus committed towards compliance of all regulations and guidelines relating to environment. It is also our endeavor to adopt-

- i. Integrated Environment Management and Practices
- ii. To exhibit sensitivity towards environmental responsibilities and conduct our activities accordingly.
- iii. Efficient utilization of energy resources.
- iv. Associate in direct activities towards environmental improvement through development of green belt and conservation of water resources.
- v. Make efforts for preservation of ecological balance & heritage.
- vi. Mitigate measures for noise, vibration and waste pollution.
- vii. Sensitize human resource of the corporation towards environmental needs.
- viii. Sustain improvement of environmental performance of the organization.

### **8.8.1 Current Initiatives in Environmental Management**

1. Dedicated Freight Corridor Corporation of India Ltd. (DFCCIL) was set up to plan and develop, mobilize finances, construct, maintain and operate dedicated rail freight corridors. Proactive approach has been adopted by DFCCIL in selecting alignments carefully to avoid/minimize damage to the environment thereby avoiding sensitive areas of wildlife, forest land and associated social impacts. Environment protection and safety in the process is of utmost importance.
2. DFC alignment is passing through 9 states in the country. On Eastern Corridor, DFC alignment passes through the states of West Bengal, Bihar, Jharkhand, Uttar Pradesh, Haryana and Punjab while the Western Corridor will traverse the distance from Dadri in Uttar Pradesh to Mumbai-Jawaharlal Nehru Port (JNPT), passing through the states of Uttar Pradesh, Haryana, Rajasthan, Gujarat and Maharashtra. All the states have a variety of environmental features that fall within the alignment.
3. DFCCIL formulated its Corporate Environment Policy in 2011. As a good Environmental Management practice, land acquisition including forest land diversion have been kept minimum possible. Alignment through Wildlife sanctuary, National Park, Eco-Sensitive Zone, Wetland, Coastal Regulated Zone (CRZ) have been avoided as far as possible and very little of such sensitive areas have been included in the project area where it was unavoidable.
4. Environment Impact Assessment (EIA) is critical for obtaining Environmental Clearance (EC) as per EIA Notification dated 14.09.2006. Though Railway project is exempted from Environmental Clearance (EC) as per EIA Notification dated 14.09.2006, DFCCIL got Environment Impact Assessment (EIA) conducted for its DFC project sections, prepared Environmental Assessment (EA) report & Environmental Management Plan (EMP) and submitted to the funding agencies for their approval. All the contractors are also to develop site/project specific Environment Management Plans during construction phase, besides obtaining statutory / regulatory clearances wherever applicable and observing the respective statutory laws.

5. Climate Change Risk Impact Assessment of the DFC project in the sections, Mughalsarai-Bhaupur and Khurja-Pilkhani, was conducted to assess the impact of environmental changes in the long term on the project.
6. Corporate Safety, Health and Environment Policy were formulated in 2012. Safety, Health and Environment (SHE) Manual of DFCCIL was approved in 2013 and is a part of all works tenders providing the minimum yardstick on the project safety and health issues. Contractors are being made to commit for implementation of all the SHE provisions.
7. As a responsible corporate entity, DFCCIL undertook study of Green House Gas emissions saving with implementation of eco-friendly electrified bulk goods movement DFC projects. The study has revealed that DFCCIL is projected to save 6.11 million ton CO<sub>2</sub> equivalents in 2016-17 which will increase to 27.23 million ton CO<sub>2</sub> equivalents by 2041-42. The timely completion of the project would enable the project to share its responsibility in the overall effort to reduce carbon footprint of the nation.
8. DFCCIL has taken pre-project statutory clearance under various environmental, forest acts such as Wildlife (Protection) Act 1972, Forest (Conservation) Act 1980, Taj Trapezium Zone, Eco-Sensitive Zone besides the clearance for an ASI monument under Ancient Monuments and Archaeological Sites and Remains (Amendment and Validation) Act 2010.
9. To ensure close monitoring of implementation of EMP during construction a Social & Environment Safeguard Monitoring and Review Consultants are being engaged for the period of construction. This would help the organization to ensure the presence of a third entity to look at the practices being followed at various phases of construction.
10. During the operation phase of DFC necessary measures for amelioration of air, noise and vibration along the newly constructed railway line, effectiveness of the noise barriers, waste and energy use reduction measures shall be taken up by DFCCIL.
11. For capacity building & to sensitize the officials on safeguards measures “Workshop cum Training on Implementation of Environmental & Social Safeguards” is being conducted by SESMRC at project site and corporate office on six monthly intervals.
12. The compliance report for the stipulated conditions under Environmental Clearance of Borrow Area & Consent to Operate for Batching Plants etc are submitted by the Contractor JV under supervision of Project Management Consultant.
13. Plantation is being carried out as per the statutory requirement & contract agreement of the DFCCIL.

### **8.9 Corporate Safety, Health and Environment (SHE) Policy.**

Dedicated Freight Corridor Corporation Ltd. is committed to conduct business with commitment to excellence in Safety, Health and Environment ensuring sustainable development, safe & healthy work environment and pollution free condition at work places. We in DFCCIL shall -

- (i) Establish and maintain effective standards for safety of employees & workers, assets and provide adequate control of the safety, health, pollution risk arising from work activities.
- (ii) Comply with relevant Rules and Regulations on Safety, Occupational Health and Environment Protection.
- (iii) Integrate Safety, Health and Environment and Practices in work activities.

- (iv) Plan, Design, Construct, Operate and maintain all facilities to secure sustained Safety, Health and Environment Protection.
- (v) Create awareness on SHE and develop required level of knowledge & skills in all personnel through need based training, internal communications and continue to enhance the said skills & competence.
- (vi) Make reasonable effort to prevent accident, work related ill health during construction & operation and preservation of ecological balance & heritage

## **8.10 Carbon Footprint of Dedicated Freight Corridor**

### **8.10.1 GHG Emission Analysis – Background.**

The implementation of the DFC is expected to generate two major impacts on the freight movement; shift of freight from road to the low carbon intensive mode rail transport and inherent improvement in energy efficiency of freight rail through adoption of improved technologies. In this context, DFC had undertaken a detail study on Green House Gas (GHG) emission forecasting for 30 year period under two scenarios where one scenario represents implementation and operation of DFC and the other represents absence of DFC and transportation of freight through a mix of existing rail and road network.

### **8.10.2 Outcome of the Study**

2016-17 is considered as the Base Year for forecasting and modelling GHG emissions for a 30 year period (i.e. 2016-17 to 2045-46; however since each 5 year period has been denoted by its reference year in this study, the 30 year period is denoted as between 2016-17 to 2041-42).

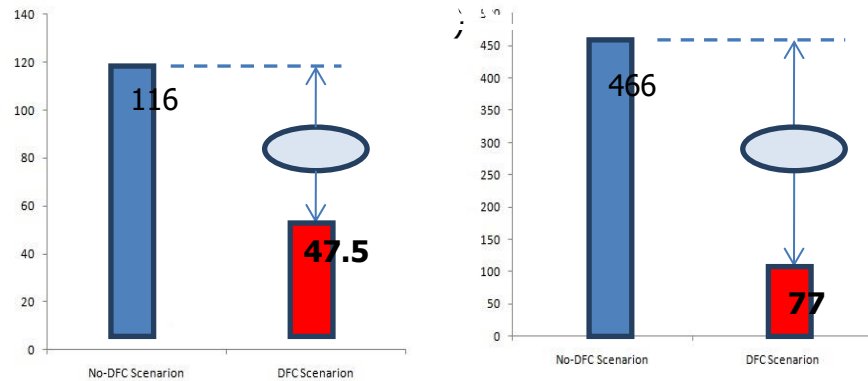
Some of the key outcomes of the study are as below:

- i. In 2016-17, in absence of DFC (i.e. ‘No-DFC scenario’) GHG emissions would have been 8.7 million ton CO<sub>2</sub> while those in case of DFC would be 2.59 million ton CO<sub>2</sub>.
- ii. According to the projection, in 2041-42, GHG emissions under ‘No-DFC scenario’ would have been 33.2 million ton CO<sub>2</sub> while those in case of DFC scenario would be 5.97 million ton CO<sub>2</sub>.
- iii. The GHG emission GAP between No-DFC scenario and DFC scenario increases from 6.11 million ton CO<sub>2</sub> in 2016-17 to 27.23 million ton CO<sub>2</sub> in 2041-42 i.e. almost by 4.5 times.
- iv. Cumulative GHG emissions over the 30 year period in the No-DFC scenario would have been 582 million ton CO<sub>2</sub> while in the DFC scenario it would be 124.5 million ton CO<sub>2</sub>. This demonstrates that in absence of DFC implementation approximately 4.5 times more GHG would be emitted in 30 year period for freight transportation in the Eastern and Western Corridor.

The Eastern DFC would produce less GHG emissions as compared to the Western DFC since the Western DFC would cater to a higher volume of traffic load than the Eastern DFC. Coal and iron-ore transportation are the major contributors to the GHG emissions of the Eastern DFC while container and RO-RO transportation are the major contributors of the GHG emissions of the Western DFC.

On a cumulative basis (over 30 years), in the Eastern Corridor, the No-DFC scenario produces 2.5 times more GHG emissions than the DFC scenario while for the Western Corridor, the No-DFC scenario produces 6 times more GHG emissions than the DFC scenario as depicted in following chart.

# Carbon Footprints of



As per the study Green DFC will save 457 million tonnes of CO2 in 30years.

### 8.10.3 Initiatives by DFC for low carbon intensity

DFC intends to follow a low carbon path adopting various technological options which can help DFC to operate in a more energy efficient fashion and at the same time explore options to offset its own GHG emissions by investing in low carbon assets such as solar power, wind power and afforestation. Some of the interventions which could reduce GHG emissions are communication based train control (CBTC), driver advice system, regenerative braking, aerodynamic profiling in rolling stock and on-board lubrication system. DFC project team is working closely with various experts and technology suppliers to assess feasibility of implementing these ideas for low carbon growth.

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## CHAPTER –IX

### OTHER INITIATIVES

#### 9.1 CORPORATE COMMUNICATIONS

Corporate communication plays a vital role in creating and maintaining the business image of any corporate entity. It is an effective strategy to communicate the brand value and reputation to its clients, stakeholders and the target audience. There are many processes of corporate communication with which one can create the desired business impact.

As a public sector corporate entity Dedicated Freight Corridor Corporation of India Ltd. (DFCCIL) understands the role and importance of Corporate Communication and this clearly reflects in its efforts for a good communication. A team consisting of experienced officers and skilled professionals take care of the department of Corporate Communication. This team is led by a GM level officer who undertakes various initiatives for a better communication inside as well as outside the organization. General public relation activities like sending Press Releases, organizing Press Conferences on important occasions, printing of Publicity Material and House Journal etc. are undertaken by the department. Apart from this, other routine exercises like publishing of tender notices, notifications and other classified advertisements are also done by the Corporate Communication team.

The nature of DFC project demands high need of communication as it involves many stake holders who may directly or indirectly affect the objectives of the company. Since it is a linear project and is spread in thousands of villages of several states, the need of the communication starts right from the process of land acquisition and continues even after the completion of the project. For the effective execution of the Corporate Strategy it was important to adopt as systematic approach. The DFCCIL appointed an agency to assess its communication needs. On the basis of recommendations of the Communication Needs Assessment (CNA) Report, a comprehensive Communication Strategy and Action Plan was prepared for DFCCIL. The Action plan is being implemented by the concerned departments and many remarkable achievements have been made in this regard so far. Several other plans are in pipeline, which can be summed up in following points:

**1. Using Social Media for effective communication:** With the increasing number of internet users and growing popularity of Social Media, communication strategy must include use of platforms like Facebook, Twitter and Youtube etc. DFCCIL acknowledges the importance of Social Media and has already started sharing information, updates, images and videos on its official Facebook page, Twitter handle and Youtube channel. This will help any visitor to get latest information and watch videos of the DFCCIL. It provides unique advantage of two way communication which is lacking in traditional media.

**2. DFCCIL website:** The website of DFCCIL is the main gateway of information for internet users. DFCCIL strives to put all important information which need to be disseminated among general public so that they should be well informed about DFCCIL and at the same time transparency is maintained on the project activities and developments. As part of efforts of improving the website and make it more user friendly, DFCCIL has planned to give it a refreshing look and make it interactive.

**3. Corporate Film on DFCCIL:** DFCCIL has made a Corporate Film which includes general information; progress of project etc. to help the viewer to get a complete picture of the project as real visuals from the locations have been used in the film.

**4. Regular Interaction with the Media:** Media plays an important role in making a good brand image of an organisation. It is very important to keep the media always updated by sending the Press Releases on any important development of the project. DFCCIL directly interacts with media by organizing Press Conference once or twice in a year. This gives Media an opportunity to interact with DFCCIL officials on the project and at the same time it also helps DFCCIL to reach people via media.

**5. Training & Workshop on Communication:** DFCCIL executes its Corporate Plan through nominated PR staff working in different field units. The staff involved in PR activities need to be trained on new practices of communication and should be updated on the communication strategy which keeps on changing according to time and situations. For this, workshops and training sessions are being organized by DFCCIL regularly.

To summarize the Corporate Communication Plan of DFCCIL, it can be said that the planning is need based. DFCCIL reviews its communication strategy on regular basis based on the feedback of the efforts, while the goal remains unchanged.

## **9.2 Whistle Blower Policy**

DFCCIL believes in conduct of its affairs with highest standards of professionalism, honesty and integrity and is committed to ensure ethical behaviour by all its employees. The company, therefore, believes in creating a culture where it should be safe for all employees to raise concerns about any unethical practices or misconduct. Accordingly Whistle Blower policy has been adopted in the organization. This policy provides a framework to enable employees wishing to raise a concern about serious irregularities within the Company without fear of victimisation and covers protected disclosures by employees of DFCCIL including those on deputation. The Policy covers malpractices or unethical behaviour involving:

- a. Demanding and/or accepting gratification other than legal remuneration in respect of an official act or for using his influence with any other official.
- b. Obtaining valuable thing, without consideration or with inadequate consideration from a person with whom he has or likely to have official dealings or his subordinates have official dealings or where he can exert influence.
- c. Obtaining for himself or for any other person any valuable thing or pecuniary advantage by corrupt or illegal means or by abusing his position as a public servant.
- d. Cases of misappropriation, forgery or cheating or other similar criminal offences.
- e. Negligence causing substantial and specific danger to public health and safety.
- f. Manipulation of company data/records.
- g. Financial irregularities, including fraud, or suspected fraud or such other criminal offence.
- h. Any other unethical behaviour or misconduct

While DFCCIL will ensure that genuine Whistle Blowers acting in good faith are accorded protection against victimization or unfair treatment for “Protected Disclosures” under this policy, any abuse of the Policy by way of deliberate and false or bogus allegations made with mala fide intentions shall invite appropriate and severe disciplinary action.

## **9.3 Rajbhasha**

In DFCCIL, special emphasis is being given to ensure maximum use of Hindi in official dealings i.e. in office notings and communication among constituents. Official Language Implementation Committee meets every quarter. Members of the Railway Hindi Salahkar Samiti along with the senior officers of DFCCIL participate in such meetings to review

the work of official language. At the end of each quarter, quarterly progress report regarding use of Hindi is prepared and sent to Railway Board and Nagar Rajbhasha Implementation committee( A committee constituted under the Ministry of Home Affairs) for necessary action.

During the Pakhwada different competitions like Hindi word knowledge, Hindi Essay, Hindi Typing and Rajbhasha quiz and cultural programs are organised in which officials from all level take part enthusiastically. Hindi workshops are also organized regularly in an effort to inculcate the habit of doing more and more work in Hindi by the officers and staff of DFCCIL to ensure the compliance of Section 3(3) of Official Language Act, all the office orders, land acquisition and gazette notifications are issued in Hindi and English bilingually. The HR Manual and Manual of Office procedure has also been translated in Hindi. The website of DFCCIL is also updated in Hindi regularly. In DFCCIL website a separate **Tap** has also been provided for Rajbhasha.related information and activities.

**9.4 List of Manuals and Documents:**In order to set up systems and procedures on DFCCIL, an upcoming organization, following manuals and references have been made available to DFCCIL officials for guidance:

- (i) Quality Manual
- (ii) Manual of Office Procedure
- (iii) HR Manual
- (iv) Works Manual
- (v) Financial Reporting Manual
- (vi) Accounting Manual
- (vii) Vigilance Manual
- (viii) Audit Manual
- (ix) JICA and WB's Procurement Guidelines,
- (x) IT Based ERP
- (xi) Schedule of Power
- (xii) Safety, Health and Environment Manual
- (xiii) Railway Amendment Act 2008

These are being updated and addition is made in the list based on experience and requirements.

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## Glossary of Terms

ADM	Additional District Magistrate
BoD	Board of Directors
CPM	Chief Project Manager
CR	Central Railway
DMIC	Delhi - Mumbai Industrial Corridor
DPE	Department of Public Enterprises
ECoR	East Coast Railway
EDFC	Eastern Dedicated Freight Corridor
EOI	Expression of Interest
ER	Eastern Railway
ERP	Enterprise Resource Planning
EXIM	Export – Import
GM	General Manager
GTKM	Gross Tonne Kilometre
HSIIDC	Haryana State Industrial and Infrastructure Development Corporation
IBRD	International Bank for Reconstruction and Development
ICD	Inland Container Depot
IDA	International Development Association
IR	Indian Railways
JNPT	Jawaharlal Nehru Port Trust
LAN	Local Area Network
MMLP	Multi Modal Logistics Park
MoR	Ministry of Railways
MoU	Memorandum of Understanding
NCR	National Capital Region
NCR	North Central Railway
NGO	Non-Government Organization
NR	Northern Railway
NTKM	Net Tonne Kilometre
NWR	North Western Railway
O&M	Operation and Maintenance
PAP	Project Affected Persons
PETS	Preliminary Engineering cum Traffic Survey
PIU	Project Implementation Unit
POL	Petroleum-Oil-Lubricants

RAP	Resettlement Action Plan
RINL	RashtriyaIspat Nigam Ltd
RITES	Rail India Technical & Economic Services
S&T	Signal & Telecommunication
SCR	South Central Railway
SECR	South East Central Railway
SEMU	Social Environment & Management Unit
SER	South Eastern Railway
SEZ	Special Economic Zone
SPV	Special Purpose Vehicle
SR	Southern Railway
WAN	Wide Area Network
WCR	West Central Railway
WDFC	Western Dedicated Freight Corridor
WR	Western Railway

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