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पावर ग्रिड कारपोरेशन ऑफ इंडिया लिमिटेड
(भारत सरकार का उद्यम)



POWER GRID CORPORATION OF INDIA LIMITED
(A Government of India Enterprise)

केन्द्रीय कार्यालय: "सौदामिनी" प्लॉट सं. 2, सेक्टर-29, गुडगाँव-122 001, (हरियाणा) दूरभाष: 0124-2571700-719, फ़ैक्स : 0124-2571762,
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C/CP/ IAI/ISS, NR-WR(B)/ WR/421

Date: 29th December 2014

MEMORANDUM

Sub: **Investment approval for Inter-Regional System Strengthening Scheme in WR and NR (Part-B)**

The Board of Directors of POWERGRID, in exercise of powers delegated to it by the Department of Public Enterprises (DPE), Ministry of Heavy Industries and Public Enterprises, Government of India through its Office Memorandum No. 26(3)/2005-GM-GL-92 dated 1st May, 2008 and Office Memorandum No. DPE/11(2)/97-Fin. dated 22nd July, 1997 (modified subsequently through Office Memorandum No. 18(24)/2003-GM-GL.64 dated 5th August, 2005), have accorded investment approval for **Inter-Regional System Strengthening Scheme in WR and NR (Part-B)** in its 308th meeting held on 24th December, 2014, as per details given below:

1. Scope of Project

Scope of work covered under the project is attached at **Annex-I**.

2. Project Cost and Funding

Estimated cost of the project is **₹6517.36 Crore** (including IDC of **₹403.93 Crore**) based on **October, 2014 price level**. The abstract cost estimate is attached at **Annex-II**.

The project is proposed to be funded through Asian Development Bank (ADB) Loan/ Domestic Borrowings/ External Commercial Borrowings (ECBs) and POWERGRID's Internal Resources with Debt : Equity ratio of 70:30.

3. Implementation Schedule

The project is scheduled to be commissioned within 40 months progressively from the date of approval of Board of Directors.

This is issued in pursuance of 308th meeting of Board of Directors of POWERGRID held on 24th December 2014.

Sh. Priyam/Javed
Make a note for
form & para
AGM (12/15)
12/15

सतीश
29.12.14
(Sathish Kumar J.)
DGM (CP)

Scope of Inter-Regional System Strengthening Scheme in WR and NR (Part-B)

Scope of the project is given below:

Transmission line

- | | |
|---|----------|
| 1) Jabalpur Pooling station - Orai 765 kV D/c line | : 419 km |
| 2) Orai – Aligarh 765kV D/c line | : 300km |
| 3) Orai – Orai(UPPTCL) 400kV D/c (Quad) line | : 38 km |
| 4) LILO of one circuit of Satna-Gwalior 765 kV 2xS/c line at Orai S/s | : 80 km |
| 5) LILO of Agra-Meerut 765 kV S/c line at Aligarh S/s | : 35km |
| 6) LILO of Kanpur – Jhatikara 765 kV S/c at Aligarh S/s | : 35km |

Substation

- 1) Extension of 765/400 kV Jabalpur Pooling Station
 - 765kV
 - Line Bay : 2 nos.
 - Line reactors -330MVAR : 2 nos.
- 2) Establishment of 2x1000MVA, 765/400KV substation at Orai (GIS)
 - 765kV
 - Line Bays : 6 nos.
 - Transformer bays : 2 nos.
 - 1000 MVA, 765/400KV transformer : 2 nos.
 - Bus Reactor bay : 2 nos.
 - Bus reactors -330MVAR : 2 nos.
 - Line reactors -330MVAR : 2 nos.
 - Line reactors -240MVAR : 3 nos.
 - 400kV
 - Line Bays : 2 nos.
 - Transformer bays : 2 nos.
- 3) Establishment of 765kV Switching station (GIS) at Aligarh
 - 765kV
 - Line Bays : 6 nos.
 - Bus Reactor bay : 2 nos.
 - Bus reactors - 330MVAR : 2 nos.
 - Line reactors - 240MVAR : 2 nos.
 - Switchable Line reactor - 330MVAR : 1 no.
- 4) Extension of 765kV Jhatikara substation.

Line reactor at Jhatikara end for Kanpur - Jhatikara 765kV S/c line to be converted into switchable line reactor.
- 5) Extension of 400kV Orai (UPPTCL) substation.
 - 400kV
 - Line Bay : 2 nos.
- 6) Extension of 765kV Gwalior Substation

Existing Line reactor at Gwalior end of Satna-Gwalior line which is to be LILOed at Orai to be converted into switchable line reactor.

Reactive Compensation

		Line length(approx.)	Line Reactor-From bus	Line Reactor-To bus
	Line Reactors			
1.	Jabalpur Pooling station - Orai 765 KV D/c	419km	330 MVAR	330 MVAR
2.	Orai – Aligarh 765kV D/c line	300km	240 MVAR	240 MVAR
3.	Orai – Orai(UPPTCL) 400kV D/c (Quad	38km	-	-
4.	LILO of one circuit of Satna-Gwalior 765 KV 2xS/c line at Orai	80km		
	Existing Satna-Gwalior 765kV S/c	350km	240 MVAR (Switchable)	240 MVAR*
	Satna-Orai 765kV S/c	320km	240 MVAR (Switchable)-To be retained	240 MVAR
	Orai-Gwalior 765kV S/c	130km	-	-
5.	LILO of Agra-Meerut 765 kV S/c line at Aligarh	35km		
	Existing Agra-Meerut 765kV S/c	270km		240 MVAR (Switchable)
	Agra-Aligarh 765kV S/c	130km	-	-
	Aligarh-Meerut 765kV S/c	200km		240 MVAR (Switchable)
6.	LILO of Kanpur – Jhatikara 765 kV S/c at Aligarh S/s	35km		
	Existing Kanpur-Jhatikara 765kV S/c	465km	330 MVAR (Switchable)	330 MVAR (Fixed)
	Kanpur-Aligarh 765kV S/c	330km	330 MVAR (Switchable)	330 MVAR (Switchable)
	Aligarh-Jhatikara 765kV S/c	190km		330 MVAR (presently fixed to be made Switchable)
	Bus Reactors			
7.	2x1000MVA, 765/400KV substation at Orai GIS S/s	2x330MVAR bus reactor		
8.	765KV Switching Station at Aligarh (GIS)	2x330MVAR bus reactor		

* Existing non-switchable line reactor at Gwalior end of Satna-Gwalior line which is to be LILOed at Orai shall be converted into switchable line reactor.

<u>ABSTRACT COST ESTIMATE</u>		
(BASE COST)		
<u>INTER-REGIONAL SYSTEM STRENGTHENING SCHEME FOR WR AND NR - PART-B</u>		
(Cost updated to OCTOBER 2014 price level)		
Sl. No.	DESCRIPTION	AMOUNT (Rs. in Crs.)
A	Preliminary Survey & Soil Investigation	2.77
B	Land Acquisition for Substation and R & R Compensation	63.45
C	Cost of Compensation for Transamission Lines	
	i) Compensation towatds Crop, Tree & PTCC	49.34
	ii) Compensation towards Forest	9.62
D	<u>Civil Works</u>	
	i) Infrastructure for substations	29.00
	ii) Non Residential Buildings	71.13
	iii) Colony for Substation	56.83
E	<u>Equipment Cost</u>	
	a) Trans.Lines	3936.11
	b) Sub-Stations	1311.39
F	Sub Total A TO E	5529.64
G	Incidental Expenditure During construction (IEDC) @ 5% of [F - C(ii)]	276.00
H	Contingencies @ 3% of [F - C(ii)]	165.60
I	Centages & Contingencies @ 8% on Compensatory Afforestation (considering Rs.1,40,000 per Ha) for 72.711 Ha	0.081
J	Customs Duty @ 20.6036% plus 2% handling charges	141.60
K	Overheads payable to SEBs	0.50
	Sub Total (A TO K)	6113.43
L	Interest During Construction(IDC)	403.93
GRAND TOTAL		6517.36

Sl. No.	Risk Parameters	Intermed milestones				Completion	Responsibility Centre*	Remarks
		Milestone-1 (MS1)	Milestone-2 (MS2)	Milestone-3 (MS3)	Milestone-4 (MS4)			
A Award of Major Work Pkgs.								
1	Tower Pkgs.	Award within 1 month of investment approval (IA)					CC, CS Chief Manager (Group G6)	
2	Substation extension Pkgs.	Engg. input for NIT within 1 month of IA	Award within 1-2 months of IA				CC, Engg. / CS Engg.(S/S): Addl. General Manager, CS: Chief Manager (Group G3)	
B Forest Clearance								
1	Submission of Proposal	By Feb 15 (NR-I) April 15 (WR-I)					Region, NR-I & WR-II: Dy General Manager, (PESM), RHQ	
2	Follow-up & approval	Recommendation of State Govt by May 15 (NR-I) & Nov 15 (WR-II)	In-principle approval by June 15 (NR-I) & Jan 16 (WR-II)	Compliance by July 15 (NR-I) & Feb 16 (WR-II)	Final approval by Aug 15 (NR-I) & March 16 (WR-II)	3 months before schedule completion	Region / ESMD NR-I & WR-II Dy General Manager, (PESM), RHQ ESMD: Dy. General Manager	Recommendation/Approval to be given by State Govt./MoEF, so constant follow-up needed to achieve this time line.
C Construction of Transmission Line								
1	Site Mobilisation	Within 2 months from LOA					Region, NR-I & WR-II: Dy. General Manager, Aligarh Dy. General Manager, Orai Dy. General Manager, Jabalpur	Advance expenditure of Rs 76.26 Crore towards preliminary survey, detailed survey (in forest / critical areas) and land acquisition for substations at Aligarh & Orai and Jabalpur Pooling Station (additional land) has been approved by the Board of Director in its meeting held on 13th January, 2014.
2	Stringing	Start within 12-15 months from LOA				Before schedule completion of tower package	Region, NR-I & WR-II: Dy. General Manager, Aligarh Dy. General Manager, Orai Dy. General Manager, Jabalpur	
D Construction of Sub-station								
1	Availability/ Handover of Land	Within 5 months from LOA					Region, NR-I & WR-II: Dy. General Manager, Aligarh Dy. General Manager, Orai Dy. General Manager, Jabalpur	
2	Site Mobilisation	Within 6 months from LOA					Region, NR-I & WR-II: Dy. General Manager, Aligarh Dy. General Manager, Orai Dy. General Manager, Jabalpur	

Note: * Overall in-charge for Responsibility Centre is Head of the respective Region/Department.

Copy for kind information please:

1. PS to Secretary (Power)
2. Chairman, Central Electricity Regulatory Commission 3rd & 4th Floor, Chanderlok Building, 36, Janpath, New Delhi- 110001
3. Chairperson, CEA , R. K. Puram, New Delhi – 110 066
4. CMD, NTPC Limited, NTPC Bhawan, SCOPE Complex, 7 Institutional Area, Lodhi Road, New Delhi-110 003.
5. Chairman, Maharashtra State Electricity Board, Commercial Section, 5th Floor, 'PRAKASHGAD', Bandra (East), MUMBAI- 400 051.
6. Chairman, Head Office Madhya Pradesh State Electricity Board, Shakti Bhawan, Jabalpur-482-008 (MP)
7. Chairman, Gujarat Electricity Board, Vidyut Bhawan, Race Course, Baroda, Gujarat
8. Chairman, Govt. of Goa, Vidhyut Bhavan, Opp. Police Station, Panjim, Goa– 403001
9. Chairman, Chhattisgarh State Electricity Board, PO – Sundarnagar, Dangania, Raipur, Chhattisgarh – 492 013
10. Secretary (Power), Electricity Department, Administration of Dadra Nagar Haveli, U.T. Silvassa – 396 230
11. Secretary (Power), Electricity Department, Administration of Daman and Diu, U.T. Daman – 396 210
12. Commissioner, Power Development Deptt., Govt. of Jammu & Kashmir, Mini Secretariat, Jammu
13. CMD, Himachal Pradesh Power Transmission Corporation Ltd., Barowalia House, Khalini, Shimla-171002
14. Chairman, Punjab State Electricity Board, The Mall, Patiala-147001
15. CMD, Haryana Vidyut Prasaran Nigam Ltd., Shakti Bhawan, sector-6, Panchkula (Haryana) – 134109
16. CMD, Rajasthan State Electricity Board, Vidyut Bhawan, Vidyut Marg, Jaipur-302005.
17. CMD, UPPCL, Shakti Bhawan, 14, Ashok Marg, Lucknow – 226001
18. CMD, Uttarakhand Power Corporation Ltd., Kaulagarh Power House, FRI complex, Dehradun-248006.
19. CMD, Delhi Transco Limited (DTL), Shakti Sadan, Kotla Road, New Delhi-02
20. Chief Engineer, Electricity Deptt., Chandigarh Administration, Mini Secretariat (U.T.), Sector-9, Chandigarh.
21. Advisor, PAMD, Planning Commission, Yojana Bhawan, New Delhi – 110 001
22. Member Secretary, Planning Commission, Yojana Bhawan, New Delhi-110 001
23. Member Secretary, WRPC, MIDC Area, Marol, Andheri East, Mumbai- 400 094
24. Member Secretary, NRPC, 18/A, Shaheed Jeet Singh Sansanwal Marg, Katwaria Sarai, New Delhi-110 016

25. Member (Power Systems), CEA, R.K.Puram, New Delhi –66
26. Secretary, CEA, Sewa Bhawan, R.K.Puram, New Delhi -66 – 03 copies
27. Joint Secretary, Ministry of Statistics & Programme Implementation, Sardar Patel Bhawan, New Delhi.
28. Joint Secretary & Financial Advisor, MoP, Shram Shakti Bhawan, New Delhi
29. Joint Secretary (Transmission), MoP, Shram Shakti Bhawan, New Delhi
30. Joint Secretary (Plan Finance Div.-II), Ministry of Finance, North Block, New Delhi
31. Director (Transmission), MoP, Shram Shakti Bhawan, New Delhi
32. Director, Ministry of Finance (Plan Finance Div.), North Block, New Delhi
33. Deputy Secretary, Cabinet Secretariat, Rashtrapati Bhawan, New Delhi
34. Under Secretary, Finance & Budget Section, Ministry of Powe, New Delhi

सतीश
29.12.14
(Sathish Kumar J.)
DGM (CP)

Important Note:

The Board of Directors desired that the following critical activities be monitored so that Corporate Monitoring Group can provide progress on the same.

- (i) Award of packages progressively from January, 2014.
- (ii) Timely supply of major equipment.
- (iii) Risk Management Matrix indicating various milestones to be monitored for the subject project is attached at **Annex-III**.

Distribution:

CEO, POSOCO

COO (CTU- Planning, FS & CE)

ED : CMG/ ERP/ HVDC and QA&I/ Eggg.- SS, TL & Civil/ Finance/CS & MM / Commercial/ ESMD, LA & CSR/ NRTS-I/ WRTS-I/ **WRTS-II**/ NRLDC/ WRLDC/ NTAMC

GM : Asset Managment

AGM : Law

Company Secretary

For kind information of:

Director (Projects)/ Director (Finance)/ Director (Personnel)/ Director (Operation)/ CVO

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DGM (CP)