

**CENTRAL ELECTRICITY REGULATORY COMMISSION
NEW DELHI**

Petition No. 326/2010

**Coram: Dr. Pramod Deo, Chairperson
Shri S. Jayaraman, Member
Shri V.S. Verma, Member
Shri M. Deena Dayalan, Member**

Date of Hearing: 22.3.2012

Date of Order: 7.9.2012

In the matter of:

Approval under Regulation 86 of Central Electricity Regulatory Commission (Conduct of Business) Regulations 1999 and Central Electricity Regulatory Commission (Terms and Conditions of Tariff) Regulations 2009 for determination of Transmission Tariff for Rihand Transmission System in Northern Region for the period from 1.4.2009 to 31.3.2014.

And

In the matter of:

Power Grid Corporation of India Ltd., Gurgaon

.....Petitioner

Vs

1. Uttar Pradesh Power Corporation Ltd., Lucknow
2. Rajasthan Rajya Vidyut Prasaran Nigam Ltd., Jaipur
3. Ajmer Vidyut Vitran Nigam Ltd, Jaipur
4. Jaipur Vidyut Vitran Nigam Ltd., Jaipur
5. Jodhpur Vidyut Vitran Nigam Ltd., Jaipur
6. Himachal Pradesh State Electricity Board, Shimla
7. Punjab State Electricity Board, Patiala
8. Haryana Power Purchase Centre, Haryana
9. Power Development Department, Jammu
10. Delhi Transco Ltd., New Delhi
11. BSES Yamuna Power Ltd., New Delhi
12. BSES Rajdhani Power Ltd., New Delhi
13. North Delhi Power Ltd., New Delhi
14. Chandigarh Administration, Chandigarh
15. Uttarakhand Power Corporation Ltd., Dehradun
16. North Central Railway, Allahabad
17. New Delhi Municipal Council, New Delhi

.....Respondents



The following were present:

1. Shri S.S. Raju, PGCIL
2. Shri M.M. Mondal, PGCIL
3. Shri Rajeev Gupta, PGCIL
4. Shri Rajiv Gupta, PGCIL
5. Shri T.P.S. Bawa, PSPCL

ORDER

This petition has been filed by Power Grid Corporation of India Limited (PGCIL) for determination of transmission tariff for Rihand Transmission System (hereinafter referred to as "transmission system") in Northern Region for the period 1.4.2009 to 31.3.2014 under Central Electricity Regulatory Commission (Terms and Conditions of Tariff) Regulations 2009 (hereinafter referred to as "2009 Tariff Regulations").

2. The transmission charges for the transmission system for the period 2004-09 were approved by the Commission by its order dated 29.2.2008 in Petition No. 96/2004. The instant petition has been filed for determination of tariff for 2009-14 for the Rihand Transmission System in Northern Region based on the admitted capital cost of ₹129378 lakh as on 31.3.2009. The petitioner has claimed additional capital expenditure incurred and projected to be incurred and de-capitalisation during 2011-12, 2012-13 and 2013-14.

3. The assets covered in the petition are as under:-

Asset I - HVDC portion of the Rihand Transmission System

Asset II - AC portion of the Rihand Transmission System

4. Details of the transmission charges claimed by the petitioner for the above mentioned assets are given as under:-

(₹ in lakh)

| Asset-I | 2009-10 | 2010-11 | 2011-12 | 2012-13 | 2013-14 |
|-----------------------------|----------------|----------------|----------------|----------------|-----------------|
| Depreciation | 1021.19 | 1021.19 | 1021.19 | 1021.19 | 1040.32 |
| Interest on Loan | 0.00 | 0.00 | 0.00 | 0.00 | 9.46 |
| Return on equity | 6027.35 | 6027.35 | 6027.35 | 6027.35 | 6036.27 |
| Interest on Working Capital | 258.69 | 265.10 | 271.88 | 278.99 | 287.30 |
| O & M Expenses | 2234.72 | 2362.77 | 2498.37 | 2640.46 | 2791.05 |
| Total | 9541.95 | 9676.41 | 9818.79 | 9967.99 | 10164.40 |

(₹ in lakh)

| Asset-II | 2009-10 | 2010-11 | 2011-12 | 2012-13 | 2013-14 |
|-----------------------------|----------------|----------------|----------------|----------------|----------------|
| Depreciation | 826.07 | 826.07 | 842.77 | 870.83 | 984.34 |
| Interest on Loan | 0.00 | 0.00 | 10.50 | 24.82 | 77.07 |
| Return on equity | 4875.67 | 4875.67 | 4885.40 | 4900.12 | 4944.48 |
| Interest on Working Capital | 228.75 | 235.01 | 242.45 | 250.68 | 262.47 |
| O & M Expenses | 2197.33 | 2322.41 | 2455.86 | 2596.50 | 2744.62 |
| Total | 8127.82 | 8259.16 | 8436.98 | 8642.95 | 9012.98 |

5. The details submitted by the petitioner in support of its claim for interest on working capital are given hereunder:-

(₹ in lakh)

| Asset-I | 2009-10 | 2010-11 | 2011-12 | 2012-13 | 2013-14 |
|--------------------|----------------|----------------|----------------|----------------|----------------|
| Maintenance Spares | 335.21 | 354.42 | 374.76 | 396.07 | 418.66 |
| O & M expenses | 186.23 | 196.90 | 208.20 | 220.04 | 232.59 |
| Receivables | 1590.33 | 1612.74 | 1636.47 | 1661.33 | 1694.07 |
| Total | 2111.77 | 2164.06 | 2219.43 | 2277.44 | 2345.32 |
| Interest | 258.69 | 265.10 | 271.88 | 278.99 | 287.30 |
| Rate of Interest | 12.25% | 12.25% | 12.25% | 12.25% | 12.25% |

(₹ in lakh)

| Asset-II | 2009-10 | 2010-11 | 2011-12 | 2012-13 | 2013-14 |
|--------------------|----------------|----------------|----------------|----------------|----------------|
| Maintenance Spares | 329.60 | 348.36 | 368.38 | 389.48 | 411.69 |
| O & M expenses | 183.11 | 193.53 | 204.66 | 216.38 | 228.72 |
| Receivables | 1354.64 | 1376.53 | 1406.16 | 1440.49 | 1502.16 |
| Total | 1867.35 | 1918.42 | 1979.20 | 2046.35 | 2142.57 |
| Interest | 228.75 | 235.01 | 242.45 | 250.68 | 262.46 |
| Rate of Interest | 12.25% | 12.25% | 12.25% | 12.25% | 12.25% |

6. No comments or suggestions have been received from the general public in response to the notices published by the petitioner under section 64 of the Electricity Act, 2003. Uttar Pradesh Power Corporation Limited (UPPCL), Respondent No. 1, has raised the issue of additional capitalisation and de-capitalisation, in its reply dated 19.3.2012. Punjab State Power Corporation Limited (PSPCL), Respondent No. 7, raised the issue of additional capitalisation and O&M expenses, in its reply dated 15.3.2011.

7. Having heard the representatives of the parties and perused the material on records, we proceed to dispose of the petition. While doing so, we also take care of the submissions of the respondents in their replies and address them in the relevant paragraphs.

CAPITAL COST

8. As regards the capital cost, Regulation 7(2) of the 2009 Regulations provides as under:-

"(2) The capital cost admitted by the Commission after prudence check shall form the basis for determination of tariff:

Provided that in case of the thermal generating station and the transmission system, prudence check of capital cost may be carried out based on the benchmark norms to be specified by the Commission from time to time:

Provided further that in cases where benchmark norms have not been specified, prudence check may include scrutiny of the reasonableness of the capital expenditure, financing plan, interest during construction, use of efficient technology, cost over-run and time over-run, and such other matters as may be considered appropriate by the Commission for determination of tariff:

Provided also that the Commission may issue guidelines for vetting of capital cost of hydro-electric projects by independent agency or expert and in that event the capital cost as vetted by such agency or expert may be considered by the Commission while determining the tariff for the hydro generating station:

Provided also that the Commission may issue guidelines for scrutiny and approval of commissioning schedule of the hydro-electric projects of a developer, not being a State controlled or owned company as envisaged in the tariff policy as amended vide Government of India Resolution No 23/2/2005-R&R (Vol.IV) dated 31st March 2008:



Provided also that in case the site of a hydro generating station is awarded to a developer(not being a State controlled or owned company), by a State Government by following a two stage transparent process of bidding, any expenditure incurred or committed to be incurred by the project developer for getting the project site allotted shall not be included in the capital cost:

Provided also that the capital cost in case of such hydro generating station shall include:

- (a) cost of approved rehabilitation and resettlement (R&R) plan of the project in conformity with National R&R Policy and R&R package as approved; and*
- (b) cost of the developer's 10% contribution towards Rajiv Gandhi Grameen Vidyutikaran Yojana (RGGVY) project in the affected area:*

Provided also that where the power purchase agreement entered into between the generating company and the beneficiaries or the implementation agreement and the transmission service agreement entered into between the transmission licensee and the long-term transmission customer, as the case may be, provide for ceiling of actual expenditure, the capital expenditure admitted by the Commission shall take into consideration such ceiling for determination of tariff:

Provided also that in case of the existing projects, the capital cost admitted by the Commission prior to 1.4.2009 and the additional capital expenditure projected to be incurred for the respective year of the tariff period 2009-14, as may be admitted by the Commission, shall form the basis for determination of tariff."

9. As per the last proviso to Regulation 7(2) of the 2009 Tariff Regulations, the admitted cost admitted cost as on 31.3.2009 was ₹129378.10 lakh. The total admitted cost for Rihand Transmission System (AC+HVDC) as on 1.4.2009 has been apportioned pro-rata, which is depicted below, as per equity taken for respective AC and HVDC systems in the 2007-08 incentive for transmission availability petition for Northern Region (Petition No.102/2008) and has been used for calculation for transmission tariff.

| (₹ in lakh) | |
|----------------|-----------|
| Asset I (HVDC) | 71522.15 |
| Asset II (AC) | 57855.95 |
| Total | 129378.10 |

ADDITIONAL CAPITALISATION AND DE-CAPITALISATION

10. Regulation 9(2) of the 2009 Tariff Regulations provides for additional capital expenditure incurred after the cut-off date as given overleaf:-

"The capital expenditure incurred on the following counts after the cut-off date may, in its discretion be admitted by the Commission, subject to prudence check.

- (i) XXX
- (i) XXX
- (ii) XXX
- (iii) XXX
- (iv) In case of transmission system any additional expenditure on items such as relays, control and instrumentation, computer system, power line carries communication, DC batteries, replacement of switchyards equipment due to increase of fault level, emergency restoration system, insulators cleaning infrastructure, replacement of damaged equipment not covered by insurance and any other expenditure which has become necessary for successful and efficient operation of transmission system."

11. The petitioner has claimed the following additional capitalisation and de-capitalisation for the tariff period 2009-14:-

| (₹ in lakh) | | | | | |
|-------------------|-----------------------------------|-----------------------------------|-----------------------------------|-----------------------------------|---------------------------|
| Name of the Asset | Additional capitalisation 2011-12 | Additional capitalisation 2012-13 | Additional capitalisation 2013-14 | De- capitalisation during 2013-14 | Estimated completion cost |
| Asset-I | - | - | 340.16 | - | 131781.44 |
| Asset-II | 371.20 | 189.98 | 1827.91 | 325.91 | |
| Total | 371.20 | 189.98 | 2168.07 | 325.91 | 131781.44 |

ADDITIONAL CAPITALISATION AND DE-CAPITALISATION

12. The petitioner has claimed the following additional capitalisation and de-capitalisation under Regulation 9 (2) (v) of the 2009 Tariff Regulations, on the basis that these replacements are necessary for efficient and successful operation of the system:-

| Name of the Asset | Year | Nature | Amount | Details of Expenditure |
|-------------------|---------|--------|-------------------------------|---|
| Asset-I | 2013-14 | S/S | 340.16 | DG set installed |
| Asset-II | 2011-12 | - | 371.20 | For tower strengthening which has become necessary due to change in the wind zone |
| | 2012-13 | - | 189.98 | -do- |
| | 2013-14 | S/S | 1112.25 | Replacement of old equipment |
| | | S/S | 715.66 | ICT-I at Ballabgarh diversion from Mainpuri sub-station |
| | | S/S | 144.41 | De-cap of old equipment and ICT at Ballabgarh |
| | S/S | 181.50 | De-cap of ICT-I at Ballabgarh | |

13. The petitioner's claim for capitalisation of additional expenditure has been discussed item-wise as under:-

Additional capital expenditure for tower strengthening: The petitioner has proposed additional capitalisation for tower strengthening for Kanpur- Ballabgarh, Ballabgarh-Dadri and Dadri-Mandola transmission lines under Asset-II during 2011-12 & 2012-13. The petitioner has submitted that the earlier towers were designed on the basis of provisions of IS:802-1977, which was based on the deterministic approach i.e. factor of safety was being applied on working loads. In line with international standards, major changes were incorporated in the revised IS:802-1995 standards, which is now based on the probabilistic approach with different reliability levels. The wind patterns in the country have changed over the years and earlier concept of three wind zones (light, medium and heavy) have been changed to six wind zones with enhanced wind pressures. The towers of 400 kV Dadri- Ballabgarh and Dadri- Mandola were designed for medium wind zone. At present, these lines fall under zone-4 (47m/sec). With the revised wind zone, the wind pressure on conductor has increased to 161 kg/m² from 90 kg/m².

14. It has been further stated that the expert committee constituted by CEA to investigate tower failure during the period January to June, 2009, observed that the tower failures occurred due to high velocity wind acting on towers and recommended to provide hip bracing on all the suspension towers upto bottom cross arm, in these transmission lines. It was submitted vide affidavit dated 2.3.2011, that there were failure of 7, 5 and 2 nos. of towers in 400 kV Kanpur-Ballabgarh, Ballabgarh-Dadri and Dadri-Mandola transmission lines, respectively.

15. PSPCL has raised the issue of tower strengthening in its reply and during the hearing on 22.3.2012. It has been submitted, that as per the petition there are frequent tower failures and there is a need for tower strengthening as the actual wind velocity is more than the designed value. As the petitioner has not provided for adequate safety margin, the cost of tower strengthening has to be borne by the petitioner and it should not be loaded on the beneficiaries through tariff, by way of additional capital expenditure. It has also been submitted by PSPCL that the incentive earned by the petitioner must be used for the purpose of tower strengthening. In response, the representative of the petitioner had submitted that there were tower failures in the transmission lines and tower strengthening is proposed based on the recommendations of the expert committee. The petitioner submitted that incentive earned by the petitioner is the reward for the efficiency in operating the transmission system and cannot be linked to the additional expenditure for tower strengthening.

16. The sample calculation for change in wind pressure on tower for Terrain Category 2 is shown below:-

Design Wind Pressure, P_d is given in the IS 802:1995 for each of the six wind zones. The wind load on tower body, F_{wt} , as per the IS 802:1995, is calculated by the following formula:

$$\text{Wind load on tower, } F_{wt} = P_d * C_{dt} * A_o * G_T$$

Where C_{dt} is the Drag Coefficient and the value of C_{dt} ranges from 2 to 3.6 depending upon the solidity ratio of the tower.

G_T is the Gust Response Factor and value of G_T ranges from 1.7 to 3.8 depending upon the height of the panel and terrain category and A_o is the net surface area of the legs, bracings

For terrain category 2 and average height of tower 20 metre, value of G_t is 2.2, approximate value of C_{dt} for lattice type of structures is 3 and P_d for Reliability Level 1 for Terrain Category 2 for Wind Zone 4 is 701 Newton per square metre.

[All these figures are available in various Tables in IS 802:1995]

$$F_{wt} = 2.2 * 3 * P_d * A_o = (6.6 * 701 * A_o) = 4626.6 A_o \text{ Newton}$$

[As per the IS 802:1995]

Wind load on tower as per as per the IS 802:1977 is calculated based on the Factor of Safety.

$$\begin{aligned} \text{Wind load on tower} &= (\text{Factor of Safety}) * \text{Wind Pressure} * A_o \\ &= (1.5 * 1910 * A_o) \quad N = 2865A_o \text{ Newton} \end{aligned}$$

[As per the IS 802:1977]

Where 1910 N/m² is the wind pressure on towers for medium intensity of pressure upto the 30 metre above Mean Retarding Surface and Factor of Safety is 1.5.

Thus, the wind load on towers as per IS 802:1995 is more than that as per the IS 802:1977. In view of above, it has been observed that the wind pressure have changed due to change in design criteria and also due to change in wind zone in the country. It is also noted that there were several tower failure in these lines and expert committee constituted by CEA has recommended tower

strengthening work in these lines by providing hip bracing upto cross arm level in all suspension towers. It is therefore, observed that the work of tower strengthening in the subject lines is justified and additional expenditure is allowed.

17. Additional capital expenditure for replacement of ICT-1 at Ballabgarh: The petitioner has submitted that the ICT-1, which was put under commercial operation on 26.10.1988, at Ballabhgarh sub-station failed in May, 2006 after completing 18 years of service due to internal fault (machinery break-down) and caught fire resulting into total burning of the transformer beyond repair. In order to meet the power requirement of Northern Region beneficiaries one ICT from Mainpuri was diverted to Ballabhgarh to replace the damaged ICT. During 2006-07, the petitioner approached the Commission for de-capitalisation and additional capitalisation of this ICT, but the same was not allowed. The ICT-I at Ballabhgarh would have completed its useful life of 25 years in September, 2013, considering date of commercial operation as October, 1988, and additional capitalisation is claimed to replace the failed ICT at Ballabhgarh.

18. In a similar case, vide order dated 3.2.2009 in Petition No. 80/2008, we did not allow the additional capitalisation and directed that capitalisation of net cost has to be financed out of insurance fund reserve created under internal insurance policy, towards which contribution is being regularly made by the beneficiaries as part of the O&M expenses. The relevant extract of the order is given overleaf:-

"10. We have gone through the details of self-insurance policy being pursued by the petitioner. We do not find any distinction between the internal and external cause of damage in the policy papers submitted by the petitioner. Even the inclusion or exclusions

on this account also have not been indicated. The cause of fire resulting in burning of the ICT, whether internal or external necessitating its replacement does not alter the basic fact that the ICT was burnt. The insurance policy covers damages to the equipment because of fire, without exception. So, the cause of fire, whether internal or external, is really not material, for meeting the expenditure.

11. We are not convinced by the petitioner's argument for capitalization of net cost which is to be financed out of insurance fund reserve created under internal insurance policy, towards which contribution is being regularly made by the beneficiaries as part of the O & M expenses. Accordingly, neither the decapitalisation nor the additional capitalisation on account of the ICTs replaced can be considered."

19. In view of above said order, the petitioner's prayer for additional capitalisation for replacement of ICT-1 at Ballabgarh is rejected.

20. Replacement of 18 nos. of 400 kV Gapped type Lightning Arrestors (LA): The petitioner has submitted that these Lightning Arrestors (LAs) are more than 21 years old and will be completing 25 years during tariff block 2009-14. These LAs are gapped type Silicon Carbide, which are phased out. As per IEEE Transaction on Power Delivery, October, 1996, gapped type LAs need to be replaced after 13 years of service, as these could not provide required protection margin for the switch yard equipment. The Gapped LAs have inherent drawbacks contrary to which the Gapless LAs improve the efficiency and performance against surges due to inherent superiority on account of fast response, high energy handling capabilities, absence of series/spark gap and superior performance under polluted environment. The Commission, in its order dated 7.8.2009 in Petition No. 76/2009, has allowed additional capitalisation for replacement of these type of LAs in Southern Region. In view of the superior performance and phasing out of Gapped LAs and earlier decision of the Commission, the replacement of the LAs is found to be justified and expenditure is accordingly allowed.

21. Retrofitment work of existing old obsolete 21 nos. of PLCC panels (speech & speech + protection): The petitioner has submitted that these PLCC panels are in service for over 21 years and are now giving frequent problems of mal-operation resulting in avoidable trippings of the load. It has been further submitted that only PLCC panels which are going to complete 25 years of service are proposed to be replaced. Protection couplers supplied with these panels have been phased out by the original manufacturer and is not giving service/repair support for these panels. The petitioner has also placed on record the correspondence with ABB, regarding their inability to support for repair of the equipment and the OEMs recommendation for retrofitment of these PLCC panels.

22. Keeping in view the importance of PLCC for system protection perspective and the recommendation of ABB, the retrofitment of PLCC Panels is found to be justified and the expenditure on this account is allowed.

23. Retrofitment of 23 nos. 400 kV old RK make and 22 nos. S&S/HAPPAM make Isolators: The petitioner has submitted that these isolators would complete 25 years of operation during 2009-14. RK make isolators were manufactured by Rade Konkar (RK) of Yugoslavia and supplied during 1988-89. The hot spot problems at hinge are also being faced frequently from time to time in these isolators. As the company is now closed, proper rectification is not possible due to non-availability of spares and technical support. The petitioner, in its affidavit dated 3.3.2011, has submitted that retrofitment of RK make isolator had been carried out successfully on experimental basis wherein, male/female arm, terminal connectors and corona shields were replaced.



24. It has also been submitted that the S&S/ Happam make isolators are old mechanical gang type and giving frequent problem in operation and maintenance. Hot spots are observed due to aging and pitting of contacts and arms. Due to various operational problems, non-availability of spares, service support from manufacturer, these isolators are not serviceable. Retrofitment of obsolete S&S make isolators at Mandola and retrofitment work of Hivelm make Isolators at Agra had been carried out with approximate cost of around ₹6-7 lakh. The cost of complete replacement may range to approximate ₹9-10 lakh as petitioner has to pay extra for supply of support insulators, structure and civil works for new foundations. New isolators would require additional cost towards the insulator, structure and the associated civil works besides longer outage period requirements for the replacements.

25. The petitioner, vide affidavit dated 15.2.2012, has submitted the details for 26 nos. isolators out of 45 nos. isolators that are proposed to be replaced. It has been observed that in case of 16 isolators, the operating mechanism is not working properly and it can be operated only from handle. In other 10 isolators there are problems in operating mechanism/ contacts/ hinges etc. Isolators have vital role in safe and reliable operation of the transmission system and smooth operation of the isolators is very important especially in the remote operation of the sub-station. The retrofitment/replacement of the 26 old, non-serviceable isolators at Ballabgarh, Bassi and Kanpur sub-stations, for which details have been submitted, is found to be justified and accordingly, expenditure on this account is allowed. In case of other isolators, the petitioner is at liberty to approach the Commission, in accordance with law, after replacement of the same, when requirement is felt for reliable and efficient operation of the power system.

26. Retrofitment of 4 nos. 400 kV M&G make Circuit Breaker (CB) with new SF6 gas circuit breaker at Ballabgarh: The petitioner has submitted that these breakers are in operation since 1988 and completed the life span of approximately 23 years. No spare and service support is available in India. Every time services are being arranged through M&G France and hence, repair and maintenance cost are very high. The petitioner, vide affidavit dated 3.3.2011, has further submitted that these design of circuit breakers are phased out and frequent problems are experienced in Hydraulic oil system, SF6 insulating gas system, grading capacitors, operating rods of these CBs. Further, vide affidavit dated 12.9.2011, it has been submitted that during routine maintenance the breakers are showing problem. As per offer from M/s M&G, France the overhauling cost would be much more as compared to new breakers.

27. It has also been submitted, vide affidavit dated 15.2.2012, that violation of the contact resistance values of circuit breakers and tan delta values of grading capacitors of these circuit breakers were observed. The Dynamic Contact Resistance Measurement (DCRM) test indicates the erosion of male and female contacts. These equipments are capital in nature with longer lead time for procurement and planned replacement is necessary as these equipments have completed useful life.

28. It is observed that the Contact Resistance Measurement / Tan Delta of grading capacitors values are high than the normal values. The DCRM signature of some circuits breakers are also indicative of eroded contacts. Keeping in view the abnormal test results, non-availability of spares, high expenditure for service support/overhauling, the replacement of these circuit breakers is found to be justified and expenditure on this account is accordingly allowed.

29. Replacement of 24 nos. old 400 kV CTs: The petitioner has submitted that all these CTs have been in service for more than 21 years. Most of these CTs are WSI make (now taken over by AREVA). Many CTs of this manufacturer have already been replaced. The petitioner, vide affidavit dated 3.3.2011, has submitted that M/s Rade Konkar manufacturing unit is closed down and M/s WSI has been taken over by M/s AREVA. The condition monitoring of CTs is being done for capacitance, Tan Delta and DGA of CT oil (IEC 60599) to ascertain deterioration of dielectric of active parts. So that the same can be removed from service to avert blasting of CTs which otherwise may lead to greater damages and a potential safety hazards for the working personnel. The refurbishment of active part is not possible in view of design obsolescence and closing down of manufacturing works of these CTs. It has also been submitted that looking in to the failure of CTs in service, which causes major consequential damage to the adjacent equipment like circuit breakers, isolators etc. affecting delivery of power as well as reliability of the grid, it is imperative to replace the CTs on priority as the cost of replacement is much less than the damage it causes to the other equipment. The petitioner has submitted, vide affidavit dated 12.9.2012, that there was problem of blasting of RK make CTs at various sub-stations in Northern Region which have been investigated. The Committee constituted for the purpose concluded that fast aging of upper part of insulation has taken place which resulted in failure of insulation in these live tank CTs and recommended to replace all RK make CTs from long lines and Bus Reactors where more switching over voltages are observed. It has also been submitted that it is essential to replace all RK make CTs due to history of failure and non-availability of technical support from manufacturer.

30. As regards WSI make CTs, it has been submitted that these CTs are very old and prone to unpredicted in-service failures causing consequential damages to adjacent equipments. The WSI make CTs are violating DGA norms as the gases are above the acceptable limits as per IEC-60599.

31. The petitioner, vide affidavit dated 15.2.2012, has submitted the details of defects in 12 nos. of WSI make CTs. It has been observed that abnormal values of some parameters were found in Dissolved Gas Analysis (DGA). In view of the abnormal results, age of these CTs and non-availability of technical support, the replacement of these 12 nos. WSI make CTs is found to be justified and accordingly the expenditure on this account is allowed. The petitioner has not filed the details of the RK make CTs that are proposed to be replaced.

32. However, the committee set up by PGCIL for investigating the failure of R.K. make CTs recommended to replace CTs in long lines and bus reactor bays, However, the replacement of R.K. make CTs is proposed in SVC bays at Kanpur. Therefore, the Add-cap for those 12 CTs at Kanpur has not been allowed at present. The petitioner is at liberty to approach the Commission, in accordance with law, after replacement of the RK make CTs for safe, efficient and reliable operation of the power system.

33. Replacement of 400 kV CVT (WSI make): The petitioner has submitted that the problem of drift in secondary voltage was observed in a number of WSI make CVTs because of aging due to which CVTs were taken out from the service. The reason for drift in voltage is due to deterioration of the capacitors elements in CVT

stacks. The CVTs were used for global energy accounting and strict monitoring of CVTs was required for accuracy class i.e. 0.5%. It has also been submitted that about 15 no. of CVTs were replaced due to drift in secondary voltage. The issue of repairs was taken up with WSI, the OEM and the OEM has confirmed that CVTs are almost 20-25 years old and design of the said CVTs have changed completely and therefore no repairs can be undertaken.

34. The petitioner has submitted the details of individual equipments of 12 CVTs out of the 24 CVTs proposed to be replaced. It has been submitted that secondary voltage drift was >0.5 Volt and the drift in secondary voltage is indicative of failure of the CVTs and hence needed replacement. The drift in secondary voltage after certain extent may cause protection and metering problems. However, there is no standard/benchmark value of drift in secondary voltage for replacement of CVTs. As per the internal norms of the petitioner, the CVTs can be replaced if secondary voltage drift is > 2.0 Volts. As per the test reports submitted by the petitioner only in few equipments the drift in secondary voltage is >2.0 Volts.

35. In view of above, it has been observed that there is no sufficient justification for replacement of all the CVTs and therefore, expenditure on this account is not allowed at this stage. However, the petitioner is at liberty to approach Commission in accordance with law, after replacement of these equipments, when it is felt necessary for efficient and safe operation of the power system.

36. Replacement of C&R panels: The petitioner has submitted that most of these protection relays under C&R panels installed in various transmission lines and

reactors have completed more than their useful life of 15 years. These relays are static type, have become obsolete and are frequently mal-operating. In the 8th Protection Sub-committee of NRPC it was decided that obsolete and old static type of relays should be replaced with state of the art Numerical Relays to increase the system reliability. It has been further submitted that Electro-mechanical or static type relays are already phased out by the OEM and no service support is available. The issue of replacement of all Electro-mechanical relays and other old and obsolete static relays was discussed in various protection committee meetings and subsequently, finalized in 12th NRPC meeting held on 22.4.2009, wherein NRPC had approved the replacement of all obsolete protection relays with numeric relays within a time bound schedule to increase the system reliability.

37. In view of the importance of C&R panels in the operation of the line and recommendation of Protection Sub-committee of NRPC and the NRPC, the replacement of old static type relays is found to be justified and expenditure on this account is allowed.

38. Add-Cap for New DG Set at HVDC Rihand sub-station: The petitioner has submitted that in Rihand-Dadri project, since Rihand sub-station was within the premises of Rihand STPS no DG set was originally envisaged. Rihand Station was running on auxiliary supply from NTPC. Multiple bi-pole trippings were experienced during the past period and another auxiliary power supply was extended from NTPC after commissioning of second unit. However, on 15.8.2009, bi-pole tripped due to power failure at Rihand. This tripping of bi-pole carrying 1200 MW could have been catastrophic, if simultaneous loss of 1000 MW generation form Rihand STPS was not

there. Apart from playing vital role in grid stability, Rihand-Dadri bi-pole also has a major role in voltage management of East-West Corridor of Northern Region. It has been submitted that DG set at Rihand has been proposed in line with the scheme adopted at Dadri and other HVDC stations to ensure reliability of the Rihand-Dadri bi-pole.

39. During hearing on 22.3.2012, the representative of petitioner had submitted that there is no DG set at Rihand and a DG set was originally planned to be installed at Muradnagar. Since, Muradnagar sub-station was shifted to Dadri, the DG set was installed at Dadri. Based on the experience at Dadri, a similar DG set has been proposed to be installed at Rihand, as per the requirement. The Rihand-Dadri Bi-pole plays a vital role in transmission of power in east-west corridor of Northern Region and in our view a DG set is required for its reliability and accordingly, the expenditure towards new DG set at Rihand end is found to be justified and hence the expenditure is allowed.

40. The respondent, UPPCL, vide affidavit dated 19.3.2012, has submitted that the petitioner may be directed to submit the auditor certificate in respect of additional capital expenditure. It is clarified that the proposed estimated additional capital expenditure has to be adjusted as per the actuals at the time of truing-up and hence auditor certificate is not required at this stage. It is further clarified that the additional capital expenditure allowed in the instant petition is for works which are considered to be of capital nature.

41. In view of the discussions in Para No.14 above, the expenditure for replacement of Lightning Arrestors, PLCC panels, C&R panels, circuit breaker and

26 out of 45 isolators are found to be justified. The additional capital expenditure for replacement of ICT-I at Ballabgarh is not found to be justified and expenditure on this account has been disallowed. As far as CTs are concerned, replacement of only 12 no. WSI make CTs at Kanpur substation is justified. The petitioner has not submitted the details of other CTs. The details of the additional capital expenditure and the de-capitalisation allowed are given hereunder:-

| Item | Quantity being allowed | ACE allowed | | |
|---------------------|------------------------|--------------|---------------|----------------|
| | | 2011-12 | 2012-13 | 2013-14 |
| DG Set | - | 0 | 0 | 340.16 |
| Tower Strengthening | - | 371.2 | 189.98 | 0 |
| ICT-I at Ballabgarh | - | 0 | 0 | 0 |
| LA | 18 | 0 | 0 | 27.07 |
| PLCC | 21 | 0 | 0 | 95.64 |
| CB | 4 | 0 | 0 | 151.94 |
| CVT | 0 | 0 | 0 | 0.00 |
| Isolators | 26 | 0 | 0 | 203.04 |
| CT | 12 | 0 | 0 | 93.71 |
| C&R Panels | 13 | 0 | 0 | 129.63 |
| TOTAL | | 371.2 | 189.98 | 1041.19 |

| | De-cap allowed | | |
|---------------------|----------------|---------|---------------|
| | 2011-12 | 2012-13 | 2013-14 |
| DG Set | 0 | 0 | 0 |
| Tower Strengthening | 0 | 0 | 0 |
| ICT-I at Ballabgarh | 0 | 0 | 0 |
| LA | 0 | 0 | 2.62 |
| PLCC | 0 | 0 | 61.99 |
| CB | 0 | 0 | 42.33 |
| CVT | 0 | 0 | 0.00 |
| Isolators | 0 | 0 | 10.68 |
| CT | 0 | 0 | 5.82 |
| C&R Panels | 0 | 0 | 1.76 |
| TOTAL | | | 125.19 |

DEBT- EQUITY RATIO:

42. Regulation 12 of the 2009 Tariff Regulations provides that-

"(1) XXX

(2) In case of generating station and transmission system declared under commercial operation prior to 1.4.2009, debt-equity ratio allowed by the Commission for determination of tariff for the period ending 31.3.2009 shall be considered. "

43. The details of debt-equity of in respect of assets considered for the purpose of tariff calculation as on 31.3.2009 are given hereunder:-

| Admitted Capital Cost as on 31.3.2009 | | |
|--|--------------------|---------------|
| Asset-I | | |
| Particulars | Amount (₹ in lakh) | % |
| Debt | 37042.72 | 51.79 |
| Equity | 34479.43 | 48.21 |
| Total | 71522.15 | 100.00 |
| Asset-II | | |
| Particulars | Amount (₹ in lakh) | % |
| Debt | 29964.72 | 51.79 |
| Equity | 27891.23 | 48.21 |
| Total | 57855.95 | 100.00 |

44. The details of the debt- equity ratio corresponding to additional capitalisation after adjusting decapitalisation are given hereunder:-

| Asset-I | | |
|--------------|--------------------|---------------|
| 2013-14 | Normative | |
| Particulars | Amount (₹ in lakh) | % |
| Debt | 238.11 | 70.30 |
| Equity | 102.05 | 30.00 |
| Total | 340.16 | 100.00 |
| Asset-II | | |
| 2011-12 | Normative | |
| Particulars | Amount (₹ in lakh) | % |
| Debt | 259.84 | 70.30 |
| Equity | 111.36 | 30.00 |
| Total | 371.20 | 100.00 |
| 2012-13 | Normative | |
| Particulars | Amount (₹ in lakh) | % |
| Debt | 132.99 | 70.30 |
| Equity | 56.99 | 30.00 |
| Total | 189.98 | 100.00 |
| 2013-14 | Normative | |
| Particulars | Amount (₹ in lakh) | % |
| Debt | 403.08 | 70.30 |
| Equity | 172.75 | 30.00 |
| Total | 575.84 | 100.00 |

45. The details of the debt-equity ratio of the transmission assets as on 31.3.2014 are given hereunder:-

| Cost as on 31.3.2014 | | |
|----------------------|--------------------|---------------|
| Asset-I | | |
| Particulars | Amount (₹ in lakh) | % |
| Debt | 37280.83 | 51.88 |
| Equity | 34581.48 | 48.12 |
| Total | 71862.31 | 100.00 |
| Asset-II | | |
| Particulars | Amount (₹ in lakh) | % |
| Debt | 30760.63 | 52.14 |
| Equity | 28232.33 | 47.86 |
| Total | 58992.96 | 100.00 |

RETURN ON EQUITY

46. Regulation 15 of the 2009 tariff regulations provides that:-

“15. (1) Return on equity shall be computed in rupee terms, on the equity base determined in accordance with regulation 12.

(2) Return on equity shall be computed on pre-tax basis at the base rate of 15.5% to be grossed up as per clause (3) of this regulation:

*Provided that in case of projects commissioned on or after 1st April, 2009, an additional return of 0.5% shall be allowed if such projects are completed within the timeline specified in **Appendix-II**:*

Provided further that the additional return of 0.5% shall not be admissible if the project is not completed within the timeline specified above for reasons whatsoever.

(3) The rate of return on equity shall be computed by grossing up the base rate with the Minimum Alternate/Corporate Income Tax Rate for the year 2008-09, as per the Income Tax Act, 1961, as applicable to the concerned generating company or the transmission licensee, as the case may be:

(4) Rate of return on equity shall be rounded off to three decimal points and be computed as per the formula given below:

$$\text{Rate of pre-tax return on equity} = \text{Base rate} / (1-t)$$

Where t is the applicable tax rate in accordance with clause (3) of this regulation.

(5) The generating company or the transmission licensee as the case may be, shall recover the shortfall or refund the excess Annual Fixed charge on account of Return on Equity due to change in applicable Minimum Alternate/ Corporate Income Tax Rate as per the Income Tax Act, 1961 (as amended from time to time) of the respective financial year directly without making any application before the Commission.

Provided further that Annual Fixed charge with respect to the tax rate applicable to the generating company or the transmission licensee, as the case may be, in line with the

provisions of the relevant Finance Acts of the respective financial year during the tariff period shall be tried up in accordance with Regulation 6 of these regulations"

47. The petitioner has prayed to allow grossing up of base rate of return with the applicable base rate as per the Finance Act for the relevant year and direct settlement of tax liability between generating company/transmission licensee and the beneficiaries/long term transmission customers on year to year basis.

48. The petitioner's prayer to allow grossing up the base rate of return on equity based on tax rates viz., MAT, surcharge, any other cess, charges, levies etc., as per relevant Finance Act, shall be settled in accordance with the provisions of Regulation 15 of 2009 Tariff Regulations.

49. The following amount of equity has been allowed for calculation of return of equity:-

| (₹ in lakh) | | | | | |
|--|----------------|----------------|----------------|----------------|----------------|
| Asset-I | 2009-10 | 2010-11 | 2011-12 | 2012-13 | 2013-14 |
| Opening Equity | 34479.43 | 34479.43 | 34479.43 | 34479.43 | 34479.43 |
| Addition due to Additional Capital expenditure | 0.00 | 0.00 | 0.00 | 0.00 | 102.05 |
| Closing Equity | 34479.43 | 34479.43 | 34479.43 | 34479.43 | 34581.48 |
| Average Equity | 34479.43 | 34479.43 | 34479.43 | 34479.43 | 34530.45 |
| Return on Equity (Base Rate) | 15.50% | 15.50% | 15.50% | 15.50% | 15.50% |
| Tax rate for the year 2008-09 (MAT) | 11.330% | 11.330% | 11.330% | 11.330% | 11.330% |
| Rate of Return on Equity (Pre Tax) | 17.481% | 17.481% | 17.481% | 17.481% | 17.481% |
| Return on Equity (Pre Tax) | 6027.35 | 6027.35 | 6027.35 | 6027.35 | 6036.27 |

| (₹ in lakh) | | | | | |
|--|----------------|----------------|----------------|----------------|----------------|
| Asset-II | 2009-10 | 2010-11 | 2011-12 | 2012-13 | 2013-14 |
| Opening Equity | 27891.23 | 27891.23 | 27891.23 | 28002.59 | 28059.58 |
| Addition due to Additional Capital expenditure | 0.00 | 0.00 | 111.36 | 56.99 | 172.75 |
| Closing Equity | 27891.23 | 27891.23 | 28002.59 | 28059.58 | 28232.33 |
| Average Equity | 27891.23 | 27891.23 | 27946.91 | 28031.09 | 28145.96 |
| Return on Equity (Base Rate) | 15.50% | 15.50% | 15.50% | 15.50% | 15.50% |
| Tax rate for the year 2008-09 (MAT) | 11.330% | 11.330% | 11.330% | 11.330% | 11.330% |
| Rate of Return on Equity (Pre Tax) | 17.481% | 17.481% | 17.481% | 17.481% | 17.481% |
| Return on Equity (Pre Tax) | 4875.67 | 4875.67 | 4885.40 | 4900.11 | 4920.20 |

INTEREST ON LOAN

50. Regulation 16 of the 2009 tariff regulations provides that-

"16. (1) The loans arrived at in the manner indicated in regulation 12 shall be considered as gross normative loan for calculation of interest on loan.

(2) The normative loan outstanding as on 1.4.2009 shall be worked out by deducting the cumulative repayment as admitted by the Commission up to 31.3.2009 from the gross normative loan.

(3) The repayment for the year of the tariff period 2009-14 shall be deemed to be equal to the depreciation allowed for that year:

(4) Notwithstanding any moratorium period availed by the generating company or the transmission licensee, as the case may be the repayment of loan shall be considered from the first year of commercial operation of the project and shall be equal to the annual depreciation allowed,.

(5) The rate of interest shall be the weighted average rate of interest calculated on the basis of the actual loan portfolio at the beginning of each year applicable to the project:

Provided that if there is no actual loan for a particular year but normative loan is still outstanding, the last available weighted average rate of interest shall be considered:

Provided further that if the generating station or the transmission system, as the case may be, does not have actual loan, then the weighted average rate of interest of the generating company or the transmission licensee as a whole shall be considered.

(6) The interest on loan shall be calculated on the normative average loan of the year by applying the weighted average rate of interest.

(7) The generating company or the transmission licensee, as the case may be, shall make every effort to re-finance the loan as long as it results in net savings on interest and in that event the costs associated with such re-financing shall be borne by the beneficiaries and the net savings shall be shared between the beneficiaries and the generating company or the transmission licensee, as the case may be, in the ratio of 2:1.

(8) The changes to the terms and conditions of the loans shall be reflected from the date of such re-financing.

(9) In case of dispute, any of the parties may make an application in accordance with the Central Electricity Regulatory Commission (Conduct of Business) Regulations, 1999, as amended from time to time, including statutory re-enactment thereof for settlement of the dispute:

Provided that the beneficiary or the transmission customers shall not withhold any payment on account of the interest claimed by the generating company or the transmission licensee during the pendency of any dispute arising out of re-financing of loan."

51. In the calculations, the interest on loan has been worked out as detailed below:-

- (i) Gross amount of loan, repayment of instalments and rate of interest and weighted average rate of interest on actual average loan have been considered as per the petition.
- (ii) Tariff is worked out considering normative loan and normative repayments. Depreciation allowed has been taken as normative repayment for the tariff period 2009-14.
- (iii) Weighted average rate of interest on actual loan worked out as above has been applied on the notional average loan during the year to arrive at the interest on loan.
- (iv) Petitioner has considered separate loan portfolio for de-capitalisation and add-capitalisation in order to work out the weighted average rate of interest. As per prevailing practice we have considered a combine loan portfolio for calculating the weighted average rate of interest.
- (v) Proportionate value of additional loan in proportion to the additional capitalisation allowed has been considered for calculating weighted average rate of interest.

52. Detailed calculations of the weighted revised average rate of interest are given in Annexure I and Annexure II to this order.

53. Details of the interest on loan worked on the above basis are given hereunder:-

| (₹ in lakh) | | | | | |
|--|----------|----------|----------|----------|----------|
| Asset-I | 2009-10 | 2010-11 | 2011-12 | 2012-13 | 2013-14 |
| Gross Normative Loan | 37042.72 | 37042.72 | 37042.72 | 37042.72 | 37042.72 |
| Cumulative Repayment upto Previous Year | 37042.72 | 37042.72 | 37042.72 | 37042.72 | 37042.72 |
| Net Loan-Opening | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Addition due to Additional Capital expenditure | 0.00 | 0.00 | 0.00 | 0.00 | 238.11 |
| Repayment during the year | 0.00 | 0.00 | 0.00 | 0.00 | 238.11 |
| Net Loan-Closing | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Average Loan | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Weighted Average Rate of Interest on Loan | 7.1552% | 8.3400% | 8.3400% | 8.3400% | 8.6134% |
| Interest | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

| (₹ in lakh) | | | | | |
|--|----------|----------|----------|----------|----------|
| Asset-II | 2009-10 | 2010-11 | 2011-12 | 2012-13 | 2013-14 |
| Gross Normative Loan | 29964.72 | 29964.72 | 29964.72 | 30224.56 | 30357.55 |
| Cumulative Repayment upto Previous Year | 29964.72 | 29964.72 | 29964.72 | 30224.56 | 30357.55 |
| Net Loan-Opening | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Addition due to Additional Capital expenditure | 0.00 | 0.00 | 259.84 | 132.99 | 403.08 |
| Repayment during the year | 0.00 | 0.00 | 259.84 | 132.99 | 403.08 |
| Net Loan-Closing | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Average Loan | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Weighted Average Rate of Interest on Loan | 7.1550% | 8.3400% | 8.5341% | 8.6097% | 8.6356% |
| Interest | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

DEPRECIATION

54. Regulation 17 (4) of the 2009 tariff regulations provides as under:-

"Depreciation shall be calculated annually based on Straight Line Method and at rates specified in Appendix-III to these regulations for the assets of the generating station and transmission system:

Provided that, the remaining depreciable value as on 31st March of the year closing after a period of 12 years from date of commercial operation shall be spread over the balance useful life of the asset".

55. The de-capitalised assets are parts of sub-station which in turn is a part of the combined assets of transmission lines and sub-stations. The petitioner has claimed capital cost of the de-capitalised equipment of ₹325.91 lakh for the year 2013-14. However, as mentioned in Para No. 16 above, de-capitalisation of ₹125.91 lakh for the year 2013-14 has been considered for tariff calculations. The petitioner has submitted, in the petition, that whole depreciable values (90% of original gross block) against these part assets is being recovered in 2013-14 and accordingly, cumulative depreciation amount corresponding to the de-capitalised assets works out to ₹293.31 lakh for 2013-14. However, in the present case, it is clear that although part-assets of the sub-station are being taken out of service, the sub-station itself is in service. It is observed that while the petitioner has shown that the full depreciable value corresponding to the part asset has been recovered; the sub-station, of which these part-assets are a part, has not depreciated fully. Thus there appears to be a mismatch in the depreciation recovery. Accordingly, proportionate cumulative depreciation corresponding to de-capitalised assets has been worked out by multiplying the capital cost of de-capitalised assets by the ratio of cumulative depreciation up to 31-03-2009 and gross block for the combined asset up to 31-03-2009. The proportionate accumulated depreciation works out to ₹90.5945 lakh for equipment proposed to be de-capitalised during 2013-14. As the part assets have been taken out of service, these amounts of depreciation have been reduced from the accumulated depreciation during the year 2012-13. The de-capitalisation and additional capital expenditure taking place during the tariff period shall change the value of gross block, therefore, in order to have a common reference point for depreciation, the ratio has been calculated considering the gross block as on 31.3.2009.



56. As per the order dated 9.5.2006 in Petition No. 96/2004, balance useful life of the asset was 17 years as on 1.4.2004 and depreciation was spread over the balance useful life. The same concept has been continued during the present tariff period too. The depreciation for Asset-I is worked out to ₹1021.19 lakh for the years 2009-10, 2010-11, 2011-12, 2012-13 and ₹1040.32 lakh for the year 2013-14. Depreciation for Asset-II is worked out to ₹826.07 lakh, ₹826.07 lakh, ₹842.77 lakh, ₹870.83 lakh, ₹925.23 lakh each year for the years 2009-10 to 2013-14 respectively

57. Details of the depreciation worked out are given below:-

(₹ in lakh)

| Asset-I | 2009-10 | 2010-11 | 2011-12 | 2012-13 | 2013-14 |
|--|----------------|----------------|----------------|----------------|----------------|
| As per Last Order | 71522.15 | 71522.15 | 71522.15 | 71522.15 | 71522.15 |
| Addition during 2009-14 due to Projected Additional Capitalisation | 0.00 | 0.00 | 0.00 | 0.00 | 340.16 |
| Gross Block | 71522.15 | 71522.15 | 71522.15 | 71522.15 | 71862.31 |
| Average Gross Block | 71522.15 | 71522.15 | 71522.15 | 71522.15 | 71692.23 |
| Rate of Depreciation | 5.2370% | 5.2370% | 5.2370% | 5.2370% | 5.2371% |
| Depreciable Value | 64010.78 | 64010.78 | 64010.78 | 64010.78 | 64163.85 |
| Weighted Balance Useful life of the asset | 12 | 11 | 10 | 9 | 8 |
| Remaining Depreciable Value | 12254.29 | 11233.10 | 10211.91 | 9190.72 | 8322.60 |
| Depreciation | 1021.19 | 1021.19 | 1021.19 | 1021.19 | 1040.32 |

(₹ in lakh)

| Asset-II | 2009-10 | 2010-11 | 2011-12 | 2012-13 | 2013-14 |
|--|----------------|----------------|----------------|----------------|----------------|
| As per Last Order | 57855.95 | 57855.95 | 57855.95 | 58227.15 | 58417.13 |
| Addition during 2009-14 due to Projected Additional Capitalisation | 0.00 | 0.00 | 371.20 | 189.98 | 575.84 |
| Gross Block | 57855.95 | 57855.95 | 58227.15 | 58417.13 | 58992.97 |
| Average Gross Block | 57855.95 | 57855.95 | 58041.55 | 58322.14 | 58705.05 |
| Rate of Depreciation | 5.2370% | 5.2370% | 5.2372% | 5.2374% | 5.2377% |
| Depreciable Value | 51779.83 | 51779.83 | 51946.87 | 52199.40 | 52544.01 |
| Weighted Balance Useful life of the asset | 12 | 11 | 10 | 9 | 8 |
| Remaining Depreciable Value | 9912.78 | 9086.72 | 8427.69 | 7837.45 | 7401.84 |
| Depreciation | 826.07 | 826.07 | 842.77 | 870.83 | 925.23 |

OPERATION & MAINTENANCE EXPENSES

58. Clause (g) of Regulation 19 of the 2009 Tariff Regulations prescribes the norms for O&M expenses based on the type of sub-station and line. The norms for the assets covered in this petition as below:-

| Element | 2009-10 | 2010-11 | 2011-12 | 2012-13 | 2013-14 |
|--|----------------|----------------|----------------|----------------|----------------|
| 400 kV S/C twin conductor T/Line(₹ lakh/ kms) | 0.358 | 0.378 | 0.400 | 0.423 | 0.447 |
| 400 kV Bays(₹ lakh/ bay.) | 0.940 | 0.994 | 1.051 | 1.111 | 1.174 |
| 33 kV Single Conductor S/C transmission line | 0.179 | 0.189 | 0.200 | 0.212 | 0.224 |
| 400 kV Bays(₹ lakh/ bay.) | 52.40 | 55.40 | 58.57 | 61.92 | 65.46 |
| Rihand-Dadri HVDC bipole-scheme ((₹ lakh) | 1450 | 1533 | 1621 | 1713 | 1811 |

59. As per the existing norms of 2009 Tariff Regulations, allowable O&M expenses for the assets covered in this petition are as under:-

(₹ in lakh)

| Asset-I | 2009-10 | 2010-11 | 2011-12 | 2012-13 | 2013-14 |
|--|----------------|----------------|----------------|----------------|----------------|
| Rihand- Dadri HVDC bipole scheme | 1450.00 | 1533.00 | 1621.00 | 1713.00 | 1811.00 |
| 815 Kms. +- 500 kV, D/C quad conductor, T/L | 766.10 | 810.11 | 856.57 | 905.47 | 956.81 |
| 52 Kms (26+26) 33 kV S/C twin conductor T/Line | 18.62 | 19.66 | 20.80 | 22.00 | 23.24 |
| Total O&M expenditure | 2234.72 | 2362.77 | 2498.37 | 2640.46 | 2791.05 |

(₹ in lakh)

| Asset-II | 2009-10 | 2010-11 | 2011-12 | 2012-13 | 2013-14 |
|--|----------------|----------------|----------------|----------------|----------------|
| 1484.946 Kms. (42.03+43.95+398+380.996+226+297.22+47.76+48.99) 400 kV S/C twin conductor T/Line | 531.61 | 561.31 | 593.98 | 628.13 | 663.77 |
| 99.7 Kms (53.4+46.3) 400 kV D/C quad conductor T/Line | 93.72 | 99.10 | 104.78 | 110.77 | 117.05 |
| 30 Nos. 400 kV Bays | 1572.00 | 1662.00 | 1757.10 | 1857.60 | 1963.80 |
| Total O&M expenditure | 2197.33 | 2322.41 | 2455.86 | 2596.50 | 2744.62 |
| Total O&M (Asset-I&II) | 4432.05 | 4685.18 | 4954.23 | 5236.96 | 5535.67 |

60. The petitioner has submitted that the O&M expenses for 2009-14 tariff block had been arrived on the basis of normalized actual O&M expenses of the petitioner

during the year 2003-04 to 2007-08. The wage hike of 50% on account of pay revision of the employees of public sector undertaking was also considered while calculating the O&M expenses for tariff period 2009-14. The petitioner has also submitted that it would approach Commission for suitable revision in the norms for O&M expenses in case the impact of wage hike w.e.f 1.1.2007 is more than 50%. It is clarified that, if any, application for revision of norms of O&M expenditure is filed by the petitioner in future, it will be dealt with in accordance with law.

61. The respondent, UPPCL, has submitted that the petitioner may be directed to submit the value of O&M expenses for the concerned lines and justify the expenditure of ₹2729 lakh, which is beyond the norms specified for the O&M expenses. PSPCL in its reply has submitted that the O&M expenses claimed by the petitioner are more than the norms specified and the O&M expenses should be allowed as per the 2009 Tariff Regulations. It is clarified that O&M expenses are allowed as per existing norms.

INTEREST ON WORKING CAPITAL

62. As per the 2009 tariff regulations the components of the working capital and the interest thereon are discussed are given as under:-

(i) Receivables: As per Regulation 18(1) (c) (i) of the 2009 tariff regulations, receivables will be equivalent to two months of fixed cost. The petitioner has claimed the receivables on the basis of 2 months transmission charges claimed in the petition. In the tariff being allowed, receivables have been worked out on the basis of 2 months transmission charges.

(ii) Maintenance spares: Regulation 18(1) (c) (ii) of the 2009 tariff regulations provides for maintenance spares @ 15% per annum of the O&M expenses from 1.4.2009. The value of maintenance spares has accordingly been worked out.

(iii) O & M expenses: Regulation 18(1) (c) (iii) of the 2009 tariff regulations provides for operation and maintenance expenses for one month of the recommended O & M expenses.

(iv) Rate of interest on working capital: In the calculations, the SBI PLR as on 1.4.2009 (i.e. 12.25%) is considered as the rate of interest on working capital.

63. Necessary computations in support of interest on working capital are appended are given below:-

(₹ in lakh)

| Asset-I | 2009-10 | 2010-11 | 2011-12 | 2012-13 | 2013-14 |
|--------------------|----------------|----------------|----------------|----------------|----------------|
| Maintenance Spares | 335.21 | 354.42 | 374.76 | 396.07 | 418.66 |
| O & M expenses | 186.23 | 196.90 | 208.20 | 220.04 | (212.14) |
| Receivables | 1590.33 | 1612.73 | 1636.46 | 1661.33 | 1692.46 |
| Total | 2,111.76 | 2,164.05 | 2,219.42 | 2,277.44 | 2,343.70 |
| Interest | 258.69 | 265.10 | 271.88 | 278.99 | 287.10 |

(₹ in lakh)

| Asset-II | 2009-10 | 2010-11 | 2011-12 | 2012-13 | 2013-14 |
|--------------------|----------------|----------------|----------------|----------------|----------------|
| Maintenance Spares | 329.60 | 348.36 | 368.38 | 389.48 | 411.69 |
| O & M expenses | 183.11 | 193.53 | 204.66 | 216.38 | 228.72 |
| Receivables | 1354.64 | 1376.52 | 1404.38 | 1436.27 | 1474.86 |
| Total | 1,867.35 | 1,918.42 | 1,977.41 | 2,042.12 | 2,115.27 |
| Interest | 228.75 | 235.01 | 242.23 | 250.16 | 259.12 |

TRANSMISSION CHARGES

64. The transmission charges being allowed for the transmission lines are summarized below:-

(₹ in lakh)

| Asset-I | 2009-10 | 2010-11 | 2011-12 | 2012-13 | 2013-14 |
|-----------------------------|----------------|----------------|----------------|----------------|-----------------|
| Depreciation | 1021.19 | 1021.19 | 1021.19 | 1021.19 | 1040.32 |
| Interest on Loan | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Return on Equity | 6027.35 | 6027.35 | 6027.35 | 6027.35 | 6036.27 |
| Interest on Working Capital | 258.69 | 265.10 | 271.88 | 278.99 | 287.10 |
| O & M Expenses | 2234.72 | 2362.77 | 2498.37 | 2640.46 | 2791.05 |
| Total | 9541.95 | 9676.41 | 9818.79 | 9967.99 | 10154.75 |

(₹ in lakh)

| Asset-II | 2009-10 | 2010-11 | 2011-12 | 2012-13 | 2013-14 |
|-----------------------------|----------------|----------------|----------------|----------------|----------------|
| Depreciation | 826.07 | 826.07 | 842.77 | 870.83 | 925.23 |
| Interest on Loan | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Return on Equity | 4875.67 | 4875.67 | 4885.40 | 4900.11 | 4920.20 |
| Interest on Working Capital | 228.75 | 235.01 | 242.23 | 250.16 | 259.12 |
| O & M Expenses | 2197.33 | 2322.41 | 2455.86 | 2596.50 | 2744.62 |
| Total | 8127.81 | 8259.15 | 8426.26 | 8617.60 | 8849.17 |

FILING FEE AND THE PUBLICATION EXPENSES

65. The petitioner has sought reimbursement of fee paid by it for filing the petition and publication expenses. The petitioner shall be entitled to recover the filing fee directly from the beneficiaries on pro-rata basis. The petitioner shall also be entitled for reimbursement of the publication expenses in connection with the present petition, directly from the beneficiary on pro-rata basis.

LICENCE FEE

66. The petitioner has submitted that in O&M expenses norms for tariff block 2009-14 the cost associated with license fees had not been captured and the license fee may be allowed to be recovered separately from the respondents. The petitioner's prayer for licence fee shall be dealt with in accordance with our order dated 25.10.2011 in Petition No. 21/2011 and 22/2011.

SERVICE TAX

67. The petitioner has made a prayer to be allowed to bill and recover the service tax on transmission charges separately from the respondents if it is subjected to such service tax in future. We consider petitioner's prayer pre-mature and accordingly this prayer is rejected.

SHARING OF TRANSMISSION CHARGES

68. The billing, collection & disbursement of the transmission charges shall be governed by the provision of Central Electricity Regulatory Commission (Sharing of Inter-State Transmission Charges and Losses) Regulations, 2010 as amended from to time.

69. This order disposes of Petition No. 326/TT/2010.

Sd/-
(M. Deena Dayalan)
Member

sd/-
(V.S. Verma)
Member

sd/-
(S. Jayaraman)
Member

sd/-
(Dr. Pramod Deo)
Chairperson

Annexure I

| CALCULATION OF WEIGHTED AVERAGE RATE OF INTEREST ON LOAN | | | | | | |
|---|--|---|---------|---------|--------------------|---------|
| | | | | | (₹ in lakh) | |
| | Details of Loan | 2009-10 | 2010-11 | 2011-12 | 2012-13 | 2013-14 |
| 1 | IBRD I | | | | | |
| | Gross loan opening | 414.21 | 414.21 | 414.21 | 414.21 | 414.21 |
| | Cumulative Repayment upto DOCO/previous year | 232.63 | 268.01 | 306.06 | 347.00 | 391.03 |
| | Net Loan-Opening | 181.58 | 146.20 | 108.15 | 67.21 | 23.18 |
| | Additions during the year | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | Repayment during the year | 35.38 | 38.06 | 40.93 | 44.03 | 23.27 |
| | Net Loan-Closing | 146.20 | 108.15 | 67.21 | 23.18 | 0.00 |
| | Average Loan | 163.89 | 127.17 | 87.68 | 45.20 | 11.59 |
| | Rate of Interest | 8.34% | 8.34% | 8.34% | 8.34% | 8.34% |
| | Interest | 13.67 | 10.61 | 7.31 | 3.77 | 0.97 |
| | Rep Schedule | 30 half yearly instalments from 1-12-1998 | | | | |
| 2 | BOND-I (Issue-III) | | | | | |
| | Gross loan opening | 131.40 | 131.40 | 131.40 | 131.40 | 131.40 |
| | Cumulative Repayment upto DOCO/previous year | 131.40 | 131.40 | 131.40 | 131.40 | 131.40 |
| | Net Loan-Opening | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | Additions during the year | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | Repayment during the year | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | Net Loan-Closing | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | Average Loan | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | Rate of Interest | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% |
| | Interest | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | Rep Schedule | Loan repaid | | | | |
| 3 | LIC -II (Replacement of GOI loan) | | | | | |
| | Gross loan opening | 8858.08 | 8858.08 | 8858.08 | 8858.08 | 8858.08 |
| | Cumulative Repayment upto DOCO/previous year | 8403.96 | 8858.08 | 8858.08 | 8858.08 | 8858.08 |
| | Net Loan-Opening | 454.12 | 0.00 | 0.00 | 0.00 | 0.00 |
| | Additions during the year | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | Repayment during the year | 454.12 | 0.00 | 0.00 | 0.00 | 0.00 |
| | Net Loan-Closing | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | Average Loan | 227.06 | 0.00 | 0.00 | 0.00 | 0.00 |
| | Rate of Interest | 6.30% | 6.30% | 6.30% | 6.30% | 6.30% |
| | Interest | 14.30 | 0.00 | 0.00 | 0.00 | 0.00 |
| | Rep Schedule | | | | | |
| 4 | NTPC Bond | | | | | |
| | Gross loan opening | 82.20 | 82.20 | 82.20 | 82.20 | 82.20 |
| | Cumulative Repayment upto DOCO/previous year | 82.20 | 82.20 | 82.20 | 82.20 | 82.20 |
| | Net Loan-Opening | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | Additions during the year | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | Repayment during the year | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |



| | | | | | | |
|---|--|-------------|---------|---------|---------|---------|
| | Net Loan-Closing | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | Average Loan | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | Rate of Interest | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% |
| | Interest | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | Rep Schedule | Loan repaid | | | | |
| | | | | | | |
| 5 | ING Bank | | | | | |
| | Gross loan opening | 692.18 | 692.18 | 692.18 | 692.18 | 692.18 |
| | Cumulative Repayment upto DOCO/previous year | 692.18 | 692.18 | 692.18 | 692.18 | 692.18 |
| | Net Loan-Opening | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | Additions during the year | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | Repayment during the year | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | Net Loan-Closing | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | Average Loan | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | Rate of Interest | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% |
| | Interest | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | Rep Schedule | Loan repaid | | | | |
| | | | | | | |
| 6 | SUMITOMO | | | | | |
| | Gross loan opening | 3997.21 | 3997.21 | 3997.21 | 3997.21 | 3997.21 |
| | Cumulative Repayment upto DOCO/previous year | 3997.21 | 3997.21 | 3997.21 | 3997.21 | 3997.21 |
| | Net Loan-Opening | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | Additions during the year | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | Repayment during the year | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | Net Loan-Closing | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | Average Loan | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | Rate of Interest | 8.64% | 8.64% | 8.64% | 8.64% | 8.64% |
| | Interest | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | Rep Schedule | Loan repaid | | | | |
| | | | | | | |
| 7 | IBJ-III | | | | | |
| | Gross loan opening | 3269.26 | 3269.26 | 3269.26 | 3269.26 | 3269.26 |
| | Cumulative Repayment upto DOCO/previous year | 3269.26 | 3269.26 | 3269.26 | 3269.26 | 3269.26 |
| | Net Loan-Opening | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | Additions during the year | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | Repayment during the year | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | Net Loan-Closing | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | Average Loan | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | Rate of Interest | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% |
| | Interest | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | Rep Schedule | Loan repaid | | | | |
| | | | | | | |
| 8 | BOND XXXIII (Add-Cap) | | | | | |
| | Gross loan opening | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | Cumulative Repayment upto DOCO/previous year | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | Net Loan-Opening | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |



| | | | | | |
|---|---------------------------------------|----------|----------|----------|----------|
| Additions during the year | 0.00 | 0.00 | 0.00 | 0.00 | 238.11 |
| Repayment during the year | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Net Loan-Closing | 0.00 | 0.00 | 0.00 | 0.00 | 238.11 |
| Average Loan | 0.00 | 0.00 | 0.00 | 0.00 | 119.06 |
| Rate of Interest | 8.64% | 8.64% | 8.64% | 8.64% | 8.64% |
| Interest | 0.00 | 0.00 | 0.00 | 0.00 | 10.29 |
| Rep Schedule | 12 Annual Instalments from 08.07.2014 | | | | |
| Total Loan | | | | | |
| Gross loan opening | 17444.54 | 17444.54 | 17444.54 | 17444.54 | 17444.54 |
| Cumulative Repayment upto DOCO/previous year | 16808.84 | 17298.34 | 17336.39 | 17377.33 | 17421.36 |
| Net Loan-Opening | 635.70 | 146.20 | 108.15 | 67.21 | 23.18 |
| Additions during the year | 0.00 | 0.00 | 0.00 | 0.00 | 238.11 |
| Repayment during the year | 489.50 | 38.06 | 40.93 | 44.03 | 23.27 |
| Net Loan-Closing | 146.20 | 108.15 | 67.21 | 23.18 | 238.11 |
| Average Loan | 390.95 | 127.17 | 87.68 | 45.20 | 130.64 |
| Weighted Average Rate of Interest | 7.1552% | 8.3400% | 8.3400% | 8.3400% | 8.6134% |
| Interest | 27.97 | 10.61 | 7.31 | 3.77 | 11.25 |



Annexure II

| CALCULATION OF WEIGHTED AVERAGE RATE OF INTEREST ON LOAN | | | | | | |
|---|--|---|---------|---------|---------|-------------|
| | | | | | | (₹ in lakh) |
| | Details of Loan | 2009-10 | 2010-11 | 2011-12 | 2012-13 | 2013-14 |
| 1 | IBRD I | | | | | |
| | Gross loan opening | 335.07 | 335.07 | 335.07 | 335.07 | 335.07 |
| | Cumulative Repayment upto DOCO/previous year | 188.25 | 216.84 | 247.60 | 280.68 | 316.27 |
| | Net Loan-Opening | 146.82 | 118.23 | 87.47 | 54.39 | 18.80 |
| | Additions during the year | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | Repayment during the year | 28.59 | 30.76 | 33.08 | 35.59 | 18.80 |
| | Net Loan-Closing | 118.23 | 87.47 | 54.39 | 18.80 | 0.00 |
| | Average Loan | 132.52 | 102.85 | 70.93 | 36.60 | 9.40 |
| | Rate of Interest | 8.34% | 8.34% | 8.34% | 8.34% | 8.34% |
| | Interest | 11.05 | 8.58 | 5.92 | 3.05 | 0.78 |
| | Rep Schedule | 30 half yearly instalments from 1-12-1998 | | | | |
| 2 | BOND-I | | | | | |
| | Gross loan opening | 106.30 | 106.30 | 106.30 | 106.30 | 106.30 |
| | Cumulative Repayment upto DOCO/previous year | 106.30 | 106.30 | 106.30 | 106.30 | 106.30 |
| | Net Loan-Opening | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | Additions during the year | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | Repayment during the year | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | Net Loan-Closing | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | Average Loan | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | Rate of Interest | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% |
| | Interest | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | Rep Schedule | Loan Repaid | | | | |
| 3 | LIC -III | | | | | |
| | Gross loan opening | 7165.51 | 7165.51 | 7165.51 | 7165.51 | 7165.51 |
| | Cumulative Repayment upto DOCO/previous year | 6798.17 | 7165.51 | 7165.51 | 7165.51 | 7165.51 |
| | Net Loan-Opening | 367.34 | 0.00 | 0.00 | 0.00 | 0.00 |
| | Additions during the year | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | Repayment during the year | 367.34 | 0.00 | 0.00 | 0.00 | 0.00 |
| | Net Loan-Closing | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | Average Loan | 183.67 | 0.00 | 0.00 | 0.00 | 0.00 |
| | Rate of Interest | 6.30% | 6.30% | 6.30% | 6.30% | 6.30% |
| | Interest | 11.57 | 0.00 | 0.00 | 0.00 | 0.00 |
| | Rep Schedule | | | | | |
| 4 | NTPC Bond | | | | | |
| | Gross loan opening | 66.50 | 66.50 | 66.50 | 66.50 | 66.50 |
| | Cumulative Repayment upto DOCO/previous year | 66.50 | 66.50 | 66.50 | 66.50 | 66.50 |
| | Net Loan-Opening | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | Additions during the year | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |



| | | | | | | |
|---|--|-------------|---------|---------|---------|---------|
| | Repayment during the year | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | Net Loan-Closing | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | Average Loan | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | Rate of Interest | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% |
| | Interest | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | Rep Schedule | Loan Repaid | | | | |
| | | | | | | |
| 5 | ING Bank | | | | | |
| | Gross loan opening | 559.92 | 559.92 | 559.92 | 559.92 | 559.92 |
| | Cumulative Repayment upto DOCO/previous year | 559.92 | 559.92 | 559.92 | 559.92 | 559.92 |
| | Net Loan-Opening | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | Additions during the year | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | Repayment during the year | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | Net Loan-Closing | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | Average Loan | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | Rate of Interest | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% |
| | Interest | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | Rep Schedule | Loan Repaid | | | | |
| | | | | | | |
| 6 | SUMITOMO | | | | | |
| | Gross loan opening | 3233.44 | 3233.44 | 3233.44 | 3233.44 | 3233.44 |
| | Cumulative Repayment upto DOCO/previous year | 3233.44 | 3233.44 | 3233.44 | 3233.44 | 3233.44 |
| | Net Loan-Opening | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | Additions during the year | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | Repayment during the year | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | Net Loan-Closing | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | Average Loan | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | Rate of Interest | 8.64% | 8.64% | 8.64% | 8.64% | 8.64% |
| | Interest | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | Rep Schedule | Loan Repaid | | | | |
| | | | | | | |
| 7 | IBJ-III | | | | | |
| | Gross loan opening | 2644.59 | 2644.59 | 2644.59 | 2644.59 | 2644.59 |
| | Cumulative Repayment upto DOCO/previous year | 2644.59 | 2644.59 | 2644.59 | 2644.59 | 2644.59 |
| | Net Loan-Opening | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | Additions during the year | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | Repayment during the year | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | Net Loan-Closing | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | Average Loan | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | Rate of Interest | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% |
| | Interest | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | Rep Schedule | Loan Repaid | | | | |
| | | | | | | |
| 8 | BOND XXXIII | | | | | |
| | Gross loan opening | 0.00 | 0.00 | 0.00 | 259.84 | 392.83 |



| | | | | | | |
|----|--|---------------------------------------|----------|----------|----------|----------|
| | Cumulative Repayment upto DOCO/previous year | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | Net Loan-Opening | 0.00 | 0.00 | 0.00 | 259.84 | 392.83 |
| | Additions during the year | 0.00 | 0.00 | 259.84 | 132.99 | 490.72 |
| | Repayment during the year | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | Net Loan-Closing | 0.00 | 0.00 | 259.84 | 392.83 | 883.55 |
| | Average Loan | 0.00 | 0.00 | 129.92 | 326.34 | 638.19 |
| | Rate of Interest | 8.64% | 8.64% | 8.64% | 8.64% | 8.64% |
| | Interest | 0.00 | 0.00 | 11.23 | 28.20 | 55.14 |
| | Rep Schedule | 12 Annual Instalments from 08.07.2014 | | | | |
| | | | | | | |
| 9 | IBJ-II Tr. D | | | | | |
| | Gross loan opening | 798.87 | 798.87 | 798.87 | 798.87 | 798.87 |
| | Cumulative Repayment upto DOCO/previous year | 798.87 | 798.87 | 798.87 | 798.87 | 798.87 |
| | Net Loan-Opening | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | Additions during the year | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | Repayment during the year | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | Net Loan-Closing | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | Average Loan | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | Rate of Interest | 17.84% | 17.84% | 17.84% | 17.84% | 17.84% |
| | Interest | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | Rep Schedule | Loan Repaid | | | | |
| | | | | | | |
| 10 | COMMERZ BANK | | | | | |
| | Gross loan opening | 427.63 | 427.63 | 427.63 | 427.63 | 427.63 |
| | Cumulative Repayment upto DOCO/previous year | 427.63 | 427.63 | 427.63 | 427.63 | 427.63 |
| | Net Loan-Opening | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | Additions during the year | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | Repayment during the year | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | Net Loan-Closing | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | Average Loan | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | Rate of Interest | 15.80% | 15.80% | 15.80% | 15.80% | 15.80% |
| | Interest | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | Rep Schedule | Loan Repaid | | | | |
| | | | | | | |
| | Total Loan | | | | | |
| | Gross loan opening | 15337.83 | 15337.83 | 15337.83 | 15597.67 | 15730.66 |
| | Cumulative Repayment upto DOCO/previous year | 14823.67 | 15219.60 | 15250.36 | 15283.44 | 15319.03 |
| | Net Loan-Opening | 514.16 | 118.23 | 87.47 | 314.23 | 411.63 |
| | Additions during the year | 0.00 | 0.00 | 259.84 | 132.99 | 490.72 |
| | Repayment during the year | 395.93 | 30.76 | 33.08 | 35.59 | 18.80 |
| | Net Loan-Closing | 118.23 | 87.47 | 314.23 | 411.63 | 883.55 |
| | Average Loan | 316.19 | 102.85 | 200.85 | 362.93 | 647.59 |
| | Weighted Average Rate of Interest | 7.1550% | 8.3400% | 8.5341% | 8.6097% | 8.6356% |
| | Interest | 22.62 | 8.58 | 17.14 | 31.25 | 55.92 |