PCR/PIF COVER SHEET Run Date: 9/22/93

OED ID: L2283 *Division: 3

*Country: India
*Project Description: Central Power Transmission
*Sector: 02 / Power
*Subsector: 02.03 / Transmission
Lending Instrument Type: SIL
L/C: L2283
Original IDA/IBRD Commitments: 250,700,000 ($US)
Total Cancellations: 119,206,102 ($US)

Key Dates	ORIGINAL	ACTUAL
Approval		5/19/83
Signing/Agreement		6/08/83
Effectiveness	9/09/83	3/29/84
Closing	3/31/89	3/31/92
PCR Receipt in OED		6/30/93

ASSIGNED TO: J. F. LANDEAU

SIGNATURE: JFL DATE: 10/4/93

Please confirm the "*" fields above, sign this sheet and return a photo-copy to Helen Sioris. Pass this sheet as the PIF cover to the Eval. Officer.

********** TO BE COMPLETED BY EVALUATION OFFICER **********

Date of Review: ___/___/___ (mm / dd / yy)

Name of Reviewer: J. F. LANDEAU

Type of Evaluation: PCR Review [X] PAR Review [ ]

If this is a PAR Review, are there major differences in the judgements from those made in the PCR Review?

Yes [ ] No [X]

If Yes, please discuss in detail on page 26 of the PIF

	ORIGINAL	LATEST
Date of Physical Completion	03/31/89 (mm/dd/yy)	03/31/92 (mm/dd/yy)
Total Project Cost ($US mill)	617.3	264.4
Applicable Disbursement Profile: (see note 11 in the PIF, page 31)	POWER - INDIA	
Number of Supervision Missions:	7	

OPERATIONS EVALUATION DEPARTMENT

PROJECT INFORMATION FORM (PIF)* 1/

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* The footnote numbers in the PIF refer to the relevant explanatory notes at the end of the PIF.

I. PROJECT OBJECTIVES

1) Were major project objectives substantially changed during implementation?2/

	(✓)
Yes	☑
No	☐

If yes, were the objectives:
Reduced ☐ Increased ☑ Otherwise modified ☐

2) Taking into account the country's level of development and the competence of the implementing agency, were the project and its major objectives:

	Sub-stantial (✓)	Par-tially (✓)	No (✓)	Not Available (✓)
RELEVANT FOR COUNTRY/SECTOR:3/				
Original Project	☑	☐	☐	☐
Revised Project	☑	☐	☐	☐
DEMANDING ON BORROWER/IMPLEMENTING AGENCY:				
Original Project	☐	☑	☐	☐
Revised Project	☐	☑	☐	☐
COMPLEX:4/				
Original Project	☐	☑	☐	☐
Revised Project	☐	☑	☐	☐
RISKY:				
Original Project	☐	☐	☑	☐
Revised Project	☐	☐	☑	☐

3) Were the criteria for judging achievement of major objectives adequately identified in the Staff Appraisal Report: ☑ ☐ ☐

II.A. ECONOMIC RATES OF RETURN

1) If an **ECONOMIC RATE OF RETURN** (ERR) was calculated for the project, provide a point or range of estimates (in %):

Appraisal Estimate	Re-estimated at Completion
N.A. %	11.0 %

On what percentage of estimated total project costs was the original **ERR** based ? N.A. %

On what percentage of total projects costs (final/latest estimate) was the re-estimated **ERR** based ? different scope %

2) If an **ERR** was not re-estimated indicate the reason(s):

	(✓)
Project not implemented	☐
Inadequate data	☐
Not relevant for the project	☐
Other (specify): _____	☐

3) If the re-estimated **ERR** differs significantly from the appraisal estimate, indicate the reason(s):

	(✓)
Cost changes	☐
Output changes	☐
Changes in output price/user charges/ terms of trade/	☐
Output delays	☐
Changes in methodology/analysis	☐
Other (specify): change in scope	☑

4) If an **ERR** was not calculated, was the cost-effectiveness of the project estimated in the PCR:

	(✓)
Same or higher than in the SAR	☐
Lower than in the SAR	☐
Information not available	☐

5) Is the re-estimated **ERR** a reasonable measure of this project's overall achievement of objectives?

	(✓)
Yes	☑
No	☐

Explain: _____

II.B. FINANCIAL RATES OF RETURN6/

1) If a **FINANCIAL RATE OF RETURN** (FRR) (or other financial indicator) was calculated for the project, indicate:

Appraisal Estimate	Re-estimated at Completion
_____%	_____%

On what percentage of estimated total project costs was the original **FRR** based ? _____%

On what percentage of total projects costs (final/latest estimate) was the re-estimated **FRR** based ? _____%

2) If a **FRR** (or other financial indicator) was not re-estimated, indicate reason:

	(✓)
Project not implemented	☐
Inadequate data	☐
Not relevant for the project	☐
Other (specify): rate of return calculated for all NTPC investments	☑

3) If the re-estimated **FRR** (or other financial indicator) differs significantly from the appraisal estimate, indicate the reason(s):

	(✓)
Cost changes	☐
Output changes	☐
Output price changes	☐
Output delays	☐
Changes in prices/tariffs/user charges	☐
Changes in methodology/analysis	☐
Other (specify): _____	☐

III. DETAILED RATINGS and UNDERLYING FACTORS
ACHIEVEMENT OF OBJECTIVES

III.A FACTORS AFFECTING ACHIEVEMENT OF MAJOR OBJECTIVES5/

	Substantial (✓)	Partial (✓)	Negligible (✓)	Not Available (✓)	Not Applicable (✓)
1) Assess the achievement of **MAJOR OBJECTIVES** (original or revised) in these areas (copy ratings to Section IV.A):7/					
Macro policies	☐	☐	☐	☐	☑
Sector policies	☐	☑	☐	☐	☐
Financial Objectives	☐	☑	☐	☐	☐
Physical Objectives	☑	☐	☐	☐	☐
2) Assess the achievement of **INSTITUTIONAL DEVELOPMENT** objectives (copy rating to Section IV.A):	☐	☑	☐	☐	☐

3) Indicate the extent to which the following factors positively(+) or negatively(-) affected the achievement of **MAJOR OBJECTIVES:**

	Substantial (+ or -)	Partial (+ or -)	Negligible (✓)	Not Available (✓)	Not Applicable (✓)
FACTORS NOT GENERALLY SUBJECT TO GOVERNMENT CONTROL					
World markets/prices	☐	☐	☑	☐	☐
Natural events	☐	☐	☐	☐	☑
Bank performance	☐	☐	☐	☐	☐
Cofinancier(s) performance	☐	☐	☐	☐	☑
Performance of contractors/ consultants8/	☐	☐	☐	☐	☐
War/civil disturbances	☐	☐	☐	☐	☑
Other (specify):_____	☐	☐	☐	☐	☐

III.A FACTORS AFFECTING ACHIEVEMENT OF MAJOR OBJECTIVES (continued)

	Substantial (+ or -)	Partial (+ or -)	Negligible (✓)	Not Available (✓)	Not Applicable (✓)
FACTORS GENERALLY SUBJECT TO GOVERNMENT CONTROL					
Macro policies/conditions	☐	☐	☐	☐	☑
Sector policies	☐	☑ +	☐	☐	☐
Government commitment	☐	☑ +	☐	☐	☐
Appointment of key staff	☐	☐	☑	☐	☐
Counterpart funds	☐	☑ +	☐	☐	☐
Administrative procedures	☐	☑ -	☐	☐	☐
Other (specify):_____	☐	☐	☐	☐	☐
FACTORS GENERALLY SUBJECT TO IMPLEMENTING AGENCY CONTROL					
Management	☑ +	☐	☐	☐	☐
Staffing	☑ +	☐	☐	☐	☐
Cost changes	☐	☑ -	☐	☐	☐
Implementation delays	☑ +	☐	☐	☐	☐
Use of technical assistance	☐	☐	☑	☐	☐
Monitoring and evaluation9/	☐	☑ +	☐	☐	☐
Beneficiary participation	☐	☐	☑	☐	☐
Other (specify):_____	☐	☐	☐	☐	☐

III.A FACTORS AFFECTING ACHIEVEMENT OF MAJOR OBJECTIVES (continued)

4) If there were major increases or decreases in project COSTS, indicate the major reasons(s) with a (+) or (-):10/

	(+ or - or blank)
Change in project scope/scale/design	+
Deficient estimate of physical quantities	
Deficient estimate of unit costs	
Inadequate price contingencies	
Change in exchange rate	+
Change in prices/tariffs/taxes	
Implementation delay	+
Performance of contractor(s)	
Other (specify): _____	

5) Indicate the major reason(s) for significant implementation DELAYS:

	(+ or - or blank)
Implementation schedule unrealistic	+
Project preparation incomplete	+
Unexpected technical difficulties	
Change(s) in project scope	+
Quality of management	
Delays in selecting staff	
Delays in selecting consultants	
Delays in receiving counterpart funds	
Delays in receiving funds from Bank/ cofinanciers	
Inefficient procurement procedures	+
Inefficient disbursement procedures	
Security problems	
Natural disasters	
Other (specify): _____	

6) If there was a major change in project scope (see Section I, question #1), indicate whether the following were major reasons:

	(✓)		(✓)
Change in project cost		Time delays	✓

III.B PROJECT SUSTAINABILITY

		Likely (✓)	Unlikely (✓)	Uncertain (✓)
1)	To what extent is the project likely to maintain an acceptable level of net benefits throughout its economic life? (copy to Section IV.B)	☑	☐	☐

2) Indicate whether the following factor(s) will have a positive(+) or negative(-) effect on the likelihood of **SUSTAINABILITY:**

	(+ or - or blank)
Government commitment	+
Policy environment	+
Institution/management effectiveness	+
Economic viability	+
Technical viability	+
Financial viability	+
Environmental viability	
Social impact/local participation	
Other (specify): _____	

			(✓)
3)	Does/did the project have a follow-on project which continued or expanded activities in the project under review?	Yes	☐
		No	☑

			(✓)
4)	Has the Borrower made alternative provisions to support the infrastructural, service, or institutional investments made under the project?	Yes	☐
		No	☐
		Not Available	☑

SPECIAL EMPHASES

III.C PUBLIC POLICY REFORM12/

1) Did the project objectives include reform of **PUBLIC POLICIES?**

	(✓)
Yes	☐
No	☑

If yes, assess the extent of achievement of these objectives:

	Sub-stantial (✓)	Partial (✓)	Negli-gible (✓)	Not Available (✓)	Not Applicable (✓)
Planning public investments/expenditures	☐	☐	☐	☐	☐
Budget process	☐	☐	☐	☐	☐
Tax system	☐	☐	☐	☐	☐
Monetary reform	☐	☐	☐	☐	☐
Debt management	☐	☐	☐	☐	☐
Exchange rate management	☐	☐	☐	☐	☐
Trade/tariff/etc.	☐	☐	☐	☐	☐
Civil service reform	☐	☐	☐	☐	☐
Regulation of private sector	☐	☐	☐	☐	☐
Government relation to public enterprises	☐	☐	☐	☐	☐
Restructuring of public enterprises	☐	☐	☐	☐	☐
Procurement policies	☐	☐	☐	☐	☐
Labor legislation	☐	☐	☐	☐	☐
Other (specify):_____	☐	☐	☐	☐	☐
OVERALL (copy to Sec. IV.C)	☐	☐	☐	☐	☐

III.C PUBLIC POLICY REFORM (continued)

2) Indicate whether the following factors had a positive(+) or negative(-) effect on the achievement of overall **PUBLIC POLICY REFORM** objectives:

	(+ or - or blank)
Sufficiency of Government commitment	☐
Adequacy of preparation/design	☐
Institutional effectiveness	☐
Realism of objectives	☐
Other (specify): _____	☐

III.D SOCIAL CONCERNS (Question #4 is to be answered in all cases)

1) Did the project address specific **SOCIAL GROUPS?**

	(✓)
Yes	☐
No	☑

If yes, what characterized these groups?

	(✓)
a. Socio-economic status (i.e. poverty)13/	☐
b. Gender (i.e., women, girls)14/	☐
c. Ethnicity (i.e. indigenous or tribal peoples)15/	☐
d. Community type or locale (e.g. resettlement)16/	☐
e. Other (specify): _____	☐

2) Indicate whether the following factors had a positive(+) or negative(-) effect on the achievement (see below) of **SOCIAL** objectives, and identify using the above letter(s) which group(s) the factors affected:

		(+ or - or blank)
Adequacy of project design	( ) ( )	☐
Sufficiency of Government/borrower commitment	( ) ( )	☐
Institutional effectiveness	( ) ( )	☐
Sufficiency of NGO/beneficiary participation	( ) ( )	☐
Realism of objectives	( ) ( )	☐
Other (specify): _____	( ) ( )	☐

3) Assess the extent of achievement of **SOCIAL** objectives (copy to Sec. IV.D)

Substantial (✓)	Partial (✓)	Negligible (✓)	Not Available (✓)	Not Applicable (✓)
☐	☐	☐	☐	☑

4) Did the project have significant unintended/unexpected positive or negative effect(s) on special **SOCIAL GROUPS**, regardless of the project's objectives?

Positive ☐ Negative ☐ No ☑

Explain: _____
_____
_____

III.E ENVIRONMENTAL CONCERNS17/ (answer question #4 in all cases)

		(✓)
1) Did the project objectives include enhancement or protection of the **ENVIRONMENT**?	Yes	☑
	No	☐

If yes, in what area(s):

	(✓)
Natural resource management	☑
Biological Diversity	☐
Air quality	☐
Water quality	☐
Soil quality	☐
Global warming/ozone depletion	☐
Noise Control	☐
Preservation of cultural heritage18/	☐
Other (specify): _____	☐

	Substantial (✓)	Partial (✓)	Negligible (✓)	Not Available (✓)	Not Applicable (✓)
2) Assess the extent of achievement of **ENVIRONMENTAL** objectives (copy to Sec. IV.E):	☑	☐	☐	☐	☐

3) Indicate whether the following factors had a positive(+) or negative(-) effect on the extent of achievement of **ENVIRONMENTAL** objectives:

	(+ or - or blank)
Project design/environmental assessment	+
Consistency with National Environmental Action Plan	+
Government/borrower commitment	+
Institutional effectiveness	+
Staff & consultant(s) effectiveness	☐
NGOs/beneficiaries participation	☐
Realism of objectives	☐
Other (specify): _____	☐

III.E **ENVIRONMENTAL CONCERNS** (continued) - answer question #4 in all cases

4) Did the project have significant unintended/unexpected positive or negative effect(s) on the **ENVIRONMENT**, regardless of the project's objectives?

Positive ☐ Negative ☐ No ☑

Explain: _____
_____
_____

III.F PRIVATE SECTOR DEVELOPMENT19/

1) Did the project include objectives to enhance/strengthen the role of the **PRIVATE SECTOR?**

	(✓)
Yes	☐
No	☑

2) Assess the extent of achievement of **PRIVATE SECTOR DEVELOPMENT** objectives (copy to Sec. IV.F):

Substantial (✓)	Partial (✓)	Negligible (✓)	Not Available (✓)	Not Applicable (✓)
☐	☐	☐	☐	☐

3) Indicate whether the following factors had a positive(+) or negative(-) effect on the extent of achievement of **PRIVATE SECTOR DEVELOPMENT** objectives:

	(+ or - or blank)
Project preparation/design	☐
Government/borrower commitment	☐
Legal framework	☐
Private sector interest	☐
Institutional strengths/weaknesses	☐
Realism of objective(s)	☐
Other (specify): _____	☐

PERFORMANCE BY PROJECT CYCLE PROCESS

III.G IDENTIFICATION, BANK PERFORMANCE

1). Assess the quality of Bank performance in the **IDENTIFICATION** of the project:20/

	Highly Satis-factory (✓)	Satis-factory (✓)	Deficient (✓)	Not Available (✓)	Not Applicable (✓)
Project consistency with Government development strategy priority	☐	☑	☐	☐	☐
Project consistency with Bank strategy for country	☐	☑	☐	☐	☐
Project innovativeness	☐	☑	☐	☐	☐
Other (specify):_____	☐	☐	☐	☐	☐
OVERALL (copy to Section IV.G)	☐	☑	☐	☐	☐

III.H PREPARATION, BORROWER/IMPLEMENTING AGENCY PERFORMANCE

1) Assess the quality of project **PREPARATION** in these areas: 20/

	Highly Satisfactory (✓)	Satis-factory (✓)	Deficient (✓)	Not Avail-able (✓)	Not Applic-able (✓)
Technical	☐	☑	☐	☐	☐
Financial	☐	☑	☐	☐	☐
Economic	☐	☑	☐	☐	☐
Commercial	☐	☐	☐	☑	☐
Institutional	☐	☑	☐	☐	☐
Environmental	☐	☐	☐	☑	☐
Sociological	☐	☐	☐	☑	☐
Other (specify) _____	☐	☐	☐	☐	☐
OVERALL (copy to Sec. IV.H)	☐	☑	☐	☐	☐

III.1 PREPARATION, BANK PERFORMANCE

1) Assess the quality of Bank performance in assisting the Borrower with project **PREPARATION** by major areas:

	Highly Satisfactory (✓)	Satis-factory (✓)	Deficient (✓)	Not Available (✓)	Not Applicable (✓)
Technical	☐	☑	☐	☐	☐
Financial	☐	☑	☐	☐	☐
Economic	☐	☑	☐	☐	☐
Commercial	☐	☐	☐	☑	☐
Institutional	☐	☑	☐	☐	☐
Environmental	☐	☐	☐	☑	☐
Sociological	☐	☐	☐	☑	☐
Other _____	☐	☐	☐	☐	☐
OVERALL (copy to Section IV.I)	☐	☑	☐	☐	☐

2) Indicate whether the following factors had a positive(+) or negative(-) effect on the above OVERALL assessment of Bank's performance in **PREPARATION** assistance:

	(+ or - or blank)
Degree of Bank involvement	☑ +
Staff quality (skill mix, continuity, ...)	☑ +
Staff quantity	☑ +
Economic and sector work	☑ +
Performance of consultant(s)	☐
Other (specify): _____	☐

III.J APPRAISAL, BANK PERFORMANCE

1) Assess the quality of Bank performance in project **APPRAISAL** by major areas:21/

	Highly Satisfactory (✓)	Satis-factory (✓)	Deficient (✓)	Not Available (✓)	Not Applicable (✓)
Technical	☐	☑	☐	☐	☐
Financial	☐	☑	☐	☐	☐
Economic	☐	☑	☐	☐	☐
Commercial	☐	☐	☐	☑	☐
Institutional	☐	☑	☐	☐	☐
Environmental	☐	☐	☐	☑	☐
Sociological	☐	☐	☐	☑	☐
Other _____	☐	☐	☐	☐	☐
OVERALL (copy to Sec. IV.J)	☐	☑	☐	☐	☐

2) Categorize the quality of **APPRAISAL** by major generic subject(s):

	Highly Satis-factory (✓)	Satis-factory (✓)	Deficient (✓)	Not Avail-able (✓)	Not Applic-able (✓)
Appraisal of commitment of government/implementing agency/ beneficiaries	☐	☑	☐	☐	☐
Appraisal of borrower/agency implementing capacity	☐	☑	☐	☐	☐
Realistic project design	☐	☑	☐	☐	☐
Identification/control for project risks/key variables22/	☐	☑	☐	☐	☐
Adequacy of implementation plan/ performance indicators	☐	☑	☐	☐	☐
Suitability of lending instrument	☐	☑	☐	☐	☐
Adequately taking into account past experience	☐	☑	☐	☐	☐
Other (specify) _____	☐	☐	☐	☐	☐

III.J APPRAISAL, BANK PERFORMANCE (continued)

3) Indicate whether the following factors had a positive(+) or negative(-) effect on the OVERALL quality assessment (see question #1 above) of the Bank's performance in project **APPRAISAL:**

	(+ or - or blank)
Staff quantity	☒
Staff quality (skill mix, continuity, ...)	☒
Performance of consultant(s)	☐
Coordination with other donors	☐
Other (specify) _____	☐

III.K IMPLEMENTATION, BORROWER/IMPLEMENTING AGENCY PERFORMANCE

1) Assess the quality of project **IMPLEMENTATION** in these areas:

	Highly Satisfactory (✓)	Satis-factory (✓)	Deficient (✓)	Not Avail-able (✓)	Not Applic-able (✓)
Macro policies	☐	☐	☐	☐	☑
Sector policies	☐	☑	☐	☐	☐
Institutional development	☐	☑	☐	☐	☐
Financial objectives	☐	☑	☐	☐	☐
Physical objectives	☐	☑	☐	☐	☐
Social objectives	☐	☐	☐	☐	☑
Other (specify) _____	☐	☐	☐	☐	☐
OVERALL (copy to Sec. IV.K)	☐	☑	☐	☐	☐

2) Indicate whether the following factors had a positive(+) or negative(-) effect on the OVERALL quality of project **IMPLEMENTATION:**

	(+ or - or blank)
Management quality (continuity, ...)	+
Staff quantity	+
Staff quality (skill mix, continuity, ...)	+
Performance of contractor(s)	☐
Performance of consultant(s)8/	☐
Government commitment	+
Government interference	☐
Project monitoring/evaluation	+
Level or timeliness of counterpart funding	☐
Other (specify): _____	☐

III.L SUPERVISION, BANK PERFORMANCE

1) Assess the quality of Bank performance in project **SUPERVISION** in these areas: 23/

	Highly Satis-factory (✓)	Satis-factory (✓)	Deficient (✓)	Not Avail-able (✓)	Not Applic-able (✓)
Reporting of project implementation progress	☐	☑	☐	☐	☐
Identification/assessment of implementation problems	☐	☑	☐	☐	☐
Attention to likely development impact	☐	☑	☐	☐	☐
Advice to implementing agency	☐	☑	☐	☐	☐
Adequacy of follow-up on advice/ decisions	☐	☑	☐	☐	☐
Enforcement of loan covenants/ exercise of remedies	☐	☑	☐	☐	☐
Flexibility in suggesting/ approving modifications	☐	☑	☐	☐	☐
Other (specify) _____	☐	☐	☐	☐	☐
OVERALL (copy to Section IV.L)	☐	☑	☐	☐	☐

2) Indicate whether the following factors had a positive(+) or negative(-) effect on the OVERALL quality of Bank performance in project **SUPERVISION:**

	(+ or - or blank)
Supervision plans	☐
Timing of supervision missions	☒
Sufficiency of time in field	☒
Staff quantity	☒
Staff quality (skill mix, continuity, ...)	☒
Performance of consultants	☐
Country implementation reviews	☐
Other (specify) _____	☐

III.M COMPLIANCE, BORROWER/IMPLEMENTING AGENCY PERFORMANCE

1) To what extent was the Government/Implementing Agency in **COMPLIANCE** with major loan covenants/commitments:

	Substantial (✓)	Partial (✓)	Negligible (✓)	Not Available (✓)	Not Applicable (✓)
Macro policies	☐	☐	☐	☐	☑
Sector policies	☐	☑	☐	☐	☐
Institutional changes	☐	☑	☐	☐	☐
Effective management/ staffing	☑	☐	☐	☐	☐
Financial improvements (tariffs, user charges, etc.)24/	☐	☑	☐	☐	☐
Provision of counterpart funds	☑	☐	☐	☐	☐
Increased efficiencies/ cost reductions	☑	☐	☐	☐	☐
Procurement 25/	☐	☑	☐	☐	☐
Progress reports	☑	☐	☐	☐	☐
Accounts and Audits 26/	☑	☐	☐	☐	☐
Use of technical assistance 27/	☐	☐	☐	☐	☑
Studies	☐	☐	☐	☐	☑
Other (specify): _____	☐	☐	☐	☐	☐
OVERALL (copy to Sec. IV.M)	☑	☐	☐	☐	☐

OUTCOME AND LESSONS

III.N ASSESSMENT OF OVERALL OUTCOME

(These ratings are defined below*)

		Highly Satis-factory (✓)	Satis-factory (✓)	Unsatis-factory (✓)	Highly Unsatis-factory (✓)
1)	Considering the project objectives (original or revised) and the extent of their achievement, give your **ASSESSMENT OF THE OVERALL OUTCOME** (or likely outcome) of the project (copy to Section IV.N):	☐	☑	☐	☐

2) Does this assessment differ from that in the PCR?

	(✓)
Yes	☐
No	☑

If yes, explain the difference(s):

_____

_____

_____

3. Is this is an outstanding project, for one or more of the following criteria?

	(✓)
Project has exceeded all of its major objectives	☐
Project highly innovative	☐
Project success highly replicable	☐
Other (specify): _____	☐

* DEFINITIONS OF OUTCOME RATINGS

Highly Satisfactory Project achieved or exceeded all its major relevant objectives and has achieved or is certain to achieve substantial development results, without major shortcomings.

Satisfactory Project achieved most of its major relevant objectives and has achieved or is expected to achieve satisfactory development results with only few major shortcomings.

Unsatisfactory Project failed to achieve most of its major relevant objectives, has not and is not expected to yield substantial development results and has significant shortcomings.

Highly Unsatisfactory Project failed to achieve any of its major relevant objectives and has not and is not expected to yield any worthwhile development results.

Note: An ERR of 10% or more for a major portion of the total investment, or other significant benefits if the ERR was less than 10%, is necessary to meet the minimal requirements for a "Satisfactory" project. Projects with an ERR of more than 10% might be "Unsatisfactory" if major policy/institutional objectives were not met or if significant external costs are omitted. Where ERRs are not estimated, the overall performance rating is made on the basis of cost-effectiveness in achieving project objectives.

III.O KEY LESSONS DRAWN

1) On the basis of the above evaluation, list the most significant positive and negative **LESSONS DRAWN** from the success or failure of the project.

a. A PRECONDITION FOR FURTHER BANK LOAN SHOULD BE THE STRENGTHENING OF COMMERCIAL ARRANGEMENTS BETWEEN NTPC AND SEBs (PCR)

b. NTPC'S MAIN FINANCIAL COVENANT SHOULD BE CHANGED FROM A RATE OF RETURN TO A SELF-FINANCING RATIO. (PCR)

c. _____

2) Do these lessons differ from those of the PCR?

	(✓)
Yes	☐
No	☑

Explain:

_____

_____

_____

IV. RATINGS SUMMARY (for DETAILED RATINGS see Section III)

ACHIEVEMENT OF OBJECTIVES	Substantial (✓)	Partial (✓)	Negligible (✓)	Not Available (✓)	Not Applicable (✓)
A. 1) Assess achievement of **MAJOR OBJECTIVES** (original or revised) in these areas:7/ (copy from page 4)					
Macro policies	☐	☐	☐	☐	☑
Sector policies	☐	☑	☐	☐	☐
Financial	☐	☑	☐	☐	☐
Physical Objectives	☑	☐	☐	☐	☐
2) Assess the achievement of **INSTITUTIONAL DEVELOPMENT** objectives: (copy from page 4)	☐	☑	☐	☐	☐

PROJECT SUSTAINABILITY	Likely (✓)	Unlikely (✓)	Uncertain (✓)
B. To what extent is the project likely to maintain an acceptable level of net benefits throughout its economic life? (copy from page 7)	☑	☐	☐

SPECIAL EMPHASES	Substantial (✓)	Partial (✓)	Negligible (✓)	Not Available (✓)	Not Applicable (✓)
C. Assess the extent of achievement of **PUBLIC POLICY** objectives (copy from page 8):	☐	☐	☐	☐	☑
D. Assess the extent of achievement of **SOCIAL** objectives (copy from page 10):	☐	☐	☐	☐	☑
E. Assess extent of achievement of **ENVIRONMENTAL OBJECTIVES** (copy from page 11):	☑	☐	☐	☐	☐
F. Assess the extent of achievement of **PRIVATE SECTOR** objectives (copy from page 13):	☐	☐	☐	☐	☑

IV. RATINGS SUMMARY (continued)

PERFORMANCE BY PROJECT CYCLE PROCESS	Highly Satisfactory (✓)	Satisfactory (✓)	Deficient (✓)	Not Available (✓)	Not Applicable (✓)
G. Assess the quality of BANK performance in the **IDENTIFICATION** of the project (copy from page 14):	☐	☑	☐	☐	☐
H. Assess the quality of BORROWER/AGENCY project **PREPARATION** (copy from page 15):	☐	☑	☐	☐	☐
I. Assess the quality of BANK performance in assisting the Borrower with project **PREPARATION** (copy from page 16):	☐	☑	☐	☐	☐
J. Assess the quality of BANK performance in project **APPRAISAL** (copy from page 17):	☐	☑	☐	☐	☐
K. Assess the quality of BORROWER/AGENCY project **IMPLEMENTATION** (copy from page 19):	☐	☑	☐	☐	☐
L. Assess the quality of BANK performance in project **SUPERVISION** (copy from page 20):	☐	☑	☐	☐	☐

	Substantial (✓)	Partial (✓)	Negligible (✓)	Not Available (✓)	Not Applicable (✓)
M. To what extent was the BORROWER/AGENCY in **COMPLIANCE** with major loan covenants/commitments (copy from page 21):	☑	☐	☐	☐	☐

ASSESSMENT OF OVERALL OUTCOME	Highly Satisfactory (✓)	Satisfactory (✓)	Unsatisfactory (✓)	Highly Unsatisfactory (✓)
N. Considering the project objectives (original or revised) and the extent of their achievement, give your **ASSESSMENT OF THE OVERALL OUTCOME** (or likely outcome) of the project (copy from page 22):	☐	☑	☐	☐

V. COMMENTS*

THE FIXED ASSETS CREATED UNDER THIS PROJECT AND THE CORRESPONDING DEBT-SERVICING OBLIGATIONS WERE TRANSFERED TO THE NEWLY CREATED NATIONAL POWER TRANSMISSION COMPANY IN AUGUST 1991.

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* Comments are encouraged, especially to clarify ambiguities in the ratings or important issues not brought out in the ratings, and also to indicate where the OED reviewer questions the judgements of the PCR. These comments can capture qualitative aspects of the project's story not captured in the ratings. Comments of a confidential nature should be made in a separate note to the Division Chief.

VI. QUALITY OF PCR

A. PCR

1) The quality of the PCR is:

	Highly Satis-factory[1] (✓)	Satis-factory[2] (✓)	Unsatis-factory[3] (✓)	Highly Unsatis-factory[4] (✓)
Coverage of important subject(s)	☐	☑	☐	☐
Availability of key data	☐	☑	☐	☐
Soundness of judgments:				
• internal consistencies	☐	☑	☐	☐
• evidence complete/ convincing	☐	☑	☐	☐
Adequacy of analysis	☐	☑	☐	☐
Consistency with SAR/ revised project	☐	☑	☐	☐
Presentation	☐	☑	☐	☐
Other (specify):_____	☐	☐	☐	☐
OVERALL	☐	☑	☐	☐

Explain: _____

_____

_____

1/ No significant qualifications.

2/ Some qualifications but generally acceptable.

3/ Significant qualifications which would have been readily susceptible to improvement.

4/ Significant qualifications which would not have been readily susceptible to improvement.

VI. QUALITY OF PCR (continued)

B. BORROWER VIEWS

1) Are the views of the borrower included in the PCR?

	(✓)
Yes	☑
No	☐

If no, give reason(s):

_____

_____

If yes, are there significant differences between Bank and Borrower views?

	(✓)
Yes	☐
No	☑

If yes, explain:

_____

_____

C. OED DATABASE

1) Identify key data in the PCR (including relevant Annexes) which are missing, incorrect or dubious and indicate whether they should be included, qualified, corrected or excluded from the OED database:

Original data in PCR	Problem with data and suggested treatment in the OED database
eg. *Completion date = 6/30/94.*	*Date is unrealistic. Should use 12/31/95 instead.*

VII. PRIORITY OF PROJECT FOR PAR AND IMPACT EVALUATION*

A. PERFORMANCE AUDIT

1) The priority of the project for PERFORMANCE AUDIT is:

High ☐ Medium ☐ Low ☑

2) If the priority is HIGH or MEDIUM, indicate reason(s):

	(✓)
Project is an adjustment operation	☐
Project is the first of its type in the subsector in the country	☐
Project is part of a series of projects which are suitable for packaging in a combined audit	☐
Project is large and complex	☐
Project has especially innovative and unusual features	☐
Project was highly successful in a difficult sector/ country	☐
PCR was incomplete/not satisfactory	☐
Project is likely to have high priority for impact evaluation	☐
OED and Operations disagree on performance rating	☐
An Executive Director has proposed audit	☐
Project is or is likely to be of considerable public interest	☐
Audit is required for special studies	☐
Other (specify): _____	☐

3) If the priority is high or medium, what are the major issues on which the audit should focus?

a) A S- AUDIT REPORT ON NTPC HAS BEEN ISSUED IN 1992.

b) _____

c) _____

---

* To be completed for every PCR.

VII. PRIORITY OF PROJECT FOR PAR AND IMPACT EVALUATION (continued)

B. IMPACT EVALUATION

1) The preliminary priority of the project for IMPACT EVALUATION is:

High ☐ Medium ☐ Low ☑

2) If the priority is HIGH or MEDIUM, indicate the reason(s):

	(✓)
*Project has a high or medium priority for performance audit or a satisfactory PCR	☐
*A satisfactory data/monitoring and evaluation system for the project exists	☐
Project gives high priority to special emphases (e.g., public sector reform, social concerns, environment, private sector development)	☐
Project is reasonably representative for sector/ subsector	☐
Project has experimental/innovative features	☐
Project is large and complex	☐
Project has considerable indirect costs and benefits/externalities	☐
Project is likely to be in operation at time of impact study	☐
Project sustainability is uncertain	☐
Project is part of a series of projects which are suitable for packaging in a combined evaluation	☐
Evaluation is required for special studies	☐
Project is or is likely to be of considerable public interest	☐
Project type not well covered by previous impact evaluations	☐
Other (specify): _____	☐

---

* These criteria are requisites for impact evaluation.

16. OD 4.30 deals with Involuntary Resettlement.

17. ODs 4.00, 4.01, and 4.02 deal with Environmental Policies, Assessment and Action Plans.

18. OD 4.25 deals with Cultural Property.

19. OD 5.20 deals with Private Sector Development.

20. OD 10.00 deals with Project Generation and Preparation.

21. OD 10.10 deals with Project Appraisal and ODs 10.20-40 deal more specifically with Technical, Sociological, Institutional and Economic criteria.

22. OD 10.40, Annex C deals with Risk and Sensitivity Analysis.

23. OD 13.05 deals with Project Supervision.

24. OD 6.00 deals with Cost Recovery and the Pricing of Public Goods.

25. ODs 11.00, 11.02 and 11.03 deal with Procurement.

26. OD 13.10 deals with Borrower Compliance with Audit Covenants.

27. OD 8.40 deals with Technical Assistance.

EXPLANATORY NOTES*

1. The purpose of the Project Information Form (PIF) is to evaluate the project and abstract relevant findings and conclusions for use in OED's Annual Reviews. It standardizes and classifies most answers to facilitate data entry in a computerized form for easy aggregation (Bankwide, by region, country, sector, lending instrument, etc.). It is a core PIF, intended to capture important information generic to most sectors, and may be supplemented by sector-specific forms as determined by each Division. The PIF is to be completed for each project both for PCRs and Performance Audits.

2. This includes only projects which have been restructured following a formal agreement between the borrower and the Bank that has been approved by or reported to the Executive Directors.

3. See relevant Country Brief or Country Strategy Paper; for SALs, see Policy Framework Paper.

4. Complexity is determined by such factors as the range of policy and institutional improvements, the number of institutions involved, the number of project components and their geographic dispersion, the number of cofinanciers, etc.

5. The objectives and how well they were achieved should be judged by the standards prevailing at the time of loan approval, not those at the time of the PCR. However, if the standards have changed during that period, this may be mentioned under Comments.

6. OD 10.50 deals with Financial Analysis and Management.

7. Section D covers more specific objectives such as public policy reforms, poverty alleviation, and environmental improvements.

8. OD 11.10, Annex F deals with the Evaluation of Consultant Performance and OD 11.13 with Reporting of Consultants' Performance.

9. OD 10.70 deals with Project Monitoring and Evaluation.

10. OD 6.50 deals with Project Cost Estimates and Contingency Allowances.

11. OD 6.50, Annex C deals with Disbursement Profiles.

12. OD 5.00 deals with Public Sector Management and OD 5.10 with Public Enterprise and Divestiture.

13. OD 4.15 deals with Poverty Reduction; OD 10.40, Annex E with Estimating the Poverty Impact of Projects.

14. OD 4.10 deals with Women in Development.

15. OD 4.20 deals with Indigenous People.

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* Not all ODs referred to have been issued but the Table of Contents to the Operational Manual provides references to relevant OMSs, OPNs or other guidelines.

OPERATIONS EVALUATION DEPARTMENT

PROJECT INFORMATION FORM (PIF)* 1/

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F. Overall Assessment of Project Results

G. Key Lessons Learned

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* The numbers in the PIF refer to the relevant explanatory notes in the Annex.

A. PIF Processing Information

Date of review: September 30, 1993

Name of reviewer: Jean-Francois Landeau

Type of Evaluation:

PCR review [X] PAR review [ ]

If this is a PAR review, are there major differences in the judgements from those in the PCR Review:

Yes [ ] No [ ]

If yes, comment on the differences: _____

B. Project Processing Information

Project Identification

Country: INDIA

Project Name: CENTRAL POWER TRANSMISSION PROJECT

Sector/Subsector: POWER/POWER TRANSMISSION

Lending Instrument: LOAN

Loan or Credit #s': 2283-IN

C. Achievement of Project Objectives

1. Project Objectives

a) Were major project objectives substantially changed during implementation? **2/**

Yes [X] No [ ]

If yes, were the objectives:

Reduced ☐ Increased [X] Otherwise modified ☐

b) Taking into account the country's level of development and the competence of the implementing agency, was the project and its major objectives:

	Very	Par-tially	No	Not Available
i. Relevant for country/sector:3/				
Original Project	[X]	☐	☐	☐
Revised Project	[X]	☐	☐	☐
ii. Demanding on Borrower/Implementing Agency:				
Original Project	☐	[X]	☐	☐
Revised Project	☐	[X]	☐	☐
iii. Complex:4/				
Original Project	☐	[X]	☐	☐
Revised Project	☐	[X]	☐	☐
iv. Risky:				
Original Project	☐	☐	[X]	☐
Revised Project	☐	☐	[X]	☐

c) Were the criteria for judging achievement of major objectives adequately quantified in the Staff Appraisal Report:

Yes [X] Partially ☐ No ☐

2. Extent of Achievement of Project Objectives 5/

a) If an economic rate of return (ERR) was calculated for the project, indicate (in %):

Appraisal Estimate	Re-estimated at Completion
N.A.	11.0

On what percentage of estimated total project costs was the original ERR based ? n.a.

On what percentage of total projects costs (final/latest estimate) was the re-estimated ERR based ? different scope

If an ERR was not re-estimated indicate reason(s):

- Project not implemented ☐
- Inadequate data ☐
- Other (specify): _____ ☐

If the re-estimated ERR differs significantly from the appraisal estimate, indicate the reason(s):

- Cost changes ☐
- Output changes ☐
- Output delays ☐
- Changes in methodology/analysis ☐
- Other (specify): scope ☒

If an ERR was not calculated, was the cost-effectiveness of the project estimated in the PCR:

Same or higher than in the SAR ☐

Lower than in the SAR ☐

Information not available ☐

b) If a financial rate of return (FRR) (or other financial indicator) was calculated for the project, indicate: **6/**

Appraisal Estimate	Re-estimated at Completion
_____	_____

If a FRR (or other financial indicator) was not re-estimated, indicate reason:

Project not implemented ☐

Inadequate data ☐

Other (specify): _____ ☐

If the re-estimated FRR (or other financial indicator) differs significantly from the appraisal estimate, indicate the reason(s):

Cost changes ☐

Output changes ☐

Changes in prices/tariffs/user charges ☐

Changes in methodology/analysis ☐

Other (specify): _____ ☐

c) Categorize achievement of major objectives (original or revised) in these areas: **7/**

	Substantial	Partial	Negligible	Not Available
Macro policies	☐	☐	[-]	[X]
Sector policies	☐	[X]	☐	☐
Institutional development	☐	[X]	☐	☐
Physical Objectives	[X]	☐	☐	☐

3. Factors Affecting Extent of Achievement

a) Indicate the extent to which the following positive(+) or negative(-) factors significantly affected achievement of major objectives:

	Substantial	Partial	Negligible	Not Available
Factors Not Generally Subject to Government Control				
World markets/prices	☐	☐	[X]	☐
Natural disasters	☐	☐	[X]	☐
Bank performance	☐	[X]	☐	☐
Cofinancier(s) performance	☐	[X]	☐	☐
Performance of contractors/ consultants **8/**	☐	[X]	☐	☐
War/civil disturbances	☐	☐	[X]	☐
Other (specify):_____	☐	☐	☐	☐

Factors Generally Subject to Government Control

Macro policies/conditions	☐	☐	[X]	☐
Sector policies	☐	[X]	☐	☐
Government commitment	☐	[X]	☐	☐
Appointment of key staff	☐	☐	[X]	☐
Counterpart funds	☐	[X]	☐	☐
Administrative procedures	☐	[X]	☐	☐
Other (specify):_____	☐	☐	☐	☐

Factors Generally Subject to Implementing Agency Control

Management	[X]	☐	☐	☐
Staffing	[X]	☐	☐	☐
Cost changes	☐	[X]	☐	☐
Implementation delays	[X]	☐	☐	☐
Use of technical assistance	☐	☐	[X]	☐
Monitoring and evaluation 9/	☐	[X]	☐	☐
Beneficiary participation	☐	☐	[X]	☐
Other (specify):_____	☐	☐	☐	☐

b) If cost changes were a substantial or partial factor, indicate the major reasons(s): **10/**

Change in project scope/scale/design	[X]
Deficient estimate of physical quantities	[ ]
Deficient estimate of base unit costs	[ ]
Deficient price contingencies	[ ]
Changes in exchange rates	[X]
Implementation delay	[X]
Performance of contractor(s)	[ ]
Other (specify): _____	[ ]

c) If implementation delays were a substantial or partial factor, indicate period from signing to physical completion (or final disbursement for adjustment loans) (in years):

Appraisal Estimate	Actual or Latest Estimate	Applicable Disbursement Profile **11/**
5.7		9.2

Indicate the major reason(s) for implementation delays:

Implementation schedule unrealistic	[ ]
Project preparation incomplete	[X]
Unexpected technical difficulties	[ ]

Change(s) in project scope	[X]
Quality of management	[ ]
Delays in selecting staff	[ ]
Delays in selecting consultants	[ ]
Delays in receiving counterpart funds	[ ]
Delays in receiving funds from Bank/ cofinanciers	[ ]
Inefficient procurement procedures	[ ]
Inefficient disbursement procedures	[ ]
Security problems	[ ]
Natural disasters	[ ]
Other (specify): _____	[ ]

4. Project Sustainability

a) To what extent is the project likely to maintain an acceptable level of net benefits throughout its economic life?

Likely	Unlikely	Uncertain
[X]	[ ]	[ ]

If sustainability is likely or unlikely, indicate the major reason(s):

Government commitment	[X]
Policy Environment	[X]
Institution/management effectiveness	[X]
Economic viability	[X]
Technical viability	[X]
Financial viability	[X]
Environmental viability	[ ]
Social impact/local participation	[ ]
Other (specify): _____	[ ]

b) Does the project include a plan for longer-term project operations after Bank participation has terminated?

Plan satisfactory [X] Plan unsatisfacatory [ ] No plan [ ]

D. Special Emphases

1. Public Policy Reform **12/**

Did the project objectives include reform of public policies?

Yes [ ] No [X]

If yes, categorize the extent of achievement of these objectives:

	Substantial	Partial	Negligible	Not Available
a. Planning public investments/expenditures	☐	☐	☐	☐
b. Budget process	☐	☐	☐	☐
c. Tax system	☐	☐	☐	☐
d. Monetary reform	☐	☐	☐	☐
e. Debt management	☐	☐	☐	☐
f. Exchange rate management	☐	☐	☐	☐
g. Trade/tariff/etc.	☐	☐	☐	☐
h. Civil service reform	☐	☐	☐	☐
i. Regulation of private sector	☐	☐	☐	☐
j. Government relation to public enterprises	☐	☐	☐	☐
k. Restructuring of public enterprises	☐	☐	☐	☐
l. Procurement policies	☐	☐	☐	☐
m. Labor legislation	☐	☐	☐	☐
m. Other (specify):_____	☐	☐	☐	☐
Overall	☐	☐	☐	☐

If overall achievement was substantial or negligible, indicate the major reason(s):

Sufficiency of Government commitment ☐

Adequacy of preparation/design ☐

Institutional effectiveness ☐

Realism of objectives ☐

Other (specify): _____ ☐

2. Social Concerns

a) Did the project address specific social groups?

Yes ☐ No [X]

If yes, what characterized these groups?

a. Socio-economic status (i.e. poverty) **13/** ☐

b. Gender (i.e., women, girls) **14/** ☐

c. Ethnicity (i.e. indigenous or tribal peoples) **15/** ☐

d. Community type or locale (e.g. resettlement) **16/** ☐

e. Other (specify): _____ ☐

Categorize extent of achievement of (original or revised) social objectives:

Substantial	Partial	Negligible	Not Available
☐	☐	☐	☐

If achievement was substantial or negligible, indicate the major reason(s), and in the parentheses give the letter(s) indicating to which group(s) the reason applies:

Adequacy of project design	( ) ( )	☐
Sufficiency of Government/borrower commitment	( ) ( )	☐
Institutional effectiveness	( ) ( )	☐
Sufficiency of NGO/beneficiary participation	( ) ( )	☐
Realism of objectives	( ) ( )	☐
Other (specify): _____	( ) ( )	☐

b) Did the project have significant unintended/unexpected positive or negative effect(s) on special groups?

Positive ☐ Negative ☐ No ☒ Unknown ☐

Comment(s):_____

_____

_____

3. Environmental Concerns 17/

a) Did the project objectives include enhancement or protection of the environment?

Yes ☐ No ☒

If yes, in what area(s):

Natural resource management ☐

Biological Diversity ☐

Air quality ☐

Water quality ☐

Soil quality ☐

Global warming/ozone depletion ☐

Noise ☐

Preservation of cultural heritage **18/** ☐

Other (specify): _____ ☐

Categorize extent of achievement of environmental objectives:

Substantial	Partial	Negligible	Not Available
☐	☐	☐	☐

If achievement was substantial or negligible, indicate the major reasons(s):

Adequacy of design/environmental assessment ☐

Consistency with National Environmental Action Plan ☐

Sufficiency of government/borrower commitment ☐

Institutional effectiveness ☐

Consultants ☐

NGOs/beneficiaries participation ☐

Realism of objectives ☐

Other (specify): _____ ☐

Did the project have significant unintended/unexpected positive or negative effect(s) on the environment?

Positive ☐ Negative ☐ No [X] Unknown ☐

Comment(s): _____

_____

_____

4. Private Sector Development 19/

Did the project include objectives to enhance/strengthen the role of the private sector?

Yes ☐ No [X]

If yes, categorize the extent of achievement of these objectives:

Substantial	Partial	Negligible	Not Available
☐	☐	☐	☐

If achievement was substantial or negligible, indicate the major reason(s):

Adequacy of preparation/design ☐

Sufficiency of government/borrower commitment ☐

Adequacy of legal framework ☐

Degree of private sector interest ☐

Institutional strengths/weaknesses ☐

Realism of objective(s) ☐

Other (specify): _____ ☐

E. Bank/Borrower Performance

I. Bank Performance

1. Categorize the quality of Bank performance in the identification of the project: 20/

	Highly Satis-factory	Satis-factory	Deficient	Not Available
Project consistency with Government development strategy priority	☐	☒	☐	☐
Project consistency with Bank strategy for country	☐	☒	☐	☐
Other (specify):_____	☐	☐	☐	☐
Overall	☐	☒	☐	☐

2. Categorize the quality of Bank performance in assisting the Borrower with project preparation by major areas and overall:20/

	Highly Satisfactory	Satis-factory	Deficient	Not Available
Technical	☐	☒	☐	☐
Financial	☐	☒	☐	☐
Economic	☐	☒	☐	☐
Commercial	☐	☐	☐	☒
Institutional	☐	☒	☐	☐
Environment	☐	☐	☐	☒
Sociological	☐	☐	☐	☒
Overall	☐	☒	☐	☐

If the overall assessment of preparation assistance is highly satisfactory or deficient, identify the major reason(s):

Staff quantity	☐
Degree of Bank involvement	☐
Staff quality (skill mix, continuity)	☐
Consultants	☐
Other (specify): _____	☐

3. Categorize the quality of Bank performance in project appraisal by major areas and overall:**21/**

	Highly Satisfactory	Satis-factory	Deficient	Not Available
Technical	☐	[X]	☐	☐
Financial	☐	[X]	☐	☐
Economic	☐	[X]	☐	☐
Commercial	☐	☐	☐	[X]
Institutional	☐	[X]	☐	☐
Environment	☐	☐	☐	[X]
Sociological	☐	☐	☐	[X]
Overall	☐	[X]	☐	☐

Categorize the quality of appraisal by major generic subject(s):

	Highly Satis-factory	Satis-factory	Deficient	Not Available
Appraisal of commitment of government/implementing agency/ beneficiaries	☐	☒	☐	☐
Appraisal of borrower/implementing agency capacity	☐	☒	☐	☐
Project complexity	☐	☒	☐	☐
Recognition of project risks/key variables **22/**	☐	☒	☐	☐
Adequacy of implementation plan/ performance indicators	☐	☒	☐	☐
Suitability of lending instrument	☐	☒	☐	☐
Taking into account adequately past experience	☐	☒	☐	☐
Other (specify)	☐	☐	☐	☐

If the overall assessment of appraisal is highly satisfactory or deficient, identify the major reason(s):

Staff quantity	☐	☐	☐	☐
Staff quality (skill mix, continuity	☐	☐	☐	☐
Consultants (quality, continuity)	☐	☐	☐	☐
Other (specify) _____	☐	☐	☐	☐

4. Categorize the quality of Bank supervision: **23/**

	Highly Satis-factory	Satis-factory	Deficient	Not Available
Reporting of project implementation progress	☐	☒	☐	☐
Identification/assessment of implementation problems	☐	☒	☐	☐
Attention to likely development impact	☐	☒	☐	☐
Advice to implementing agency	☐	☒	☐	☐
Adequacy of follow-up on advice/ decisions	☐	☒	☐	☐
Enforcement of loan covenants/ exercise of remedies	☐	☒	☐	☐
Flexibility in suggesting/ approving modifications	☐	☒	☐	☐
Other (specify) _____	☐	☐	☐	☐
Overall	☐	☒	☐	☐

If the overall assessment of supervision is highly satisfactory or deficient, identify the major reason(s):

Staff quantity	☐	☐	☐	☐
Sufficiency of time in field	☐	☐	☐	☐
Staff quality (skill mix, continuity)	☐	☐	☐	☐
Consultants (quality, continuity)	☐	☐	☐	☐

Supervision plans	☐	☐	☐	☐
Timing of supervision missions	☐	☐	☐	☐
Country implementation reviews	☐	☐	☐	☐
Other (specify) _____	☐	☐	☐	☐

II. Government/Implementing Agency Performance

1. Categorize the quality of project preparation in these areas and overall: **20/**

	Highly Satisfactory	Satis-factory	Deficient	Not Avail-able
Technical	☐	☒	☐	☐
Financial	☐	☒	☐	☐
Economic	☐	☒	☐	☐
Commercial	☐	☐	☐	☒
Institutional	☐	☒	☐	☐
Environment	☐	☐	☐	☒
Sociological	☐	☐	☐	☒
Overall	☐	☒	☐	☐

2. Categorize the quality of project implementation in these areas and overall:

	Highly Satisfactory	Satis-factory	Deficient	Not Avail-able
a. Macro policies	☐	☐	☐	☒
b. Sector policies	☐	☒	☐	☐
c. Institutional development	☐	☒	☐	☐
d. Physical objectives	☐	☒	☐	☐
e. Social objectives	☐	☐	☐	☒
Overall	☐	☒	☐	☐

If the overall assessment of project implementation is highly satisfactory or deficient, identify the major reason(s):

- Quality of management ☐
- Quality of staff ☐
- Performance of contractor(s) ☐
- Performance of consultant(s) 8/ ☐
- Government commitment ☐
- Government interference ☐
- Adequacy of project monitoring/ evaluation ☐
- Other (specify): _____ ☐

3. To what extent did the Government/Implementing Agency comply with major loan covenants/commitments:

	Substantial	Partial	Negligible	Not Available
Macro policies	☐	☐	☐	☒
Sector policies	☒	☐	☐	☐
Institutional changes	☐	☐	☐	☒
Effective management/ staffing	☒	☐	☐	☐
Financial improvements (tariffs, user charges, etc.) **24/**	☒	☐	☐	☐
Provision of counterpart funds	☒	☐	☐	☐
Increased efficiencies/ cost reductions	☒	☐	☐	☐
Procurement **25/**	☒	☐	☐	☐
Progress reports	☒	☐	☐	☐
Accounts and Audits **26/**	☒	☐	☐	☐
Use of technical assistance **27/**	☐	☒	☐	☐
Studies	☐	☐	☐	☒
Other (specify): _____	☐	☐	☐	☐
Overall	☒	☐	☐	☐

F. Overall Performance Assessment

1. Considering the project objectives (original or revised) and the extent of their achievement, give your assessment of the overall success (or likely success) of the project:

Highly Satisfactory	Project achieved or exceeded all its major relevant objectives and has achieved or is certain to achieve substantial development results, without major shortcomings.	☐
Satisfactory	Project achieved most of its major relevant objectives and has achieved or is expected to achieve satisfactory development results with only few major shortcomings.	☒
Unsatisfactory	Project failed to achieve most of its major relevant objectives, has not and is not expected to yield substantial development results and has significant shortcomings.	☐
Highly Unsatisfactory	Project failed to achieve any of its major relevant objectives and has not and is not expected to yield any worthwhile development results.	☐

Note: An ERR of 10% or more for a major portion of the total investment, or other significant benefits if the ERR was less than 10%, is necessary to meet the minimal requirements for a "Satisfactory" project. Projects with an ERR of more than 10% might be "Unsatisfactory" if major policy/institutional objectives were not met or if significant external costs are omitted. Where ERRs are not estimated, the overall performance rating is made on the basis of cost-effectiveness in achieving project objectives.

2. Does the above assessment differ from that in the PCR?

Yes ☐ No ☒ Not available ☐

If yes, comment on the difference(s):

_____

_____

3. Is this an outstanding project, for one or more of the following reasons:

Project has exceeded all its major objectives	☐
Project highly innovative	☐
Project success highly replicable	☐
Other (specify): _____	☐

G. Key Lessons Learned

On the basis of the above evaluation, list the most significant positive and negative lessons learned from the success or failure of the project. Mark with an asterisk (*) those lessons most relevant for similar projects in sector/subsector or the country:

a. A precondition for further loans should be the strengthening of commercial arrangements between NTPC and SEBs.

b. NTPC's main financial covenant should be changed from a rate of return to a self-financing ratio.

c. _____

_____

H. Comments*

The fixed assets created under this project and the corresponding debt-servicing obligations were transfered to the newly created National Power Transmission Company in August 1991.

---

* Comments are optional. They might include, for example, clarifying ambiguities in the ratings or important issues not brought out in the ratings. Comments of a confidential nature should be made in a separate note to the Division Chief.

EXPLANATORY NOTES *

1. The purpose of the Project Information Form (PIF) is to evaluate the project and abstract relevant findings and conclusions for use in OED's Annual Reviews. It standardizes and classifies most answers to facilitate data entry in a computerized form for easy aggregation (Bankwide, by region, country, sector, lending instrument, etc.). It is a core PIF, intended to capture important information generic to most sectors, and may be supplemented by sector-specific forms as determined by each Division. The PIF is to be completed for each project both for PCRs and Performance Audits. Boxes are to be marked only if applicable.

2. This includes only projects which have been restructured following a formal agreement between the borrower and the Bank that has been approved by or reported to the Executive Directors.

3. See relevant Country Brief or Country Strategy Paper; for SALs, see Policy Framework Paper.

4. Complexity is determined by such factors as the range of policy and institutional improvements, the number of institutions involved, the number of project components and their geographic dispersion, the number of cofinanciers, etc.

5. The objectives and how well they were achieved should be judged by the standards prevailing at the time of loan approval, not those at the time of the PCR. However, if the standards have changed during that period, this may be mentioned under Comments.

6. OD 10.50 deals with Financial Analysis and Management.

7. Section D covers more specific objectives such as public policy reforms, poverty alleviation, and environmental improvements.

8. OD 11.10, Annex F deals with the Evaluation of Consultant Performance and OD 11.13 with Reporting of Consultants' Performance.

9. OD 10.70 deals with Project Monitoring and Evaluation.

10. OD 6.50 deals with Project Cost Estimates and Contingency Allowances.

11. OD 6.50, Annex C deals with Disbursement Profiles.

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* Not all ODs referred to have been issued but the Table of Contents to the Operational Manual provides references to relevant OMSs, OPNs or other guidelines.

12. OD 5.00 deals with Public Sector Management and OD 5.10 with Public Enterprise and Divestiture.

13. OD 4.15 deals with Poverty Reduction; OD 10.40, Annex E with Estimating the Poverty Impact of Projects.

14. OD 4.10 deals with Women in Development.

15. OD 4.20 deals with Indigenous People.

16. OD 4.30 deals with Involuntary Resettlement.

17. ODs 4.00, 4.01, and 4.02 deal with Environmental Policies, Assessment and Action Plans.

18. OD 4.25 deals with Cultural Property.

19. OD 5.20 deals with Private Sector Development.

20. OD 10.00 deals with Project Generation and Preparation.

21. OD 10.10 deals with Project Appraisal and ODs 10.20-40 deal more specifically with Technical, Sociological, Institutional and Economic criteria.

22. OD 10.40, Annex C deals with Risk and Sensitivity Analysis.

23. OD 13.05 deals with Project Supervision.

24. OD 6.00 deals with Cost Recovery and the Pricing of Public Goods.

25. ODs 11.00, 11.02 and 11.03 deal with Procurement.

26. OD 13.10 deals with Borrower Compliance with Audit Covenants.

27. OD 8.40 deals with Technical Assistance.

OPERATIONS EVALUATION DEPARTMENT

QUALITY OF PROJECT COMPLETION REPORT (PCR)[1/]

1. Project Identification

Country: INDIA

Project Name: CENTRAL POWER TRANSMISSION

Sector/Subsector: POWER/POWER TRANSMISSION

Lending Instrument: LOAN

Loan or Credit No: 2283-IN

Date of Review: September 30, 1993

Evaluating Officer: Jean-Francois Landeau

Division Chief: Yves Albouy

A. PCR Quality

2. The quality of the PCR is:

	Highly Satisfactory:[2/]	Satisfactory [3/]	Unsatisfactory [4/]	Highly Unsatisfactory [5/]
Coverage of important subject(s)	☐	☒	☐	☐
Availability of key data	☐	☒	☐	☐

1/ To be completed for every PCR

2/ No significant qualifications.

3/ Some qualifications but generally acceptable.

4/ Significant qualifications but they would have been readily susceptible to improvement.

5/ Significant qualifications which would not have been readily susceptible to improvement.

Soundness of judgment(s)				
(i) internal consistencies	☐	☒	☐	☐
(ii) evidence complete/convincing	☐	☒	☐	☐
Adequacy of analysis	☐	☒	☐	☐
Consistency with SAR/ revised project	☐	☒	☐	☐
Presentation	☐	☒	☐	☐
Other (specify):_____	☐	☐	☐	☐
Overall	☐	☒	☐	☐

Comments: _____

_____

_____

B. Borrower Views

3. Are the views of the borrower included in the PCR?

Yes ☒ No ☐

If no, give reason(s):

_____

_____

If yes, are there significant differences between Bank and Borrower views?

Yes ☐ No [X]

If yes, comment:

_____

_____

C. OED Database

4. Identify key data in the PCR (including relevant Annexes) which are missing, incorrect or dubious and indicate whether they should be included, qualified, corrected or excluded from the OED database:

a) (i) Original data _____

(ii) Treatment in OED database _____

b) (i) Original data _____

(ii) Treatment in OED database _____

OPERATIONS EVALUATION DEPARTMENT

PRIORITY OF PROJECT FOR PERFORMANCE AUDIT AND IMPACT EVALUATION[1/]

1. Project Identification

Country:	INDIA
Project Name:	CENTRAL POWER TRANSMISSION
Sector/Subsector:	POWER/POWER TRANSMISSION
Lending Instrument:	LOAN
Loan or Credit No:	2283-IN
Date of Review:	September 30, 1993
Evaluating Officer:	Jean-Francois LANDEAU
Division Chief:	Yves ALBOUY

A. Performance Audit

2. The priority of the project for performance audit is:

High ☐ Medium ☐ Low [X]

3. If the priority is high or medium, indicate reason(s):

Project is an adjustment operation ☐

Project is the first of its type in the subsector in the country ☐

Project is part of a series of projects which are suitable for packaging in a combined audit ☐

1/ To be completed for every PCR

Project is large and complex	☐
Project has especially innovative and unusual features	☐
Project was highly successful in a difficult sector/ country	☐
PCR was incomplete/not satisfactory	☐
Project is likely to have high priority for impact evaluation	☐
OED and Operations disagree on performance rating	☐
An Executive Director has proposed audit	☐
Project is or is likely to be of considerable public interest	☐
Audit is required for special studies	☐
Other (specify): _____	☐

4. If the priority is high or medium, what are the major issues on which the audit should focus?

a) _____

_____

b) _____

_____

c) _____

_____

B. <u>Impact Evaluation</u>

5. The preliminary priority of the project for <u>impact evaluation</u> is:

High ☐ Medium ☐ Low [X]

6. If the priority is high or medium, indicate reason(s):

*Project has a high or medium priority for performance audit or a satisfactory PCR ☐

*A satisfactory data/monitoring and evaluation system for the project exists ☐

Project gives high priority to special emphases (e.g., public sector reform, social concerns, environment, private sector development) ☐

Project is reasonably representative for sector/subsector ☐

Project has experimental/innovative features ☐

Project is large and complex ☐

Project has considerable indirect costs and benefits/externalities ☐

Project is likely to be in operation at time of impact study ☐

Project sustainability is uncertain ☐

Project is part of a series of projects which are suitable for packaging in a combined evaluation ☐

Evaluation is required for special studies ☐

Project is or is likely to be of considerable public interest ☐

Project type not well covered by previous impact evaluations ☐

Other (specify): _____ ☐

---

* These criteria are prerequisites for impact evaluation.

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Report No. 12550

PROJECT COMPLETION REPORT

INDIA

CENTRAL POWER TRANSMISSION PROJECT
(LOAN 2283-IN)

NOVEMBER 22, 1993

Energy Operations Division
Country Department II (India)
South Asia Region

THE WORLD BANK
Washington, D.C. 20433
U.S.A.

Office of Director-General
Operations Evaluation

MEMORANDUM TO THE EXECUTIVE DIRECTORS AND THE PRESIDENT

December 10, 1993

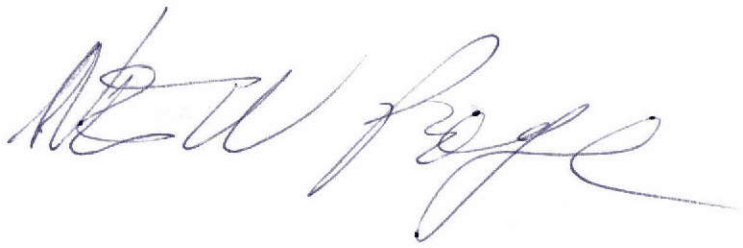
SUBJECT: Project Completion Report on India
Central Power Transmission Project (Loan 2283-IN)

Attached is the "Project Completion Report on India - Central Power Transmission Project (Loan 2283-IN)" prepared by the South Asia Region. Part II was provided by the Borrower.

The US$250.7 million loan increased the capacity of the transmission grid feeding power from the National Thermal Power Company (NTPC) to the regional power companies. The Bank approved a revision in the project scope which was fully justified under the original project objectives. Almost half of the loan amount was canceled (US$119.2 million) partly because of foreign currency savings. There were three extensions and the project was not fully completed at loan closing.

All the project objectives were substantially obtained albeit with substantial delays. The re-estimated economic rate of return is 11% (not directly comparable with the initial figure because of the change in scope). NTPC maintained its good financial health but its performance in bill collection has prompted the Bank to insist on very strong remedial actions by the Government with respect to the least responsive State Electricity Boards. The project strengthened NTPC's transmission planning and project management capacity. The know how thus acquired was transferred to POWERGRID, the recently created national transmission company.

Overall, the project outcome is rated as satisfactory, its sustainability as likely, and its institutional impact as substantial. The PCR gives a thorough account of project preparation and implementation which was mostly uneventful except for the initial delays. No audit is planned.



A

COUNTRY EXCHANGE RATES AND ABBREVIATIONS

Currency Unit = Rupee (Rs.)
Rs. 1 = Paise 100

Rupee (Rs.)/US$ Exchange Rates and CPI (Yearly Averages)

Fiscal Year	Rupees/US$	Consumer Price Index FY80/81=100
FY83 (Project appraisal & approval)	10.10 /a	
FY84	11.36	
FY85	12.37	133.3
FY86	12.61	141.2
FY87	12.96	148.0
FY88	13.92	163.2
FY89	16.23	176.3
FY90	17.50	190.6
FY91	22.74	216.3
FY92	26.20	237.0 (estimate)

/a Conversions in the Staff Appraisal Report were made at Rs 9.5/US$.

Government of India and
National Thermal Power Corporation
Fiscal Year: April 1 - March 31

Measures and Equivalents

1 Ton (t)		=	1 metric ton=1,000 kg.=2,200 lbs.
1 Kilovolt (kV)		=	1,000 volts (V)
1 Kilovolt ampere	(kVA)	=	1,000 volt-amperes (VA)
1 Kilowatt-hour	(kVh)	=	1,000 watt-hours
1 Megawatt-hour	(MWh)	=	1,000 kilowatt-hours
1 Gigawatt-hour	(GWh)	=	1,000,000 kilowatt-hours

Abbreviations and Acronyms

CEA	Central Electricity Authority
DESU	Delhi Electric Supply Undertaking
GOI	Government of India
IBRD	International Bank for Reconstruction & Development
IDA	International Development Association
MOU	Memoranda of Understanding
NHPC	National Hydroelectric Power Corporation
NPTC	National Power Transmission Corporation
NTPC	National Thermal Power Corporation
POWERGRID	Power Grid Corporation of India
ROR	Rate of Return
SEBs	State Electricity Boards

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Report No: 12550

PROJECT COMPLETION REPORT

INDIA

CENTRAL POWER TRANSMISSION PROJECT
(LOAN 2283-IN)

November 22, 1993

Energy Operations Division
Country Department II (India)
South Asia Region

PROJECT COMPLETION REPORT

INDIA

CENTRAL POWER TRANSMISSION PROJECT
(LOAN 2283-IN)

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INDIA

CENTRAL POWER TRANSMISSION PROJECT
(Loan 2283-IN)

PROJECT COMPLETION REPORT

Availability of Transmission Lines and Sub-stations in 1992

Line	Jan 92	Feb 92	Mar 92	Apr 92	May 92	Jun 92	Jul 92	Aug 92	Sep 92	Oct 92	Nov 92	Dec 92	Jan-Dec 92
TRANSMISSION LINES													
1. RDM-CPR1	100.00	100.00	100.00	100.00	100.00	100.00	100.00	98.70	100.00	98.81	100.00	100.00	99.8
2. RDM-CPR2	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.0
3. NSR-GTY	99.85	99.85	100.00	99.76	96.60	97.98	98.28	98.06	97.10	100.00	100.00	100.00	99.0
4. GTY-BGL	99.99	99.99	100.00	100.00	96.79	100.00	99.94	98.02	98.92	99.92	100.00	100.00	99.5
5. VJA-GZW a/	-	-	94.83	99.92	100.00	95.39	100.00	55.16	100.00	100.00	100.00	99.18	98.5 b/
6. RDM-KMM a/	-	-	96.14	89.93	95.23	96.38	100.00	92.66	100.00	100.00	100.00	99.69	97.0
7. KMM-VJA a/	-	-	95.51	90.75	97.41	96.18	100.00	92.46	100.00	99.52	93.68	91.88	95.7
SUB-STATIONS													
1. Vijayawada	100.00	96.99	99.52	100.00	100.00	99.83	100.00	12.24	-	95.34	100.00	92.50	98.4 c/
2. Hyderabad	99.59	100.00	83.66	100.00	100.00	100.00	98.70	100.00	100.00	100.00	100.00	100.00	100.0 d/
3. Gazuwaka	100.00	100.00	100.00	99.72	100.00	96.11	100.00	92.54	100.00	100.00	100.00	100.00	99.6 e/
4. Bangalore	100.00	100.00	100.00	89.95	100.00	100.00	99.63	100.00	100.00	99.98	93.68	100.00	99.4 f/
5. Gooty	100.00	100.00	99.79	99.36	99.59	99.09	99.28	93.28	100.00	99.52	100.00	100.00	99.2

a/ Lines commissioned on March 20, 1992
b/ Excluding availability in August 1992

c/ Excluding shutdown in August & September 1992
d/ Excluding shutdown in March 1992
e/ Excluding shutdown in August 1992
f/ Excluding shutdown in April 1992

NATIONAL THERMAL POWER CORPORATION LTD.

INCOME STATEMENTS

(Rs million)

Year ending March 31	1985		1986		1987		1988		1989		1990		1991		1992	
INCOME DESCRIPTION	Forecast	Actual	Forecast	Actual	Forecast	Actual	Forecast	Actual	Forecast	Actual	Forecast	Actual	Forecast	Actual	Forecast	Actual
Electricity Generation (GWh)		9,248		14,174		15,921		19,378		27,298		38,595		43,985		61,197
Less: Aux Cons. (GWh)		932		1,335		1,513		1,845		2,421		3,174		3,659		4,540
Electricity Sales (GWh)	8,138	8,316	11,492	12,839	13,448	14,408	17,922	17,533	25,934	24,875	35,451	35,421	43,983	40,306	48,759	56,657
Av. Bulk Tariff (P/kwh)		37	38	38	40	40	40	41	41	46	43	52	44	53	45	61
Operating Revenues:																
Electricity Sales	2,948	3,077	4,421	4,829	5,365	5,736	7,257	7,201	10,715	11,460	15,103	16,376	19,817	21,254	22,080	34,347
Transmission Charges		148		284		555		1,178		993		1,691		2,404		3,742
Electricity Duty	113	111	231	111	249	87	331	93	479	179	655	294	812	347	901	455
Other Income	151	102	212	70	358	75	557	152	928	116	1,506	212	2,234	201	2,938	1,384
TOTAL OPERATING REVENUES	3,210	3,438	4,864	5,294	5,972	6,453	8,145	8,622	12,122	12,748	17,264	20,573	22,363	24,207	25,919	39,928
Operating Expenses:																
Fuel Cost		1,252		1,952	1,259	2,360	1,849	3,165	2,600	5,285	3,557	8,985	4,481	9,780		16,424
																898
																1,672
Operation and Maintenance		404		483	547	616	729	807	964	1,175	1,180	1,745	1,303	2,105		974
Depreciation		265		377	779	448	1,078	579	2,035	912	2,881	1,398	3,174	2,251	3,343	3,625
Electricity Duty		112		111	272	87	168	93	494	179	629	294	740	347		455
Others*		10		21		11		69		8		147		113		86
TOTAL OPERATING EXPENSES	1,704	2,042	2,646	2,943	3,225	3,522	4,678	4,712	7,602	7,559	10,423	12,567	12,935	14,577	14,406	24,134
Opr. Income bef. Interest	1,506	1,396	2,218	2,350	2,747	2,931	3,467	3,910	4,520	5,189	6,841	8,006	9,428	9,630	11,511	15,794
Interest	614	492	1,117	570	1,499	866	2,500	1,248	4,035	1,791	5,494	2,730	5,782	3,472	5,686	5,643
Profit before Tax	892	904	1,101	1,781	1,248	2,065	967	2,662	485	3,398	1,347	5,276	3,646	6,158	5,825	10,151
Less:Provision for Taxes				1		1				0						
Profit after Tax	892	904	1,101	1,780	1,248	2,064	967	2,662	485	3,398	1,347	5,276	3,646	6,158	5,825	10,151
Prior Period Income (Net)		(28)		50		53		362		(90)		90		851		69
Net Profit	892	875	1,101	1,830	1,248	2,118	967	3,024	485	3,308	1,347	5,366	3,646	7,009	5,825	10,220
Average Net Fixed Assets		10,957		14,016	29,862	17,209	51,025	23,856	78,048	35,078	91,488	53,567	99,232	75,482	101,077	102,945
Rate of Return on Assets (%)		13%		17%	9%	17%	7%	16%	6%	15%	7%	15%	10%	13%	11%	15%
Return on Capital Employed																
Operating Ratio (%)	88%	89%	84%	86%	84%	85%	87%	85%	83%	89%	80%	81%	88%	80%	86%	80%

* Includes deferred expenses, preliminary expenses, bonds expenses, rebate to costumer and contingencies.

** No tax provision has been made for future projections.

NATIONAL THERMAL POWER CORPORATION

SOURCES AND APPLICATION OF FUNDS

(Rs million)

Year ending March 31

	1985		1986		1987		1988		1989		1990		1991		1992	
SOURCES DESCRIPTION	Forecast	Actual	Forecast	Actual	Forecast	Actual	Forecast	Actual	Forecast	Actual	Forecast	Actual	Forecast	Actual	Forecast	Actual
SOURCES OF FUNDS																
Operating Income bef. Int.	1,506	1,398	2,218	2,350	2,747	2,931	3,467	3,910	4,520	5,189	6,841	8,006	9,428	9,830	11,511	15,794
Prior Period Income (Net)	0	(28)		50		53		362		(90)		90		851		
Depreciation(e)	387	265	630	377	779	448	1,078	579	2,035	912	2,661	1,396	3,174	2,251	3,343	3,625
Total Internal Cash Gen.	1,893	1,632	2,848	2,777	3,526	3,432	4,545	4,851	6,555	6,011	9,522	9,492	12,602	12,732	14,854	19,419
Equity Contributions	13,574	4,859	6,279	6,808	2,460	5,909	3,007	6,879	3,564	3,682	3,745	6,594	6,569	12,812	0	6,687
Capital Receipt		26		0		114		24		87		21		117		26
Borrowings																
Loans Contracted	6,225	4,416	13,582	5,731	13,423	5,865	9,394	4,836	6,678	11,972	2,524	5,712	693	5,019	4,876	25,437
Bonds		0		1,634		4,300		4,394		1,499		4,346		4,000		7,984
Total Borrowings	6,225	4,416	13,582	7,365	13,423	10,165	9,394	9,230	6,678	13,471	2,524	11,058	693	9,019	4,876	33,421
TOTAL SOURCES	21,692	10,933	24,709	16,950	19,409	19,620	16,946	20,984	16,797	23,251	15,791	27,165	19,864	34,660	19,730	59,533
APPLICATION OF FUNDS																
Total Investment	20,066	10,011	23,388	14,048	17,449	17,806	13,536	17,830	11,857	19,064	8,215	20,397	10,823	26,079	9,906	52,754
Debt Service																
Interest Charged to Oper.	614	492		570	1,499	866	2,500	1,248	4,035	1,791	5,494	2,730	5,782	3,472	5,586	5,643
Amortization of Loans		-		-	300		476	-	785	747	1,697	1,087	2,997	1,542	3,956	2,581
Total Debt Service	614	492		570	1,799	866	2,976	1,248	4,820	2,538	7,191	3,817	8,779	5,015	9,542	8,224
Increase (Dec.) in W. C.		430		2,332	155	845	416	(3,416)	360	3,812	376	1,842	259	3,278	177	(3,838)
Provision for Tax				1		1				0						
TOTAL APPLICATION OF FUNDS	20,680	10,933		16,950		19,620		20,984		25,414		26,056		34,371	19,727	57,141
				608	6	102	16	5,522	10	(2,163)	8	1,109	3	308	2	2,244
Contribution to Constr.				-0.01	9%	10%	9%	40%	12%	-2%	24%	19%	33%	17%	51%	28%
Cont. to Const. (3-yr. Av)																
Debt Service Coverage	3.08	3.32		4.87	1.96	3.96	1.53	3.89	1.36	2.37	1.32	2.49	1.44	2.54	1.54	2.36

(e) Depreciation pertains to operations.

NATIONAL THERMAL POWER CORPORATION

BALANCE SHEETS

(Rs million)

Year ending March 31	1985		1986		1987		1988		1989		1990		1991		1992	
BALANCE DESCRIPTION	Forecast	Actual	Forecast	Actual	Forecast	Actual	Forecast	Actual	Forecast	Actual	Forecast	Actual	Forecast	Actual	Forecast	Actual
ASSETS																
Gross Block	21,064	13,363	28,178	16,047	36,880	20,689	70,341	30,506	90,090	44,784	105,986	69,972	111,433	92,422	118,194	131,138
Less:Depreciation		476	1,286	903	2,047	1,416	3,125	2,069	5,210	3,068	7,891	4,554	11,065	6,877	14,408	10,791
Net Fixed Assets in Ops.	21064.00	12,887	24,890	15,144	34,833	19,273	67,216	28,439	84,880	41,716	98,095	65,418	100,368	85,546	101,786	120,345
Capital Works in Progress		19,556	48,884	31,069	55,629	44,302	35,704	52,187	27,612	57,062	19,931	52,360	25,307	56,039	30,454	70,080
Total Fixed Assets	21064.00	32,543	73,774	46,213	90,462	63,575	102,920	80,626	112,492	98,778	118,026	117,778	125,675	141,584	132,240	190,425
Current Assets																
Cash and Bank Balance	11	84	13	448	19	134	35	5,973	45	2	53	291	58	884	58	1,742
Short-term deposits		395		837		1,053		737		4,544		5,864		5,279		6,465
Receivables	246	1,628	368	2,284	447	2,828	605	4,058	893	5,981	1,259	11,561	1,610	15,102	1,840	18,086
Inventories	211	704	262	940	369	1,322	703	1,742	901	2,639	1,060	3,632	1,114	5,414	1,162	7,306
Loans & Advances		326		1,972		3,842		783		2,814		1,824		2,088		2,497
Other Cur. Asset/Debtor	2	17	2	13	2	148	2	178	2	104	2	125	2	231	2	399
Total Current Assets	470	3,151	645	6,293	837	9,127	1,345	13,469	1,841	15,884	2,374	22,797	2,782	28,799	3,062	34,495
Misc.Capital Expenditure		19		19		16		17		18		19		41		39
TOTAL ASSETS	21,534	35,713	74,419	52,526	91,299	72,718	104,265	94,112	114,333	114,680	120,400	140,594	128,457	170,424	135,302	224,959
LIABILITIES																
Equity																
Share Capital Issued		20,832		26,685	47,110	32,851	50,117	37,658	53,681	44,073	57,428	49,840	63,995	59,237	63,995	69,841
Share Deposit		236		990		734		2,806		73		1,100		4,314		377
Retained Earnings		1,402		3,231	3,667	5,463	4,634	8,511	5,119	11,906	6,466	17,293	10,112	24,420	15,937	34,526
Total Equity	0	22,270	0	30,906	50,777	39,048	54,751	48,975	58,800	56,052	63,892	68,033	74,107	87,971	79,932	104,744
Total Long-term Debt		10,364		17,729	40,362	27,894	49,260	37,124	55,173	49,848	58,000	59,819	53,696	67,296	54,724	97,766
Current Liabilities	84	3,081	129	3,891	160	5,778	234	8,014	360	8,780	509	12,742	655	15,158	756	22,448
Total Debt	84	13,445	129	21,620	40,522	33,672	49,514	45,138	55,533	58,628	58,509	72,561	54,351	82,454	55,480	120,214
TOTAL EQUITY & LIABILITIES	84	35,715	129	52,526	91,299	72,720	104,265	94,113	114,333	114,680	120,401	140,594	128,458	170,425	135,412	224,958
Debt:Equity Ratio		32/68		36/64		42/58		43/57		47/53		47/53		43/57	41/59	48/52
Current Ratio	5.6	1.0	5.0	1.6	5.2	1.6	5.7	1.7	5.1	1.8	4.7	1.8	4.2	1.9	4.1	1.5
Acc. Receiv. (no. of days)	28	170	27	155	27	158	27	169	27	169	28	202	28	225	28	145

PROJECT COMPLETION REPORT
INDIA
CENTRAL POWER TRANSMISSION PROJECT
(LOAN 2283-IN)

Preface

This is the Project Completion Report (PCR) for the Central Power Transmission Project, for which Loan 2283-IN in the amount of US$250.7 million was approved on May 19, 1983. The loan was made to India, acting by its President, for on-lending to the National Thermal Power Corporation (NTPC). The original loan closing date of March 31, 1989, was extended three times and the loan was closed on March 31, 1992. On December 5, 1991, an amount of US$50 million of savings arising mainly because of exchange rate variations were cancelled from the loan account. Disbursements were completed on September 8, 1992, and the undisbursed balance of US$69.2 million was cancelled. Thus, total disbursements under the loan amounted to US$131.5 million.

On August 16, 1991, the management of the project (operation and maintenance of the assets in service and implementation of those still under construction) was transferred from NTPC to the National Power Transmission Corporation Ltd. (NPTC), the newly established utility responsible for transmission and grid operations, under a Management Contract signed between the two Corporations. NPTC was later named Power Grid Corporation of India Ltd. (POWERGRID). On January 8, 1993, an Ordinance providing for all the rights, titles and other interests related to the transmission systems of NTPC and two other centrally-owned utilities[1], to be transferred to POWERGRID, with effect from April 1, 1992, was promulgated by the President of India. At the time of preparation of this PCR, the Bank was in the process of finalizing the modifications on the Development Credit, Loan and Project Agreements to formalize the transfer of the Bank loans and IDA credits from NTPC and NHPC to POWERGRID retroactively with effect from April 1, 1992. With regard to Loan 2283-IN, assets and liabilities for about US$3.4 million remained with NTPC and assets and liabilities for about US$128.1 million have been transferred to POWERGRID. The amounts will be finalized after accounts between NTPC and POWERGRID are settled.

The PCR was prepared by the Energy Operations Division of the Country Department II (India) of the South Asia Regional Office, and by NTPC and POWERGRID. The former prepared the Preface, Evaluation Summary and Parts I and III of the PCR, while the implementing agencies prepared Part II, and provided all the supporting data.

Preparation of Parts I and III of the PCR was based on information in the Staff Appraisal Report, the Loan and Project Agreements, and material on the project in Bank files and that provided by NTPC and POWERGRID. The preparation was also based on discussions with some of the Bank staff who were involved with the project and the officials of the Government of India (GOI), NTPC, POWERGRID and the project beneficiaries (i.e., State Electricity Boards) during a PCR mission to India in February 1993.

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[1] National Hydro Power Corporation (NHPC) and North-Eastern Electric Power Corporation (NEEPCO).

PROJECT COMPLETION REPORT

INDIA

CENTRAL POWER TRANSMISSION PROJECT
(LOAN 2283-IN)

Evaluation Summary

Objectives

The two main objectives of the project were: (a) to support GOI's strategy to extend and improve power supply through the establishment of centrally owned regional grids and intra-regional connections leading to the promotion of a national grid; and (b) to improve, in the long run, the operational, institutional and financial performance of the State Electricity Boards (SEBs), by assisting in the development of a financially sound, and technically and institutionally competent centrally-owned power utility which would serve as a model to SEBs (Part I, para. 3.1).

Implementation Experience

NTPC (and, since August 1991, POWERGRID) successfully implemented the project. Implementation of the project components financed under the loan was really begun in April 1987, almost four years from Board approval. The delay was mostly due to NTPC's decision not to proceed with the implementation of the 400 kV transmission lines and substations in the Southern Region (major portion of the Project) until firm agreements were reached with the State Electricity Boards in the Southern Region on the cost recovery arrangements for the transmission facilities to be built under the project. In the meantime, the planning was modified by GOI and subsequently the description of the project was amended twice. At appraisal, all the project components were scheduled to be commissioned by March 1988. At the time the Bank closed the loan on March 31, 1992, the project was not completed. Supplies and works amounting to US$23.2 million remained - these expenditures are being funded under Loan 3577-IN, and are expected to be completed during FY94 (Part I, paras. 5.2 and 5.10).

Results

Overall the project achieved its physical objectives, albeit with substantial delays. The project has been the first major component in the establishment of centrally owned regional grids and intra-regional connections. The power transmission capacity in the Southern Region has been increased in a manner which helps optimal utilization of the installed thermal and hydro capacities in this region and permits for exchanges between the Southern and Western Regions. The interconnection between the Northern and the Western Regions is currently used for limited exchanges of power between the two regions and helps the stability of the systems (Part I, para. 7.1).

The project contributed in making NTPC an efficient utility, but did not, however, contribute towards the longer-term objective of improving the operational, institutional and financial performance of SEBs (Part I, 7.1).

NTPC's financial rate of return on historically valued net fixed assets declined from a high 17% in FY86 and FY87 to 15% in FY92 against the covenanted rate of return of 9.5%. Because of the changes agreed by the parties on the project description, it is not possible to make a reasonable comparison between the internal economic rate of return (IERR) of the original and revised project scopes. The IERR for the project as implemented was estimated at 11% (Part I, paras. 8.1 and 10.2).

Sustainability

The project is sustainable, even though at present its components are not yet being fully utilized. Sustainability is certainly assured for the future, as the facilities built under the project are integral components of the transmission system development program in India (Part I, para. 10.1).

Insufficient generation and transmission tariffs and an unchecked increase of NTPC's and POWERGRID's accounts receivable could endanger such sustainability. The Bank, GOI, NTPC and POWERGRID have been taking actions to avoid such occurrence.

Findings and Lessons Learned

Major findings are as follows:

a) The project was not completely finalized when the Bank approved it - the first transmission line equipment contract was awarded in March 88, four years ten months from the date of approval by the Bank. Furthermore the specific conditions for effectiveness had to be modified. The long delay in the start-up of project implementation, and the consequent project revision, are attributed partly to the Bank not verifying that there was full agreement and understanding on the part of the SEBs to pay NTPC for the transmission charges. NTPC's unwillingness to begin work before all contracts with the Southern Region SEBs were signed was not appreciated sufficiently. Therefore, the Bank approved this Loan prematurely (Part I, paras. 5.1 and 5.2);

b) Once implementation got under way, NTPC implemented the project successfully, with only minor problems and delays (Part I, para. 5.3);

c) The Bank's agreement on the "revised" project (para. 3.3) which was determined to require some three additional years for its completion, gave GOI and NTPC the perception that the loan would be extended until the completion of the project; therefore, the Bank's decision not to extend for a fourth time the closing date of the loan came as a surprise to GOI and NTPC (Part I, para. 5.4);

d) The project contributed to the enhancement of NTPC's (later POWERGRID's) expertise in the area of high voltage transmission, created employment of local labor and helped to the development of local manufacturing industry (Part I, paras. 5.5 and 5.6);

e) The average time taken from bid opening to the award of the contract (including Bank acceptance of the proposed award) was generally less than nine months. In an effort to speed up procurement, standard bidding documents will in future be used by NTPC and POWERGRID.

H. Status of Compliance of Covenants

Section	Summary of Undertaking (Covenant)	Status
LA 2.02(b) amended	GOI shall maintain a special account in U.S. Dollars	Complied
LA 3.01(b)	GOI onlending to NTPC under terms acceptable to the Bank (not less than 12% per annum)	Complied
LA 4.03 amended	GOI to furnish audit on special account (due within 6 months of FY end)	Complied
LA 4.04 amended	GOI to furnish audit on SOEs (due within 6 months of FY end)	Received
PA 2.04/3.04	NTPC to take out adequate insurance	Complied
LA 4.02	(a) For goods to be supplied from overseas, GOI to promptly grant permission to import them;	Complied (bureaucratic delays)
	(b) For goods to be manufactured in India, GOI to promptly issue import licenses, make available necessary foreign exchange and allocate materials	Complied (bureaucratic delays)
PA 2.02	NTPC to employ engineering consultants to assist in carrying out Part F of the Project	Complied
PA 4.02	NTPC to have its accounts and financial statements audited and to submit audited reports, within seven months of the end of the year to the Bank	Complied (delays in earlier years)
PA 4.03	NTPC to set tariffs and other actions to achieve a rate of return of not less than 9.5% p.a. from April 1, 1990 and thereafter	Complied

I. Use of Bank Resources

I.1 Staff Inputs

Staff inputs in carrying out the various tasks through the project cycle from preparation in FY83 to completion in FY93 were as follows:

Task	Input (Staff-weeks)
Project Preparation	27.5
Project Appraisal	40.7
Loan Negotiations	04.1
Project Supervision	46.3
Project Administration	00.1
TOTAL	118.7

I.2 Missions

Project Cycle	Month/ Year	Number of Persons	Days in Field	Specialization /a	Performance Rating /b	Type of Problems /c
Through Appraisal						
Identification /d						
Preparation /d						
Pre-appraisal /d						
Appraisal	10/82					
Supervision						
Supervision 1	05/19/85 to 06/17/85	2		E; FA	1	
Supervision 2	02/19/86 to 03/02/86	1		FA	4	
Supervision 3	03/20/87 to 04/01/87	2		E; FA	4	
Supervision 4	01/18/88 to 02/22/88	4		E; E; FA; FA	2	
Supervision 5	08/16/89 to 08/30/89	2		E; EC	2	
Supervision 6	02/17/91 to 02/26/91	1		E	2	
Supervision 7	07/22/91 to 07/30/91	2		E; FA	2	

/a E: Engineer; LO: Loan Officer; FA: Financial Analyst; EC: Economist
/b 1 = No or minor problem; 2 = moderate problem; 3 = major problem
/c I: Implementation delays; PR: Procurement problems and delays
/d Identification was made by GOI in 1974. Preparation and pre-appraisal were made by NTPC in 1978.

Annex 1

INDIA

CENTRAL POWER TRANSMISSION PROJECT
(Loan 2283-IN)

Description of the Original Project

The original project approved by the Board on May 19, 1983, consisted of the following components:

Part A 400 kV AC Transmission Lines (Construction)

	Approximate Length	Estimated in SAR to be commissioned by
Ramagundam-Mangur double circuit line	230 km	June 1987
Mangur-Vijayawada, double circuit line	160 km	December 1987
Vijayawada-Nellore, single circuit line	305 km	June 1987
Nellore-Red Hills, single circuit line	245 km	December 1987
Singrauli-Vindhyachal, single circuit line	14 km	March 1988
Ramagundam-Chandrapur, double circuit line	158 km	March 1988

Part B Sub-stations (400/200 kV) (Construction or Extension)

Ramagundam	-	extension for the 400 kV Ramagundam-Chandrapur line and for the second 400 kV Ramagundam-Mangur circuit (the equipment for the fir circuit was provided under the Second Ramagundam Thermal Power Project)
Mangur	-	new (1x315 MVA)
Vijayawada	-	new (1x315 MVA)
Nellore	-	new (1x315 MVA)
Red Hills	-	extension for the 400 kV Nellore-Red Hills line
Chandrapur	-	extension for the 400 kV Ramagundam-Chandrapur line
Singrauli	-	extension for the 400 kV Singrauli-Vindhyachal line
Vindhyachal	-	extension for the 400 kV Singrauli-Vindhyachal line

In SAR, the sub-stations were estimated to be commissioned with their associated transmission lines.

Part C 500 MW HVDC Sub-station

The construction of a (two 250 MW) back-to-back sub-station at Vindhyachal (estimated in SAR to be commissioned in March 1988).

Part D Metering and Instrumentation

Installation of tariff metering systems and disturbance recorders in important sub-stations of the Northern, Western and Southern Regional grids.

Part E Communications

The acquisition and utilization of power line carrier communication (PLCC) equipment for speech transmission, line protection and data transmission on each 400 kV transmission line.

Part F Technical Services

Utilization of technical services for the carrying out of detailed equipment and system engineerin and supervision during construction, for the High Voltage Direct Current (HVDC) back-to-back inter-tie at Vindhyachal linking the Singrauli and Korba power stations.

Annex 2

INDIA

CENTRAL POWER TRANSMISSION PROJECT

PROJECT COMPLETION REPORT

Description of the Revised Project

After the loan was signed, GOI obtained financing from Sweden for the HVDC sub-station At GOI request, in January 1985, the Bank agreed to make the change in the project description and to t reallocation of the loan funds. NTPC did not initiate the construction of the 400 kV transmission lines an substations in the Southern Region until the SEBs in this region agreed to pay for the transmission charge The last agreement was signed in April 1987, almost four years after the approval of the loan by the ban In the meantime, the project components in the Southern Region transmission system underwent major revision. The reasons for the revision were as follows: (i) Even before the Loan Negotiations, some of th SEBs had been questioning NTPC the usefulness to themselves of the transmission lines being constructe under the Ramagundam project (Loan 2076-IN), and had been expressing reluctance to pay the charges f those transmission lines. The discussions between NTPC and those SEBs became protracted, partly because the SEBs had not dealt before with a centrally-owned utility tariffs which they thought were too high, while at the same time each one of those SEBs had already been allocated a specified share of the power from the Ramagundam plant; (ii) The load generation scenario in the Southern Region had changed substantially from that prepared by CEA in 1982, which was the basis for the transmission system of the subject project. The construction of the Manguru (because of environmental and other problems) and the extension of the Vijayawada thermal power plants were deferred beyond the Seventh Plan period. In addition, there was a change in the power demand scenario, with higher priority being allocated to the development of small-scale industry and to rural electrification in the region; and (iii) The plan to construc the coastal transmission line (Vijayawada-Nellore-Madras) was abandoned because of the increased risk from the serious cyclones on the coast. After lengthy discussion between NTPC, the SEBs and with the involvement of CEA, a new transmission system configuration was proposed. It should be noted that the power from the Ramagundam thermal plant was delivered to its customers, albeit under less than optima transmission conditions, while the above changes were being decided upon.

On November 16, 1986, the Bank agreed on the revision of Parts A and B of the project as per the following:

Status of Transmission Lines and Sub-stations/Switching Stations after Revision

A. 400 kV AC Transmission Lines

	Length
Ramagundam-Khammam (single circuit)	202 km
Khammam-Vijayawada (single circuit)	110 km
Vijayawada-Gazuwaka (single circuit)	317 km
Nagarjunasagar-Gooty (single circuit)	298 km
Gooty-Bangalore (single circuit)	302 km
Singrauli-Vindhyachal (double circuit)	4 km
Ramagundam-Chandrapur (double circuit)	180 km

B. Sub-stations/Switching Stations

Ramagundam (Ext)	Hyderabad-Nagarjunasagar (Ext)	Chandrapur (Ext)
Khammam (New)	Nagarjunasagar (Ext)	Singrauli (Ext)
Vijayawada (New)	Gooty (New)	Vindhyachal (Ext)
Gazuwaka (New)	Bangalore (Ext)	

Other parts of the project were not changed.

- Date of Agreement by the Bank: November 16, 1986
- Date of Finalization by GOI: August 1987

They would also give further emphasis to finishing promptly the payments for the contracts, so that the closing dates of new loan(s) would not need to be extended (Part I, para. 5.7);

f) By the time the Loan was closed India had repaid almost half of the loan amount utilized (Part I, para. 5.10);

g) The area where NTPC's performance fell considerably short of expectations was in bill recovery. Maintaining a specific level of accounts receivables was not a condition of this loan and it was only introduced in 1985 under Loan 2555-IN for the Rihand Power Transmission Project. Substantial arrears by SEBs affected NTPC's financial position adversely (Part I, paras. 8.2 and 12.2);

h) GOI interventions through the central appropriations helped NTPC resolve, albeit for limited periods, its accounts receivable problem. These interventions aimed at having NTPC operate efficiently, thus keep the electric energy supply at an adequate level. It is doubtful that GOI's actions have led to SEBs improving their operational efficiency and their billing and collection procedures and practices. What is equally important, but so far received little attention, is the need for energy conservation on the customer side through adoption of appropriate tariffs and tariff structure at SEBs and through end-use efficiencies (Part I, para. 8.4);

i) The SAR adopted the conventional rate of return (ROR) on average historic fixed assets in operation as the sole covenant for NTPC's financial performance. This performance indicator is less appropriate for a fast growing utility where the utility's major concern is to ensure the availability of adequate funds for investment. Furthermore, when the revenues collected are substantially lower than the revenues accrued (due to the large accounts receivable), the financial performance indicators such as ROR, operating ratio, etc., are less meaningful (Part I, para. 8.6);

j) A more appropriate covenant would have been a cash generation covenant, e.g. "contribution towards investment" which would have also highlighted the deterioration in NTPC's performance (Part I, para. 8.6); and

k) Bank's position (only partially shared by GOI) is that the electricity industry provides a service which has to be fully paid through user-charges. The perception of the State Governments and SEBs, perhaps for political reasons, is that provision of electricity is partly a social service. The transfer of funds to NTPC through central appropriations is but another subsidy (whether it comes from GOI or from SEB), and not a direct payment through tariffs (Part I, para. 12.4).

Major lessons learned from this project are summarized below:

a) As a precondition for further Bank loans, more emphasis should be given to improving the commercial arrangements between NTPC and its clients. However, this has proved to be difficult to achieve in practice unless the financial performance of the SEBs is improved (Part I, para. 12.4);

b) To enable NTPC to operate on a purely commercial basis, GOI should allow NTPC to sell to other customers the allocated shares of the SEBs which do not comply with their agreements with NTPC. In cases where technical reallocation (by limiting availability of power to a particular SEB) cannot be implemented, commercial reallocation can be done. This can be done by limiting allocations to a defaulting SEB and charging a stiff penalty for drawals exceeding the reduced allocation (Part I, para. 12.4); and

c) As a result of the changes in the overall economic policy environment within which NTPC is operating, its financial policies need orientation. Under the circumstances, it would be appropriate to change the existing rate of return covenant into a self financing ratio covenant, because it would not only provide a better monitoring mechanism for NTPC's financial performance, but also provide better support to NTPC towards meeting its development challenges (Part I, para. 8.6).

The lessons drawn from this and previous projects implemented by NTPC have been used in the preparation, appraisal and negotiations of the NTPC Power Generation Project, which was approved on June 29, 1993:

a) GOI has adopted new investment and commercial policies and electricity tariffs allowing NTPC to shut-off or restrict power supply if its clients are in default with their bulk supply agreements. These policies are designed to introduce better commercial discipline at SEBs, along with improving NTPC's own operational and financial performance, including improving revenue collection (para. 12.3);

b) NTPC has agreed with the Bank on an internal cash generation covenant (para. 8.6);

c) GOI established POWERGRID to: (i) improve the efficiency in power transmission and systems operations, through an extensive restructuring of the transmission sector; and (ii) complement its policy initiatives to encourage private generation and competition in power generation (para. 2.6); and

d) The Bank and NTPC agreed on standard bidding documents whose use would curtail the procurement period (para. 5.7).

The last two points were also taken into account under Loan 3577-IN for the POWERGRID System Development Project.

PROJECT COMPLETION REPORT

INDIA

CENTRAL POWER TRANSMISSION PROJECT
(LOAN 2283-IN)

PART I: PROJECT REVIEW FROM BANK'S PERSPECTIVE

1. Project Identity

Name	: Central Power Transmission
Loan No	: Loan 2283-IN
RVP Unit	: South Asia Region
Country	: India
Sector	: Energy
Sub-sector	: Power

2. Project Background

2.1 In India, the responsibility for electricity supply is shared constitutionally between the Government of India (GOI) and the states. In addition, India is one of the few developing countries with a vibrant, if small, private sector presence in public power supply. At independence, private utilities and licensed local authorities, located in urban areas, provided about 80% of public electricity supply. GOI opted to embark on an ambitious electrification program to support the development of power-intensive industries for a rapid industrial development and expansion of irrigation. The Electricity (Supply) Act of 1948 (the Act) created the state electricity boards (SEBs) and entrusted the state governments and the boards with primary responsibility for public power supply. The coordination of SEBs' activities within the national power development policy, and the formulation of longer-term plans for power development is the responsibility of Central Electricity Authority (CEA), established in 1950.

2.2 Between 1960 and 1980, power demand grew twice as fast as the economy, and the generating capacity increased almost five-fold from about 5,600 MW to about 32,000 MW. Yet, for the entire period the country faced power shortages, frequent power interruptions, wide variations in system frequency, and large drops in voltage at the consumer level because SEBs could not fulfill their responsibilities. Though set up as autonomous bodies, SEBs have been under the stringent control of their state governments in vital matters such as changes to tariffs and tariff structure, with the result that they have not developed commercial and financial disciplines, and their financial performance generally has been poor, to the extent of depending on the state governments for operational subsidies.

2.3 In mid-1970s, GOI reoriented its strategy in order to supplement efforts of SEBs in increasing installed capacity and establishing high voltage transmission networks. Emphasis was put on: (a) accelerating the development of the hydro power potential and large coal-fired power plants both at pithead and in the proximity of load centers; (b) improving the efficiency of thermal power plants and reducing losses in the transmission and distribution

networks; (c) expanding the rural electrification program; and (d) strengthening the organizational and management capabilities of the SEBs.

2.4 GOI established in 1975 two power generating companies, the National Thermal Power Corporation (NTPC) and the National Hydroelectric Power Corporation (NHPC) to construct and operate large thermal and hydro power stations and associated transmission systems. The rapid increase in generation necessitated to expand the transmission networks and also to increase the voltage level to handle the transfer of large blocks of power from generating stations to load centers. Simultaneously, for the first time a need was felt for power planning and development on a regional basis to ensure the optimum utilization of natural resources which are rather unevenly distributed over the country and also for enhancing the reliability and security of the power transmission systems. The country was divided into five contiguous regions (Northern, North Eastern, Eastern, Western and Southern) with a view to build regional integrated grids. Regional Electricity Boards (REB) were established to integrate the operations of each grid through regional load dispatch centers and to improve collaboration among the SEBs.

2.5 By the time the Central Power Transmission Project was appraised in October 1982, IDA/Bank had financed under nine operations implemented by NTPC, 6,800 MW of pithead coal-fired thermal power plants (TPPs) in four sites (Singrauli, Korba, Ramagundam and Farakka) and associated transmission lines to evacuate the power generated at these power stations into the networks owned and operated by SEBs. The project was the 31st Bank/IDA operation in the sector, and tenth operation with NTPC. As in the previous NTPC projects, India, acting by its President, was the borrower and NTPC the implementing agency. The project was developed from studies conducted by CEA with assistance by Teshmont Inc. consultants from Canada.

2.6 In 1989, GOI established the National Power Transmission Corporation Ltd. (NPTC) to improve the efficiency in power transmission and systems operations, through an extensive restructuring of the transmission sector, and complement its policy initiatives to encourage private generation and competition in power generation. On August 16, 1991, the management of the transmission assets (operation and maintenance of the assets in service and implementation of those still under construction) of NTPC, including the Project, was transferred to NPTC, under a Management Contract signed between the two Corporations. Subsequently, two other GOI-owned utilities (NHPC and the North-Eastern Electric Power Corporation - NEEPCO) which had transmission lines and substations in operation or under construction, signed similar management contracts with NPTC. NPTC was later named Power Grid Corporation of India Ltd. (POWERGRID). On January 8, 1993, an Ordinance providing for all the rights, titles and other interests related to the transmission systems of NTPC, NHPC and NEEPCO, to be transferred to POWERGRID, with effect from April 1, 1992, was promulgated by the President of India. The Bank supports the establishment and development of POWERGRID under the US$350 million Loan No. 3577-IN for the POWERGRID System Development Project, approved on March 23, 1993. At the time of preparation of this PCR, the Bank was working on the finalization of the modifications on the Development Credit, Loan and Project Agreements to formalize the transfer of the Bank loans and IDA credits from NTPC and NHPC to POWERGRID, retroactively with effect from April 1, 1992. With regard to Loan 2283-IN, assets and liabilities for about US$3.4 million remained with NTPC and assets and liabilities for about US$128.1 million have been transferred to POWERGRID. The amounts will be finalized after accounts between NTPC and POWERGRID are settled.

D. Installation and Commissioning of Transmission Lines and Sub-stations/Switchyard (*)

A. Installation of 400 kV AC Transmission Lines

		Commissioned in	Length (km)
1.	Ramagundam-Khammam (S/C)	March 1992	202
2.	Khammam-Vijayawada (S/C)	March 1992	110
3.	Vijayawada-Gazuwaka (S/C)	January 1992	317
4.	Nagarjunasagar-Gooty (S/C)	July 1991	298
5.	Gooty-Bangalore (S/C)	July 1991	302
	Total Single Circuit Lines:		1,229

B. 400 kV Inter-Regional System

1.	Ramagundam-Chandrapur (D/C)	February 1991	180
2.	Vindhyachal-Singrauli (D/C)	December 1987	4
	Total Double Circuit Lines:		184

C. 400 kV AC Sub-stations/Switchyard Extensions

1.	Khammam (new)	March 1992
2.	Vijayawada (new)	January 1992
3.	Gazuwaka (new)	January 1992
4.	Gooty (new)	July 1991
5.	Ramagundam (ext)	February 1991
6.	Chandrapur (ext)	February 1991
7.	Vindhyachal (ext)	December 1987
8.	Singrauli (ext)	December 1987
9.	Bangalore (ext)	March 1990
10.	Nagarjunasagar (ext)	March 1991

(*) Commissioning dates estimated in SAR for the original project are given in Annex 1.

E. Project Costs -- Estimated and Actual

	Estimated		Actual	
	Rs Million	US$ Million	Rs Million	US$ Million
400 kV lines	1,435.10	151.04	2,416.5	128.9
400 kV substations	851.90	89.66	1,092.6	57.0
Back-to-back HVDC substation	813.45	85.62	1,556.4	59.1
Metering and Instrumentation	201.60	21.22	95.6	5.2
PLCC Communications	39.47	4.15	72.9	4.0
Sub-total	3,341.52	351.69	5,234.0	254.2
Physical Contingencies	171.17	18.03	--	--
Price Contingencies	915.96	96.47	--	--
Total	4,428.65	466.19	5,234.0	254.2
Consultancy	23.75	2.50	10.0	0.5
Engineering and Administration	297.45	31.31	178.7	9.7
Total Project Cost (before duties and taxes)	4,749.85	500.00	5,422.7	264.4
Duties and Taxes	617.50	65.00		
Total Project Cost	5,367.35	565.00		
Interest During Construction	490.31	51.58		
Front-End Fee	6.65	0.70		
Total Financing Required	5,864.31	617.28	5,422.7	264.4

F. Allocation of Loan Proceeds
(Original and Actual)
(US$ million)

		Loan Agreement	Actual
(1)	Equipment and Materials	235,000,000	123,721,729.58
(2)	Consultants' Services	2,500,000	-
(3)	Fee	625,187	625,187.00
(4)	Associated civil works and erection	-	7,316,027.03
	Unallocated	12,574,813	-
	Difference due to cross exchange rates on Special Account transactions		(169,045.60)
	Total disbursed		131,493,898.01
	Amount cancelled (Dec. 5, 1991)		50,000,000.00
	Amount cancelled (Sept. 8, 1992)		69,206,101.99
	Original Loan Amount	250,000,000	250,700,000.00

G. Summary of the Internal Economic Rate of Return Computations /a

		OUTFLOW		INFLOW	NET	Discounted @
		Investment	O & M	Revenue	OUTFLOW	11.10%
0	1985-86	3155.8	10.0	135.0	3030.9	3030.9
1	1986-87	1965.8	15.8	214.3	1767.3	1590.7
2	1987-88	2495.6	21.9	286.5	2231.1	1807.4
3	1988-89	2184.9	34.9	359.0	1860.7	1356.7
4	1989-90	1673.3	77.8	773.2	977.9	641.7
5	1990-91	1402.5	86.2	962.9	525.9	310.6
6	1991-92	1254.0	110.4	1370.9	-6.4	-3.4
7	1992-93	207.9	133.4	1740.7	-1399.4	-669.6
8	1993-94	718.8	204.9	2210.4	-1285.7	-553.7
9	1994-95		204.9	2210.4	-2005.5	-777.4
10	1995-96		204.9	2210.4	-2005.5	-699.7
11	1996-97		204.9	2210.4	-2005.5	-629.8
12	1997-98		204.9	2210.4	-2005.5	-566.9
13	1998-99		204.9	2210.4	-2005.5	-510.2
14	1999- 0		204.9	2210.4	-2005.5	-459.2
15	2001- 1		204.9	2210.4	-2005.5	-413.3
16	2002- 2		204.9	2210.4	-2005.5	-372.0
17	2002- 3		204.9	2210.4	-2005.5	-334.8
18	2003- 4		204.9	2210.4	-2005.5	-301.4
19	2004- 5		204.9	2210.4	-2005.5	-271.3
20	2005- 6		204.9	2210.4	-2005.5	-244.1
21	2006- 7		204.9	2210.4	-2005.5	-219.7
22	2007- 8		204.9	2210.4	-2005.5	-197.8
23	2008- 9		204.9	2210.4	-2005.5	-178.0
24	2009-10		204.9	2210.4	-2005.5	-160.2
25	2010-11		204.9	2210.4	-2005.5	-144.2
26	2011-12		204.9	2210.4	-2005.5	-129.8
27	2012-13		204.9	2210.4	-2005.5	-116.8
28	2013-14		204.9	2210.4	-2005.5	-105.2
29	2014-15		204.9	2210.4	-2005.5	-94.6
30	2015-16		204.9	2210.4	-2005.5	-85.2
31	2016-17		204.9	2210.4	-2005.5	-76.7
32	2017-18		204.9	2210.4	-2005.5	-69.0
33	2018-19		204.9	2210.4	-2005.5	-62.1
34	2019-20		204.9	2210.4	-2005.5	-55.9
35	2020-21		204.9	2210.4	-2005.5	-50.3
36	2021-22		204.9	2210.4	-2005.5	-45.3
37	2022-23		204.9	2210.4	-2005.5	-40.8
38	2023-24		204.9	2210.4	-2005.5	-36.7
39	2024-25		204.9	2210.4	-2005.5	-33.0
40	2025-26		204.9	2210.4	-2005.5	-29.7

The internal rate of return of the project is computed as 11.1%.

/a Detail tables have been forwarded to Asia Information Center.

3. Project Objectives and Description

3.1 Project Objectives. The primary objective of the project was to support GOI's strategy to extend and improve power supply through the establishment of centrally owned regional grids and intra-regional connections leading to the promotion of a national grid. To attain this objective, the project provided for:

(a) an increased capacity of power transmission system from NTPC's Ramagundam TTP in the Southern Region, in order to ensure optimal utilization from the installed thermal and hydro capacities in this region;

(b) a strong power transmission tie between the predominantly hydro-based Southern Region and the predominantly thermal-based Western Region; and

(c) an asynchronous inter-tie between the Northern and the Western Regions in order to permit larger exchanges of power between the two regions to meet the growing system demands while ensuring stability of the systems.

As in the previous Bank-financed projects with NTPC, another objective was to improve, in the long run, the operational, institutional and financial performance of the State Electricity Boards (SEBs), by assisting in the development of a financially sound, and technically and institutionally competent centrally-owned power utility which would serve as a model to SEBs.

3.2 Original Project Description. The project, as approved by the Board on May 19, 1983, is detailed in Annex 1 and comprised:

(a) construction of 548 km of double circuit and 564 km of single circuit 400 kV transmission lines;

(b) construction of three new and extension of five 400/220 kV substations associated with the lines mentioned in (a);

(c) construction of a 2x250 MW capacity "back-to-back", high voltage direct current (HVDC) substation at Vindhyachal TPP to provide an asynchronous interconnection between the Northern and the Western Regions;

(d) technical services, for detailed equipment and system engineering and construction supervision of the HVDC back-to-back interconnection;

(e) installation of metering, instrumentation and communication facilities; and

(f) installation of power line carrier communication equipment for voice transmission, line protection and data transmission on each 400 kV transmission line.

3.3 Revised Project Description. After the loan and project agreements were signed, GOI obtained financing for the HVDC back-to-back

station from Sweden. The Bank welcomed this co-financing and at GOI's request, agreed, on January 23, 1985, to reallocate loan funds and thus amend the project description. In 1984, the construction of two large thermal power plant projects (Manguru and Vijayawada projects) to be built in the Southern Region were deferred beyond the Seventh Plan. In addition, CEA and NTPC wanted to avoid forest land and ensure optimum utilization of the facilities with respect to the revised demand and supply scenarios[2]. After protracted discussions between the Southern Region SEBs and NTPC, and with the involvement of CEA, a new transmission system configuration was proposed. Therefore, the project components to be built in the Southern Region (major portion of Parts a and b of the project - para. 3.2) underwent major revision. The proposed changes were found by the Bank technically acceptable and justifiable on the basis of the long-term development of the Southern Region. The Bank thus agreed on the new scheme on November 16, 1986. However, GOI finalized the scheme only in August 1987. The final project description is detailed in Annex 2 and summarized as follows:

(a) construction of 184 km of double circuit and 1,229 km of single circuit transmission lines; and

(b) construction of four new and extension of seven 400/220 kV substations, and of one new switching station associated with the lines mentioned in (a).

Parts (c)-(f) of the project were not amended. The new project description was still within the overall objectives of the project as originally approved by the Board. Thus the Management considered that the approval of the Board for the said changes was not necessary.

4. Project Design and Organization

4.1 Project Design. Unlike the previous Bank operations with NTPC, where the loans were made for the construction of power generation plants and for the associated transmission lines to evacuate the power generated, this project was solely to strengthen the transmission system. NTPC had already acquired adequate experience in the area of 400 kV transmission line and substation design and engineering during the construction of the transmission lines and substations associated with the Singrauli, Korba, Ramagundam and

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[2] Changes in the supply scenario came from GOI's decision to delay the Manguru and Vijayawada power projects beyond the Seventh Plan, due to environmental, resettlement and rehabilitation problems (for the Manguru project) and lack of financial resources. Changes in the demand scenario came from higher priority being allocated to small scale industry and to rural electrification. The Ramagundam-Manguru-Vijaywada transmission line was re-routed via Khammam to minimize the passage through the forests, where Manguru is located. The Vijaywada-Nellore-Red Hills (near Madras) coastal transmission line was discarded because of the severe cyclonic conditions in that area, which would have placed a high risk of damage to the envisaged coastal line.

Farakka power plant projects[3]. The basic and detailed engineering work for the 400 kV transmission lines and substations was carried out by NTPC in-house. The detailed engineering of the HVDC back-to-back transmission link component was carried out by NTPC in cooperation with ABB, Sweden, the equipment supplier. NTPC carried out the preparation of specifications, bidding documents, bid evaluation reports and construction supervision of all the components of the project. To ensure smooth implementation, the execution of the project required co-ordination with a number of major agencies including beneficiary SEBs. This coordination was not always without problems (para. 5.2).

4.2 Project Organization[4]. At the time of appraisal, NTPC had already adopted its current three-tier organizational structure at corporate, regional and project levels. The Corporation is headed by a Chairman and Managing Director (CMD), who is assisted by five full time functional directors, namely, Director (Projects), Director (Operations), Director (Technical), Director (Finance) and Director (Personnel). At the Corporate Office, corporate planning and central procurement functions are headed by Executive Directors reporting to the CMD. For the purpose of the administration and execution of work at the sites, the Corporation is divided into five regions (Northern, Western, Eastern, Southern and National Capital Regions) with headquarters at present located at Allahabad, Nagpur, Patna, Hyderabad and Delhi, respectively. These regions are under the control of Regional Executive Directors who are responsible for the implementation, operation and maintenance of power plants in their respective regions. Each power plant is headed by a General Manager[5]. The structure has shown the advantage of optimizing the span of control of the CMD and provided for the decentralization of line responsibility while retaining centralized systems in areas such as long-term planning, basic engineering, procurement of critical equipment and spares, quality assurance, co-ordination with the World Bank and other financing agencies and inspection. Various parts of the Project were located in the Northern, Western and Southern regions and were managed by the respective regional offices.

5. Project Implementation

5.1 Loan Effectiveness. Loan 2283-IN was approved on May 19, 1983; the Loan and Project Agreements were signed on June 8, 1983. It was expected that the loan would be declared effective by September 9, 1983. Signing of a Subsidiary Loan Agreement between GOI and NTPC, satisfactory to the Bank, and of bulk supply contracts between NTPC and the SEBs for the sale of electricity from the Bank financed Singrauli and Korba power plants, were conditions for loan effectiveness. The Subsidiary Loan Agreement was provided on time. However, delays were experienced in finalizing contractual arrangements with

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[3] All these coal-fired power plant projects were partly funded under IDA credits and Bank loans.

[4] As NTPC was the legal implementing agency of the project during the life of Ln. 2283-IN, NTPC's project organization and management is reviewed in this section.

[5] Until August 16, 1991, NTPC's regional transmission units were also headed by a General Manager (para. 2.6).

SEBs. This had been originally a condition for loan negotiations but subsequently was made a condition for loan effectiveness. The delays led to postponing twice the loan effectiveness date eventually to March 1984. By that time, NTPC could only sign Memoranda of Understanding (MOU) with the concerned SEBs. The Bank noted some deficiencies[6] in these MOUs, but concluded that they fulfilled the purpose of providing an agreement between NTPC and the relevant SEBs and other institutions[7], covering the sale of electricity from the Singrauli and Korba power plants. The loan was declared effective on March 29, 1984, a delay of 6 1/2 months from the date of effectiveness originally determined at signing.

5.2 Project Start-up and Implementation Schedule. At appraisal, the project was expected to be completed by March 31, 1988. The construction of the HVDC back-to-back station proceeded satisfactorily. The station which was projected to be commissioned in March 1988, was put into service in end 1987. On the other hand, NTPC could not proceed with the implementation of the 400 kV transmission lines and substations in the Southern Region (major portion of the Project) until firm agreements were reached with the Southern Region SEBs on the cost recovery arrangements for the transmission facilities to be built

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[6] The deficiencies found by the Bank were summarized as: (i) short remaining validity period of the MOUs, to March 1985; (ii) lack of fixed commitment charge for the SEBs; (iii) lack of definition for profits in tariff calculation; and (iv) lack of calculations of flat rate, variable energy price and transmission charge. NTPC's comments on the above are: (i) MOUs were valid from February 1982 to March 1985; (ii) No commitment charges were provided as NTPC was not in a position to assure delivery of shares to SEBs. The tariff in Rs./kWh basis enabled NTPC to earn higher returns as the actual levels of operation were above the normative levels. Absence of fixed commitment charges did not in any way prove detrimental to NTPC's interests; (iii) Profit by way of return on equity was included in the tariffs as an element of fixed charges; and, (iv) Although the calculations did not form part of the MOUs, the tariffs were based on detailed calculations based on the principles and parameters mentioned in the MOUs.

[7] Delhi Electric Supply Undertaking (DESU) and the Department of Power of the Union Territory of Goa.

PROJECT COMPLETION REPORT

INDIA

CENTRAL POWER TRANSMISSION PROJECT
(LOAN 2283-IN)

PART III: STATISTICAL SUMMARY

A. Related IDA Credits and Bank Loans

Cr./Loan No. and Title	Purpose	Year of Approval	Status	Comments
Cr. 685-IN Singrauli Thermal Power Project	To help reduce the power shortage in the Northern Region through the construction of the 3x200 MW initial phase of the NTPC's first large coal fired thermal power plant with associated 400 kV transmission lines.	April 1977	Closed on June 30, 1984	The project was successfully completed
Cr. 1027-IN Second Singrauli Thermal Power Project	Assist NTPC to mitigate power shortages in the Northern Region through the construction of 2x200 MW and 2x500 MW coal-fired units and associated 400 kV transmission lines.	May 1980	Closed on June 30, 1989	The project was successfully completed.
Cr. 793-IN Korba Thermal Power Project	To help reduce the power shortage in Western Region through the construction of the 3x200 MW coal fired thermal power plant with associated 400 kV transmission lines.	April 1978	Closed on March 31, 1986	The project was successfully completed.
Cr. 1172-IN Second Korba Thermal Power Project	To help reduce power shortages in the Western Region through the construction of 3x500 MW coal-fired units and associated 400 kV transmission lines.	July 1981	Closed on December 31, 1991	The project was successfully completed.

Cr./Loan No. and Title	Purpose	Year of Approval	Status	Comments
Ln.1648-IN & Cr. 874-IN Ramagundam Thermal Power Project	To help: (a) solve rationing in the Southern Region by providing 3x200 MW generating units; (b) assist GOI in achieving its objective of further advancing the regional and ultimately the national integration of the power sub-sector.	January 1979	Closed on June 30, 1987	The project was successfully completed.
Loan 2076-IN Second Ramagundam Thermal Power Project	Alleviation of power shortages in the Southern Region through the construction of 3x200 MW and 3x500 MW coal-fired units and associated 400 kV transmission lines.	December 1981	Closed March 31, 1992	The project was successfully completed.

Sectoral Objectives Common to All the Above Projects

	In addition to the above project-wide objectives, the sectoral objective was to assist NTPC become an efficient utility (implementation of projects, operation of power plants, institution- and finance-wide) to form a model to the poor performing SEBs.			This purpose was not fully attained

B. Project Timetable

Item	Date Planned	Date	Date Actual
Appraisal Mission			October 1982
Credit Negotiation			April 18-22, 1983
Board Approval			May 19, 1983
Credit Signature			June 8, 1983
Credit Effectiveness	Sept. 9, 1983 /a		March 29, 1984
Credit Closing	March 31, 1989	a) 3/31/90 b) 3/31/91	March 31, 1992
Completion of Disbursements			September 8, 1992

/a At Loan signing.

C. Disbursements (Estimated and Actual)
(US$ million)

	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992
(a) Estimate	3.5	20.0	90.0	180.0	240.5	250.7	250.7	250.7	a/	
(b) Actual	-	0.6	0.6	0.8	19.8	26.1	40.5	84.0	126.7	131.5 b/
Ratio (b)/(a)	-	3%	7%	4%	8%	10%	16%	34%		

a/ US$50 million from the Loan amount was cancelled on December 5, 1991.
b/ The Final Disbursement was in September 1992.

under the Project[8]. In the meantime, the generation and transmission plans for the Southern Region and the description of the project were modified (para. 3.3). The SAR envisaged that the bid documents for the first contracts for all the transmission lines (contract packages for the supply and erection of the line towers) would be issued at the latest by September 1983 and the contracts would be awarded by June 1984. The bid documents for these packages were issued in April 1987[9], and the first contract was awarded in March 1988 (four years ten months from Board approval).

5.3 Implementation Process. Once project implementation got under way, there were some delays but these were not of significance - minor delays occurred in the design and fabrication of tower parts for Ramagundam-Khammam line, and supply of some 400 kV circuit breakers. The design, procurement and installation of the metering, instrumentation and communications equipment (para. 3.2, Items d, e and f) were not given the importance they deserved and their commissionings were delayed substantially to 1990-1992.

5.4 Extensions of the Closing Date. The loan was scheduled to be closed on March 31, 1989. Implementation of the project components financed under the loan was really begun in April 1987, almost four years from Board approval. While agreeing to GOI's request to revise the project, the Bank recognized that extension of the loan closing date would be required. A supervision mission estimated in January 1989 that the revised project would only be completed by March 1992, and that completion of the payments would require the extension of the closing date to 1993. However, the Bank reserved the right to review progress under the project and extend the closing date when necessary. The Bank carried out these reviews annually and agreed extending the closing date by one year each time, for a total of 36 months to March 31, 1992. In the meantime, in March 1991, in an effort to accelerate disbursements under the project, the Bank also agreed in principle to finance items of equipment totalling US$27.2 million that were originally planned to be financed by NTPC. The Bank did not extend the closing date of the loan beyond March 31, 1992, but informed GOI that it would be willing to consider to include funding the completion of the ongoing contracts retroactively under the POWERGRID System Development Project. The latter project was approved by

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[8] Even before project negotiations, some of the Southern Region SEBs had questioned NTPC on the utility or the benefit to themselves from the transmission lines being set up under the Ramagundam project, and manifested significant reluctance to agreeing to pay NTPC for the transmission line charges for those lines constructed under the said Ramagundam Project. The discussions/negotiations between NTPC and Southern Region SEBs became protracted partly because these SEBs had not dealt before with a centrally-owned utility in terms of sharing the power generated from the plant, and the cost of that power. It took about four years for the parties involved to develop a consensus on NTPC's tariffs. Although NTPC commented that the last agreement for the Southern Region was signed in April 1985, Bank's files show that this was an issue until the March 22 - April 7, 1987, supervision mission.

[9] It should be noted that at that time, GOI had not yet granted its full clearance for the new transmission development scheme, which it did in August 1987.

the Board on March 23, 1993 (Loan 3577-IN; para. 2.6) and includes US$23.2 million for the completion of the contracts of the Central Power Transmission Project. Disbursements for these expenditures under Loan 3577-IN would be completed during FY94.

5.5 Procurement. The equipment and materials financed under the loan were split into 71 packages, most of which were procured under international competitive bidding (ICB) procedures in accordance with Bank guidelines. Contractors who supplied transmission line tower structure were in charge of the erection of the towers, insulators and hardware, and stringing of the line conductors, on a supply and erect basis. Suppliers of main equipment for the substations were also in charge of the erection of the substations. NTPC procured, always under ICB, the conductors, line material such as insulators and hardware and the electrical equipment including metering and instrumentation and had these equipment erected by the above mentioned contractors. The relatively large number of contracts and the above forms of packaging created a significant workload on NTPC as well as Bank staff to monitor and supervise these contracts. However, the above two characteristics helped NTPC staff to acquire valuable experience in preparing contract documentation, reviewing and evaluating bids, and in managing the engineering of the project, since they were responsible for proper interfacing of project materials and equipment from different suppliers. Most of the said NTPC staff have been transferred to POWERGRID. However, it is noted that the above procurement system applied by NTPC, which required drawing up of specifications for tenders, preparation of bidding documents and carrying out of bid evaluations swamped NTPC staff who at one point had to handle some 1,200 contracts valued at over US$1 billion. On the other hand, dividing the project material/equipment into numerous contract packages, promoted participation from a range of large and medium sized local manufacturers/ suppliers which, in turn, has contributed to the development of local manufacturing industry.

5.6 Of the 71 contracts (total value: US$169 million equivalent) put out for ICB, 12 contracts (valued at US$31 million or about 18% of the total) were awarded to foreign manufacturers/suppliers. Of the two highest value contracts (both for the supply of conductors) one was awarded to a local and the other to a foreign manufacturer/supplier. The local industry was fairly competitive where the size of contract packages was within its manufacturing and/or supply capability. NTPC followed its practice of specifying the qualification requirements of the prospective suppliers on the bidding documents; this was not objected to by the Bank and worked reasonably.

5.7 For all contracts estimated to cost over US$2.5 million equivalent, NTPC submitted for Bank's review and comments the bidding documents and evaluation reports. Bank files show that there were delays in procurement, and on some occasions there was need to amend the bid documents, and also to re-bid in some cases. Based on the available documentation, the average time taken from bid opening to the award of the contract (including Bank acceptance of the proposed award) was generally less than nine months. In an effort to speed up procurement, standard bidding documents will in the future be used by NTPC and POWERGRID. Under the NTPC Power Generation Project[10] and Loan 3577-IN for the POWERGRID System Development Project, NTPC

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[10] This project was approved on June 29, 1993.

and POWERGRID respectively agreed on standard bidding documents, whose use would reduce the procurement period substantially. NTPC and POWERGRID would also give further emphasis to finishing promptly the payments for the contracts, so that the closing dates of new loan(s) would not need to be extended.

5.8 Project Costs (Part III, Table E). The total cost of the original project, including contingencies, taxes and duties, was estimated in the SAR at about Rs. 5,864 million (US$617.3 million equivalent). The actual cost of the revised project was Rs. 5,423 million (US$264.4 million equivalent). In US dollar equivalent, the actual project cost was substantially lower than the appraisal estimate because of the substantial devaluation of the Rupee from Rs.9.5/US$ at appraisal to Rs.25/US$ in March 1992, when the loan was closed. During the implementation period, the weighted average rate was Rs.20.5/US$. While inflation increased project costs in local currency, the devaluation resulted in the loan proceeds generating a substantially larger amount in local currency than had been expected. Despite the inflation, in current Rupee terms, the actual project costs were slightly lower than the appraisal estimates. Although a detailed and realistic cost comparison between the appraisal estimates and the actual costs is not possible due to the major changes to some of the transmission lines and the associated substations, it is concluded that costs at appraisal were overestimated.

5.9 Project Financing. The financing plan was changed substantially. The plan estimated at appraisal and the actual plan are summarized in the following table.

Financing of the Project

Sources	SAR		Actual /a	
	(US$ million)	(%)	(US$ million)	(%)
- Bank Loan	250.7	41	131.5	50
- GOI (as Equity and Loan)	366.6	59	73.8	28
- Credit from Sweden	-	-	59.1	22
Total	617.3	100	264.4	100

/a Excludes US$23.2 million to be disbursed under Loan 3577-IN (para. 2.6).

5.10 Disbursements. The estimated and actual disbursements, and the original and revised allocation of the loan proceeds are given in Part III, Tables E and F, respectively. Due to the fact that the HVDC substation was hived off from Bank financing and the hiatus in the implementation of the lines and substations led to virtually no disbursement of loan proceeds through end 1986. By the time of the original closing date (March 31, 1989), cumulative disbursements were only US$40.5 million, 16% of the original loan amount. The closing date of the loan was extended three times by one year each, to March 31, 1992 (para. 5.4). In December 1991, US$50 million of savings arising mainly of exchange rate variations were cancelled from the loan amount. The loan was closed on March 31, 1992; disbursements were completed on September 8, 1992. The undisbursed balance of US$69.2 million was cancelled on that date. Thus disbursements under the loan were US$131.5 million. India began repaying the proceeds of the loan on September 1, 1988,

and will continue to do so until March 1, 2003. It is noted that by the time the loan was closed, India had already repaid US$64,666,000, almost half of the loan amount utilized.

6. Environment, Resettlement and Rehabilitation

6.1 The project did not create any significant environmental and resettlement and rehabilitation problems. NTPC selected the line routings so as to minimize infringement on forest land. Where trees had to be felled in order to provide access to the lines, trees of a corresponding number were planted in the vicinity. The question of relocation of people affected by the project did not arise because transmission line routes and substation sites were selected in un-inhabitated areas remote from the population centers.

7. Physical Results

7.1 Project Objectives. Overall, the project has achieved its objectives (para. 3.1). The project has been the first major component in the establishment of centrally owned regional grids and intra-regional connections. The power transmission capacity in the Southern Region has been increased in a manner which helps optimal utilization of the installed thermal and hydro capacities in this region and permits for exchanges between the Southern and Western Regions. The asynchronous interconnection between the Northern and the Western Regions is currently used for limited exchanges of power between the two regions and helps the stability of the systems. The project contributed in making NTPC an efficient utility but failed in its sectoral objective in inducing improvements in the operational, institutional and financial performance of SEBs, as seen in the disappointing operational, financial and institutional performances of many SEBs. It is not clear how, if any, NTPC's institutional development helped those performing SEBs, such as the Maharashtra and Andhra Pradesh SEBs whose transmission networks were strengthened by this project. The failure in obtaining improvements at SEBs while supporting the development of NTPC as a model utility can be traced to the fact that the Bank had not fully appreciated the extent of the interference by the state governments in the affairs of SEBs (para. 12.4).

7.2 Physical Results. The individual components of the revised project were commissioned at various dates given in Part III, Table D. The 2x250 MW HVDC component was commissioned in end 1987, compared with the appraisal estimate of March 1988, and has been providing for power exchanges between the Northern and Western Regions (each block of 250 MW is capable of operating independently in either direction). The lines and substations in the Southern Region were, at appraisal, projected to be commissioned during the June-December 1987 period. These lines and substations which were delayed awaiting agreement from the SEBs (para. 5.2) and suffered from NTPC's overload in processing contract documents (para. 5.5), were actually commissioned between May 1991 and March 1992.

7.3 Since their commissioning, the project components have in general functioned satisfactorily. The problems which did arise were invariably of a minor nature and were resolved without seriously affecting the transmission of power. The availability of the individual components has been almost 100% in 1992 (Annex 3). However, the average daily power transmitted through some of the lines is short of its design capacity. The reasons for this underutilization are: (i) suboptimal operation of generating plant on a

PROJECT COMPLETION REPORT

INDIA

CENTRAL POWER TRANSMISSION PROJECT
(LOAN 2283-IN)

PART II: PROJECT REVIEW FROM BORROWER'S PERSPECTIVE

Comments by NTPC and Endorsed by the Government of India

A. Preface

1. The loan was made to India in May 1983 for on-lending to the National Thermal Power Corporation (NTPC). The two main objectives of the project were: (a) to support GOI's strategy to extend and improve power supply through the establishment of centrally owned regional grids and intra-regional connections leading to the promotion of a national grid; and (b) to improve, in the long run, the operational, institutional and financial performance of the State Electricity Boards (SEBs), by assisting in the development of a financially sound, and technically and institutionally competent centrally-owned power utility which would serve as a model to SEBs. On August 16, 1991, the management of the project was transferred from NTPC to National Power Transmission Corporation Ltd., under a Management contract signed between the two corporations. On January 8, 1993, an ordinance providing for all the rights, titles and other interests related to the transmission systems of NTPC to be transferred to POWERGRID (NPTC was later renamed as Power Grid Corporation of India) was promulgated by the President of India.

B. Comments on the Analysis in Part-I

2. The analysis made by the Bank under Part-I is comprehensive and has covered the important aspects. The analysis is generally in order. Nevertheless, there are certain issues which need to be further examined keeping in view the background of developments as they took place to better appreciate the events. These are as follows:

Project Start-up and Implementation Schedule (reference para. 5.2 of Part-I)

3. Actual dates of signing of BPSA (Bulk Power Supply Agreement) in Southern region are as follows:

APSEB	22.3.1985
KEB	21.3.1985
TNEB	22.3.1985
KSEB	10.4.1985
GOA	17.4.1985

Extensions of the Closing date (reference para. 5.4 of Part-I)

4. The Bank did not accept GOI's request to cover the expenditure on ongoing contracts under the savings available under other ongoing loans to NTPC after loan closing date till POWERGRID System Development Project loan

became effective. The continuity in Bank financing was sought on account of certain problems relating to the deemed export benefits to the contractors and also relating to the import license.

Procurement (reference para. 5.7 of Part-I)

5.1 In an effort to speed up procurement and after having extensive discussions, NTPC had finalized with the World Bank a standard bidding document in April 1992. However, the Bank withdrew its "No-Objection" to this standard bidding document in December 1992 and wanted certain modifications to be included. NTPC has now finalized standard bidding documents with the Bank based on the suggested modifications and further discussions. NTPC will use this document for procurement under the recently negotiated loan for NTPC Power Generation Project. This is expected to reduce the procurement time. Further, the proposed NTPC Power Generation Project, negotiated with the Bank in May 1993 would be under time slice concept which would help in bringing about timely disbursements.

5.2 NTPC has started giving further emphasis to finishing promptly the payments to the contractors.

Project Costs (reference para. 5.8 of Part-I)

6. It has been stated that "that costs at appraisal were over estimated". It is clarified that the basis of costing during the appraisal had been explained in the Staff Appraisal Report. It, inter-alia, states that the estimates for the main items of equipment and material are based on the quotations received since 1980 for similar projects such as the 400 kV links and sub-stations associated with Singrauli, Korba, Ramagundam and Farakka Power Plants with prices updated to mid-1982 price levels. On the other hand, the exchange rate changes have played a major role in bringing down the project cost in dollars terms.

Financial Performance (reference para. 8.2 to 8.5 of Part-I)

7. In the discussions on accounts receivable presented in Section 8 of the Part I, the Bank has included the amount due to NTPC by way of Central Appropriation in the accounts receivables. GOI has in the past ordered Central Appropriation of plan assistance funds to State sectors for offseting their dues to Central sector agencies like NTPC. Such amounts are being paid to NTPC as per agreed schedules and the Bank had been kept informed about the arrangement since August 1990. Considering that these were committed payments from GOI, the amounts were set off against the dues of the SEBs and NTPC's accounts receivable reduced by the total amount of Central appropriation.

As has been mentioned in para. 8.3, during the negotiations of the proposed NTPC Power Generation Project, agreement was reached that NTPC would maintain the level of its accounts receivable at two months of sales equivalent excluding the amount still to be paid through the Central appropriations for which a specific payment schedule was also agreed.

8. The Operations Evaluation Department of the World Bank conducted the performance audit of few Bank-funded projects, namely Korba (Credit 793-IN), Ramagundam (Credit 874-IN and Loan 1648-IN), Singrauli-II (Credit 1027-IN) and Farakka (Credit 1053-IN and Loan 1887-IN). In its report No. 10854

published in February 1993, the Audit Mission has summed up NTPC's financial policy in a paragraph as below:

> "NTPC has reached its large size (it is India's largest corporate entity in terms of fixed assets) in a record time without jeopardizing or compromising its financial viability, even in spite of the accounts receivable issue. This is a performance that very few utilities in the same situation are able to achieve. The performance is even more impressive since NTPC is still in a major investment mode. A good part of NTPC's above-par performance is to be credited to GOI's original design (e.g., debt-equity ratio set at a conservative 1:1; tariff formula to pass on all investment, operation, and financial costs.)"

9. As is common practice in transaction of a commodity like electricity, the agreements allow the beneficiary of its energy supply a period of 30 days from issue of the bills for making payments. Therefore, outstanding should be reckoned after expiry of this period of 30 days.

Bank Performance (reference paras. 11.2 & 11.3 of Part-I)

10. It has been stated that the Bank's decision not to present to the Board the then proposed Regional Power System Project because of GOI and NTPC's inability to fulfil the conditions for Board presentation within a reasonable time period, has helped GOI to promote reforms in the power sector. It is worth mentioning that the sectoral reforms are brought about gradually with time. It is easier to bring out such changes when they are accompanied by large development programmes such as the proposed US$1.2 billion time slice loan operation of World Bank for NTPC Power Generation Project.

Comments by POWERGRID and Endorsed by the Government of India

Environment, Resettlement and Rehabilitation

11.1 In the context of transmission projects there is no significant impact on environment except in the cases where the transmission lines involve any forest area. The impact of transmission line projects on environment is not considered as severe as in case of thermal, hydel, nuclear power projects. This is primarily because the effect on forest due to laying of tranmission lines is reversible and can be nullified by planting more trees.

11.2 With the worldwide concern over the fast depleting forest reserves, due consideration is given to these aspects at the planning and designing stage itself. While identifying the transmission system for CTP-I, detailed surveys were conducted by the executing agency in association with the state forest authorities to identify most suitable route having minimum infringement on forest land. Where trees had to be felled in order to provide access to the lines, trees of a corresponding number were planted in the vicinity as per guidelines from Ministry of Environment and Forest.

11.3 Sites for construction of the sub-stations were generally selected in uninhabitated areas remote from the population centers. Hence, the resettlement and rehabilitation of people did not arise.

Final Payments

12. The loan was originally scheduled to be closed on March 31, 1989. But the project configuration underwent major revision following the reluctance of SEBs to pay the fixed transmission charges associated with this project and also because of changes in load generation scenario in Southern Region than what was envisaged at the planning stage. The revised project configuration was approved in August 1987. Thereafter, Bank decided to extend the loan closing date by one year each time for a total of 36 months to March 1992. The total disbursement of loan till March 1992 was US$131.49 million. Further, the Bank has included funding the balance portion of the on-going contracts retroactively under the new POWERGRID System Development Project (Loan No. 3577-IN).

Procurement

13. GOI approval for the revised project was accorded in August 1987 and immediately thereafter the exercise for placement of award for tower package (for eight transmission lines) was begun. Awarding took 6 to 8 months to complete. This was possible due to advance planning in preparation of bid document. However, this time could have been further reduced by around a month had the Bank approval been obtained in a period of about 15 days. As regards procurement of domestic goods and services, a comprehensive procurement action plan resulted in cutting down of award time, and hence achieved the completion of project without any delays.

Evaluation of the Borrower's Own Performance

14.1 The project has achieved its objectives. With the satisfactory completion of the project, the power transmission capacity, security and reliability in the Southern region has increased. The inter-connection between the Northern and the Western regions is currently used for limited exchange of power between the two regions and helps the stability of the systems.

14.2 Unlike the previous Bank funded power projects, this project was solely for the purpose of transmission system. Since NTPC had already acquired sufficient experience in the area of design and engineering of 400 kV transmission lines and substations, entire basic and detailed engineering work for the 400 kV transmission lines and substations was carried out by NTPC/POWERGRID in-house.

14.3 This project also provided an opportunity for NTPC/POWERGRID to gain valuable experience in procurement under ICB procedures, which was later used for other Bank financed projects. Also the first time introduction of HVDC technology with this project helped NTPC staff to enlarge its skills and to gain valuable experience in the execution of HVDC substation, which was later used, on a consultancy basis, in the installation of HVDC stations in other countries.

regional basis; and (ii) indifferent or unresponsive generation tariff structure. Generation plants are not operated optimally because individual SEBs do not observe cost merit order in power generation. The tariff structure in effect up to November 1992 did not encourage merit order plant dispatch in the regional grids. The actual NTPC tariff in application since November 1992, is on two part basis as per the recommendations of GOI's K.P. Rao Committee. This tariff is conducive to the introduction of merit order operation. POWERGRID is pursuing further tariff improvements in transmission. Assistance is being provided under Loan 3577-IN.

7.4 The Ramagundam-Chandrapur double circuit line linking the Southern and Western Regions was intended for use mainly during emergencies in either region. Only one circuit is presently in regular use carrying power (which is only a fraction of the line's load carrying capacity) from the Western Region directly to some of the northern areas of Andhra Pradesh in the Southern Region. The construction of an asynchronous tie (HVDC back-to-back station similar to the one implemented under the project) to be built at Chandrapur is being examined by POWERGRID to help effect large exchanges of power between the two regions in the future and the loading of the Ramagundam-Chandrapur line will increase. When commissioned, this inter-tie will increase the loading of the Chandrapur-Ramagundam double circuit lines.

7.5 The 400 kV transmission system under the project was intended to improve voltage levels and carry electric power over long distances with low losses. However, in practice voltages in the systems drop sometimes to well below the permissible limits (as low as 300 kV). This problem affects adversely those SEBs which are further away from the sources of generation, and is due to the SEBs nearer the generation sources who draw higher reactive power (MVARs) from the 400 kV systems. Ways to rectify the situation are for SEBs either to install shunt capacitors or to make it obligatory and enforce the installation of capacitors on all large motors, including irrigation pump motors. Five major grid failures were reported in the Southern Region during the period November 1991 to January 1993. In every one of these occasions, low voltages were prevailing in the regional grid, because SEBs were drawing unusually high MVARs over the 400 kV network. The problem was aggravated because of low generation in certain states. However, NTPC/POWERGRID 400 kV network worked satisfactorily during this period and did not contribute to the grid failures.

8. NTPC's Financial Performance

8.1 NTPC started its commercial operation in February 1982, a few months prior to the appraisal of the project. From 1982 to the present, NTPC's financial performance has been satisfactory, except for the large accounts receivable (para. 8.2). NTPC's financial statements for the period FY85 to FY92 are given in Annexes 4.1-4.3 and a summary for the last five years is given in Table 8.1 below. NTPC's operating data reflect the growth the Corporation experienced since 1982. Key financial parameters, e.g., assets in operation, revenue from electricity sales, total operating revenues, and operating income before interest, increased some five-fold since 1987. The rate of return on net average fixed assets (historically valued) for this period was high, generally around 15% (between 13% and 17%), well in excess of the 8% between FY85-FY90 and 9.5% starting from FY91, as was stipulated in the project agreement.

Table 8.1 KEY FINANCIAL INDICATORS

	1985		1986		1987		1988		1989		1990		1991		1992	
	Forecast	Actual	Forecast	Actual	Forecast	Actual	Forecast	Actual	Forecast	Actual	Forecast	Actual	Forecast	Actual	Forecast	Actual
Electricity Sales (Gwh)		8,816	11,492	12,839	13,446	14,408	17,922	17,533	25,934	24,875	35,451	35,421	43,983	40,306	48,759	56,657
Incr. in Elec. Sales				4,523	1,954	1,569	4,476	3,125	8,012	7,342	9,517	10,546	8,512	4,885	4,798	16,351
Elect. Sales Revenue		3,077	4,421	4,829	5,365	5,736	7,257	7,201	10,715	11,460	15,103	16,376	19,317	21,254	22,060	34,347
Incr. in Sales Rev.				1,752	944	907	1,892	1,465	3,458	4,259	4,388	5,916	4,214	2,878	2,763	13,093
Total Operating Revenue	3,210	3,438	4,864	5,294	5,972	6,453	8,145	8,622	12,122	12,748	17,264	20,573	22,383	24,207	25,919	39,928
Incr. in Oper. Rev.				1,856	1,108	1,159	2,173	2,169	3,977	4,126	5,142	7,825	5,099	3,634	3,556	15,722
Accounts Receivable	248	1,626	388	2,284	447	2,828	605	4,058	893	5,981	1,259	11,561	1,610	15,102	1,840	16,086
Incr. in Acc. Recev.			122	658	79	544	158	1,230	288	1,923	366	5,580	351	3,541	230	984
Accounts Receiv. (no of Days)	28	170	27	155	27	158	27	169	27	169	26	202	26	225	26	145
Current Ratio		1.0	5.0	1.6	5.2	1.6	5.7	1.7	5.1	1.8	4.7	1.8	4.2	1.9	4.1	1.5
Rate of Return (%)				17%	9%	17%	7%	16%	8%	15%	7%	15%	10%	13%	11%	15%
Operating Ratio (%)				56%	54%	55%	57%	55%	63%	59%	60%	61%	58%	60%	56%	60%
Contribution to Const. (%)				-1%	9%	10%	9%	40%	12%	-2%	24%	19%	33%	17%	51%	28%
Debt Service Coverage (times)				4.9	2.0	4.0	1.5	3.9	1.4	2.4	1.3	2.5	1.4	2.5	1.5	2.4
(a) Cash and Bank Balance	11	84	13	448	19	134	35	5,973	45	2	53	291	56	884	58	1,742
(b) Ave. Monthly Cash Oper. Exp.	142	148	221	214	204	256	300	344	464	554	645	931	813	1,027	922	1,709
(c) Ratio (a)/(b)	0.08	0.56	0.06	2.09	0.09	0.52	0.12	17.34	0.10	0.00	0.08	0.31	0.07	0.87	0.06	1.02

8.2 Bill collection and accounts receivable have been persistent problems for NTPC, because of the poor financial situation of many SEBs. NTPC's accounts receivable increased at a far greater pace than its revenues and operating income in successive years. The receivables, which represented some 5.2 months of billing in 1987, steadily increased to 7.5 months in 1991, compared to less than one month (27 days) projected in the SAR for the entire period. A covenant specifying the level of accounts receivable not to exceed an amount equivalent to the proceeds of its sales of power for the two preceding months, was first introduced for NTPC under Loan 2555-IN for the Rihand Power Transmission Project approved in May 1985, with effect from the end of FY86. The covenant was repeated in three subsequent Bank loans[11], but NTPC has never been able to comply. In 1991, the increase in accounts receivable (over 1990) was some Rs 3.53 billion, while the corresponding increases in electricity sales revenue and in total operating revenues were Rs 2.88 billion and Rs 3.63 billion respectively; in practical terms, NTPC collected virtually no additional revenue in FY91, even though it sold an additional 4,800 GWh of energy. In 1986, NTPC internal cash generation barely met its debt service requirements and the increase in working capital (Annex 4.2). A liquidity crisis was averted by the cash received by NTPC from its first issue of medium-term bonds. Since then NTPC has been issuing such medium-term bonds every year, mostly to help finance the expansion of its facilities. The level of its accounts receivable have also been increasing every year in absolute terms as well as a percentage of its annual billings. The funds raised from these bonds have helped NTPC to bridge finance its increasing working capital requirements.

8.3 Increasing bill collection and accounts receivable problems led to several interventions by GOI on behalf of NTPC during the period FY88 to FY92. At each of these interventions, GOI assumed the responsibility to clear some of the arrears from SEBs by transferring to NTPC corresponding amounts from its allocations to the respective states. Such payments are carried out over a period of four years. In February 1992, NTPC acquired the Unchahar power station in lieu of arrears of the Uttar Pradesh SEB. As indicated in Table 8.1 above, NTPC has received over Rs 11 billion from the transfers through the central appropriations from 1988 to January 1993. Combined with other bill collection efforts, NTPC was able to reduce its level of accounts receivable despite the rapid increase in sales. At the end of FY93, the overall level of accounts receivable was 3.3 months of sales equivalent, but excluding the amount still to be paid through the central appropriations, it was 1.4 months of sales equivalent. More encouraging is that during the last three months of FY93, 93% of billing was realized directly from the SEBs. During the negotiations of the NTPC Power Generation Project, agreement was reached that NTPC would maintain the level of its accounts receivable at two months of sales equivalent excluding the amount still to be paid through the central appropriations for which a specific payment schedule was also agreed.

8.4 GOI's interventions through the central appropriations helped NTPC avert financial crises and resolve, for limited periods, its accounts receivable problem. These interventions aimed at having NTPC operate efficiently, thus keep the electric energy supply in the country at an

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[11] Ln. 2674-IN for the Gas Based Combined Cycle Power Project (FY86); Ln. 2844-IN for the National Capital Power Project (FY87); and Ln. 2845-IN for the Talcher Thermal Power Project (FY87).

adequate level. It is doubtful that GOI's actions have resulted in SEBs improving their operational efficiency as well as their billing and collection practices from their own customers. What is equally important, but so far received little attention, is the need for energy conservation on the customer (SEBs) side through adoption of appropriate tariffs and tariff structure at SEBs and through end-use efficiencies.

8.5 The accounts receivable as of March 1990 were about Rs 11.5 billion (some US$500 million equivalent, and represented over six months of current billings). It was around the same time that the Bank took the exceptional step of cancelling the processing of a loan of US$375 million to NTPC for a project which had already been negotiated, primarily because of the inability of NTPC to reduce its accounts receivable. Since October 1992, GOI adopted new investment and commercial policies and electricity tariffs for NTPC. They are designed to introduce better commercial discipline at SEBs, along with improving NTPC's own operational and financial performance, including revenue collection. New two part bulk supply tariffs for NTPC coal fired stations became effective in November 1992. Further reforms in bulk power and transmission tariffs will be studied and implemented under Loan 3577-IN. The process of establishing commercial contracts between the SEBs and the central utilities is cumbersome, but progress is being made with strong Bank support under Loan 3577-IN and the NTPC Power Generation Project. The new commercial policies and bulk power supply agreements should enable NTPC to reach a level of bill collection close to 100% during FY94.

8.6 The legal documents of the Loan adopted a sole covenant on NTPC's financial performance, the conventional rate of return (ROR) on average historic fixed assets in operation. An important objective of this conventional ROR indicator is to serve as a measure of the adequacy of revenues compared to the cost of capital. Therefore, it has more appropriate application with mature utilities, and where the investment, which is not included in the rate base, is a fraction of the utility's net fixed assets in operation (or the rate base). Table 8.1 indicates that throughout the entire project implementation period i.e., FY84-FY92, the projected "Works in Progress" (WIP) was a substantially high proportion of the rate base; through 1987, WIP was higher than the Gross Assets in Operation; for practical purposes the rate base was insignificant relative to the annual investment. A utility could well have a very high rate of return performance but be faced with liquidity crisis, and the computation of other standard financial indicators such as operating ratio would not provide meaningful information[12]. One could, readily conclude that such a performance indicator was not appropriate for NTPC at the time. A more appropriate financial indicator under such circumstances is "contribution to the investment", because it targets at generating from internal sources a pre-determined level of funds towards the on-going investment after taking into account debt service and working capital requirements. Under the NTPC Power Generation Project, NTPC agreed that it would produce, starting from FY95, funds from its internal cash generation equivalent to not less than 20% of its capital expenditures on a three-year moving average. The amount for FY94 would be 15% of the average of NTPC's capital expenditures for the FY93-FY95 period.

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[12] The most recent analysis of NTPC's finances is given in the SAR for the NTPC Power Generation Project (Report No. 11827-IN; Dated June 4, 1993).

9. Compliance with Loan Covenants

9.1 The key institutional and cost recovery covenants introduced in the Loan and the Project Agreements and the extent they were complied with are listed in Part III, Table H.

10. Sustainability and Internal Economic Rate of Return

10.1 The project is sustainable, even though at present its components are not yet being fully utilized (paras. 7.3 and 7.4). Sustainability is certainly assured for the future, as the facilities built under the project are integral components of POWERGRID's system development program. However, insufficient generation and transmission tariffs and an unchecked increase of NTPC's and POWERGRID's accounts receivable could endanger such sustainability. The Bank, GOI, NTPC and POWERGRID have been taking actions to avoid such occurrence (paras. 8.5 and 8.6).

10.2 Because of the changes agreed by the parties on the project description, it is not possible to make a reasonable comparison between the internal economic rate of return (IERR) of the original and revised project scopes. The IERR for NTPC/POWERGRID's time-slice investments for the FY84-FY92 period has been estimated at 11%. Under Loan 3577-IN, the IERR for POWERGRID's time-slice investments during the FY93-FY2002 period was estimated as 22%. The difference is explained by improvements in tariff setting parameters[13] and the unusually high inflation encountered in India in late 1980s and early 1990s, which brought down tariff revenues in real terms (Part III, Table G).

11. Bank Performance

11.1 It is difficult to provide a judgement for a project whose description was substantially amended twice, albeit within its original objectives, and was really begun about four years from Board approval. The Bank might have cancelled Loan 2283-IN during the project hiatus in 1984-1987. But it might have lost an opportunity to influence transmission development in India. Instead the Bank opted to continue its dialogue with GOI, CEA, NTPC and POWERGRID on transmission system development and operations. The dialogue has culminated with the recent approval of Loan 3577-IN (para. 2.6).

11.2 On another front, the Bank opted not to suspend disbursements under loans to NTPC, when NTPC fell into default of the accounts receivable covenant and substantial arrears from SEBs began creating problems for this Corporation's financial position and overall future (para. 8.2). Although the accounts receivable covenant was not included in this Loan, the Bank had considerable leverage in refusing to extend the closing date after March 1989, particularly, if the Bank had invoked the accounts receivable covenants in other on-going projects with NTPC. The Bank decided to continue its dialogue to encourage GOI to adopt for NTPC new investment and commercial policies, and electricity tariffs. It alerted GOI and NTPC that the Bank's continued

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[13] The return on equity for projects started before FY90 was 10%; for those projects started in FY91 and FY92 it was 12%. The return has since been adjusted to 16% for future projects. Depreciation was also increased.

funding for their projects would no longer be possible unless actions to correct NTPC's finances are taken. In 1990, the Bank decided not to present to the Board the then-negotiated Regional Power Systems Project, because GOI and NTPC were unable to fulfill the conditions for Board presentation within a reasonable time period. Other multilateral and bilateral agencies followed the Bank in limiting their financing of NTPC projects. All these actions helped GOI to initiate reforms in the power sector and adopt new investment and commercial policies for NTPC. If the Bank had suspended disbursements, it might have lost another opportunity, this time to influence reforms in power generation. In view of GOI's, POWERGRID's and NTPC's recent actions prior to the approval of Loan 3577-IN and negotiations of the NTPC Power Generation Project, the Bank's above decisions bore their fruits.

11.3 Bank's supervision effort was concentrated mainly on the procurement issues, in which area the Bank provided valuable help to NTPC. It covered as well, other important areas such as physical progress including problems in implementation, in disbursements performance, etc. However, visits to the work sites by each mission could not be undertaken because each mission covered supervision of all Bank funded NTPC projects. It is concluded that the Bank's performance under the project was satisfactory.

11.4 Even though contracts amounting to about US$23.2 million equivalent were already committed (but not yet paid) under the project, and there were ample funds still available in the loan account on March 31, 1992, the Bank did not extend the closing date of the loan for a fourth time. Just a year before, the Bank had extended the loan for the third time without stating this was the last extension or any other conditions. At that time the Bank had also agreed on funding contracts which were originally to be financed by NTPC. This might have given GOI and NTPC the impression that the Bank was following the views of the January 1989 mission (para. 5.4). The Bank's 1992 decision not to extend the closing date came as a surprise to GOI and NTPC and increased NTPC's fiscal problems as the utility did not have the local and foreign funds to pay its suppliers and contractors on time. The Bank's action stemmed from (i) its more stringent implementation of the policy on the management of the closing dates; and (ii) its desire to have NTPC reach promptly, an agreement with POWERGRID on the transfer of the transmission assets.

12. Borrower Performance

12.1 The performance of NTPC in the technical and managerial activities was satisfactory. Bank missions have reported delays in preparation of specifications, bidding documents and bid evaluations, and in preparing its quarterly progress reports in a timely manner; these shortcomings, however, have been mainly due to the large workload of NTPC at the time and because the information needs to be collected from various sites which are located in

remote places[14]. The project provided continuing opportunity for NTPC to enlarge its skills and experience in procurement under ICB procedures, in designing the transmission systems and in supervising their implementation and construction. The PCR mission was advised that the services of NTPC staff, involved in implementation of the HVDC substation, were subsequently used by the supplier, on a consultancy basis, in the installation of HVDC substation in another country.

12.2 The only area where NTPC's performance fell considerably short of expectations was in bill recovery. Maintaining a specific level of accounts receivables was not a condition of this loan and it was only introduced in 1985 under Loan 2555-IN for the Rihand Transmission Project. Substantial arrears by SEBs affected NTPC's financial position adversely. NTPC maintained it had little recourse against the defaulting SEBs, because of its understanding that it could not cut off the power supply to the defaulting SEBs even if it wanted to. At present NTPC is carrying out more systematic and aggressive efforts at all levels of the organization (from the regional managers to the CMD) to obtain letters of credit from SEBs for the appropriate amounts of energy sales. These actions include seeking the intervention of the Minister of Power in order to collect dues from SEBs. GOI's new commercial policies and new bulk power supply agreements should enable NTPC to reach a level of bill collection close to 100% during FY94.

12.3 GOI has recently adopted new investment and commercial policies and electricity tariffs allowing NTPC to shut-off or restrict power supply if its clients are in default with their bulk supply agreements. These policies are designed to introduce better commercial discipline at SEBs, along with improving NTPC's own operational and financial performance, including improving revenue collection (para. 8.5).

12.4 There appears to be a difference in the positions of the Bank, GOI and the State Governments. The Bank's position is that the electricity industry provides a service which has to be fully paid for by each customer category (cross-subsidization permitted) through user charges. GOI seems to be moving towards the Bank's position as shown by the measures and incentives taken in recent years including recommendations to the state governments to increase tariffs. The states in general, appear to perceive (sometimes for political purposes) the provision of electricity as a social service and do not allow SEBs to operate independently and in line with commercial practices (para. 2.2). Furthermore, in an economy, where the public perception of a public utility often is to provide primarily a social service, the use of a profit criterion as the sole measure of the utility's financial performance is not generating adequate public support.

13. Performance of Consultants and Contractors

13.1 The performance of consultants engaged in the design and construction of HVDC and 400 kV facilities was satisfactory. There was a

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[14] Furthermore, after the transfer of the management of NTPC's transmission assets to POWERGRID, the information relating to the transmission system are collected from this Corporation. Stabilization of a proper coordination system between the two Corporations has taken some time.

positive transfer of technical know-how from these consultants to NTPC staff. Barring a few problems and some minor delays, overall the performance of the contractors/suppliers was also satisfactory. The packaging of contracts in appropriate sizes promoted participation from local manufacturing industry, and the Bank's and NTPC's involvements resulted in improvement in the quality of the product.

14. Project Relationship

14.1 A good working relationship was maintained between the Bank and GOI and NTPC, and later also with POWERGRID.

15. Project Documentation and Data

15.1 The project's legal agreements adequately reflected the objectives of the project and the Bank's interests. The staff appraisal report provided a relatively useful framework for the Bank and NTPC during project implementation. One of the weaknesses of the SAR was that it did not verify whether there was a full agreement and understanding on the part of the SEBs to pay for the transmission charges (paras. 5.1 and 5.2). Bank supervision missions appear to have been adequate in terms of their frequency. However, most of the missions had to supervise and/or prepare other projects. It is therefore likely that the missions were not able to make visits to some of project sites. Some of the important project documentation (e.g. supervision mission reports, aide-memoires), project progress reports and annual financial statements was not found in the Bank files.

Table 8.1

KEY FINANCIAL INDICATORS

	1985		1986		1987		1988		1989		1990		1991		1992	
	Forecast	Actual	Forecast	Actual	Forecast	Actual	Forecast	Actual	Forecast	Actual	Forecast	Actual	Forecast	Actual	Forecast	Actual
Electricity Sales (Gwh)		8,816	11,492	12,839	13,446	14,408	17,922	17,533	25,934	24,875	35,451	35,421	43,963	40,306	48,759	56,657
Incr. in Elec. Sales				4,523	1,954	1,569	4,476	3,125	8,012	7,342	9,517	10,546	8,512	4,885	4,798	16,351
Elect. Sales Revenue		3,077	4,421	4,829	5,365	5,736	7,257	7,201	10,715	11,460	15,103	16,376	19,317	21,254	22,080	34,347
Incr. in Sales Rev.				1,752	944	907	1,892	1,465	3,458	4,259	4,388	5,916	4,214	2,878	2,763	13,093
Total Operating Revenue	3,210	3,438	4,864	5,294	5,972	6,453	8,145	8,622	12,122	12,748	17,264	20,573	22,363	24,207	25,919	39,928
Incr. in Oper. Rev.				1,856	1,108	1,159	2,173	2,169	3,977	4,126	5,142	7,825	5,099	3,634	3,556	15,722
Accounts Receivable	248	1,626	366	2,264	447	2,828	605	4,058	893	5,981	1,259	11,561	1,610	15,102	1,840	16,086
Incr. in Acc. Recev.			122	658	79	544	158	1,230	288	1,923	366	5,580	351	3,541	230	984
Accounts Receiv. (no of Days)	28	170	27	155	27	158	27	169	27	169	26	202	26	225	26	145
Current Ratio		1.0	5.0	1.6	5.2	1.6	5.7	1.7	5.1	1.8	4.7	1.8	4.2	1.9	4.1	1.5
Rate of Return (%)				17%	9%	17%	7%	16%	6%	15%	7%	15%	10%	13%	11%	15%
Operating Ratio (%)				56%	54%	55%	57%	55%	63%	59%	60%	61%	58%	60%	56%	60%
Contribution to Const. (%)				-1%	9%	10%	9%	40%	12%	-2%	24%	19%	33%	17%	51%	28%
Debt Service Coverage (times)				4.9	2.0	4.0	1.5	3.9	1.4	2.4	1.3	2.5	1.4	2.5	1.5	2.4
(a) Cash and Bank Balance	11	84	13	448	19	134	35	5,973	45	2	53	291	56	684	58	1,742
(b) Ave. Monthly Cash Oper. Exp.	142	148	221	214	204	256	300	344	464	554	645	931	813	1,027	922	1,709
(c) Ratio (a)/(b)	0.08	0.56	0.06	2.09	0.09	0.52	0.12	17.34	0.10	0.00	0.08	0.31	0.07	0.67	0.06	1.02

NATIONAL THERMAL POWER CORPORATION LTD.

INCOME STATEMENTS

(Rs million)

Year ending March 31	1985		1986		1987		1988		1989		1990		1991		1992	
INCOME DESCRIPTION	Forecast	Actual	Forecast	Actual	Forecast	Actual	Forecast	Actual	Forecast	Actual	Forecast	Actual	Forecast	Actual	Forecast	Actual
Electricity Generation (GWh)		9,248		14,174		15,921		19,378		27,298		38,595		43,965		61,197
Less: Aux Cons.(GWh)		932		1,335		1,513		1,845		2,421		3,174		3,659		4,540
Electricity Sales (GWH)	8,133	8,316	11,492	12,839	13,446	14,408	17,922	17,533	25,934	24,875	35,451	35,421	43,963	40,306	48,759	56,657
Av. Bulk Tariff (P/kwh)		37	38	38	40	40	40	41	41	46	43	52	44	53	45	61
Operating Revenues:																
Electricity Sales	2,946	3,077	4,421	4,629	5,365	5,736	7,257	7,201	10,715	11,460	15,103	16,376	19,317	21,254	22,080	34,347
Transmission Charges		148		284		555		1,176		993		1,691		2,404		3,742
Electricity Duty	113	111	231	111	249	87	331	93	479	179	655	294	812	347	901	455
Other Income	151	102	212	70	358	75	557	152	928	116	1,506	212	2,234	201	2,938	1,384
TOTAL OPERATING REVENUES	3,210	3,438	4,864	5,294	5,972	6,453	8,145	8,622	12,122	12,748	17,264	20,573	22,363	24,207	25,919	39,928
Operating Expenses:																
Fuel Cost		1,252		1,952	1,259	2,380	1,849	3,165	2,600	5,285	3,557	8,985	4,461	9,780		18,424
																898
																1,672
Operation and Maintenance		404		483	547	616	729	807	964	1,175	1,180	1,745	1,303	2,105		974
Depreciation		265		377	779	448	1,078	579	2,035	912	2,681	1,398	3,174	2,251	3,343	3,625
Electricity Duty		112		111	272	87	166	93	494	179	629	294	740	347		455
Others@		10		21		11		69		8		147		113		86
TOTAL OPERATING EXPENSES	1,704	2,042	2,646	2,943	3,225	3,522	4,678	4,712	7,602	7,559	10,423	12,567	12,935	14,577	14,408	24,134
Opr. Income bef. Interest	1,506	1,396	2,218	2,350	2,747	2,931	3,467	3,910	4,520	5,189	6,841	8,006	9,428	9,630	11,511	15,794
Interest	614	492	1,117	570	1,499	866	2,500	1,248	4,035	1,791	5,494	2,730	5,782	3,472	5,686	5,643
Profit before Tax	892	904	1,101	1,781	1,248	2,065	967	2,662	485	3,398	1,347	5,276	3,646	6,158	5,825	10,151
Less:Provision for Taxes				1		1				0						
Profit after Tax	892	904	1,101	1,780	1,248	2,064	967	2,662	485	3,398	1,347	5,276	3,646	6,158	5,825	10,151
Prior Period Income (Net)		(28)		50		53		362		(90)		90		851		69
Net Profit	892	875	1,101	1,830	1,248	2,118	967	3,024	485	3,308	1,347	5,366	3,646	7,009	5,825	10,220
Average Net Fixed Assets		10,957		14,016	29,862	17,209	51,025	23,856	76,048	35,078	91,488	53,567	99,232	75,482	101,077	102,945
Rate of Return on Assets (%)		13%		17%	9%	17%	7%	16%	6%	15%	7%	15%	10%	13%	11%	15%
Return on Capital Employed																
Operating Ratio (%)	88%	59%	54%	56%	54%	55%	57%	55%	63%	59%	60%	61%	58%	60%	56%	60%

@ Includes deferred expenses,preliminary expenses,bonds expenses,rebate to costumer and contingencies.

@@ No tax provision has been made for future projections.

NATIONAL THERMAL POWER CORPORATION

SOURCES AND APPLICATION OF FUNDS

(Rs million)

Year ending March 31	1985		1986		1987		1988		1989		1990		1991		1992	
SOURCES DESCRIPTION	Forecast	Actual	Forecast	Actual	Forecast	Actual	Forecast	Actual	Forecast	Actual	Forecast	Actual	Forecast	Actual	Forecast	Actual
SOURCES OF FUNDS																
Operating Income bef. Int.	1,506	1,396	2,218	2,350	2,747	2,931	3,467	3,910	4,520	5,189	6,841	8,006	9,428	9,630	11,511	15,794
Prior Period Income (Net)	0	(28)		50		53		362		(90)		90		851		
Depreciation(*)	387	265	630	377	779	448	1,078	579	2,035	912	2,681	1,398	3,174	2,251	3,343	3,825
Total Internal Cash Gen.	1,893	1,632	2,848	2,777	3,526	3,432	4,545	4,851	6,555	6,011	9,522	9,492	12,602	12,732	14,854	19,419
Equity Contributions	13,574	4,859	6,279	6,808	2,460	5,909	3,007	6,879	3,564	3,682	3,745	8,594	6,569	12,812	0	6,667
Capital Receipt		26		0		114		24		87		21		117		26
Borrowings																
Loans Contracted	6,225	4,416	13,582	5,731	13,423	5,865	9,394	4,836	6,678	11,972	2,524	5,712	693	5,019	4,876	25,437
Bonds		0		1,634		4,300		4,394		1,499		4,346		4,000		7,984
Total Borrowings	6,225	4,416	13,582	7,365	13,423	10,165	9,394	9,230	6,678	13,471	2,524	11,058	693	9,019	4,876	33,421
TOTAL SOURCES	21,692	10,933	24,709	16,950	19,409	19,620	16,946	20,984	16,797	23,251	15,791	27,165	19,864	34,660	19,730	59,533
APPLICATION OF FUNDS																
Total Investment	20,066	10,011	23,388	14,048	17,449	17,806	13,536	17,630	11,657	19,064	8,215	20,397	10,823	26,079	9,906	52,754
Debt Service																
Interest Charged to Oper.	614	492		570	1,499	866	2,500	1,248	4,035	1,791	5,494	2,730	5,782	3,472	5,686	5,643
Amortization of Loans		-		-	300		476	-	785	747	1,697	1,087	2,997	1,542	3,956	2,581
Total Debt Service	614	492		570	1,799	866	2,976	1,248	4,820	2,538	7,191	3,817	8,779	5,015	9,642	8,224
Increase (Dec.) in W. C.		430		2,332	155	845	418	(3,416)	360	3,812	376	1,842	259	3,278	177	(3,838)
Provision for Tax				1		1				0						
TOTAL APPLICATION OF FUNDS	20,680	10,933		16,950		19,620		20,984		25,414		26,056		34,371	19,727	57,141
				606	6	102	16	5,522	10	(2,163)	8	1,109	3	308	2	2,244
Contribution to Constr.				-0.01	9%	10%	9%	40%	12%	-2%	24%	19%	33%	17%	51%	28%
Cont. to Const. (3-yr. Av)																
Debt Service Coverage	3.08	3.32		4.87	1.98	3.98	1.53	3.89	1.36	2.37	1.32	2.49	1.44	2.54	1.54	2.36

(*) Depreciation pertains to operations.

NATIONAL THERMAL POWER CORPORATION

BALANCE SHEETS

(Rs million)

Year ending March 31	1985		1986		1987		1988		1989		1990		1991		1992	
BALANCE DESCRIPTION	Forecast	Actual	Forecast	Actual	Forecast	Actual	Forecast	Actual	Forecast	Actual	Forecast	Actual	Forecast	Actual	Forecast	Actual
ASSETS																
Gross Block	21,064	13,363	26,176	16,047	36,880	20,689	70,841	30,508	90,090	44,784	105,988	69,972	111,433	92,422	116,194	131,136
Less:Depreciation		476	1,286	903	2,047	1,416	3,125	2,069	5,210	3,068	7,891	4,554	11,065	6,877	14,408	10,791
Net Fixed Assets in Ope.	21064.00	12,887	24,890	15,144	34,833	19,273	67,216	28,439	84,880	41,716	98,095	65,418	100,368	85,546	101,786	120,345
Capital Works in Progress		19,656	48,884	31,069	55,629	44,302	35,704	52,187	27,612	57,062	19,931	52,360	25,307	56,039	30,454	70,080
Total Fixed Assets	21064.00	32,543	73,774	46,213	90,462	63,575	102,920	80,626	112,492	98,778	118,026	117,778	125,675	141,584	132,240	190,425
Current Assets																
Cash and Bank Balance	11	84	13	448	19	134	35	5,973	45	2	53	291	56	684	58	1,742
Short-term deposits		895		637		1,053		737		4,544		5,864		5,279		8,485
Receivables	246	1,626	368	2,284	447	2,626	605	4,058	893	5,981	1,259	11,561	1,610	15,102	1,840	18,086
Inventories	211	704	262	940	369	1,322	703	1,742	901	2,639	1,060	3,632	1,114	5,414	1,162	7,306
Loans & Advances		326		1,972		3,642		783		2,614		1,824		2,088		2,497
Other Cur. Asset/Debtor	2	17	2	13	2	148	2	178	2	104	2	125	2	231	2	399
Total Current Assets	470	3,151	645	6,293	837	9,127	1,345	13,469	1,841	15,884	2,374	22,797	2,782	28,799	3,062	34,495
Misc.Capital Expenditure		19		19		18		17		18		19		41		39
TOTAL ASSETS	21,534	35,713	74,419	52,526	91,299	72,718	104,265	94,112	114,333	114,680	120,400	140,594	128,457	170,424	135,302	224,959
LIABILITIES																
Equity																
Share Capital Issued		20,632		26,685	47,110	32,851	50,117	37,658	53,681	44,073	57,426	49,840	63,995	59,237	63,995	89,841
Share Deposit		236		990		734		2,806		73		1,100		4,314		377
Retained Earnings		1,402		3,231	3,667	5,463	4,634	8,511	5,119	11,906	6,466	17,293	10,112	24,420	15,937	34,526
Total Equity	0	22,270	0	30,906	50,777	39,048	54,751	48,975	58,800	56,052	63,892	68,033	74,107	87,971	79,932	104,744
Total Long-term Debt		10,364		17,729	40,362	27,894	49,280	37,124	55,173	49,848	56,000	59,819	53,696	67,296	54,724	97,766
Current Liabilities	84	3,081	129	3,891	160	5,778	234	8,014	360	8,780	509	12,742	655	15,158	756	22,448
Total Debt	84	13,445	129	21,620	40,522	33,672	49,514	45,138	55,533	58,628	56,509	72,561	54,351	82,454	55,480	120,214
TOTAL EQUITY & LIABILITIES	84	35,715	129	52,526	91,299	72,720	104,265	94,113	114,333	114,680	120,401	140,594	128,458	170,425	135,412	224,958
Debt:Equity Ratio		32/68		36/64		42/58		43/57		47/53		47/53		43/57	41/59	48/52
Current Ratio	5.6	1.0	5.0	1.6	5.2	1.6	5.7	1.7	5.1	1.6	4.7	1.8	4.2	1.9	4.1	1.5
Acc. Receiv. (no. of days)	28	170	27	155	27	158	27	169	27	159	28	202	28	225	28	145

SecM93-1284

FROM: Vice President and Secretary

December 17, 1993

PROJECT COMPLETION REPORT

INDIA:

Central Power Transmission Project

(Loan 2283-IN)

Attached is a copy of a memorandum from Mr. Picciotto with its accompanying report entitled "Project Completion Report: India: Central Power Transmission Project (Loan 2283-IN)" dated November 22, 1993 (Report No. 12550) prepared by the South Asia Region, with Part II contributed by the Borrower.

Distribution

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Report No. 12550

PROJECT COMPLETION REPORT

INDIA

CENTRAL POWER TRANSMISSION PROJECT
(LOAN 2283-IN)

NOVEMBER 22, 1993

Energy Operations Division
Country Department II (India)
South Asia Region

COUNTRY EXCHANGE RATES AND ABBREVIATIONS

Currency Unit = Rupee (Rs.)
Rs. 1 = Paise 100

Rupee (Rs.)/US$ Exchange Rates and CPI (Yearly Averages)

Fiscal Year	Rupees/US$	Consumer Price Index FY80/81=100
FY83 (Project appraisal & approval)	10.10 /a	
FY84	11.36	
FY85	12.37	133.3
FY86	12.61	141.2
FY87	12.96	148.0
FY88	13.92	163.2
FY89	16.23	176.3
FY90	17.50	190.6
FY91	22.74	216.3
FY92	26.20	237.0 (estimate)

/a Conversions in the Staff Appraisal Report were made at Rs 9.5/US$.

Government of India and
National Thermal Power Corporation
Fiscal Year: April 1 - March 31

Measures and Equivalents

1 Ton (t)		=	1 metric ton=1,000 kg.=2,200 lbs.
1 Kilovolt (kV)		=	1,000 volts (V)
1 Kilovolt ampere	(kVA)	=	1,000 volt-amperes (VA)
1 Kilowatt-hour	(kVh)	=	1,000 watt-hours
1 Megawatt-hour	(MWh)	=	1,000 kilowatt-hours
1 Gigawatt-hour	(GWh)	=	1,000,000 kilowatt-hours

Abbreviations and Acronyms

CEA	Central Electricity Authority
DESU	Delhi Electric Supply Undertaking
GOI	Government of India
IBRD	International Bank for Reconstruction & Development
IDA	International Development Association
MOU	Memoranda of Understanding
NHPC	National Hydroelectric Power Corporation
NPTC	National Power Transmission Corporation
NTPC	National Thermal Power Corporation
POWERGRID	Power Grid Corporation of India
ROR	Rate of Return
SEBs	State Electricity Boards

THE WORLD BANK
Washington, D.C. 20433
U.S.A.

Office of Director-General
Operations Evaluation

MEMORANDUM TO THE EXECUTIVE DIRECTORS AND THE PRESIDENT

December 10, 1993

SUBJECT: Project Completion Report on India
Central Power Transmission Project (Loan 2283-IN)

Attached is the "Project Completion Report on India - Central Power Transmission Project (Loan 2283-IN)" prepared by the South Asia Region. Part II was provided by the Borrower.

The US$250.7 million loan increased the capacity of the transmission grid feeding power from the National Thermal Power Company (NTPC) to the regional power companies. The Bank approved a revision in the project scope which was fully justified under the original project objectives. Almost half of the loan amount was canceled (US$119.2 million) partly because of foreign currency savings. There were three extensions and the project was not fully completed at loan closing.

All the project objectives were substantially obtained albeit with substantial delays. The re-estimated economic rate of return is 11% (not directly comparable with the initial figure because of the change in scope). NTPC maintained its good financial health but its performance in bill collection has prompted the Bank to insist on very strong remedial actions by the Government with respect to the least responsive State Electricity Boards. The project strengthened NTPC's transmission planning and project management capacity. The know how thus acquired was transferred to POWERGRID, the recently created national transmission company.

Overall, the project outcome is rated as satisfactory, its sustainability as likely, and its institutional impact as substantial. The PCR gives a thorough account of project preparation and implementation which was mostly uneventful except for the initial delays. No audit is planned.

PROJECT COMPLETION REPORT

INDIA

CENTRAL POWER TRANSMISSION PROJECT
(LOAN 2283-IN)

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PROJECT COMPLETION REPORT
INDIA
CENTRAL POWER TRANSMISSION PROJECT
(LOAN 2283-IN)

Preface

This is the Project Completion Report (PCR) for the Central Power Transmission Project, for which Loan 2283-IN in the amount of US$250.7 million was approved on May 19, 1983. The loan was made to India, acting by its President, for on-lending to the National Thermal Power Corporation (NTPC). The original loan closing date of March 31, 1989, was extended three times and the loan was closed on March 31, 1992. On December 5, 1991, an amount of US$50 million of savings arising mainly because of exchange rate variations were cancelled from the loan account. Disbursements were completed on September 8, 1992, and the undisbursed balance of US$69.2 million was cancelled. Thus, total disbursements under the loan amounted to US$131.5 million.

On August 16, 1991, the management of the project (operation and maintenance of the assets in service and implementation of those still under construction) was transferred from NTPC to the National Power Transmission Corporation Ltd. (NPTC), the newly established utility responsible for transmission and grid operations, under a Management Contract signed between the two Corporations. NPTC was later named Power Grid Corporation of India Ltd. (POWERGRID). On January 8, 1993, an Ordinance providing for all the rights, titles and other interests related to the transmission systems of NTPC and two other centrally-owned utilities[1], to be transferred to POWERGRID, with effect from April 1, 1992, was promulgated by the President of India. At the time of preparation of this PCR, the Bank was in the process of finalizing the modifications on the Development Credit, Loan and Project Agreements to formalize the transfer of the Bank loans and IDA credits from NTPC and NHPC to POWERGRID retroactively with effect from April 1, 1992. With regard to Loan 2283-IN, assets and liabilities for about US$3.4 million remained with NTPC and assets and liabilities for about US$128.1 million have been transferred to POWERGRID. The amounts will be finalized after accounts between NTPC and POWERGRID are settled.

The PCR was prepared by the Energy Operations Division of the Country Department II (India) of the South Asia Regional Office, and by NTPC and POWERGRID. The former prepared the Preface, Evaluation Summary and Parts I and III of the PCR, while the implementing agencies prepared Part II, and provided all the supporting data.

Preparation of Parts I and III of the PCR was based on information in the Staff Appraisal Report, the Loan and Project Agreements, and material on the project in Bank files and that provided by NTPC and POWERGRID. The preparation was also based on discussions with some of the Bank staff who were involved with the project and the officials of the Government of India (GOI), NTPC, POWERGRID and the project beneficiaries (i.e., State Electricity Boards) during a PCR mission to India in February 1993.

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[1] National Hydro Power Corporation (NHPC) and North-Eastern Electric Power Corporation (NEEPCO).

PROJECT COMPLETION REPORT

INDIA

CENTRAL POWER TRANSMISSION PROJECT
(LOAN 2283-IN)

Evaluation Summary

Objectives

The two main objectives of the project were: (a) to support GOI's strategy to extend and improve power supply through the establishment of centrally owned regional grids and intra-regional connections leading to the promotion of a national grid; and (b) to improve, in the long run, the operational, institutional and financial performance of the State Electricity Boards (SEBs), by assisting in the development of a financially sound, and technically and institutionally competent centrally-owned power utility which would serve as a model to SEBs (Part I, para. 3.1).

Implementation Experience

NTPC (and, since August 1991, POWERGRID) successfully implemented the project. Implementation of the project components financed under the loan was really begun in April 1987, almost four years from Board approval. The delay was mostly due to NTPC's decision not to proceed with the implementation of the 400 kV transmission lines and substations in the Southern Region (major portion of the Project) until firm agreements were reached with the State Electricity Boards in the Southern Region on the cost recovery arrangements for the transmission facilities to be built under the project. In the meantime, the planning was modified by GOI and subsequently the description of the project was amended twice. At appraisal, all the project components were scheduled to be commissioned by March 1988. At the time the Bank closed the loan on March 31, 1992, the project was not completed. Supplies and works amounting to US$23.2 million remained - these expenditures are being funded under Loan 3577-IN, and are expected to be completed during FY94 (Part I, paras. 5.2 and 5.10).

Results

Overall the project achieved its physical objectives, albeit with substantial delays. The project has been the first major component in the establishment of centrally owned regional grids and intra-regional connections. The power transmission capacity in the Southern Region has been increased in a manner which helps optimal utilization of the installed thermal and hydro capacities in this region and permits for exchanges between the Southern and Western Regions. The interconnection between the Northern and the Western Regions is currently used for limited exchanges of power between the two regions and helps the stability of the systems (Part I, para. 7.1).

The project contributed in making NTPC an efficient utility, but did not, however, contribute towards the longer-term objective of improving the operational, institutional and financial performance of SEBs (Part I, 7.1).

NTPC's financial rate of return on historically valued net fixed assets declined from a high 17% in FY86 and FY87 to 15% in FY92 against the covenanted rate of return of 9.5%. Because of the changes agreed by the parties on the project description, it is not possible to make a reasonable comparison between the internal economic rate of return (IERR) of the original and revised project scopes. The IERR for the project as implemented was estimated at 11% (Part I, paras. 8.1 and 10.2).

Sustainability

The project is sustainable, even though at present its components are not yet being fully utilized. Sustainability is certainly assured for the future, as the facilities built under the project are integral components of the transmission system development program in India (Part I, para. 10.1).

Insufficient generation and transmission tariffs and an unchecked increase of NTPC's and POWERGRID's accounts receivable could endanger such sustainability. The Bank, GOI, NTPC and POWERGRID have been taking actions to avoid such occurrence.

Findings and Lessons Learned

Major findings are as follows:

a) The project was not completely finalized when the Bank approved it - the first transmission line equipment contract was awarded in March 88, four years ten months from the date of approval by the Bank. Furthermore the specific conditions for effectiveness had to be modified. The long delay in the start-up of project implementation, and the consequent project revision, are attributed partly to the Bank not verifying that there was full agreement and understanding on the part of the SEBs to pay NTPC for the transmission charges. NTPC's unwillingness to begin work before all contracts with the Southern Region SEBs were signed was not appreciated sufficiently. Therefore, the Bank approved this Loan prematurely (Part I, paras. 5.1 and 5.2);

b) Once implementation got under way, NTPC implemented the project successfully, with only minor problems and delays (Part I, para. 5.3);

c) The Bank's agreement on the "revised" project (para. 3.3) which was determined to require some three additional years for its completion, gave GOI and NTPC the perception that the loan would be extended until the completion of the project; therefore, the Bank's decision not to extend for a fourth time the closing date of the loan came as a surprise to GOI and NTPC (Part I, para. 5.4);

d) The project contributed to the enhancement of NTPC's (later POWERGRID's) expertise in the area of high voltage transmission, created employment of local labor and helped to the development of local manufacturing industry (Part I, paras. 5.5 and 5.6);

e) The average time taken from bid opening to the award of the contract (including Bank acceptance of the proposed award) was generally less than nine months. In an effort to speed up procurement, standard bidding documents will in future be used by NTPC and POWERGRID.

They would also give further emphasis to finishing promptly the payments for the contracts, so that the closing dates of new loan(s) would not need to be extended (Part I, para. 5.7);

f) By the time the Loan was closed India had repaid almost half of the loan amount utilized (Part I, para. 5.10);

g) The area where NTPC's performance fell considerably short of expectations was in bill recovery. Maintaining a specific level of accounts receivables was not a condition of this loan and it was only introduced in 1985 under Loan 2555-IN for the Rihand Power Transmission Project. Substantial arrears by SEBs affected NTPC's financial position adversely (Part I, paras. 8.2 and 12.2);

h) GOI interventions through the central appropriations helped NTPC resolve, albeit for limited periods, its accounts receivable problem. These interventions aimed at having NTPC operate efficiently, thus keep the electric energy supply at an adequate level. It is doubtful that GOI's actions have led to SEBs improving their operational efficiency and their billing and collection procedures and practices. What is equally important, but so far received little attention, is the need for energy conservation on the customer side through adoption of appropriate tariffs and tariff structure at SEBs and through end-use efficiencies (Part I, para. 8.4);

i) The SAR adopted the conventional rate of return (ROR) on average historic fixed assets in operation as the sole covenant for NTPC's financial performance. This performance indicator is less appropriate for a fast growing utility where the utility's major concern is to ensure the availability of adequate funds for investment. Furthermore, when the revenues collected are substantially lower than the revenues accrued (due to the large accounts receivable), the financial performance indicators such as ROR, operating ratio, etc., are less meaningful (Part I, para. 8.6);

j) A more appropriate covenant would have been a cash generation covenant, e.g. "contribution towards investment" which would have also highlighted the deterioration in NTPC's performance (Part I, para. 8.6); and

k) Bank's position (only partially shared by GOI) is that the electricity industry provides a service which has to be fully paid through user-charges. The perception of the State Governments and SEBs, perhaps for political reasons, is that provision of electricity is partly a social service. The transfer of funds to NTPC through central appropriations is but another subsidy (whether it comes from GOI or from SEB), and not a direct payment through tariffs (Part I, para. 12.4).

Major lessons learned from this project are summarized below:

a) As a precondition for further Bank loans, more emphasis should be given to improving the commercial arrangements between NTPC and its clients. However, this has proved to be difficult to achieve in practice unless the financial performance of the SEBs is improved (Part I, para. 12.4);

b) To enable NTPC to operate on a purely commercial basis, GOI should allow NTPC to sell to other customers the allocated shares of the SEBs which do not comply with their agreements with NTPC. In cases where technical reallocation (by limiting availability of power to a particular SEB) cannot be implemented, commercial reallocation can be done. This can be done by limiting allocations to a defaulting SEB and charging a stiff penalty for drawals exceeding the reduced allocation (Part I, para. 12.4); and

c) As a result of the changes in the overall economic policy environment within which NTPC is operating, its financial policies need orientation. Under the circumstances, it would be appropriate to change the existing rate of return covenant into a self financing ratio covenant, because it would not only provide a better monitoring mechanism for NTPC's financial performance, but also provide better support to NTPC towards meeting its development challenges (Part I, para. 8.6).

The lessons drawn from this and previous projects implemented by NTPC have been used in the preparation, appraisal and negotiations of the NTPC Power Generation Project, which was approved on June 29, 1993:

a) GOI has adopted new investment and commercial policies and electricity tariffs allowing NTPC to shut-off or restrict power supply if its clients are in default with their bulk supply agreements. These policies are designed to introduce better commercial discipline at SEBs, along with improving NTPC's own operational and financial performance, including improving revenue collection (para. 12.3);

b) NTPC has agreed with the Bank on an internal cash generation covenant (para. 8.6);

c) GOI established POWERGRID to: (i) improve the efficiency in power transmission and systems operations, through an extensive restructuring of the transmission sector; and (ii) complement its policy initiatives to encourage private generation and competition in power generation (para. 2.6); and

d) The Bank and NTPC agreed on standard bidding documents whose use would curtail the procurement period (para. 5.7).

The last two points were also taken into account under Loan 3577-IN for the POWERGRID System Development Project.

PROJECT COMPLETION REPORT

INDIA

CENTRAL POWER TRANSMISSION PROJECT
(LOAN 2283-IN)

PART I: PROJECT REVIEW FROM BANK'S PERSPECTIVE

1. Project Identity

Name	: Central Power Transmission
Loan No	: Loan 2283-IN
RVP Unit	: South Asia Region
Country	: India
Sector	: Energy
Sub-sector	: Power

2. Project Background

2.1 In India, the responsibility for electricity supply is shared constitutionally between the Government of India (GOI) and the states. In addition, India is one of the few developing countries with a vibrant, if small, private sector presence in public power supply. At independence, private utilities and licensed local authorities, located in urban areas, provided about 80% of public electricity supply. GOI opted to embark on an ambitious electrification program to support the development of power-intensive industries for a rapid industrial development and expansion of irrigation. The Electricity (Supply) Act of 1948 (the Act) created the state electricity boards (SEBs) and entrusted the state governments and the boards with primary responsibility for public power supply. The coordination of SEBs' activities within the national power development policy, and the formulation of longer-term plans for power development is the responsibility of Central Electricity Authority (CEA), established in 1950.

2.2 Between 1960 and 1980, power demand grew twice as fast as the economy, and the generating capacity increased almost five-fold from about 5,600 MW to about 32,000 MW. Yet, for the entire period the country faced power shortages, frequent power interruptions, wide variations in system frequency, and large drops in voltage at the consumer level because SEBs could not fulfill their responsibilities. Though set up as autonomous bodies, SEBs have been under the stringent control of their state governments in vital matters such as changes to tariffs and tariff structure, with the result that they have not developed commercial and financial disciplines, and their financial performance generally has been poor, to the extent of depending on the state governments for operational subsidies.

2.3 In mid-1970s, GOI reoriented its strategy in order to supplement efforts of SEBs in increasing installed capacity and establishing high voltage transmission networks. Emphasis was put on: (a) accelerating the development of the hydro power potential and large coal-fired power plants both at pithead and in the proximity of load centers; (b) improving the efficiency of thermal power plants and reducing losses in the transmission and distribution

networks; (c) expanding the rural electrification program; and (d) strengthening the organizational and management capabilities of the SEBs.

2.4 GOI established in 1975 two power generating companies, the National Thermal Power Corporation (NTPC) and the National Hydroelectric Power Corporation (NHPC) to construct and operate large thermal and hydro power stations and associated transmission systems. The rapid increase in generation necessitated to expand the transmission networks and also to increase the voltage level to handle the transfer of large blocks of power from generating stations to load centers. Simultaneously, for the first time a need was felt for power planning and development on a regional basis to ensure the optimum utilization of natural resources which are rather unevenly distributed over the country and also for enhancing the reliability and security of the power transmission systems. The country was divided into five contiguous regions (Northern, North Eastern, Eastern, Western and Southern) with a view to build regional integrated grids. Regional Electricity Boards (REB) were established to integrate the operations of each grid through regional load dispatch centers and to improve collaboration among the SEBs.

2.5 By the time the Central Power Transmission Project was appraised in October 1982, IDA/Bank had financed under nine operations implemented by NTPC, 6,800 MW of pithead coal-fired thermal power plants (TPPs) in four sites (Singrauli, Korba, Ramagundam and Farakka) and associated transmission lines to evacuate the power generated at these power stations into the networks owned and operated by SEBs. The project was the 31st Bank/IDA operation in the sector, and tenth operation with NTPC. As in the previous NTPC projects, India, acting by its President, was the borrower and NTPC the implementing agency. The project was developed from studies conducted by CEA with assistance by Teshmont Inc. consultants from Canada.

2.6 In 1989, GOI established the National Power Transmission Corporation Ltd. (NPTC) to improve the efficiency in power transmission and systems operations, through an extensive restructuring of the transmission sector, and complement its policy initiatives to encourage private generation and competition in power generation. On August 16, 1991, the management of the transmission assets (operation and maintenance of the assets in service and implementation of those still under construction) of NTPC, including the Project, was transferred to NPTC, under a Management Contract signed between the two Corporations. Subsequently, two other GOI-owned utilities (NHPC and the North-Eastern Electric Power Corporation - NEEPCO) which had transmission lines and substations in operation or under construction, signed similar management contracts with NPTC. NPTC was later named Power Grid Corporation of India Ltd. (POWERGRID). On January 8, 1993, an Ordinance providing for all the rights, titles and other interests related to the transmission systems of NTPC, NHPC and NEEPCO, to be transferred to POWERGRID, with effect from April 1, 1992, was promulgated by the President of India. The Bank supports the establishment and development of POWERGRID under the US$350 million Loan No. 3577-IN for the POWERGRID System Development Project, approved on March 23, 1993. At the time of preparation of this PCR, the Bank was working on the finalization of the modifications on the Development Credit, Loan and Project Agreements to formalize the transfer of the Bank loans and IDA credits from NTPC and NHPC to POWERGRID, retroactively with effect from April 1, 1992. With regard to Loan 2283-IN, assets and liabilities for about US$3.4 million remained with NTPC and assets and liabilities for about US$128.1 million have been transferred to POWERGRID. The amounts will be finalized after accounts between NTPC and POWERGRID are settled.

3. Project Objectives and Description

3.1 Project Objectives. The primary objective of the project was to support GOI's strategy to extend and improve power supply through the establishment of centrally owned regional grids and intra-regional connections leading to the promotion of a national grid. To attain this objective, the project provided for:

(a) an increased capacity of power transmission system from NTPC's Ramagundam TTP in the Southern Region, in order to ensure optimal utilization from the installed thermal and hydro capacities in this region;

(b) a strong power transmission tie between the predominantly hydro-based Southern Region and the predominantly thermal-based Western Region; and

(c) an asynchronous inter-tie between the Northern and the Western Regions in order to permit larger exchanges of power between the two regions to meet the growing system demands while ensuring stability of the systems.

As in the previous Bank-financed projects with NTPC, another objective was to improve, in the long run, the operational, institutional and financial performance of the State Electricity Boards (SEBs), by assisting in the development of a financially sound, and technically and institutionally competent centrally-owned power utility which would serve as a model to SEBs.

3.2 Original Project Description. The project, as approved by the Board on May 19, 1983, is detailed in Annex 1 and comprised:

(a) construction of 548 km of double circuit and 564 km of single circuit 400 kV transmission lines;

(b) construction of three new and extension of five 400/220 kV substations associated with the lines mentioned in (a);

(c) construction of a 2x250 MW capacity "back-to-back", high voltage direct current (HVDC) substation at Vindhyachal TPP to provide an asynchronous interconnection between the Northern and the Western Regions;

(d) technical services, for detailed equipment and system engineering and construction supervision of the HVDC back-to-back interconnection;

(e) installation of metering, instrumentation and communication facilities; and

(f) installation of power line carrier communication equipment for voice transmission, line protection and data transmission on each 400 kV transmission line.

3.3 Revised Project Description. After the loan and project agreements were signed, GOI obtained financing for the HVDC back-to-back

station from Sweden. The Bank welcomed this co-financing and at GOI's request, agreed, on January 23, 1985, to reallocate loan funds and thus amend the project description. In 1984, the construction of two large thermal power plant projects (Manguru and Vijayawada projects) to be built in the Southern Region were deferred beyond the Seventh Plan. In addition, CEA and NTPC wanted to avoid forest land and ensure optimum utilization of the facilities with respect to the revised demand and supply scenarios[2]. After protracted discussions between the Southern Region SEBs and NTPC, and with the involvement of CEA, a new transmission system configuration was proposed. Therefore, the project components to be built in the Southern Region (major portion of Parts a and b of the project - para. 3.2) underwent major revision. The proposed changes were found by the Bank technically acceptable and justifiable on the basis of the long-term development of the Southern Region. The Bank thus agreed on the new scheme on November 16, 1986. However, GOI finalized the scheme only in August 1987. The final project description is detailed in Annex 2 and summarized as follows:

(a) construction of 184 km of double circuit and 1,229 km of single circuit transmission lines; and

(b) construction of four new and extension of seven 400/220 kV substations, and of one new switching station associated with the lines mentioned in (a).

Parts (c)-(f) of the project were not amended. The new project description was still within the overall objectives of the project as originally approved by the Board. Thus the Management considered that the approval of the Board for the said changes was not necessary.

4. Project Design and Organization

4.1 Project Design. Unlike the previous Bank operations with NTPC, where the loans were made for the construction of power generation plants and for the associated transmission lines to evacuate the power generated, this project was solely to strengthen the transmission system. NTPC had already acquired adequate experience in the area of 400 kV transmission line and substation design and engineering during the construction of the transmission lines and substations associated with the Singrauli, Korba, Ramagundam and

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[2] Changes in the supply scenario came from GOI's decision to delay the Manguru and Vijayawada power projects beyond the Seventh Plan, due to environmental, resettlement and rehabilitation problems (for the Manguru project) and lack of financial resources. Changes in the demand scenario came from higher priority being allocated to small scale industry and to rural electrification. The Ramagundam-Manguru-Vijaywada transmission line was re-routed via Khammam to minimize the passage through the forests, where Manguru is located. The Vijaywada-Nellore-Red Hills (near Madras) coastal transmission line was discarded because of the severe cyclonic conditions in that area, which would have placed a high risk of damage to the envisaged coastal line.

Farakka power plant projects[3]. The basic and detailed engineering work for the 400 kV transmission lines and substations was carried out by NTPC in-house. The detailed engineering of the HVDC back-to-back transmission link component was carried out by NTPC in cooperation with ABB, Sweden, the equipment supplier. NTPC carried out the preparation of specifications, bidding documents, bid evaluation reports and construction supervision of all the components of the project. To ensure smooth implementation, the execution of the project required co-ordination with a number of major agencies including beneficiary SEBs. This coordination was not always without problems (para. 5.2).

4.2 Project Organization[4]. At the time of appraisal, NTPC had already adopted its current three-tier organizational structure at corporate, regional and project levels. The Corporation is headed by a Chairman and Managing Director (CMD), who is assisted by five full time functional directors, namely, Director (Projects), Director (Operations), Director (Technical), Director (Finance) and Director (Personnel). At the Corporate Office, corporate planning and central procurement functions are headed by Executive Directors reporting to the CMD. For the purpose of the administration and execution of work at the sites, the Corporation is divided into five regions (Northern, Western, Eastern, Southern and National Capital Regions) with headquarters at present located at Allahabad, Nagpur, Patna, Hyderabad and Delhi, respectively. These regions are under the control of Regional Executive Directors who are responsible for the implementation, operation and maintenance of power plants in their respective regions. Each power plant is headed by a General Manager[5]. The structure has shown the advantage of optimizing the span of control of the CMD and provided for the decentralization of line responsibility while retaining centralized systems in areas such as long-term planning, basic engineering, procurement of critical equipment and spares, quality assurance, co-ordination with the World Bank and other financing agencies and inspection. Various parts of the Project were located in the Northern, Western and Southern regions and were managed by the respective regional offices.

5. Project Implementation

5.1 Loan Effectiveness. Loan 2283-IN was approved on May 19, 1983; the Loan and Project Agreements were signed on June 8, 1983. It was expected that the loan would be declared effective by September 9, 1983. Signing of a Subsidiary Loan Agreement between GOI and NTPC, satisfactory to the Bank, and of bulk supply contracts between NTPC and the SEBs for the sale of electricity from the Bank financed Singrauli and Korba power plants, were conditions for loan effectiveness. The Subsidiary Loan Agreement was provided on time. However, delays were experienced in finalizing contractual arrangements with

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[3] All these coal-fired power plant projects were partly funded under IDA credits and Bank loans.

[4] As NTPC was the legal implementing agency of the project during the life of Ln. 2283-IN, NTPC's project organization and management is reviewed in this section.

[5] Until August 16, 1991, NTPC's regional transmission units were also headed by a General Manager (para. 2.6).

SEBs. This had been originally a condition for loan negotiations but subsequently was made a condition for loan effectiveness. The delays led to postponing twice the loan effectiveness date eventually to March 1984. By that time, NTPC could only sign Memoranda of Understanding (MOU) with the concerned SEBs. The Bank noted some deficiencies[6] in these MOUs, but concluded that they fulfilled the purpose of providing an agreement between NTPC and the relevant SEBs and other institutions[7], covering the sale of electricity from the Singrauli and Korba power plants. The loan was declared effective on March 29, 1984, a delay of 6 1/2 months from the date of effectiveness originally determined at signing.

5.2 Project Start-up and Implementation Schedule. At appraisal, the project was expected to be completed by March 31, 1988. The construction of the HVDC back-to-back station proceeded satisfactorily. The station which was projected to be commissioned in March 1988, was put into service in end 1987. On the other hand, NTPC could not proceed with the implementation of the 400 kV transmission lines and substations in the Southern Region (major portion of the Project) until firm agreements were reached with the Southern Region SEBs on the cost recovery arrangements for the transmission facilities to be built

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[6] The deficiencies found by the Bank were summarized as: (i) short remaining validity period of the MOUs, to March 1985; (ii) lack of fixed commitment charge for the SEBs; (iii) lack of definition for profits in tariff calculation; and (iv) lack of calculations of flat rate, variable energy price and transmission charge. NTPC's comments on the above are: (i) MOUs were valid from February 1982 to March 1985; (ii) No commitment charges were provided as NTPC was not in a position to assure delivery of shares to SEBs. The tariff in Rs./kWh basis enabled NTPC to earn higher returns as the actual levels of operation were above the normative levels. Absence of fixed commitment charges did not in any way prove detrimental to NTPC's interests; (iii) Profit by way of return on equity was included in the tariffs as an element of fixed charges; and, (iv) Although the calculations did not form part of the MOUs, the tariffs were based on detailed calculations based on the principles and parameters mentioned in the MOUs.

[7] Delhi Electric Supply Undertaking (DESU) and the Department of Power of the Union Territory of Goa.

under the Project[8]. In the meantime, the generation and transmission plans for the Southern Region and the description of the project were modified (para. 3.3). The SAR envisaged that the bid documents for the first contracts for all the transmission lines (contract packages for the supply and erection of the line towers) would be issued at the latest by September 1983 and the contracts would be awarded by June 1984. The bid documents for these packages were issued in April 1987[9], and the first contract was awarded in March 1988 (four years ten months from Board approval).

5.3 Implementation Process. Once project implementation got under way, there were some delays but these were not of significance - minor delays occurred in the design and fabrication of tower parts for Ramagundam-Khammam line, and supply of some 400 kV circuit breakers. The design, procurement and installation of the metering, instrumentation and communications equipment (para. 3.2, Items d, e and f) were not given the importance they deserved and their commissionings were delayed substantially to 1990-1992.

5.4 Extensions of the Closing Date. The loan was scheduled to be closed on March 31, 1989. Implementation of the project components financed under the loan was really begun in April 1987, almost four years from Board approval. While agreeing to GOI's request to revise the project, the Bank recognized that extension of the loan closing date would be required. A supervision mission estimated in January 1989 that the revised project would only be completed by March 1992, and that completion of the payments would require the extension of the closing date to 1993. However, the Bank reserved the right to review progress under the project and extend the closing date when necessary. The Bank carried out these reviews annually and agreed extending the closing date by one year each time, for a total of 36 months to March 31, 1992. In the meantime, in March 1991, in an effort to accelerate disbursements under the project, the Bank also agreed in principle to finance items of equipment totalling US$27.2 million that were originally planned to be financed by NTPC. The Bank did not extend the closing date of the loan beyond March 31, 1992, but informed GOI that it would be willing to consider to include funding the completion of the ongoing contracts retroactively under the POWERGRID System Development Project. The latter project was approved by

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[8] Even before project negotiations, some of the Southern Region SEBs had questioned NTPC on the utility or the benefit to themselves from the transmission lines being set up under the Ramagundam project, and manifested significant reluctance to agreeing to pay NTPC for the transmission line charges for those lines constructed under the said Ramagundam Project. The discussions/negotiations between NTPC and Southern Region SEBs became protracted partly because these SEBs had not dealt before with a centrally-owned utility in terms of sharing the power generated from the plant, and the cost of that power. It took about four years for the parties involved to develop a consensus on NTPC's tariffs. Although NTPC commented that the last agreement for the Southern Region was signed in April 1985, Bank's files show that this was an issue until the March 22 - April 7, 1987, supervision mission.

[9] It should be noted that at that time, GOI had not yet granted its full clearance for the new transmission development scheme, which it did in August 1987.

the Board on March 23, 1993 (Loan 3577-IN; para. 2.6) and includes US$23.2 million for the completion of the contracts of the Central Power Transmission Project. Disbursements for these expenditures under Loan 3577-IN would be completed during FY94.

5.5 Procurement. The equipment and materials financed under the loan were split into 71 packages, most of which were procured under international competitive bidding (ICB) procedures in accordance with Bank guidelines. Contractors who supplied transmission line tower structure were in charge of the erection of the towers, insulators and hardware, and stringing of the line conductors, on a supply and erect basis. Suppliers of main equipment for the substations were also in charge of the erection of the substations. NTPC procured, always under ICB, the conductors, line material such as insulators and hardware and the electrical equipment including metering and instrumentation and had these equipment erected by the above mentioned contractors. The relatively large number of contracts and the above forms of packaging created a significant workload on NTPC as well as Bank staff to monitor and supervise these contracts. However, the above two characteristics helped NTPC staff to acquire valuable experience in preparing contract documentation, reviewing and evaluating bids, and in managing the engineering of the project, since they were responsible for proper interfacing of project materials and equipment from different suppliers. Most of the said NTPC staff have been transferred to POWERGRID. However, it is noted that the above procurement system applied by NTPC, which required drawing up of specifications for tenders, preparation of bidding documents and carrying out of bid evaluations swamped NTPC staff who at one point had to handle some 1,200 contracts valued at over US$1 billion. On the other hand, dividing the project material/equipment into numerous contract packages, promoted participation from a range of large and medium sized local manufacturers/ suppliers which, in turn, has contributed to the development of local manufacturing industry.

5.6 Of the 71 contracts (total value: US$169 million equivalent) put out for ICB, 12 contracts (valued at US$31 million or about 18% of the total) were awarded to foreign manufacturers/suppliers. Of the two highest value contracts (both for the supply of conductors) one was awarded to a local and the other to a foreign manufacturer/supplier. The local industry was fairly competitive where the size of contract packages was within its manufacturing and/or supply capability. NTPC followed its practice of specifying the qualification requirements of the prospective suppliers on the bidding documents; this was not objected to by the Bank and worked reasonably.

5.7 For all contracts estimated to cost over US$2.5 million equivalent, NTPC submitted for Bank's review and comments the bidding documents and evaluation reports. Bank files show that there were delays in procurement, and on some occasions there was need to amend the bid documents, and also to re-bid in some cases. Based on the available documentation, the average time taken from bid opening to the award of the contract (including Bank acceptance of the proposed award) was generally less than nine months. In an effort to speed up procurement, standard bidding documents will in the future be used by NTPC and POWERGRID. Under the NTPC Power Generation Project[10] and Loan 3577-IN for the POWERGRID System Development Project, NTPC

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[10] This project was approved on June 29, 1993.

and POWERGRID respectively agreed on standard bidding documents, whose use would reduce the procurement period substantially. NTPC and POWERGRID would also give further emphasis to finishing promptly the payments for the contracts, so that the closing dates of new loan(s) would not need to be extended.

5.8 Project Costs (Part III, Table E). The total cost of the original project, including contingencies, taxes and duties, was estimated in the SAR at about Rs. 5,864 million (US$617.3 million equivalent). The actual cost of the revised project was Rs. 5,423 million (US$264.4 million equivalent). In US dollar equivalent, the actual project cost was substantially lower than the appraisal estimate because of the substantial devaluation of the Rupee from Rs.9.5/US$ at appraisal to Rs.25/US$ in March 1992, when the loan was closed. During the implementation period, the weighted average rate was Rs.20.5/US$. While inflation increased project costs in local currency, the devaluation resulted in the loan proceeds generating a substantially larger amount in local currency than had been expected. Despite the inflation, in current Rupee terms, the actual project costs were slightly lower than the appraisal estimates. Although a detailed and realistic cost comparison between the appraisal estimates and the actual costs is not possible due to the major changes to some of the transmission lines and the associated substations, it is concluded that costs at appraisal were overestimated.

5.9 Project Financing. The financing plan was changed substantially. The plan estimated at appraisal and the actual plan are summarized in the following table.

Financing of the Project

Sources	SAR		Actual /a	
	(US$ million)	(%)	(US$ million)	(%)
- Bank Loan	250.7	41	131.5	50
- GOI (as Equity and Loan)	366.6	59	73.8	28
- Credit from Sweden	-	-	59.1	22
Total	617.3	100	264.4	100

/a Excludes US$23.2 million to be disbursed under Loan 3577-IN (para. 2.6).

5.10 Disbursements. The estimated and actual disbursements, and the original and revised allocation of the loan proceeds are given in Part III, Tables E and F, respectively. Due to the fact that the HVDC substation was hived off from Bank financing and the hiatus in the implementation of the lines and substations led to virtually no disbursement of loan proceeds through end 1986. By the time of the original closing date (March 31, 1989), cumulative disbursements were only US$40.5 million, 16% of the original loan amount. The closing date of the loan was extended three times by one year each, to March 31, 1992 (para. 5.4). In December 1991, US$50 million of savings arising mainly of exchange rate variations were cancelled from the loan amount. The loan was closed on March 31, 1992; disbursements were completed on September 8, 1992. The undisbursed balance of US$69.2 million was cancelled on that date. Thus disbursements under the loan were US$131.5 million. India began repaying the proceeds of the loan on September 1, 1988,

and will continue to do so until March 1, 2003. It is noted that by the time the loan was closed, India had already repaid US$64,666,000, almost half of the loan amount utilized.

6. Environment, Resettlement and Rehabilitation

6.1 The project did not create any significant environmental and resettlement and rehabilitation problems. NTPC selected the line routings so as to minimize infringement on forest land. Where trees had to be felled in order to provide access to the lines, trees of a corresponding number were planted in the vicinity. The question of relocation of people affected by the project did not arise because transmission line routes and substation sites were selected in un-inhabitated areas remote from the population centers.

7. Physical Results

7.1 Project Objectives. Overall, the project has achieved its objectives (para. 3.1). The project has been the first major component in the establishment of centrally owned regional grids and intra-regional connections. The power transmission capacity in the Southern Region has been increased in a manner which helps optimal utilization of the installed thermal and hydro capacities in this region and permits for exchanges between the Southern and Western Regions. The asynchronous interconnection between the Northern and the Western Regions is currently used for limited exchanges of power between the two regions and helps the stability of the systems. The project contributed in making NTPC an efficient utility but failed in its sectoral objective in inducing improvements in the operational, institutional and financial performance of SEBs, as seen in the disappointing operational, financial and institutional performances of many SEBs. It is not clear how, if any, NTPC's institutional development helped those performing SEBs, such as the Maharashtra and Andhra Pradesh SEBs whose transmission networks were strengthened by this project. The failure in obtaining improvements at SEBs while supporting the development of NTPC as a model utility can be traced to the fact that the Bank had not fully appreciated the extent of the interference by the state governments in the affairs of SEBs (para. 12.4).

7.2 Physical Results. The individual components of the revised project were commissioned at various dates given in Part III, Table D. The 2x250 MW HVDC component was commissioned in end 1987, compared with the appraisal estimate of March 1988, and has been providing for power exchanges between the Northern and Western Regions (each block of 250 MW is capable of operating independently in either direction). The lines and substations in the Southern Region were, at appraisal, projected to be commissioned during the June-December 1987 period. These lines and substations which were delayed awaiting agreement from the SEBs (para. 5.2) and suffered from NTPC's overload in processing contract documents (para. 5.5), were actually commissioned between May 1991 and March 1992.

7.3 Since their commissioning, the project components have in general functioned satisfactorily. The problems which did arise were invariably of a minor nature and were resolved without seriously affecting the transmission of power. The availability of the individual components has been almost 100% in 1992 (Annex 3). However, the average daily power transmitted through some of the lines is short of its design capacity. The reasons for this underutilization are: (i) suboptimal operation of generating plant on a

regional basis; and (ii) indifferent or unresponsive generation tariff structure. Generation plants are not operated optimally because individual SEBs do not observe cost merit order in power generation. The tariff structure in effect up to November 1992 did not encourage merit order plant dispatch in the regional grids. The actual NTPC tariff in application since November 1992, is on two part basis as per the recommendations of GOI's K.P. Rao Committee. This tariff is conducive to the introduction of merit order operation. POWERGRID is pursuing further tariff improvements in transmission. Assistance is being provided under Loan 3577-IN.

7.4 The Ramagundam-Chandrapur double circuit line linking the Southern and Western Regions was intended for use mainly during emergencies in either region. Only one circuit is presently in regular use carrying power (which is only a fraction of the line's load carrying capacity) from the Western Region directly to some of the northern areas of Andhra Pradesh in the Southern Region. The construction of an asynchronous tie (HVDC back-to-back station similar to the one implemented under the project) to be built at Chandrapur is being examined by POWERGRID to help effect large exchanges of power between the two regions in the future and the loading of the Ramagundam-Chandrapur line will increase. When commissioned, this inter-tie will increase the loading of the Chandrapur-Ramagundam double circuit lines.

7.5 The 400 kV transmission system under the project was intended to improve voltage levels and carry electric power over long distances with low losses. However, in practice voltages in the systems drop sometimes to well below the permissible limits (as low as 300 kV). This problem affects adversely those SEBs which are further away from the sources of generation, and is due to the SEBs nearer the generation sources who draw higher reactive power (MVARs) from the 400 kV systems. Ways to rectify the situation are for SEBs either to install shunt capacitors or to make it obligatory and enforce the installation of capacitors on all large motors, including irrigation pump motors. Five major grid failures were reported in the Southern Region during the period November 1991 to January 1993. In every one of these occasions, low voltages were prevailing in the regional grid, because SEBs were drawing unusually high MVARs over the 400 kV network. The problem was aggravated because of low generation in certain states. However, NTPC/POWERGRID 400 kV network worked satisfactorily during this period and did not contribute to the grid failures.

8. NTPC's Financial Performance

8.1 NTPC started its commercial operation in February 1982, a few months prior to the appraisal of the project. From 1982 to the present, NTPC's financial performance has been satisfactory, except for the large accounts receivable (para. 8.2). NTPC's financial statements for the period FY85 to FY92 are given in Annexes 4.1-4.3 and a summary for the last five years is given in Table 8.1 below. NTPC's operating data reflect the growth the Corporation experienced since 1982. Key financial parameters, e.g., assets in operation, revenue from electricity sales, total operating revenues, and operating income before interest, increased some five-fold since 1987. The rate of return on net average fixed assets (historically valued) for this period was high, generally around 15% (between 13% and 17%), well in excess of the 8% between FY85-FY90 and 9.5% starting from FY91, as was stipulated in the project agreement.

Table 8.1 KEY FINANCIAL INDICATORS

	1985		1986		1987		1988		1989		1990		1991		1992	
	Forecast	Actual	Forecast	Actual	Forecast	Actual	Forecast	Actual	Forecast	Actual	Forecast	Actual	Forecast	Actual	Forecast	Actual
Electricity Sales (Gwh)		8,816	11,492	12,839	13,446	14,406	17,922	17,533	25,934	24,875	35,451	35,421	43,963	40,306	48,759	56,657
Incr. in Elec. Sales				4,523	1,954	1,569	4,476	3,125	8,012	7,342	9,517	10,546	8,512	4,885	4,798	16,351
Elect. Sales Revenue		3,077	4,421	4,829	5,365	5,736	7,257	7,201	10,715	11,460	15,103	16,376	19,317	21,254	22,060	34,347
Incr. in Sales Rev.				1,752	944	907	1,892	1,465	3,458	4,259	4,388	6,916	4,214	2,878	2,763	13,093
Total Operating Revenue	3,210	3,438	4,864	5,294	5,972	6,453	8,145	8,622	12,122	12,748	17,264	20,573	22,363	24,207	25,919	39,928
Incr. in Oper. Rev.				1,856	1,108	1,159	2,173	2,169	3,977	4,126	5,142	7,825	5,099	3,634	3,558	15,722
Accounts Receivable	245	1,826	368	2,284	447	2,828	605	4,058	893	5,981	1,259	11,581	1,810	15,102	1,840	16,086
Incr. in Acc. Recev.			122	458	79	544	158	1,230	288	1,923	366	5,600	351	3,541	230	984
Accounts Receiv. (no of Days)	28	170	27	155	27	158	27	169	27	169	26	202	26	225	26	145
Current Ratio		1.0	5.0	1.6	5.2	1.6	5.7	1.7	5.1	1.6	4.7	1.6	4.2	1.9	4.1	1.5
Rate of Return (%)				17%	9%	17%	7%	16%	6%	15%	7%	15%	10%	13%	11%	15%
Operating Ratio (%)				56%	54%	55%	57%	55%	63%	59%	60%	61%	58%	60%	56%	60%
Contribution to Const. (%)				-1%	9%	10%	9%	40%	12%	-2%	24%	19%	33%	17%	51%	28%
Debt Service Coverage (times)				4.9	2.0	4.0	1.5	3.9	1.4	2.4	1.3	2.5	1.4	2.5	1.5	2.4
(a) Cash and Bank Balance	11	84	13	448	19	134	35	5,973	45	2	53	291	56	884	58	1,742
(b) Ave. Monthly Cash Oper. Exp.	142	148	221	214	204	258	300	344	464	554	645	931	813	1,027	922	1,709
(c) Ratio (a)/(b)	0.08	0.56	0.06	2.09	0.09	0.52	0.12	17.34	0.10	0.00	0.08	0.31	0.07	0.87	0.06	1.02

8.2 Bill collection and accounts receivable have been persistent problems for NTPC, because of the poor financial situation of many SEBs. NTPC's accounts receivable increased at a far greater pace than its revenues and operating income in successive years. The receivables, which represented some 5.2 months of billing in 1987, steadily increased to 7.5 months in 1991, compared to less than one month (27 days) projected in the SAR for the entire period. A covenant specifying the level of accounts receivable not to exceed an amount equivalent to the proceeds of its sales of power for the two preceding months, was first introduced for NTPC under Loan 2555-IN for the Rihand Power Transmission Project approved in May 1985, with effect from the end of FY86. The covenant was repeated in three subsequent Bank loans[11], but NTPC has never been able to comply. In 1991, the increase in accounts receivable (over 1990) was some Rs 3.53 billion, while the corresponding increases in electricity sales revenue and in total operating revenues were Rs 2.88 billion and Rs 3.63 billion respectively; in practical terms, NTPC collected virtually no additional revenue in FY91, even though it sold an additional 4,800 GWh of energy. In 1986, NTPC internal cash generation barely met its debt service requirements and the increase in working capital (Annex 4.2). A liquidity crisis was averted by the cash received by NTPC from its first issue of medium-term bonds. Since then NTPC has been issuing such medium-term bonds every year, mostly to help finance the expansion of its facilities. The level of its accounts receivable have also been increasing every year in absolute terms as well as a percentage of its annual billings. The funds raised from these bonds have helped NTPC to bridge finance its increasing working capital requirements.

8.3 Increasing bill collection and accounts receivable problems led to several interventions by GOI on behalf of NTPC during the period FY88 to FY92. At each of these interventions, GOI assumed the responsibility to clear some of the arrears from SEBs by transferring to NTPC corresponding amounts from its allocations to the respective states. Such payments are carried out over a period of four years. In February 1992, NTPC acquired the Unchahar power station in lieu of arrears of the Uttar Pradesh SEB. As indicated in Table 8.1 above, NTPC has received over Rs 11 billion from the transfers through the central appropriations from 1988 to January 1993. Combined with other bill collection efforts, NTPC was able to reduce its level of accounts receivable despite the rapid increase in sales. At the end of FY93, the overall level of accounts receivable was 3.3 months of sales equivalent, but excluding the amount still to be paid through the central appropriations, it was 1.4 months of sales equivalent. More encouraging is that during the last three months of FY93, 93% of billing was realized directly from the SEBs. During the negotiations of the NTPC Power Generation Project, agreement was reached that NTPC would maintain the level of its accounts receivable at two months of sales equivalent excluding the amount still to be paid through the central appropriations for which a specific payment schedule was also agreed.

8.4 GOI's interventions through the central appropriations helped NTPC avert financial crises and resolve, for limited periods, its accounts receivable problem. These interventions aimed at having NTPC operate efficiently, thus keep the electric energy supply in the country at an

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[11] Ln. 2674-IN for the Gas Based Combined Cycle Power Project (FY86);
Ln. 2844-IN for the National Capital Power Project (FY87); and
Ln. 2845-IN for the Talcher Thermal Power Project (FY87).

adequate level. It is doubtful that GOI's actions have resulted in SEBs improving their operational efficiency as well as their billing and collection practices from their own customers. What is equally important, but so far received little attention, is the need for energy conservation on the customer (SEBs) side through adoption of appropriate tariffs and tariff structure at SEBs and through end-use efficiencies.

8.5 The accounts receivable as of March 1990 were about Rs 11.5 billion (some US$500 million equivalent, and represented over six months of current billings). It was around the same time that the Bank took the exceptional step of cancelling the processing of a loan of US$375 million to NTPC for a project which had already been negotiated, primarily because of the inability of NTPC to reduce its accounts receivable. Since October 1992, GOI adopted new investment and commercial policies and electricity tariffs for NTPC. They are designed to introduce better commercial discipline at SEBs, along with improving NTPC's own operational and financial performance, including revenue collection. New two part bulk supply tariffs for NTPC coal fired stations became effective in November 1992. Further reforms in bulk power and transmission tariffs will be studied and implemented under Loan 3577-IN. The process of establishing commercial contracts between the SEBs and the central utilities is cumbersome, but progress is being made with strong Bank support under Loan 3577-IN and the NTPC Power Generation Project. The new commercial policies and bulk power supply agreements should enable NTPC to reach a level of bill collection close to 100% during FY94.

8.6 The legal documents of the Loan adopted a sole covenant on NTPC's financial performance, the conventional rate of return (ROR) on average historic fixed assets in operation. An important objective of this conventional ROR indicator is to serve as a measure of the adequacy of revenues compared to the cost of capital. Therefore, it has more appropriate application with mature utilities, and where the investment, which is not included in the rate base, is a fraction of the utility's net fixed assets in operation (or the rate base). Table 8.1 indicates that throughout the entire project implementation period i.e., FY84-FY92, the projected "Works in Progress" (WIP) was a substantially high proportion of the rate base; through 1987, WIP was higher than the Gross Assets in Operation; for practical purposes the rate base was insignificant relative to the annual investment. A utility could well have a very high rate of return performance but be faced with liquidity crisis, and the computation of other standard financial indicators such as operating ratio would not provide meaningful information[12]. One could, readily conclude that such a performance indicator was not appropriate for NTPC at the time. A more appropriate financial indicator under such circumstances is "contribution to the investment", because it targets at generating from internal sources a pre-determined level of funds towards the on-going investment after taking into account debt service and working capital requirements. Under the NTPC Power Generation Project, NTPC agreed that it would produce, starting from FY95, funds from its internal cash generation equivalent to not less than 20% of its capital expenditures on a three-year moving average. The amount for FY94 would be 15% of the average of NTPC's capital expenditures for the FY93-FY95 period.

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[12] The most recent analysis of NTPC's finances is given in the SAR for the NTPC Power Generation Project (Report No. 11827-IN; Dated June 4, 1993).

9. Compliance with Loan Covenants

9.1 The key institutional and cost recovery covenants introduced in the Loan and the Project Agreements and the extent they were complied with are listed in Part III, Table H.

10. Sustainability and Internal Economic Rate of Return

10.1 The project is sustainable, even though at present its components are not yet being fully utilized (paras. 7.3 and 7.4). Sustainability is certainly assured for the future, as the facilities built under the project are integral components of POWERGRID's system development program. However, insufficient generation and transmission tariffs and an unchecked increase of NTPC's and POWERGRID's accounts receivable could endanger such sustainability. The Bank, GOI, NTPC and POWERGRID have been taking actions to avoid such occurrence (paras. 8.5 and 8.6).

10.2 Because of the changes agreed by the parties on the project description, it is not possible to make a reasonable comparison between the internal economic rate of return (IERR) of the original and revised project scopes. The IERR for NTPC/POWERGRID's time-slice investments for the FY84-FY92 period has been estimated at 11%. Under Loan 3577-IN, the IERR for POWERGRID's time-slice investments during the FY93-FY2002 period was estimated as 22%. The difference is explained by improvements in tariff setting parameters[13] and the unusually high inflation encountered in India in late 1980s and early 1990s, which brought down tariff revenues in real terms (Part III, Table G).

11. Bank Performance

11.1 It is difficult to provide a judgement for a project whose description was substantially amended twice, albeit within its original objectives, and was really begun about four years from Board approval. The Bank might have cancelled Loan 2283-IN during the project hiatus in 1984-1987. But it might have lost an opportunity to influence transmission development in India. Instead the Bank opted to continue its dialogue with GOI, CEA, NTPC and POWERGRID on transmission system development and operations. The dialogue has culminated with the recent approval of Loan 3577-IN (para. 2.6).

11.2 On another front, the Bank opted not to suspend disbursements under loans to NTPC, when NTPC fell into default of the accounts receivable covenant and substantial arrears from SEBs began creating problems for this Corporation's financial position and overall future (para. 8.2). Although the accounts receivable covenant was not included in this Loan, the Bank had considerable leverage in refusing to extend the closing date after March 1989, particularly, if the Bank had invoked the accounts receivable covenants in other on-going projects with NTPC. The Bank decided to continue its dialogue to encourage GOI to adopt for NTPC new investment and commercial policies, and electricity tariffs. It alerted GOI and NTPC that the Bank's continued

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[13] The return on equity for projects started before FY90 was 10%; for those projects started in FY91 and FY92 it was 12%. The return has since been adjusted to 16% for future projects. Depreciation was also increased.

funding for their projects would no longer be possible unless actions to correct NTPC's finances are taken. In 1990, the Bank decided not to present to the Board the then-negotiated Regional Power Systems Project, because GOI and NTPC were unable to fulfill the conditions for Board presentation within a reasonable time period. Other multilateral and bilateral agencies followed the Bank in limiting their financing of NTPC projects. All these actions helped GOI to initiate reforms in the power sector and adopt new investment and commercial policies for NTPC. If the Bank had suspended disbursements, it might have lost another opportunity, this time to influence reforms in power generation. In view of GOI's, POWERGRID's and NTPC's recent actions prior to the approval of Loan 3577-IN and negotiations of the NTPC Power Generation Project, the Bank's above decisions bore their fruits.

11.3 Bank's supervision effort was concentrated mainly on the procurement issues, in which area the Bank provided valuable help to NTPC. It covered as well, other important areas such as physical progress including problems in implementation, in disbursements performance, etc. However, visits to the work sites by each mission could not be undertaken because each mission covered supervision of all Bank funded NTPC projects. It is concluded that the Bank's performance under the project was satisfactory.

11.4 Even though contracts amounting to about US$23.2 million equivalent were already committed (but not yet paid) under the project, and there were ample funds still available in the loan account on March 31, 1992, the Bank did not extend the closing date of the loan for a fourth time. Just a year before, the Bank had extended the loan for the third time without stating this was the last extension or any other conditions. At that time the Bank had also agreed on funding contracts which were originally to be financed by NTPC. This might have given GOI and NTPC the impression that the Bank was following the views of the January 1989 mission (para. 5.4). The Bank's 1992 decision not to extend the closing date came as a surprise to GOI and NTPC and increased NTPC's fiscal problems as the utility did not have the local and foreign funds to pay its suppliers and contractors on time. The Bank's action stemmed from (i) its more stringent implementation of the policy on the management of the closing dates; and (ii) its desire to have NTPC reach promptly, an agreement with POWERGRID on the transfer of the transmission assets.

12. Borrower Performance

12.1 The performance of NTPC in the technical and managerial activities was satisfactory. Bank missions have reported delays in preparation of specifications, bidding documents and bid evaluations, and in preparing its quarterly progress reports in a timely manner; these shortcomings, however, have been mainly due to the large workload of NTPC at the time and because the information needs to be collected from various sites which are located in

remote places[14]. The project provided continuing opportunity for NTPC to enlarge its skills and experience in procurement under ICB procedures, in designing the transmission systems and in supervising their implementation and construction. The PCR mission was advised that the services of NTPC staff, involved in implementation of the HVDC substation, were subsequently used by the supplier, on a consultancy basis, in the installation of HVDC substation in another country.

12.2 The only area where NTPC's performance fell considerably short of expectations was in bill recovery. Maintaining a specific level of accounts receivables was not a condition of this loan and it was only introduced in 1985 under Loan 2555-IN for the Rihand Transmission Project. Substantial arrears by SEBs affected NTPC's financial position adversely. NTPC maintained it had little recourse against the defaulting SEBs, because of its understanding that it could not cut off the power supply to the defaulting SEBs even if it wanted to. At present NTPC is carrying out more systematic and aggressive efforts at all levels of the organization (from the regional managers to the CMD) to obtain letters of credit from SEBs for the appropriate amounts of energy sales. These actions include seeking the intervention of the Minister of Power in order to collect dues from SEBs. GOI's new commercial policies and new bulk power supply agreements should enable NTPC to reach a level of bill collection close to 100% during FY94.

12.3 GOI has recently adopted new investment and commercial policies and electricity tariffs allowing NTPC to shut-off or restrict power supply if its clients are in default with their bulk supply agreements. These policies are designed to introduce better commercial discipline at SEBs, along with improving NTPC's own operational and financial performance, including improving revenue collection (para. 8.5).

12.4 There appears to be a difference in the positions of the Bank, GOI and the State Governments. The Bank's position is that the electricity industry provides a service which has to be fully paid for by each customer category (cross-subsidization permitted) through user charges. GOI seems to be moving towards the Bank's position as shown by the measures and incentives taken in recent years including recommendations to the state governments to increase tariffs. The states in general, appear to perceive (sometimes for political purposes) the provision of electricity as a social service and do not allow SEBs to operate independently and in line with commercial practices (para. 2.2). Furthermore, in an economy, where the public perception of a public utility often is to provide primarily a social service, the use of a profit criterion as the sole measure of the utility's financial performance is not generating adequate public support.

13. Performance of Consultants and Contractors

13.1 The performance of consultants engaged in the design and construction of HVDC and 400 kV facilities was satisfactory. There was a

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[14] Furthermore, after the transfer of the management of NTPC's transmission assets to POWERGRID, the information relating to the transmission system are collected from this Corporation. Stabilization of a proper coordination system between the two Corporations has taken some time.

positive transfer of technical know-how from these consultants to NTPC staff. Barring a few problems and some minor delays, overall the performance of the contractors/suppliers was also satisfactory. The packaging of contracts in appropriate sizes promoted participation from local manufacturing industry, and the Bank's and NTPC's involvements resulted in improvement in the quality of the product.

14. Project Relationship

14.1 A good working relationship was maintained between the Bank and GOI and NTPC, and later also with POWERGRID.

15. Project Documentation and Data

15.1 The project's legal agreements adequately reflected the objectives of the project and the Bank's interests. The staff appraisal report provided a relatively useful framework for the Bank and NTPC during project implementation. One of the weaknesses of the SAR was that it did not verify whether there was a full agreement and understanding on the part of the SEBs to pay for the transmission charges (paras. 5.1 and 5.2). Bank supervision missions appear to have been adequate in terms of their frequency. However, most of the missions had to supervise and/or prepare other projects. It is therefore likely that the missions were not able to make visits to some of project sites. Some of the important project documentation (e.g. supervision mission reports, aide-memoires), project progress reports and annual financial statements was not found in the Bank files.

PROJECT COMPLETION REPORT

INDIA

CENTRAL POWER TRANSMISSION PROJECT
(LOAN 2283-IN)

PART II: PROJECT REVIEW FROM BORROWER'S PERSPECTIVE

Comments by NTPC and Endorsed by the Government of India

A. Preface

1. The loan was made to India in May 1983 for on-lending to the National Thermal Power Corporation (NTPC). The two main objectives of the project were: (a) to support GOI's strategy to extend and improve power supply through the establishment of centrally owned regional grids and intra-regional connections leading to the promotion of a national grid; and (b) to improve, in the long run, the operational, institutional and financial performance of the State Electricity Boards (SEBs), by assisting in the development of a financially sound, and technically and institutionally competent centrally-owned power utility which would serve as a model to SEBs. On August 16, 1991, the management of the project was transferred from NTPC to National Power Transmission Corporation Ltd., under a Management contract signed between the two corporations. On January 8, 1993, an ordinance providing for all the rights, titles and other interests related to the transmission systems of NTPC to be transferred to POWERGRID (NPTC was later renamed as Power Grid Corporation of India) was promulgated by the President of India.

B. Comments on the Analysis in Part-I

2. The analysis made by the Bank under Part-I is comprehensive and has covered the important aspects. The analysis is generally in order. Nevertheless, there are certain issues which need to be further examined keeping in view the background of developments as they took place to better appreciate the events. These are as follows:

Project Start-up and Implementation Schedule (reference para. 5.2 of Part-I)

3. Actual dates of signing of BPSA (Bulk Power Supply Agreement) in Southern region are as follows:

APSEB	22.3.1985
KEB	21.3.1985
TNEB	22.3.1985
KSEB	10.4.1985
GOA	17.4.1985

Extensions of the Closing date (reference para. 5.4 of Part-I)

4. The Bank did not accept GOI's request to cover the expenditure on ongoing contracts under the savings available under other ongoing loans to NTPC after loan closing date till POWERGRID System Development Project loan

became effective. The continuity in Bank financing was sought on account of certain problems relating to the deemed export benefits to the contractors and also relating to the import license.

Procurement (reference para. 5.7 of Part-I)

5.1 In an effort to speed up procurement and after having extensive discussions, NTPC had finalized with the World Bank a standard bidding document in April 1992. However, the Bank withdrew its "No-Objection" to this standard bidding document in December 1992 and wanted certain modifications to be included. NTPC has now finalized standard bidding documents with the Bank based on the suggested modifications and further discussions. NTPC will use this document for procurement under the recently negotiated loan for NTPC Power Generation Project. This is expected to reduce the procurement time. Further, the proposed NTPC Power Generation Project, negotiated with the Bank in May 1993 would be under time slice concept which would help in bringing about timely disbursements.

5.2 NTPC has started giving further emphasis to finishing promptly the payments to the contractors.

Project Costs (reference para. 5.8 of Part-I)

6. It has been stated that "that costs at appraisal were over estimated". It is clarified that the basis of costing during the appraisal had been explained in the Staff Appraisal Report. It, inter-alia, states that the estimates for the main items of equipment and material are based on the quotations received since 1980 for similar projects such as the 400 kV links and sub-stations associated with Singrauli, Korba, Ramagundam and Farakka Power Plants with prices updated to mid-1982 price levels. On the other hand, the exchange rate changes have played a major role in bringing down the project cost in dollars terms.

Financial Performance (reference para. 8.2 to 8.5 of Part-I)

7. In the discussions on accounts receivable presented in Section 8 of the Part I, the Bank has included the amount due to NTPC by way of Central Appropriation in the accounts receivables. GOI has in the past ordered Central Appropriation of plan assistance funds to State sectors for offseting their dues to Central sector agencies like NTPC. Such amounts are being paid to NTPC as per agreed schedules and the Bank had been kept informed about the arrangement since August 1990. Considering that these were committed payments from GOI, the amounts were set off against the dues of the SEBs and NTPC's accounts receivable reduced by the total amount of Central appropriation.

As has been mentioned in para. 8.3, during the negotiations of the proposed NTPC Power Generation Project, agreement was reached that NTPC would maintain the level of its accounts receivable at two months of sales equivalent excluding the amount still to be paid through the Central appropriations for which a specific payment schedule was also agreed.

8. The Operations Evaluation Department of the World Bank conducted the performance audit of few Bank-funded projects, namely Korba (Credit 793-IN), Ramagundam (Credit 874-IN and Loan 1648-IN), Singrauli-II (Credit 1027-IN) and Farakka (Credit 1053-IN and Loan 1887-IN). In its report No. 10854

published in February 1993, the Audit Mission has summed up NTPC's financial policy in a paragraph as below:

> "NTPC has reached its large size (it is India's largest corporate entity in terms of fixed assets) in a record time without jeopardizing or compromising its financial viability, even in spite of the accounts receivable issue. This is a performance that very few utilities in the same situation are able to achieve. The performance is even more impressive since NTPC is still in a major investment mode. A good part of NTPC's above-par performance is to be credited to GOI's original design (e.g., debt-equity ratio set at a conservative 1:1; tariff formula to pass on all investment, operation, and financial costs.)"

9. As is common practice in transaction of a commodity like electricity, the agreements allow the beneficiary of its energy supply a period of 30 days from issue of the bills for making payments. Therefore, outstanding should be reckoned after expiry of this period of 30 days.

Bank Performance (reference paras. 11.2 & 11.3 of Part-I)

10. It has been stated that the Bank's decision not to present to the Board the then proposed Regional Power System Project because of GOI and NTPC's inability to fulfil the conditions for Board presentation within a reasonable time period, has helped GOI to promote reforms in the power sector. It is worth mentioning that the sectoral reforms are brought about gradually with time. It is easier to bring out such changes when they are accompanied by large development programmes such as the proposed US$1.2 billion time slice loan operation of World Bank for NTPC Power Generation Project.

Comments by POWERGRID and Endorsed by the Government of India

Environment, Resettlement and Rehabilitation

11.1 In the context of transmission projects there is no significant impact on environment except in the cases where the transmission lines involve any forest area. The impact of transmission line projects on environment is not considered as severe as in case of thermal, hydel, nuclear power projects. This is primarily because the effect on forest due to laying of tranmission lines is reversible and can be nullified by planting more trees.

11.2 With the worldwide concern over the fast depleting forest reserves, due consideration is given to these aspects at the planning and designing stage itself. While identifying the transmission system for CTP-I, detailed surveys were conducted by the executing agency in association with the state forest authorities to identify most suitable route having minimum infringement on forest land. Where trees had to be felled in order to provide access to the lines, trees of a corresponding number were planted in the vicinity as per guidelines from Ministry of Environment and Forest.

11.3 Sites for construction of the sub-stations were generally selected in uninhabitated areas remote from the population centers. Hence, the resettlement and rehabilitation of people did not arise.

Final Payments

12. The loan was originally scheduled to be closed on March 31, 1989. But the project configuration underwent major revision following the reluctance of SEBs to pay the fixed transmission charges associated with this project and also because of changes in load generation scenario in Southern Region than what was envisaged at the planning stage. The revised project configuration was approved in August 1987. Thereafter, Bank decided to extend the loan closing date by one year each time for a total of 36 months to March 1992. The total disbursement of loan till March 1992 was US$131.49 million. Further, the Bank has included funding the balance portion of the on-going contracts retroactively under the new POWERGRID System Development Project (Loan No. 3577-IN).

Procurement

13. GOI approval for the revised project was accorded in August 1987 and immediately thereafter the exercise for placement of award for tower package (for eight transmission lines) was begun. Awarding took 6 to 8 months to complete. This was possible due to advance planning in preparation of bid document. However, this time could have been further reduced by around a month had the Bank approval been obtained in a period of about 15 days. As regards procurement of domestic goods and services, a comprehensive procurement action plan resulted in cutting down of award time, and hence achieved the completion of project without any delays.

Evaluation of the Borrower's Own Performance

14.1 The project has achieved its objectives. With the satisfactory completion of the project, the power transmission capacity, security and reliability in the Southern region has increased. The inter-connection between the Northern and the Western regions is currently used for limited exchange of power between the two regions and helps the stability of the systems.

14.2 Unlike the previous Bank funded power projects, this project was solely for the purpose of transmission system. Since NTPC had already acquired sufficient experience in the area of design and engineering of 400 kV transmission lines and substations, entire basic and detailed engineering work for the 400 kV transmission lines and substations was carried out by NTPC/POWERGRID in-house.

14.3 This project also provided an opportunity for NTPC/POWERGRID to gain valuable experience in procurement under ICB procedures, which was later used for other Bank financed projects. Also the first time introduction of HVDC technology with this project helped NTPC staff to enlarge its skills and to gain valuable experience in the execution of HVDC substation, which was later used, on a consultancy basis, in the installation of HVDC stations in other countries.

PROJECT COMPLETION REPORT

INDIA

CENTRAL POWER TRANSMISSION PROJECT
(LOAN 2283-IN)

PART III: STATISTICAL SUMMARY

A. Related IDA Credits and Bank Loans

Cr./Loan No. and Title	Purpose	Year of Approval	Status	Comments
Cr. 685-IN Singrauli Thermal Power Project	To help reduce the power shortage in the Northern Region through the construction of the 3x200 MW initial phase of the NTPC's first large coal fired thermal power plant with associated 400 kV transmission lines.	April 1977	Closed on June 30, 1984	The project was successfully completed
Cr. 1027-IN Second Singrauli Thermal Power Project	Assist NTPC to mitigate power shortages in the Northern Region through the construction of 2x200 MW and 2x500 MW coal-fired units and associated 400 kV transmission lines.	May 1980	Closed on June 30, 1989	The project was successfully completed.
Cr. 793-IN Korba Thermal Power Project	To help reduce the power shortage in Western Region through the construction of the 3x200 MW coal fired thermal power plant with associated 400 kV transmission lines.	April 1978	Closed on March 31, 1986	The project was successfully completed.
Cr. 1172-IN Second Korba Thermal Power Project	To help reduce power shortages in the Western Region through the construction of 3x500 MW coal-fired units and associated 400 kV transmission lines.	July 1981	Closed on December 31, 1991	The project was successfully completed.

Cr./Loan No. and Title	Purpose	Year of Approval	Status	Comments
Ln.1648-IN & Cr. 874-IN Ramagundam Thermal Power Project	To help: (a) solve rationing in the Southern Region by providing 3x200 MW generating units; (b) assist GOI in achieving its objective of further advancing the regional and ultimately the national integration of the power sub-sector.	January 1979	Closed on June 30, 1987	The project was successfully completed.
Loan 2076-IN Second Ramagundam Thermal Power Project	Alleviation of power shortages in the Southern Region through the construction of 3x200 MW and 3x500 MW coal-fired units and associated 400 kV transmission lines.	December 1981	Closed March 31, 1992	The project was successfully completed.

Sectoral Objectives Common to All the Above Projects

	In addition to the above project-wide objectives, the sectoral objective was to assist NTPC become an efficient utility (implementation of projects, operation of power plants, institution- and finance-wide) to form a model to the poor performing SEBs.			This purpose was not fully attained

B. Project Timetable

Item	Date Planned	Date	Date Actual
Appraisal Mission			October 1982
Credit Negotiation			April 18-22, 1983
Board Approval			May 19, 1983
Credit Signature			June 8, 1983
Credit Effectiveness	Sept. 9, 1983 /a		March 29, 1984
Credit Closing	March 31, 1989	a) 3/31/90 b) 3/31/91	March 31, 1992
Completion of Disbursements			September 8, 1992

/a At Loan signing.

C. Disbursements (Estimated and Actual)
(US$ million)

	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992
(a) Estimate	3.5	20.0	90.0	180.0	240.5	250.7	250.7	250.7	a/	
(b) Actual	-	0.6	0.6	0.8	19.8	26.1	40.5	84.0	126.7	131.5 b/
Ratio (b)/(a)	-	3%	7%	4%	8%	10%	16%	34%		

a/ US$50 million from the Loan amount was cancelled on December 5, 1991.
b/ The Final Disbursement was in September 1992.

D. Installation and Commissioning of Transmission Lines and Sub-stations/Switchyard (*)

A. Installation of 400 kV AC Transmission Lines	Commissioned in	Length (km)
1. Ramagundam-Khammam (S/C)	March 1992	202
2. Khammam-Vijayawada (S/C)	March 1992	110
3. Vijayawada-Gazuwaka (S/C)	January 1992	317
4. Nagarjunasagar-Gooty (S/C)	July 1991	298
5. Gooty-Bangalore (S/C)	July 1991	302
Total Single Circuit Lines:		1,229
B. 400 kV Inter-Regional System		
1. Ramagundam-Chandrapur (D/C)	February 1991	180
2. Vindhyachal-Singrauli (D/C)	December 1987	4
Total Double Circuit Lines:		184

C. 400 kV AC Sub-stations/Switchyard Extensions	
1. Khammam (new)	March 1992
2. Vijayawada (new)	January 1992
3. Gazuwaka (new)	January 1992
4. Gooty (new)	July 1991
5. Ramagundam (ext)	February 1991
6. Chandrapur (ext)	February 1991
7. Vindhyachal (ext)	December 1987
8. Singrauli (ext)	December 1987
9. Bangalore (ext)	March 1990
10. Nagarjunasagar (ext)	March 1991

(*) Commissioning dates estimated in SAR for the original project are given in Annex 1.

E. Project Costs -- Estimated and Actual

	Estimated		Actual	
	Rs Million	US$ Million	Rs Million	US$ Million
400 kV lines	1,435.10	151.04	2,416.5	128.9
400 kV substations	851.90	89.66	1,092.6	57.0
Back-to-back HVDC substation	813.45	85.62	1,556.4	59.1
Metering and Instrumentation	201.60	21.22	95.6	5.2
PLCC Communications	39.47	4.15	72.9	4.0
Sub-total	3,341.52	351.69	5,234.0	254.2
Physical Contingencies	171.17	18.03	--	--
Price Contingencies	915.96	96.47	--	--
Total	4,428.65	466.19	5,234.0	254.2
Consultancy	23.75	2.50	10.0	0.5
Engineering and Administration	297.45	31.31	178.7	9.7
Total Project Cost (before duties and taxes)	4,749.85	500.00	5,422.7	264.4
Duties and Taxes	617.50	65.00		
Total Project Cost	5,367.35	565.00		
Interest During Construction	490.31	51.58		
Front-End Fee	6.65	0.70		
Total Financing Required	5,864.31	617.28	5,422.7	264.4

F. Allocation of Loan Proceeds
(Original and Actual)
(US$ million)

		Loan Agreement	Actual
(1)	Equipment and Materials	235,000,000	123,721,729.58
(2)	Consultants' Services	2,500,000	-
(3)	Fee	625,187	625,187.00
(4)	Associated civil works and erection	-	7,316,027.03
	Unallocated	12,574,813	-
	Difference due to cross exchange rates on Special Account transactions		(169,045.60)
	Total disbursed		131,493,898.01
	Amount cancelled (Dec. 5, 1991)		50,000,000.00
	Amount cancelled (Sept. 8, 1992)		69,206,101.99
	Original Loan Amount	250,000,000	250,700,000.00

G. Summary of the Internal Economic Rate of Return Computations /a

		OUTFLOW		INFLOW	NET	Discounted @
		Investment	O & M	Revenue	OUTFLOW	11.10%
0	1985-86	3155.8	10.0	135.0	3030.9	3030.9
1	1986-87	1965.8	15.8	214.3	1767.3	1590.7
2	1987-88	2495.6	21.9	286.5	2231.1	1807.4
3	1988-89	2184.9	34.9	359.0	1860.7	1356.7
4	1989-90	1673.3	77.8	773.2	977.9	641.7
5	1990-91	1402.5	86.2	962.9	525.9	310.6
6	1991-92	1254.0	110.4	1370.9	-6.4	-3.4
7	1992-93	207.9	133.4	1740.7	-1399.4	-669.6
8	1993-94	718.8	204.9	2210.4	-1285.7	-553.7
9	1994-95		204.9	2210.4	-2005.5	-777.4
10	1995-96		204.9	2210.4	-2005.5	-699.7
11	1996-97		204.9	2210.4	-2005.5	-629.8
12	1997-98		204.9	2210.4	-2005.5	-566.9
13	1998-99		204.9	2210.4	-2005.5	-510.2
14	1999- 0		204.9	2210.4	-2005.5	-459.2
15	2001- 1		204.9	2210.4	-2005.5	-413.3
16	2002- 2		204.9	2210.4	-2005.5	-372.0
17	2002- 3		204.9	2210.4	-2005.5	-334.8
18	2003- 4		204.9	2210.4	-2005.5	-301.4
19	2004- 5		204.9	2210.4	-2005.5	-271.3
20	2005- 6		204.9	2210.4	-2005.5	-244.1
21	2006- 7		204.9	2210.4	-2005.5	-219.7
22	2007- 8		204.9	2210.4	-2005.5	-197.8
23	2008- 9		204.9	2210.4	-2005.5	-178.0
24	2009-10		204.9	2210.4	-2005.5	-160.2
25	2010-11		204.9	2210.4	-2005.5	-144.2
26	2011-12		204.9	2210.4	-2005.5	-129.8
27	2012-13		204.9	2210.4	-2005.5	-116.8
28	2013-14		204.9	2210.4	-2005.5	-105.2
29	2014-15		204.9	2210.4	-2005.5	-94.6
30	2015-16		204.9	2210.4	-2005.5	-85.2
31	2016-17		204.9	2210.4	-2005.5	-76.7
32	2017-18		204.9	2210.4	-2005.5	-69.0
33	2018-19		204.9	2210.4	-2005.5	-62.1
34	2019-20		204.9	2210.4	-2005.5	-55.9
35	2020-21		204.9	2210.4	-2005.5	-50.3
36	2021-22		204.9	2210.4	-2005.5	-45.3
37	2022-23		204.9	2210.4	-2005.5	-40.8
38	2023-24		204.9	2210.4	-2005.5	-36.7
39	2024-25		204.9	2210.4	-2005.5	-33.0
40	2025-26		204.9	2210.4	-2005.5	-29.7

The internal rate of return of the project is computed as 11.1%.

/a Detail tables have been forwarded to Asia Information Center.

H. Status of Compliance of Covenants

Section	Summary of Undertaking (Covenant)	Status
LA 2.02(b) amended	GOI shall maintain a special account in U.S. Dollars	Complied
LA 3.01(b)	GOI onlending to NTPC under terms acceptable to the Bank (not less than 12% per annum)	Complied
LA 4.03 amended	GOI to furnish audit on special account (due within 6 months of FY end)	Complied
LA 4.04 amended	GOI to furnish audit on SOEs (due within 6 months of FY end)	Received
PA 2.04/3.04	NTPC to take out adequate insurance	Complied
LA 4.02	(a) For goods to be supplied from overseas, GOI to promptly grant permission to import them;	Complied (bureaucratic delays)
	(b) For goods to be manufactured in India, GOI to promptly issue import licenses, make available necessary foreign exchange and allocate materials	Complied (bureaucratic delays)
PA 2.02	NTPC to employ engineering consultants to assist in carrying out Part F of the Project	Complied
PA 4.02	NTPC to have its accounts and financial statements audited and to submit audited reports, within seven months of the end of the year to the Bank	Complied (delays in earlier years)
PA 4.03	NTPC to set tariffs and other actions to achieve a rate of return of not less than 9.5% p.a. from April 1, 1990 and thereafter	Complied

I. Use of Bank Resources

I.1 Staff Inputs

Staff inputs in carrying out the various tasks through the project cycle from preparation in FY83 to completion in FY93 were as follows:

Task	Input (Staff-weeks)
Project Preparation	27.5
Project Appraisal	40.7
Loan Negotiations	04.1
Project Supervision	46.3
Project Administration	00.1
TOTAL	118.7

I.2 Missions

Project Cycle	Month/ Year	Number of Persons	Days in Field	Specialization /a	Performance Rating /b	Type of Problems /c
Through Appraisal						
Identification /d						
Preparation /d						
Pre-appraisal /d						
Appraisal	10/82					
Supervision						
Supervision 1	05/19/85 to 06/17/85	2		E; FA	1	
Supervision 2	02/19/86 to 03/02/86	1		FA	4	
Supervision 3	03/20/87 to 04/01/87	2		E; FA	4	
Supervision 4	01/18/88 to 02/22/88	4		E; E; FA; FA	2	
Supervision 5	08/16/89 to 08/30/89	2		E; EC	2	
Supervision 6	02/17/91 to 02/26/91	1		E	2	
Supervision 7	07/22/91 to 07/30/91	2		E; FA	2	

/a E: Engineer; LO: Loan Officer; FA: Financial Analyst; EC: Economist
/b 1 = No or minor problem; 2 = moderate problem; 3 = major problem
/c I: Implementation delays; PR: Procurement problems and delays
/d Identification was made by GOI in 1974. Preparation and pre-appraisal were made by NTPC in 1978.

Annex 1

INDIA

CENTRAL POWER TRANSMISSION PROJECT
(Loan 2283-IN)

Description of the Original Project

The original project approved by the Board on May 19, 1983, consisted of the following components:

Part A 400 kV AC Transmission Lines (Construction)

	Approximate Length	Estimated in SAR to be commissioned by
Ramagundam-Mangur double circuit line	230 km	June 1987
Mangur-Vijayawada, double circuit line	160 km	December 1987
Vijayawada-Nellore, single circuit line	305 km	June 1987
Nellore-Red Hills, single circuit line	245 km	December 1987
Singrauli-Vindhyachal, single circuit line	14 km	March 1988
Ramagundam-Chandrapur, double circuit line	158 km	March 1988

Part B Sub-stations (400/200 kV) (Construction or Extension)

Ramagundam	-	extension for the 400 kV Ramagundam-Chandrapur line and for the second 400 kV Ramagundam-Mangur circuit (the equipment for the fir circuit was provided under the Second Ramagundam Thermal Power Project)
Mangur	-	new (1x315 MVA)
Vijayawada	-	new (1x315 MVA)
Nellore	-	new (1x315 MVA)
Red Hills	-	extension for the 400 kV Nellore-Red Hills line
Chandrapur	-	extension for the 400 kV Ramagundam-Chandrapur line
Singrauli	-	extension for the 400 kV Singrauli-Vindhyachal line
Vindhyachal	-	extension for the 400 kV Singrauli-Vindhyachal line

In SAR, the sub-stations were estimated to be commissioned with their associated transmission lines.

Part C 500 MW HVDC Sub-station

The construction of a (two 250 MW) back-to-back sub-station at Vindhyachal (estimated in SAR to be commissioned in March 1988).

Part D Metering and Instrumentation

Installation of tariff metering systems and disturbance recorders in important sub-stations of the Northern, Western and Southern Regional grids.

Part E Communications

The acquisition and utilization of power line carrier communication (PLCC) equipment for speech transmission, line protection and data transmission on each 400 kV transmission line.

Part F Technical Services

Utilization of technical services for the carrying out of detailed equipment and system engineerin and supervision during construction, for the High Voltage Direct Current (HVDC) back-to-back inter-tie at Vindhyachal linking the Singrauli and Korba power stations.

Annex 2

INDIA

CENTRAL POWER TRANSMISSION PROJECT

PROJECT COMPLETION REPORT

Description of the Revised Project

After the loan was signed, GOI obtained financing from Sweden for the HVDC sub-station At GOI request, in January 1985, the Bank agreed to make the change in the project description and to t reallocation of the loan funds. NTPC did not initiate the construction of the 400 kV transmission lines an substations in the Southern Region until the SEBs in this region agreed to pay for the transmission charge The last agreement was signed in April 1987, almost four years after the approval of the loan by the ban In the meantime, the project components in the Southern Region transmission system underwent major revision. The reasons for the revision were as follows: (i) Even before the Loan Negotiations, some of th SEBs had been questioning NTPC the usefulness to themselves of the transmission lines being constructe under the Ramagundam project (Loan 2076-IN), and had been expressing reluctance to pay the charges f those transmission lines. The discussions between NTPC and those SEBs became protracted, partly because the SEBs had not dealt before with a centrally-owned utility tariffs which they thought were too high, while at the same time each one of those SEBs had already been allocated a specified share of the power from the Ramagundam plant; (ii) The load generation scenario in the Southern Region had changed substantially from that prepared by CEA in 1982, which was the basis for the transmission system of the subject project. The construction of the Manguru (because of environmental and other problems) and the extension of the Vijayawada thermal power plants were deferred beyond the Seventh Plan period. In addition, there was a change in the power demand scenario, with higher priority being allocated to the development of small-scale industry and to rural electrification in the region; and (iii) The plan to construc the coastal transmission line (Vijayawada-Nellore-Madras) was abandoned because of the increased risk from the serious cyclones on the coast. After lengthy discussion between NTPC, the SEBs and with the involvement of CEA, a new transmission system configuration was proposed. It should be noted that the power from the Ramagundam thermal plant was delivered to its customers, albeit under less than optima transmission conditions, while the above changes were being decided upon.

On November 16, 1986, the Bank agreed on the revision of Parts A and B of the project as per the following:

Status of Transmission Lines and Sub-stations/Switching Stations after Revision

A. 400 kV AC Transmission Lines

	Length
Ramagundam-Khammam (single circuit)	202 km
Khammam-Vijayawada (single circuit)	110 km
Vijayawada-Gazuwaka (single circuit)	317 km
Nagarjunasagar-Gooty (single circuit)	298 km
Gooty-Bangalore (single circuit)	302 km
Singrauli-Vindhyachal (double circuit)	4 km
Ramagundam-Chandrapur (double circuit)	180 km

B. Sub-stations/Switching Stations

Ramagundam (Ext)	Hyderabad-Nagarjunasagar (Ext)	Chandrapur (Ext)
Khammam (New)	Nagarjunasagar (Ext)	Singrauli (Ext)
Vijayawada (New)	Gooty (New)	Vindhyachal (Ext)
Gazuwaka (New)	Bangalore (Ext)	

Other parts of the project were not changed.

- Date of Agreement by the Bank: November 16, 1986
- Date of Finalization by GOI: August 1987

INDIA

CENTRAL POWER TRANSMISSION PROJECT
(Loan 2283-IN)

PROJECT COMPLETION REPORT

Availability of Transmission Lines and Sub-stations in 1992

Line	Jan 92	Feb 92	Mar 92	Apr 92	May 92	Jun 92	Jul 92	Aug 92	Sep 92	Oct 92	Nov 92	Dec 92	Jan-Dec 92
TRANSMISSION LINES													
1. RDM-CPR1	100.00	100.00	100.00	100.00	100.00	100.00	100.00	98.70	100.00	98.81	100.00	100.00	99.8
2. RDM-CPR2	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.0
3. NSR-GTY	99.85	99.85	100.00	99.76	96.60	97.98	98.28	98.06	97.10	100.00	100.00	100.00	99.0
4. GTY-BGL	99.99	99.99	100.00	100.00	96.79	100.00	99.94	98.02	98.92	99.92	100.00	100.00	99.5
5. VJA-GZW a/	-	-	94.83	99.92	100.00	95.39	100.00	55.16	100.00	100.00	100.00	99.18	98.5 b/
6. RDM-KMM a/	-	-	96.14	89.93	95.23	96.38	100.00	92.66	100.00	100.00	100.00	99.69	97.0
7. KMM-VJA a/	-	-	95.51	90.75	97.41	96.18	100.00	92.46	100.00	99.52	93.68	91.88	95.7
SUB-STATIONS													
1. Vijayawada	100.00	96.99	99.52	100.00	100.00	99.83	100.00	12.24	-	95.34	100.00	92.50	98.4 c/
2. Hyderabad	99.59	100.00	83.66	100.00	100.00	100.00	98.70	100.00	100.00	100.00	100.00	100.00	100.0 d/
3. Gazuwaka	100.00	100.00	100.00	99.72	100.00	96.11	100.00	92.54	100.00	100.00	100.00	100.00	99.6 e/
4. Bangalore	100.00	100.00	100.00	89.95	100.00	100.00	99.63	100.00	100.00	99.98	93.68	100.00	99.4 f/
5. Gooty	100.00	100.00	99.79	99.36	99.59	99.09	99.28	93.28	100.00	99.52	100.00	100.00	99.2

a/ Lines commissioned on March 20, 1992
b/ Excluding availability in August 1992

c/ Excluding shutdown in August & September 1992
d/ Excluding shutdown in March 1992
e/ Excluding shutdown in August 1992
f/ Excluding shutdown in April 1992

NATIONAL THERMAL POWER CORPORATION LTD.

INCOME STATEMENTS

(Rs million)

Year ending March 31	1985		1986		1987		1988		1989		1990		1991		1992	
INCOME DESCRIPTION	Forecast	Actual	Forecast	Actual	Forecast	Actual	Forecast	Actual	Forecast	Actual	Forecast	Actual	Forecast	Actual	Forecast	Actual
Electricity Generation (GWh)		9,248		14,174		15,921		19,378		27,296		38,595		43,965		61,197
Less: Aux Cons.(GWh)		932		1,335		1,513		1,845		2,421		3,174		3,659		4,540
Electricity Sales (GWh)	8,133	8,316	11,492	12,839	13,446	14,408	17,922	17,533	25,934	24,875	35,451	35,421	43,963	40,306	48,759	56,657
Av. Bulk Tariff (P/kwh)		37	38	38	40	40	40	41	41	48	43	52	44	53	45	61
Operating Revenues:																
Electricity Sales	2,946	3,077	4,421	4,829	5,365	5,736	7,257	7,201	10,715	11,460	15,103	16,376	19,317	21,254	22,080	34,347
Transmission Charges		148		284		555		1,176		993		1,891		2,404		3,742
Electricity Duty	113	111	231	111	249	87	331	93	479	179	655	294	812	347	901	455
Other Income	151	102	212	70	358	75	557	152	928	116	1,506	212	2,234	201	2,938	1,384
TOTAL OPERATING REVENUES	3,210	3,438	4,864	5,294	5,972	6,453	8,145	8,622	12,122	12,748	17,264	20,573	22,363	24,207	25,919	39,928
Operating Expenses:																
Fuel Cost		1,252		1,952	1,259	2,360	1,849	3,165	2,800	5,285	3,557	8,985	4,461	9,780		16,424
																898
																1,672
Operation and Maintenance		404		483	547	616	729	807	984	1,175	1,180	1,745	1,303	2,105		974
Depreciation		285		377	779	448	1,078	579	2,035	912	2,881	1,396	3,174	2,251	3,343	3,625
Electricity Duty		112		111	272	87	166	93	494	179	829	294	740	347		455
Others		10		21		11		89		8		147		113		86
TOTAL OPERATING EXPENSES	1,704	2,042	2,648	2,943	3,225	3,522	4,678	4,712	7,802	7,559	10,423	12,567	12,935	14,577	14,408	24,134
Opr. Income bef. Interest	1,506	1,396	2,218	2,350	2,747	2,931	3,467	3,910	4,320	5,189	6,841	8,006	9,428	9,630	11,511	15,794
Interest	614	492	1,117	570	1,499	865	2,500	1,248	4,035	1,791	5,494	2,730	5,782	3,472	5,686	5,643
Profit before Tax	892	904	1,101	1,781	1,248	2,065	967	2,662	485	3,398	1,347	5,276	3,646	6,158	5,825	10,151
Less:Provision for Taxes				1		1				0						
Profit after Tax	892	904	1,101	1,780	1,248	2,064	967	2,662	485	3,398	1,347	5,276	3,646	6,158	5,825	10,151
Prior Period Income (Net)		(28)		50		53		362		(90)		90		851		69
Net Profit	892	875	1,101	1,830	1,248	2,118	967	3,024	485	3,308	1,347	5,366	3,646	7,009	5,825	10,220
Average Net Fixed Assets		10,957		14,018	29,862	17,209	51,025	23,858	76,048	35,078	91,488	53,567	99,232	75,482	101,077	102,945
Rate of Return on Assets (%)		13%		17%	9%	17%	7%	16%	6%	15%	7%	15%	10%	13%	11%	15%
Return on Capital Employed																
Operating Ratio (%)	58%	59%	54%	55%	54%	55%	57%	55%	63%	59%	60%	61%	58%	60%	56%	60%

* Includes deferred expenses,preliminary expenses,bonds expenses,rebate to costumer and contingencies.

** No tax provision has been made for future projections.

NATIONAL THERMAL POWER CORPORATION

SOURCES AND APPLICATION OF FUNDS

(Rs million)

Year ending March 31	1985		1986		1987		1988		1989		1990		1991		1992	
SOURCES DESCRIPTION	Forecast	Actual	Forecast	Actual	Forecast	Actual	Forecast	Actual	Forecast	Actual	Forecast	Actual	Forecast	Actual	Forecast	Actual
SOURCES OF FUNDS																
Operating Income bef. Int.	1,506	1,398	2,218	2,350	2,747	2,931	3,467	3,910	4,520	5,189	6,841	8,008	9,428	9,830	11,511	15,794
Prior Period Income (Net)	0	(28)		50		53		362		(90)		90		851		
Depreciation(e)	387	265	630	377	779	448	1,078	579	2,035	912	2,681	1,396	3,174	2,251	3,343	3,825
Total Internal Cash Gen.	1,893	1,632	2,848	2,777	3,526	3,432	4,545	4,851	6,555	6,011	9,522	9,492	12,602	12,732	14,854	19,419
Equity Contributions	13,574	4,859	8,279	6,808	2,460	5,909	3,007	6,879	3,564	3,882	3,745	6,594	6,569	12,812	0	6,667
Capital Receipt		26		0		114		24		87		21		117		26
Borrowings																
Loans Contracted	8,225	4,416	13,582	5,731	13,423	5,865	9,394	4,836	8,678	11,972	2,524	8,712	693	5,019	4,878	25,437
Bonds		0		1,634		4,300		4,394		1,499		4,346		4,000		7,984
Total Borrowings	8,225	4,416	13,582	7,365	13,423	10,165	9,394	9,230	8,678	13,471	2,524	11,058	693	9,019	4,878	33,421
TOTAL SOURCES	21,892	10,933	24,709	16,950	19,409	19,820	16,946	20,984	16,797	23,251	15,791	27,165	19,864	34,680	19,730	59,533
APPLICATION OF FUNDS																
Total Investment	20,066	10,011	23,388	14,048	17,449	17,806	13,536	17,830	11,657	19,064	8,215	20,397	10,623	26,079	9,906	52,754
Debt Service																
Interest Charged to Oper.	514	492		570	1,499	866	2,500	1,248	4,035	1,791	5,494	2,730	5,782	3,472	5,688	5,643
Amortization of Loans		-		-	300		478	-	785	747	1,697	1,087	2,997	1,542	3,958	2,581
Total Debt Service	514	492		570	1,799	866	2,978	1,248	4,820	2,538	7,191	3,817	8,779	5,015	9,642	8,224
Increase (Dec.) in W. C.		430		2,332	155	848	416	(3,416)	360	3,812	376	1,842	259	3,278	177	(3,838)
Provision for Tax				1		1				0						
TOTAL APPLICATION OF FUNDS	20,580	10,933		16,950		19,820		20,984		25,414		26,056		34,371	19,727	57,141
				606	8	102	16	5,522	10	(2,163)	8	1,109	3	308	2	2,244
Contribution to Constr.				-0.01	9%	10%	9%	40%	12%	-2%	24%	19%	33%	17%	51%	28%
Cont. to Const. (3-yr. Av)																
Debt Service Coverage	3.08	3.32		4.87	1.96	3.98	1.53	3.89	1.36	2.37	1.32	2.49	1.44	2.54	1.54	2.36

(e) Depreciation pertains to operations.

NATIONAL THERMAL POWER CORPORATION

BALANCE SHEETS

(Re million)

Year ending March 31	1985		1986		1987		1988		1989		1990		1991		1992	
BALANCE DESCRIPTION	Forecast	Actual	Forecast	Actual	Forecast	Actual	Forecast	Actual	Forecast	Actual	Forecast	Actual	Forecast	Actual	Forecast	Actual
ASSETS																
Gross Block	21,064	13,363	26,176	16,047	36,880	20,889	70,341	30,508	90,090	44,784	105,986	69,972	111,433	92,422	116,194	131,186
Less:Depreciation		476	1,286	903	2,047	1,418	3,125	2,069	5,210	3,068	7,891	4,554	11,065	6,877	14,408	10,791
Net Fixed Assets in Ops.	21064.00	12,887	24,890	15,144	34,833	19,275	67,216	28,439	84,880	41,716	98,095	65,418	100,368	85,548	101,786	120,345
Capital Works in Progress		19,556	48,884	31,069	55,629	44,302	35,704	52,187	27,612	57,062	19,931	52,360	25,307	58,039	30,454	70,080
Total Fixed Assets	21064.00	32,543	73,774	46,213	90,462	63,575	102,920	80,626	112,492	98,778	118,026	117,778	125,675	141,584	132,240	190,425
Current Assets																
Cash and Bank Balance	11	84	13	.448	19	184	85	5,973	45	2	53	291	58	884	58	1,742
Short-term deposits		395		637		1,053		737		4,544		5,864		5,279		6,465
Receivables	248	1,626	368	2,284	447	2,828	605	4,058	893	5,981	1,259	11,561	1,810	15,102	1,840	15,085
Inventories	211	704	262	940	369	1,322	703	1,742	901	2,639	1,060	3,532	1,114	5,414	1,162	7,306
Loans & Advances		326		1,972		3,842		783		2,614		1,824		2,088		2,497
Other Cur. Asset/Debtor	2	17	2	13	2	148	2	178	2	104	2	125	2	231	2	399
Total Current Assets	470	3,151	645	6,293	837	9,127	1,345	13,469	1,841	15,884	2,374	22,797	2,782	28,799	3,062	34,495
Misc.Capital Expenditure		19		19		18		17		18		19		41		39
TOTAL ASSETS	21,534	35,713	74,419	52,526	91,299	72,718	104,265	94,112	114,333	114,680	120,400	140,594	128,457	170,424	135,302	224,959
LIABILITIES																
Equity																
Share Capital Issued		20,632		26,685	47,110	32,851	50,117	37,658	53,681	44,073	57,426	49,840	63,995	59,237	63,995	69,841
Share Deposit		236		990		734		2,806		73		1,100		4,314		377
Retained Earnings		1,402		3,231	3,867	5,483	4,634	8,511	5,119	11,906	6,466	17,293	10,112	24,420	15,937	34,528
Total Equity	0	22,270	0	30,906	50,777	39,048	54,751	48,975	58,800	56,052	63,892	68,033	74,107	87,971	79,932	104,744
Total Long-term Debt		10,364		17,729	40,362	27,894	49,280	37,124	55,173	49,848	56,000	59,819	53,696	67,295	54,724	97,758
Current Liabilities	84	3,081	129	3,891	160	5,778	234	8,014	360	8,780	509	12,742	655	15,158	756	22,448
Total Debt	84	13,445	129	21,620	40,522	33,672	49,514	45,138	55,533	58,628	56,509	72,561	54,351	82,454	55,480	120,214
TOTAL EQUITY & LIABILITIES	84	35,715	129	52,526	91,299	72,720	104,265	94,113	114,333	114,680	120,401	140,594	128,458	170,425	135,412	224,958
Debt:Equity Ratio		32/68		38/64		42/58		43/57		47/53		47/53		43/57	41/59	48/52
Current Ratio	5.6	1.0	5.0	1.6	5.2	1.6	5.7	1.7	5.1	1.8	4.7	1.8	4.2	1.9	4.1	1.5
Acc. Receiv. (no. of days)	28	170	27	155	27	158	27	169	27	169	28	202	28	225	28	145

पावर ग्रिड कारपोरेशन
ऑफ इंडिया लिमिटेड
(भारत सरकार का उद्यम)
POWER GRID CORPORATION
OF INDIA LIMITED
(A Government of India Enterprise)

पंजीकृत कार्यालय : हेमकुन्ट चैम्बर्स, दसवीं मंजिल, 89, नेहरु प्लेस, नई दिल्ली - 110 019
दूरभाष : 647 1259 फैक्स : 011-6466823 टैलेक्स : 66138, 65949 तार : 'नेटग्रिड'
Registered Office : Hemkunt Chambers, 10th Floor, 89, Nehru Place, New Delhi - 110 019
Tel : 647 1259 Fax : 011-6466823 Telex : 66138, 65949, Grams : NATGRID

केन्द्रीय कार्यालय / CORPORATE CENTRE

अमूल्य चरण
महाप्रबन्धक (निगमित: आयोजना)
Amulya Charan
General Manager (Corporate Planning)

C/CP/WB-00
June 18,1993

Dear Mr. Ceyhan,

As desired, the details on the total financing of the Rihand transmission project (Loan 2555 -IN) are as under:

Financing of the project

Item	Sources	SAR US$ million	(%)	Actual US$ million	(%)
1.	Bank Loan	250.0	36.1	191.5	26.1
2.	GOI(Loan & Equity)	308.0	44.44	248.9	33.9
3.	Credit from Sweden	135.0	19.46	164.5	22.4
4.	IBJ	-	-	15.3	2.1
5.	EXIM	-	-	58.3	7.9
6.	Bonds	-	-	56.1	7.6
Total		693.0	100.0	734.6	100.0

It may however be noted that the actual figures available against some of the funding sources, as obtained from NTPC, are available only in India Rs., which are as under-

(Rs.million)

1.	GOI(Loan & Equity)	:	4833.0
2.	Credit from Sweden	:	3193.5
3.	IBJ	:	297.9
4.	EXIM	:	1133.0
5.	Bonds	:	1089.2

These have been further converted into US$ after working out the suitable rate of exchange. We hope this is found in order.

With kind regards,

Sincerely Yours

(AMULYA CHARAN)

Mr. A. Ceyhan
Sr. Power Engineer
The World Bank
India Country Deptt.
1818 H Street, N.W.
Washington D.C.-20433
U.S.A.

पावर ग्रिड कारपोरेशन
ऑफ इंडिया लिमिटेड
(भारत सरकार का उद्यम)
POWER GRID CORPORATION
OF INDIA LIMITED
(A Government of India Enterprise)

पंजीकृत कार्यालय : हेमकुन्ट चैम्बर्स, दसवीं मंजिल, 89, नेहरु प्लेस, नई दिल्ली - 110 019
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केन्द्रीय कार्यालय / CORPORATE CENTRE

अमूल्य चरण
महाप्रबन्धक (निगमित: आयोजना)
Amulya Charan
General Manager (Corporate Planning)

FAX

Ref:C/CP/WB-00
June 15,1993

Subject: Central Power Transmission Project (Loan 2283-IN) and Rihand Power Transmission Project (Loan 2555-IN) -Project Completion Report

Dear Mr. Bauer,

Kindly refer your letter dated May 28,1993 on the above subject forwarding therewith the project completion reports (PCRs) of CTP-I & Rihand transmission projects, prepared by World Bank, for our review and comments. Our comments on the Part-I & Part-III of these reports are as follows :

(A) CENTRAL POWER TRANSMISSION PROJECT (CTP-I)

1.0 The detailed description of the project alongwith the line lengths and dates of commissioning may be modified as under. This information is based on 'as built' scope of the project.

(I) 400 KV AC Transmission System	**Scope**	**Commissioned In**
a) Ramagundam - Khammam (S/C)	202 Km.	March 1992
b) Khammam - Vijayawada (S/C)	110 Km.	March 1992
c) Vijayawada - Gazuwaka (S/C)	317 Km.	January 1992
d) Nagarjunasagar - Gooty (S/C)	298 Km.	July 1991
e) Gooty - Bangalore (S/C)	302 Km.	July 1991
TOTAL (S/C) :	1229 Km.	

(II) 400 KV Inter-Regional System	**Scope**	**Commissioned In**
a) Ramagundam - Chandrapur (D/C)	180 Km.	February 1991
b) Vindhyachal - Singrauli (D/C)	4 Km.	December 1987
TOTAL (D/C) :	184 Km.	

(III) 400 KV AC Sub-stations/ Switchyard Extensions	Commissioned In
a) Khammam (New)	March 1992
b) Vijayawada (New)	January 1992
c) Gazuwaka (New)	January 1992
d) Gooty (New)	July 1991
e) Ramagundam (Extension)	February 1991
f) Chandrapur (Extension)	February 1991
g) Vindhyachal (Extension)	December 1987
h) Singrauli (Extension)	December 1987
i) Bangalore (Extension)	March 1990
j) Nagarjunasagar(Extension)	March 1991

Kindly incorporate the above information suitably in **Para 3.3(a) on page 4, Table D on page 25 and Annexure-2 on page 32** of the project completion report of CTP-I.

2.0 First three lines in **para 4.1 on page 5** in CTP-I PCR should be redrafted as 'The basic and detailed engineering work for the 400 KV transmission lines and substations was carried out by NTPC in-house'.

(B)RIHAND POWER TRANSMISSION PROJECT (RIHAND-I)

1.0 The detailed description of the project alongwith the line lengths and dates of commissioning may be modified as under. This information is based on 'as built' scope of the project.

(I) 400 KV AC Transmission System	Scope	Commissioned In
i) Rihand - Singrauli(S/C)	42 Km.	March 1988
ii) Rihand -Kanpur(POWERGRID)(S/C)	498 Km.	December 1988
iii) LILO of Singrauli -Kanpur(D/C) I&II(UPSEB) at Kanpur(POWERGRID)	20 Km.	-
iv) Kanpur(POWERGRID)-Ballabhgarh(S/C)	410 Km.	October 1988
v) Ballabhgarh - Jaipur(POWERGRID)(S/C)	217 Km.	September 1988
vi) Jaipur(POWERGRID) - Jaipur(RSEB)(S/C)	20 Km.	August 1990
vii) Dadri - Malerkotla(S/C)	302 Km.	July 1992
viii)Ballabhgarh - Dadri(D/C)	53 Km.	November 1990
ix) Dadri - Mandaula(D/C)	46 Km.	November 1990
x) LILO of Muradnagar(UPSEB)(D/C) Panipat at Dadri	59 Km.	June 1989
xi) LILO of Agra-Jaipur(RSEB)(D/C) at Jaipur (POWERGRID)	7 Km.	July 1990
xii) Shifting of Kanpur(UPSEB)-(S/C) Agra line to Kanpur(POWERGRID)	20 Km.	-
TOTAL (S/C) :	1509 Km.	
TOTAL (D/C):	185 Km.	

xiii)New POWERGRID substations at Ballabhgarh, Mandaula, Malerkotla, Kanpur & Jaipur.
xiv) Extension of existing Jaipur(RSEB) substation.

(II) 500 KV HVDC System	Scope	Commissioned In
i) 500 KV HVDC, 1500 MW Bi-polar transmission line Rihand to Delhi	815 Km.	December 1990 September 1991
ii) 500 KV HVDC, 1500 MW bipoles at Rihand and Delhi.		December 1990

Kindly incorporate the above information suitably in the **Para 3.3(b) on page 5, Table D on page 22 and Annexure-1&2 on page 30** of the project completion report of Rihand-I.

2.0 Dadri-Malerkotla line commissioned on July 1,1992 and not on January 7,1992(refer **Item 11,Annexure 3 on page 31**).

3.0 March 31,1992 in **Line 8, Para 5.4 on page 7** should read December 31,1992.

4.0 Kindly refer to **para 4.1 on page 5&6** of Rihand PCR and replace the portion from sixth line onwards till the end of the paragraph with ' The basic and detailed engineering work for the 400 KV lines and substations was thus carried out by NTPC in-house. As the long distance HVDC link technology was new to India and NTPC, the preliminary engineering of HVDC line, its conductor and voltage optimization etc. was done by M/s Hydro Quebec Inc., Canada. However, M/s Teshmont Inc., Canada were appointed as consultant who were responsible for work related to HVDC terminals. NTPC was responsible for the preparation of all specifications, bidding documents, bid evaluation reports and construction supervision'.

Also find enclosed herewith the draft Part-II of the PCRs for CTP-I & Rihand each which has been prepared from the POWERGRID's perspective. We have drafted a portion of the draft part-II covering only those areas where POWERGRID was involved during construction. The Borrower originally being NTPC, we have sent a copy of this to them, for the finalization of part-II of PCR for both CTP-I & Rihand Transmission projects.

With kind regards,

Sincerely Yours

(AMULYA CHARAN)

Mr.J.F.Bauer
Chief
Energy Operations Division
India Department
The World Bank
1818 H Street, N.W.
Washington D.C. 20433
U.S.A.

Copy to:

1) **Shri N.K.Singh:**
Additional Secretary
Ministry of Finance
DEA, North Block
New Delhi 110 001

The PCRs may kindly be processed for forwarding your comments to the World Bank by June 21, 1993.

2) **Shri R.K.Nair:**
Jt.Secretary (PC)
Ministry of Power
Shram Shakti Bhawan
Rafi Marg
New Delhi 110 001

The PCRs may kindly be processed for forwarding your comments to the World Bank by June 21, 1993.

3) **Shri Rajendra Singh:**
CMD,NTPC
NTPC Bhawan
7,Institutional Area
Lodhi Road
New Delhi 110 003

The draft Part-II of PCRs of CTP-I & Rihand may kindly be finalised and forwarded to GOI & World Bank at the earliest as the formal comments from GOI to the World Bank have to reach them latest by June 21,1993.

PROJECT COMPLETION REPORT

INDIA

CENTRAL POWER TRANSMISSION PROJECT (2283- IN)

PART II:PROJECT REVIEW FROM THE BORROWER'S PERSPECTIVE

ENVIRONMENT, RESETTLEMENT AND REHABILITATION

In the context of transmission projects there is no significant impact on environment except in the cases where the transmission lines involve any forest area. The impact of transmission line projects on environment is not considered as severe as in case of thermal, hydel, nuclear power projects. This is primarily because the effect on forest due to laying of transmission lines is reversible and can be nullified by planting more trees.

With the worldwide concern over the fast depleting forest reserves, due consideration is given to these aspects at the planning & designing stage itself. While identifying the transmission system for CTP-I, detailed surveys were conducted by the executing agency in association with the state forest authorities to identify most suitable route having minimum infringement on forest land. Where trees had to be felled in order to provide access to the lines, trees of a corresponding number were planted in the vicinity as per guidelines from Ministry of Environment and Forest..

Sites for construction of the sub-stations were generally selected in uninhabitated areas remote from the population centers . Hence, the resettlement and rehabilitation of people did not arise.

FINAL PAYMENTS

The loan was originally scheduled to be closed on March 31, 1989. But the project configuration underwent major revision following the reluctance of SEBs to pay the fixed transmission charges associated with this project and also because of changes in load generation scenario in Southern Region than what was envisaged at the planning stage. The revised project configuration was approved in August'87. Thereafter, Bank decided to extend the loan closing date by one year each time for a total of 36 months to March'92. The total disbursement of loan till March'92 was US$ 131.49 million. Further, the Bank has included funding the balance portion of the on-going contracts retroactively under the new POWERGRID System Development Project (loan No. 3577-IN).

PROCUREMENT

GOI approval for the revised project was accorded in Aug'87 and immediately thereafter the exercise for placement of award for tower package (for eight transmission lines) was begun . Awarding took 6 to 8 months to complete. This was possible due to advance planning in preparation of bid document. However this time could have been further reduced by around a month had the Bank approval been obtained in a period of

about 15 days. As regards procurement of domestic goods & services a comprehensive procurement action plan resulted in cutting down of award time and, hence achieved the completion of project without any delays.

EVALUATION OF THE BORROWER'S OWN PERFORMANCE

The project has achieved its objectives. With the satisfactory completion of the project the power transmission capacity, security & reliability in the Southern region has increased. The inter connection between the Northern and the Western region is currently used for limited exchange of power between the two regions and helps the stability of the systems.

Unlike the previous Bank funded power projects, this project was solely for the purpose of transmission system. Since NTPC had already acquired sufficient experience in the area of design & engineering of 400 KV transmission lines and substations, entire basic and detailed engineering work for the 400 KV transmission lines and substations was carried out by NTPC/POWERGRID in-house.

This project also provided an opportunity for NTPC/POWERGRID to gain valuable experience in procurement under ICB procedures, which was later used for other Bank financed projects. Also the first time introduction of HVDC technology with this project helped NTPC staff to enlarge its skills and to gain valuable experience in the execution of HVDC sub station, which was later used , on a consultancy basis, in the installation of HVDC stations in other countries.

PROJECT COMPLETION REPORT

INDIA

RIHAND POWER TRANSMISSION PROJECT (2555- IN)

PART II: PROJECT REVIEW FROM THE BORROWER'S PERSPECTIVE

ENVIRONMENT, RESETTLEMENT AND REHABILITATION

In the context of transmission projects there is no significant impact on environment except in the cases where the transmission lines involve any forest area. The impact of transmission line projects on environment is not considered as severe as in case of thermal, hydel, nuclear power projects. This is primarily because the effect on forest due to laying of transmission lines is reversible and can be nullified by planting more trees.

With the worldwide concern over the fast depleting forest reserves, due consideration is given to these aspects at the planning & designing stage itself. While identifying the transmission system for Rihand-I, detailed surveys were conducted by the executing agency in association with the state forest authorities to identify most suitable route having minimum infringement on forest land. Where trees had to be felled in order to provide access to the lines, trees of a corresponding number were planted in the vicinity as per guidelines from Ministry of Environment and Forest.

Sites for construction of the sub-stations were generally selected in uninhabitated areas remote from the population centers . Hence, the resettlement and rehabilitation of people did not arise.

FINAL PAYMENTS

The loan was originally scheduled to be closed on December 31, 1989. But as a consequence of a change in location of the 4X210 MW coal fired NCTPP project of NTPC from Muradnagar to Dadri, the project configuration underwent major revision. After appraising the revised scheme, Bank decided to extend the loan closing date by one year each time, for a total of 36 months to December 31,1992.The total disbursement of loan till March'92 was US$ 191.5 million. Further, Bank has included funding the balance portion of the on-going contracts amounting to US$ 7.6 million retroactively under the new POWERGRID System Development Project (loan No. 3577-IN).

PROCUREMENT

It generally takes 3 to 4 months before the bids are invited are opened for evaluation. Further, all major packages were awarded within a period ranging from 5 to 7 months. Therefore a total procurement period varied from 8 months to 11 months. Keeping in view the complexities involved in some of the contract packages, the time taken seems to be reasonable.

EVALUATION OF THE BORROWER'S OWN PERFORMANCE

The project has overall achieved its objectives. The project has been a major component in the establishment of centrally owned regional grids and intra-regional connections. With the satisfactory completion of the project the power transmission capacity , security & reliability in the Northern Region has increased.

Since NTPC had already acquired sufficient experience in the area of design & engineering of 400 KV transmission lines and substations, entire basic and detailed engineering work for the 400 KV transmission lines and substations was carried out by NTPC/PoWERGRID in-house.

This project also provided an opportunity for NTPC/POWERGRID to gain valuable experience in procurement under ICB procedures, which was later used for other Bank financed projects. Also the introduction of HVDC technology helped NTPC staff to enlarge its skills and to gain valuable experience in the execution of HVDC sub station, which was later used, on a consultancy basis, in the installation of HVDC stations in other countries.

1/9

FAX

FROM : P.K. BASU, DIRECTOR(THERMAL), MINISTRY OF POWER, RAFI MARG, NEW DELHI.

TO : MR. JEAN FRANCOIS BAUER, CHIEF ENERGY OPERATIONS DIVISION, INDIA DEPARTMENT, WORLD BANK, WASHINGTON, USA.

Fax No.001 202 477 8556

KINDLY REFER TO FAX No.C/CP/WB-00/65 dated JUNE 15, 1993, from Sh. Amulya Charan, General Manager(Corporate Planning) Power Grid Corporation of India Limited forwarding Powergrid's comments on Part I & Part III and material for Part II of the Project Completion Reports in respect of central power transmission project(Loan 2283-IN) and Rihand Power transmission Project(Loan 2555-IN).

Based on NTPC's comments, additional material for inclusion in Part II of the Report is sent herewith. We shall be grateful if you could incorporate the additional material now being furnished in the Part II of the above Project Completion Reports.

Best regards,

(P.K. BASU)
DIRECTOR(TH.)

F.No. 6/2/93-POWERGRID
2.8.93

INDIA DEPARTMENT
ENERGY DIVISION
DATE RECEIVED 8/5/93
LOG NO. 730
ROUTED TO: a) Ceyhan
b)
ACTION TAKEN

1/9

2/9

PROJECT COMPLETION REPORT

INDIA

PART II: PROJECT REVIEW FROM THE BORROWERS PERSPECTIVE

CTP (LOAN 2283-IN)

A. Preface

1. The loan was made to India in May 1983 for on-lending to the National Thermal Power Corporation (NTPC). The two main objectives of the project were : (a) to support GOI's strategy to extend and improve power supply through the establishment of centrally owned regional grids and intra-regional connections leading to the promotion of a national grid ; and (b) to improve, in the long run, the operational, institutional and financial performance of the State Electricity Boards (SEBs),by assisting in the development of a financially sound, and technically and institutionally competent centrally-owned power utility which would serve as a model to SEBs. On August 16, 1991, the management of the project was transferred from NTPC to National Power Transmission Corporation Ltd. , under a Management contract signed between the two corporations. On January 8 1993 , an ordinance providing for all the rights , titles and other interests related to the transmission systems of NTPC to be transferred to POWERGRID (NPTC was later renamed as Power Grid Corporation of India) was promulgated by the President of India.

B. Comments on the Analysis in Part-I

2. The analysis made by the Bank under Part-I is comprehensive and has covered the important aspects. The analysis is generally in order. Nevertheless , there are certain issues which need to be further examined keeping in view the background of developments as they took place to better appreciate the events. These are as follows :

Project Start-up and Implementation Schedule(reference para 5.2 of Part-I)

3. Actual dates of signing of BPSA (Bulk Power Supply Agreement) in Southern region are as follows :

3. Actual dates of signing of BPSA (Bulk Power Supply Agreement) in Southern region are as follows :

APSEB	22.3.1985
KEB	21.3.1985
TNEB	22.3.1985
KSEB	10.4.1985
GOA	17.4.1985

2/9

3/9

Extensions of the Closing date (reference para 5.4 of Part-I)

4. The Bank did not accept GOI's request to cover the expenditure on ongoing contracts under the savings available under other ongoing loans to NTPC after loan closing date till POWERGRID System Development Project loan became effective. The continuity in Bank financing was sought on account of certain problems relating to the deemed export benefits to the contractors and also relating to the import licence.

Procurement(reference Para 5.7 of Part-I)

5.1 In an effort to speed up procurement, and after having extensive discussions NTPC had finalized with the World Bank a standard bidding documents in April, 1992 . However, the Bank withdrew its "No-Objection" to this standard bidding documents in December, 1992 and wanted certain modifications to be included. NTPC has now finalized standard bidding documents with the Bank based on the suggested modifications and further discussions. NTPC will use this document for procurement under the recently negotiated loan for NTPC Power Generation Project. This is expected to reduce the procurement time. Further, the proposed NTPC Power Generation Project, negotiated with the Bank in May, 1993 would be under time slice concept which would help in bringing about timely disbursements.

5.2 NTPC has started giving further emphasis to finishing promptly the payments to the contractors.

para 5.8 of Part-I)

the payments to the contractors.

Project Costs (reference para 5.8 of Part-I)

6. It has been stated that " that costs at appraisal were over estimated". It is clarified that the basis of costing during the appraisal had been explained in the Staff Appraisal Report. It, inter-alia, states that the estimates for the main items of equipment and material are based on the quotations received since 1980 for similar projects such as the 400 KV links and sub-stations associated with Singrauli, Korba, Ramagundam and Farakka Power Plants with prices updated to mid 1982 price levels. On the other hand the exchange rate changes have played a major role in bringing down the project cost in dollars terms.

Financial Performance (reference para 8.2 to 8.5 of Part-I)

7. In the discussions on accounts receivable presented in Section 8 of the Part I, the Bank has included the amount due to NTPC by way of Central Appropriation in the accounts receivables.

2/7

GOI has in the past ordered Central Appropriation of plan assistance funds to State sectors for offseting their dues to Central sector agencies like NTPC. Such amounts are being paid to NTPC as per agreed schedules and the Bank had been kept informed about the arrangement since August, 1990. Considering that these were committed payments from GOI, the amounts were set off against the dues of the SEBs and NTPC's accounts receivable reduced by the total amount of Central appropriation.

As has been mentioned in Para 8.3, during the negotiations of the proposed NTPC Power Generation Project, agreement was reached that NTPC would maintain the level of its accounts receivable at 2 months of sales equivalent excluding the amount still to be paid through the Central appropriations for which a specific payment schedule was also agreed.

With regard

8. The Operation Evaluation Department of the World Bank conducted the performance audit of few Bank-funded projects, namely, Korba (Credit 793-IN), Ramagundam (Credit 874-IN and Loan 1648-IN), Singrauli-II (Credit 1027-IN) and Farakka (Credit 1053-IN and Loan 1887-IN). In its report No. 10854 published in February, 1993, the Audit Mission has summed up NTPC's financial policy in a paragraph as below:

> "NTPC has reached its large size (it is India's largest corporate entity in terms of fixed assets) in a record time without jeopardizing or compromising its financial viability, even in spite of the accounts receivable issue. This is a performance that very few utilities in the same situation are able to achieve. The performance is even more impressive since NTPC is still in a major investment mode. A good part of NTPC's above-par performance is to be credited to GOI's original design (e.g., debt-equity ratio set at a conservative 1:1; tariff formula to pass on all investment, operation, and financial costs.)"

9. As is common practice in transaction of a commodity like electricity, the agreements allow the beneficiary of its energy supply a period of 30 days from issue of the bills for making payments. Therefore, outstanding should be reckoned after expiry of this period of 30 days.

Bank Performance (reference para 11.2 & 11.3 of Part-I)

10. It has been stated that the Bank's decision not to present to the Board the then proposed Regional Power System Project because

10. It has been stated that the Bank's decision not to present to the Board the then proposed Regional Power System Project because of GOI and NTPC's inability to fulfill the conditions for Board presentation within a reasonable time period, has helped Government of India to promote reforms in power sector. It is worth-

1/1

mentioning that the sectoral reforms are brought about gradually with time . It is easier to bring out such changes when they are accompanied by large development programmes such as the proposed US$ 1.2 billion time slice loan operation of World Bank for NTPC Power Generation Project.

INDIA

RIHAND POWER TRANSMISSION PROJECT

PART II: PROJECT REVIEW FROM THE BORROWERS PERSPECTIVE (IBRD LOAN 2555-IN)

A. Preface

1. The loan was made to India in May 1985 for on-lending to the National Thermal Power Corporation (NTPC). The objectives of the project were : (a) to meet the electricity demand in the Northern Region by providing the transmission linkage between the thermal power generation plants in the Singrauli-Rihand complex in the south-east of the region and the main load centers of the western parts of the region ; and, (b) to ensure the evacuation of power from these plants at least cost to the economy. The project was also to serve as a vehicle for the introduction of a new technology (long distance HVDC links) needed for the expansion and reinforcement of EHV transmission grid. Another objective to (c) to improve, in the long run, the operational, institutional and financial performance of the State Electricity Boards (SEBs),by assisting in the development of a financially sound, and technically and institutionally competent centrally-owned power utility which would serve as a model to SEBs. On August 16, 1991, the management of the project was transferred from NTPC to National Power Transmission Corporation Ltd. , under a Management contract signed between the two corporations. On January 8 1993 , an ordinance providing for all the rights , titles and other interests related to the transmission systems of NTPC to be transferred to POWERGRID (NPTC was later renamed as Power Grid Corporation of India) was promulgated by the President of India.

POWERGRID (NPTC was later renamed as [illegible] India) was promulgated by the President of India.

B. Comments on the Analysis in Part-I

2. The analysis made by the Bank under Part-I is comprehensive and has covered the important aspects. The analysis is generally in order. Nevertheless , there are certain issues which need to be further examined keeping in view the background of developments as they took place to better appreciate the events. These are as follows :

Preface (reference para 1)

3. It may mentioned here that savings of US$ 48 million has arisen mainly on account of the exchange rate variations.

Procurement(reference Para 5.7 of Part-I)

4.1 In an effort to speed up procurement, and after having extensive discussions NTPC had finalized with the World Bank a standard bidding documents in April, 1992 . However, the Bank withdrew its "No-Objection" to this standard bidding documents in December, 1992 and wanted certain modifications to be included. NTPC has now finalized standard bidding documents with the Bank based on the suggested modifications and further discussions. NTPC will use this document for procurement under the recently negotiated loan for NTPC Power Generation Project. This is expected to reduce the procurement time. Further, the proposed NTPC Power Generation Project, negotiated with the Bank in May, 1993 would be under time slice concept which would help in bringing about timely disbursements.

4.2 NTPC has started giving further emphasis to finishing promptly the payments to the contractors.

Physical Results -Project objectives (reference para 7)

Physical Results -Project objectives (reference para 7)

5. Under NTPC's new commercial and investment policies: (a) NTPC has been permitted to shut-off or restrict power supply from its concerned power stations, whenever physically and technically feasible, in case of non-compliance with the agreed terms, including appropriate payment coverage by letters of credit (LCs), of the bulk power supply agreements (BPSA) with the SEBs: (b) if the above is not possible, the defaulting state (s) would be charged penal rates for drawals (power imports) exceeding LC coverage; (c) for new power stations, NTPC and POWERGRID have been instructed to design the system in such a way that it would allow the shut off or diversion of supplies in case of non-compliance with the BPSA; (d) NTPC would delay new investments in a state if that state is not in compliance with the BPSA; and (e) NTPC is permitted to undertake projects in one region with a substantial part of the output to be allocated to other regions. 2) In addition, NTPC was authorised in January, 1993 to enter into joint ventures with foreign and local private partners and to develop with those partners power projects either from its own investment program or those offered by others.

Financial Performance (reference para 8.2 to 8.5 of Part-I)

6. In the discussions on accounts receivable presented in Section 8 of the Part I, the Bank has included the amount due to NTPC by way of Central Appropriation [illegible]

8/9

Central sector agencies like NTPC. Such amounts are being paid to NTPC as per agreed schedules and the Bank had been kept informed about the arrangement since August, 1990. Considering that these were committed payments from GOI, the amounts were set off against the dues of the SEBs and NTPC's accounts receivable reduced by the total amount of Central appropriation.

As has been mentioned in Para 8.3, during the negotiations of the proposed NTPC Power Generation Project, agreement was reached that NTPC would maintain the level of its accounts receivable at 2 months of sales equivalent excluding the amount still to be paid through the Central appropriations for which a specific payment schedule was also agreed.

7. The Operation Evaluation Department of the World Bank conducted the performance audit of few Bank-funded projects, namely, Korba (Credit 793-IN), Ramagundam (Credit 874-IN and Loan 1648-IN), Singrauli-II (Credit 1027-IN) and Farakka (Credit 1053-IN and Loan 1887-IN). In its report No. 10854 published in February, 1993, the Audit Mission has summed up NTPC's financial policy in a paragraph as below:

"NTPC has reached its large size (it is India's largest [illegible] entity in terms of fixed assets) in a record time [illegible]

"NTPC has reached its large size (it is India's largest corporate entity in terms of fixed assets) in a record time without jeopardizing or compromising its financial viability, even in spite of the accounts receivable issue. This is a performance that very few utilities in the same situation are able to achieve. The performance is even more impressive since NTPC is still in a major investment mode. A good part of NTPC's above-par performance is to be credited to GOI's original design (e.g., debt-equity ratio set at a conservative 1:1; tariff formula to pass on all investment, operation, and financial costs.)"

8. As is common practice in transaction of a commodity like electricity, the agreements allow the beneficiary of its energy supply a period of 30 days from issue of the bills for making payments. Therefore, outstanding should be reckoned after expiry of this period of 30 days.

Sustainability (reference Para 10.1)

9. Regarding transfer of assets from NTPC to POWERGRID, GOI has informed World Bank vide letter dated January 12, 1993 that all transmission assets shall be transferred to POWERGRID and while it had been decided to transfer the Rihand-Dadri HVDC link with terminals, because of contractual matters, the terminals would be transferred a little later. It was also informed that the

8/9

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terminals, because of [illegible] transferred a little later. It was also informed that the

Vindhyachal HVDC back to back system would be transferred straightway being quite clearly a part of the transmission system. It was also clarified that switchyards of existing NTPC power stations will not be transferred and all new stations will be designed to have switchyards owned and operated by POWERGRID.

Bank Performance (reference para 11.2 of Part-I)

16. It has been stated that the Bank's decision not to present to the Board the then proposed Regional Power System Project because of GOI and NTPC's inability to fulfill the conditions for Board presentation within a reasonable time period, has helped Government of India to promote reforms in the power sector. It is worth mentioning that the sectoral reforms are brought about gradually with time . It is easier to bring out such changes when they are accompanied by large development programmes such as the proposed US$ 1.2 billion time slice loan operation of World Bank for NTPC Power Generation Project.

THE WORLD BANK/IFC/MIGA

OFFICE MEMORANDUM

DATE: February 3, 1994

TO: Mr. Oktay Yenal, Chief, Resident Mission

FROM: Yves Albouy, Chief, OEDD3

EXTENSION: 31690

SUBJECT: Central Power Transmission Project (Loan 2283-IN)
Final version of the Project Completion Report

Kindly distribute the enclosed copies of the final version of the above Report and cover letters to the officials concerned (see attached list). I have included additional copies of the report for your information.

Enclosures

The World Bank
INTERNATIONAL BANK FOR RECONSTRUCTION AND DEVELOPMENT
INTERNATIONAL DEVELOPMENT ASSOCIATION

1818 H Street, N.W.
Washington, D.C. 20433
U.S.A.

(202) 477-1234
Cable Address: INTBAFR
Cable Address: INDEVAS

February 3, 1994

Mr. M. Prasad, Deputy Secretary (FB)
Department of Economic Affairs
Ministry of Finance
North Block
New Delhi 110 001, India

Re: Central Power Transmission Project (2283-IN)
Final version of the Project Completion Report

Dear Mr. Prasad:

The final version of the above report has now been distributed to the Bank's Board of Executive Directors and it is my pleasure to send you 5 copies for your information.

Sincerely yours,

Yves Albouy
Chief
Infrastructure and Energy Division
Operations Evaluation Department

Enclosures

The World Bank
INTERNATIONAL BANK FOR RECONSTRUCTION AND DEVELOPMENT
INTERNATIONAL DEVELOPMENT ASSOCIATION

1818 H Street, N.W.
Washington, D.C. 20433
U.S.A.

(202) 477-1234
Cable Address: INT[illegible]FRAD
Cable Address: IND[illegible]AS

February 3, 1994

Mr. R. Vasudevan, Secretary
Department of Power
Ministry of Power and
Non-Conventional Energy Sources
Shram Shakti Bhawan
Rafi Marg
New Delhi 110 001, India

Re: Central Power Transmission Project (2283-IN)
Final version of the Project Completion Report

Dear Mr. Vasudevan:

The final version of the above report has now been distributed to the Bank's Board of Executive Directors and it is my pleasure to send you 5 copies for your information.

Sincerely yours,

Yves Albouy
Chief
Infrastructure and Energy Division
Operations Evaluation Department

Enclosures

The World Bank
INTERNATIONAL BANK FOR RECONSTRUCTION AND DEVELOPMENT
INTERNATIONAL DEVELOPMENT ASSOCIATION

1818 H Street, N.W. (202) 477-1234
Washington, D.C. 20433 Cable Address: INTBAFRAD
U.S.A. Cable Address: INDEVAS

February 3, 1994

Mr. Rajendra Singh, Chairman and Managing Director
National Thermal Power Corporation
NTPC Bhawan, SCOPE Complex
7 Institutional Area, Lodi Road
New Delhi 110 003, India

Re: Central Power Transmission Project (Loan 2283-IN)
Final version of the Project Completion Report

Dear Mr. Singh:

The final version of the above report has now been distributed to the Bank's Board of Executive Directors and it is my pleasure to send you 5 copies for your information.

Sincerely yours,

Yves Albouy
Chief
Infrastructure and Energy Division
Operations Evaluation Department

Enclosures

The World Bank
INTERNATIONAL BANK FOR RECONSTRUCTION AND DEVELOPMENT
INTERNATIONAL DEVELOPMENT ASSOCIATION

1818 H Street, N.W. (202) 477-1234
Washington, D.C. 20433 Cable Address: INTBAFRAD
U.S.A. Cable Address: INDEVAS

August 3, 1993

Mr. R. K. Narayan, Chairman and Managing Director
Power Grid Corporation of India
Hemkunt Chambers, 10th Floor
89 Nehru Place
New Delhi 110 019, India

Re: Central Power Transmission Project (Loan 2283-IN)
Final version of the Project Completion Report

Dear Mr. Narayan:

The final version of the above report has now been distributed to the Bank's Board of Executive Directors and it is my pleasure to send you 5 copies for your information.

Sincerely yours,

Yves Albouy
Chief
Infrastructure and Energy Division
Operations Evaluation Department

Enclosures

The World Bank
INTERNATIONAL BANK FOR RECONSTRUCTION AND DEVELOPMENT
INTERNATIONAL DEVELOPMENT ASSOCIATION

1818 H Street, N.W. (202) 477-1234
Washington, D.C. 20433 Cable Address: INTBAFRAD
U.S.A. Cable Address: INDEVAS

February 3, 1994

List of persons to whom copies of the Project Completion Report

Re: Central Power Transmission Project (Loan 2283-IN)
Final version of the Project Completion Report

Mr. M. Prasad, Deputy Secretary (FB)
Department of Economic Affairs
Ministry of Finance
North Block
New Delhi 110 001, India

Mr. R. Vasudevan, Secretary
Department of Power
Ministry of Power and
Non-Conventional Energy Sources
Shram Shakti Bhawan
Rafi Marg
New Delhi 110 001, India

Mr. Rajendra Singh, Chairman and Managing Director
National Thermal Power Corporation
NTPC Bhawan, Scope Complex
7 Institutional Area, Lodi Road
New Delhi 110 003, India

Mr. R. K. Narayan, Chairman and Managing Director
Power Grid Corporation of India
Hemkunt Chambers, 10th Floor
89 Nehru Place
New Delhi 110 019, India

THE WORLD BANK / IFC / MIGA

OFFICE MEMORANDUM

DATE: June 30, 1993

JUN 3 0 1993

TO: Mr. Hans-Eberhard Kopp, Director, OED

THROUGH: Mr. Heinz Vergin, Director, India Department

FROM: Jean-Francois Bauer, Chief, SA2EG

EXTENSION: 81464

SUBJECT: INDIA: Central Power Transmission Project (Ln. 2283-IN)
Rihand Power Transmission Project (Ln. 2555-IN) --
Project Completion Reports

1. Attached are four copies each of the Project Completion Reports for the above projects. The reports incorporate comments from internal review, and have been cleared by the Legal and Loan Departments.

2. Parts I and III, for both projects, were sent to the Government of India (GOI), the National Thermal Power Corporation (NTPC) and the Power Grid Corporation on May 28, 1993. Although the GOI authorities promized to the Task Manager, during his recent mission to New Delhi, that they will send their comments and Part IIs, by June 21, 1993, to date we have not received the said comments. Upon receiving them, we plan to retype them, without editing, incorporate them into the respective PCR, and submit to you the entire package.

3. Mr. Argun Ceyhan, Task Manager for these projects, may be reached on extension 81874 for any questions or comments.

4. The following are the officials in India to whom we should send the completed PCRs:

Mr. M. Prasad, Deputy Secretary (FB)
Department of Economic Affairs
Ministry of Finance
North Block
New Delhi 110 001 India

Mr. R. Vasudevan, Secretary
Department of Power
Ministry of Power and
Non-Conventional Energy Sources
Shram Shakti Bhawan
Rafi Marg
New Delhi 110 001 India

Mr. Rajendra Singh, Chairman and Managing Director
National Thermal Power Corporation
NTPC Bhawan, SCOPE Complex
7 Institutional Area, Lodi Road
New Delhi 110 003 India

Mr. R.K. Narayan, Chairman and Managing Director
Power Grid Corporation of India
Hemkunt Chambers, 10th Floor
89 Nehru Place
New Delhi 110 019 India

Attachments (2): -- PCR on Central Power Transmission Project;
-- PCR on Rihand Power Transmission Project.

Cleared with and cc (with Attachments):
Messrs. Singh (LEGSA); Perera (LOAAS)

cc (with Attachments):
Messrs./Mmes. Vergin, Humphrey, Hanan (SA2DR); Shirazi, Dolenc (SA2CI); Storm, Fujii, Nyman, Betre (SA2EG); Mejia, Gulati (SA2ND); Pereira (ASTIN)
SA2EG Project Black Books
Asia Information Center

ACeyhan:
Document Name: PCR93.01

THE WORLD BANK / IFC / MIGA

OFFICE MEMORANDUM

MM. PCR File

OCT 27 1993

DATE: October 27, 1993

TO: Mr. Hans-Eberhard Kopp, Director, OED

FROM: Javad Khalilzadeh-Shirazi, Acting Director, India Department

EXTENSION: 80352

SUBJECT: INDIA : Central Power Transmission Project (Ln. 2283-IN)
Project Completion Report

1. We refer to your Memorandum dated October 21, 1993, about OED Review Note for the above mentioned PCR.

2. We do not have any comments on OED's findings on overall assessment, sustainability and institutional development.

3. However, we would prefer that OED points out, in the Review Note, to NTPC's bill collection performance and accounts receivable which are the main weaknesses of the Corporation. Under Ln.2283-IN for the Central Power Transmission Project the sole covenant adopted for NTPC's financial performance was the conventional rate of return (ROR) on average historic fixed assets. This indicator has proved to be less appropriate for a fast growing utility where the utility's major concern is to ensure the availability of adequate funds for investment. Furthermore, when the revenues collected are substantially lower that the revenues accrued (due to large accounts receivable), the financial performance indicators such as ROR, operating ratio, etc., are less meaningful. A covenant specifying the level of accounts receivable not to exceed an amount equivalent to the proceeds of its sales of power for the two preceding months, was first introduced for NTPC under Loan 2555-IN for the Rihand Power Transmission Project approved in May 1985, with effect from the end of NTPC's fiscal year 1986. NTPC was never able to comply with this covenant until March 1993. NTPC's non-compliance with the accounts receivable covenant prevented the Bank to lend to this Corporation from 1987 to 1993. It was after the Government of India and NTPC took remedial actions, based on the lessons drawn for the Central Power Transmision and other previous projects implemented by NTPC, that Loan 3632-IN for NTPC Power Generation Project was approved on June 29, 1993. The said actions were summarized in page (v) of the PCR. Therefore, mentioning NTPC's weakness in financial performance and the Bank's insistance on remedial actions in the Evaluation Summary would give a more balanced picture of the Bank-NTPC dialogue.

4. We received the Government's comments in August 1993 and communicated them to OED with our Memorandum dated August 20, 1993. We would greatly appreciate that Part II is included into the version of the PCR to be distributed to the Executive Directors and the President. A copy of the said Memo (with its annexes) is enclosed for your easy reference.

Attachment (1): Copy of SA2DR Memo dated August 20, 1993, to OED; with its annexes, which included the following documents:

1. PCR on Central Power Transmission Project;
2. PCR on Rihand Power Transmission Project;
3. Copy of POWERGRID's letter dated June 18, 1993; and,
4. Copy of GOI's fax message of August 2, 1993.

Cleared with and cc (w/o Attchs.):
Messrs. Humphrey (SA2DR); Pollak, Storm (SA2EG)

cc (w/o Attachments):
Messrs./Mmes. Vergin (SA2DR, o/r); Dolenc (SA2CI); Bauer (o/r), Fujii, Nyman, Betre (SA2EG); Mejia, Gulati (SA2ND)
SA2EG Project Black Book
Asia Information Center

ACeyhan: Document Name: PCR93.03

THE WORLD BANK/IFC/M.I.G.A.

ROUTING SLIP	DATE: December 10, 1993
NAME	ROOM NO.
Mr. Robert Picciotto, DGO	F-13-035

D. G. O.
'93 DEC 10 AM 11 25
12/10

	URGENT		PER YOUR REQUEST
	FOR COMMENT		FOR ACTION
X	FOR SIGNATURE		FOR APPROVAL/CLEARANCE

RE: INIDIA: Central Power Transmission Project
(Loan 2283-IN)

REMARKS:

For your signature before printing.
Changes of the Review Note have been made as per the region's request.

FROM:	ROOM NO.:	EXTENSION:
Yves Albouy, Actg. Director	T-9079	31690

Maryvonne

THE WORLD BANK/IFC/M.I.G.A.

ROUTING SLIP	DATE: November 22, 1993
NAME	ROOM NO.
Mr. Robert Picciotto, DGO	F-13-035
THRU: Mr. H. Eberhard Köpp, OEDDR	T-9-025

D. G. O.
'93 NOV 23 PM 2 04

	URGENT		PER YOUR REQUEST
	FOR COMMENT		FOR ACTION
XX	FOR SIGNATURE		FOR APPROVAL/CLEARANCE

RE: INDIA: Central Power Transmission Project
(Loan 2283-IN) - PCR

REMARKS:

For your signature before printing.
No further comments were received from the Region.

FROM:	ROOM NO.:	EXTENSION:
Yves Albouy, Chief, OEDD3	T-9079	31690

THE WORLD BANK
Washington, D.C. 20433
U.S.A.

Office of Director-General
Operations Evaluation

MEMORANDUM TO THE EXECUTIVE DIRECTORS AND THE PRESIDENT

December 10, 1993

SUBJECT: Project Completion Report on India
Central Power Transmission Project (Loan 2283-IN)

Attached is the "Project Completion Report on India - Central Power Transmission Project (Loan 2283-IN)" prepared by the South Asia Region. Part II was provided by the Borrower.

The US$250.7 million loan increased the capacity of the transmission grid feeding power from the National Thermal Power Company (NTPC) to the regional power companies. The Bank approved a revision in the project scope which was fully justified under the original project objectives. Almost half of the loan amount was canceled (US$119.2 million) partly because of foreign currency savings. There were three extensions and the project was not fully completed at loan closing.

All the project objectives were substantially obtained albeit with substantial delays. The re-estimated economic rate of return is 11% (not directly comparable with the initial figure because of the change in scope). NTPC maintained its good financial health but its performance in bill collection has prompted the Bank to insist on very strong remedial actions by the Government with respect to the least responsive State Electricity Boards. The project strengthened NTPC's transmission planning and project management capacity. The know how thus acquired was transferred to POWERGRID, the recently created national transmission company.

Overall, the project outcome is rated as satisfactory, its sustainability as likely, and its institutional impact as substantial. The PCR gives a thorough account of project preparation and implementation which was mostly uneventful except for the initial delays. No audit is planned.

later version

THE WORLD BANK
Washington, D.C. 20433
U.S.A.

Office of Director-General
Operations Evaluation

MEMORANDUM TO THE EXECUTIVE DIRECTORS AND THE PRESIDENT

November 22, 1993

SUBJECT: Project Completion Report on India
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Document of
THE WORLD BANK

FOR OFFICIAL USE ONLY

Report No.

PROJECT COMPLETION REPORT

INDIA

CENTRAL POWER TRANSMISSION PROJECT
(LOAN 2283-IN)

November 22, 1993

Energy Operations Division
Country Department II (India)
South Asia Region

COUNTRY EXCHANGE RATES AND ABBREVIATIONS

Currency Unit = Rupee (Rs.)
Rs. 1 = Paise 100

Rupee (Rs.)/US$ Exchange Rates and CPI (Yearly Averages)

Fiscal Year	Rupees/US$	Consumer Price Index FY80/81=100
FY83 (Project appraisal & approval)	10.10 /a	
FY84	11.36	
FY85	12.37	133.3
FY86	12.61	141.2
FY87	12.96	148.0
FY88	13.92	163.2
FY89	16.23	176.3
FY90	17.50	190.6
FY91	22.74	216.3
FY92	26.20	237.0 (estimate)

/a Conversions in the Staff Appraisal Report were made at Rs 9.5/US$.

Government of India and
National Thermal Power Corporation
Fiscal Year: April 1 - March 31

Measures and Equivalents

1 Ton (t)		=	1 metric ton=1,000 kg.=2,200 lbs.
1 Kilovolt (kV)		=	1,000 volts (V)
1 Kilovolt ampere	(kVA)	=	1,000 volt-amperes (VA)
1 Kilowatt-hour	(kVh)	=	1,000 watt-hours
1 Megawatt-hour	(MWh)	=	1,000 kilowatt-hours
1 Gigawatt-hour	(GWh)	=	1,000,000 kilowatt-hours

Abbreviations and Acronyms

CEA	Central Electricity Authority
DESU	Delhi Electric Supply Undertaking
GOI	Government of India
IBRD	International Bank for Reconstruction & Development
IDA	International Development Association
MOU	Memoranda of Understanding
NHPC	National Hydroelectric Power Corporation
NPTC	National Power Transmission Corporation
NTPC	National Thermal Power Corporation
POWERGRID	Power Grid Corporation of India
ROR	Rate of Return
SEBs	State Electricity Boards

PROJECT COMPLETION REPORT

INDIA

CENTRAL POWER TRANSMISSION PROJECT
(LOAN 2283-IN)

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PROJECT COMPLETION REPORT
INDIA
CENTRAL POWER TRANSMISSION PROJECT
(LOAN 2283-IN)

Preface

This is the Project Completion Report (PCR) for the Central Power Transmission Project, for which Loan 2283-IN in the amount of US$250.7 million was approved on May 19, 1983. The loan was made to India, acting by its President, for on-lending to the National Thermal Power Corporation (NTPC). The original loan closing date of March 31, 1989, was extended three times and the loan was closed on March 31, 1992. On December 5, 1991, an amount of US$50 million of savings arising mainly because of exchange rate variations were cancelled from the loan account. Disbursements were completed on September 8, 1992, and the undisbursed balance of US$69.2 million was cancelled. Thus, total disbursements under the loan amounted to US$131.5 million.

On August 16, 1991, the management of the project (operation and maintenance of the assets in service and implementation of those still under construction) was transferred from NTPC to the National Power Transmission Corporation Ltd. (NPTC), the newly established utility responsible for transmission and grid operations, under a Management Contract signed between the two Corporations. NPTC was later named Power Grid Corporation of India Ltd. (POWERGRID). On January 8, 1993, an Ordinance providing for all the rights, titles and other interests related to the transmission systems of NTPC and two other centrally-owned utilities[1], to be transferred to POWERGRID, with effect from April 1, 1992, was promulgated by the President of India. At the time of preparation of this PCR, the Bank was in the process of finalizing the modifications on the Development Credit, Loan and Project Agreements to formalize the transfer of the Bank loans and IDA credits from NTPC and NHPC to POWERGRID retroactively with effect from April 1, 1992. With regard to Loan 2283-IN, assets and liabilities for about US$3.4 million remained with NTPC and assets and liabilities for about US$128.1 million have been transferred to POWERGRID. The amounts will be finalized after accounts between NTPC and POWERGRID are settled.

The PCR was prepared by the Energy Operations Division of the Country Department II (India) of the South Asia Regional Office, and by NTPC and POWERGRID. The former prepared the Preface, Evaluation Summary and Parts I and III of the PCR, while the implementing agencies prepared Part II, and provided all the supporting data.

Preparation of Parts I and III of the PCR was based on information in the Staff Appraisal Report, the Loan and Project Agreements, and material on the project in Bank files and that provided by NTPC and POWERGRID. The preparation was also based on discussions with some of the Bank staff who were involved with the project and the officials of the Government of India (GOI), NTPC, POWERGRID and the project beneficiaries (i.e., State Electricity Boards) during a PCR mission to India in February 1993.

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[1] National Hydro Power Corporation (NHPC) and North-Eastern Electric Power Corporation (NEEPCO).

PROJECT COMPLETION REPORT

INDIA

CENTRAL POWER TRANSMISSION PROJECT
(LOAN 2283-IN)

Evaluation Summary

Objectives

The two main objectives of the project were: (a) to support GOI's strategy to extend and improve power supply through the establishment of centrally owned regional grids and intra-regional connections leading to the promotion of a national grid; and (b) to improve, in the long run, the operational, institutional and financial performance of the State Electricity Boards (SEBs), by assisting in the development of a financially sound, and technically and institutionally competent centrally-owned power utility which would serve as a model to SEBs (Part I, para. 3.1).

Implementation Experience

NTPC (and, since August 1991, POWERGRID) successfully implemented the project. Implementation of the project components financed under the loan was really begun in April 1987, almost four years from Board approval. The delay was mostly due to NTPC's decision not to proceed with the implementation of the 400 kV transmission lines and substations in the Southern Region (major portion of the Project) until firm agreements were reached with the State Electricity Boards in the Southern Region on the cost recovery arrangements for the transmission facilities to be built under the project. In the meantime, the planning was modified by GOI and subsequently the description of the project was amended twice. At appraisal, all the project components were scheduled to be commissioned by March 1988. At the time the Bank closed the loan on March 31, 1992, the project was not completed. Supplies and works amounting to US$23.2 million remained - these expenditures are being funded under Loan 3577-IN, and are expected to be completed during FY94 (Part I, paras. 5.2 and 5.10).

Results

Overall the project achieved its physical objectives, albeit with substantial delays. The project has been the first major component in the establishment of centrally owned regional grids and intra-regional connections. The power transmission capacity in the Southern Region has been increased in a manner which helps optimal utilization of the installed thermal and hydro capacities in this region and permits for exchanges between the Southern and Western Regions. The interconnection between the Northern and the Western Regions is currently used for limited exchanges of power between the two regions and helps the stability of the systems (Part I, para. 7.1).

The project contributed in making NTPC an efficient utility, but did not, however, contribute towards the longer-term objective of improving the operational, institutional and financial performance of SEBs (Part I, 7.1).

NTPC's financial rate of return on historically valued net fixed assets declined from a high 17% in FY86 and FY87 to 15% in FY92 against the covenanted rate of return of 9.5%. Because of the changes agreed by the parties on the project description, it is not possible to make a reasonable comparison between the internal economic rate of return (IERR) of the original and revised project scopes. The IERR for the project as implemented was estimated at 11% (Part I, paras. 8.1 and 10.2).

Sustainability

The project is sustainable, even though at present its components are not yet being fully utilized. Sustainability is certainly assured for the future, as the facilities built under the project are integral components of the transmission system development program in India (Part I, para. 10.1).

Insufficient generation and transmission tariffs and an unchecked increase of NTPC's and POWERGRID's accounts receivable could endanger such sustainability. The Bank, GOI, NTPC and POWERGRID have been taking actions to avoid such occurrence.

Findings and Lessons Learned

Major findings are as follows:

a) The project was not completely finalized when the Bank approved it - the first transmission line equipment contract was awarded in March 88, four years ten months from the date of approval by the Bank. Furthermore the specific conditions for effectiveness had to be modified. The long delay in the start-up of project implementation, and the consequent project revision, are attributed partly to the Bank not verifying that there was full agreement and understanding on the part of the SEBs to pay NTPC for the transmission charges. NTPC's unwillingness to begin work before all contracts with the Southern Region SEBs were signed was not appreciated sufficiently. Therefore, the Bank approved this Loan prematurely (Part I, paras. 5.1 and 5.2);

b) Once implementation got under way, NTPC implemented the project successfully, with only minor problems and delays (Part I, para. 5.3);

c) The Bank's agreement on the "revised" project (para. 3.3) which was determined to require some three additional years for its completion, gave GOI and NTPC the perception that the loan would be extended until the completion of the project; therefore, the Bank's decision not to extend for a fourth time the closing date of the loan came as a surprise to GOI and NTPC (Part I, para. 5.4);

d) The project contributed to the enhancement of NTPC's (later POWERGRID's) expertise in the area of high voltage transmission, created employment of local labor and helped to the development of local manufacturing industry (Part I, paras. 5.5 and 5.6);

e) The average time taken from bid opening to the award of the contract (including Bank acceptance of the proposed award) was generally less than nine months. In an effort to speed up procurement, standard bidding documents will in future be used by NTPC and POWERGRID.

They would also give further emphasis to finishing promptly the payments for the contracts, so that the closing dates of new loan(s) would not need to be extended (Part I, para. 5.7);

f) By the time the Loan was closed India had repaid almost half of the loan amount utilized (Part I, para. 5.10);

g) The area where NTPC's performance fell considerably short of expectations was in bill recovery. Maintaining a specific level of accounts receivables was not a condition of this loan and it was only introduced in 1985 under Loan 2555-IN for the Rihand Power Transmission Project. Substantial arrears by SEBs affected NTPC's financial position adversely (Part I, paras. 8.2 and 12.2);

h) GOI interventions through the central appropriations helped NTPC resolve, albeit for limited periods, its accounts receivable problem. These interventions aimed at having NTPC operate efficiently, thus keep the electric energy supply at an adequate level. It is doubtful that GOI's actions have led to SEBs improving their operational efficiency and their billing and collection procedures and practices. What is equally important, but so far received little attention, is the need for energy conservation on the customer side through adoption of appropriate tariffs and tariff structure at SEBs and through end-use efficiencies (Part I, para. 8.4);

i) The SAR adopted the conventional rate of return (ROR) on average historic fixed assets in operation as the sole covenant for NTPC's financial performance. This performance indicator is less appropriate for a fast growing utility where the utility's major concern is to ensure the availability of adequate funds for investment. Furthermore, when the revenues collected are substantially lower than the revenues accrued (due to the large accounts receivable), the financial performance indicators such as ROR, operating ratio, etc., are less meaningful (Part I, para. 8.6);

j) A more appropriate covenant would have been a cash generation covenant, e.g. "contribution towards investment" which would have also highlighted the deterioration in NTPC's performance (Part I, para. 8.6); and

k) Bank's position (only partially shared by GOI) is that the electricity industry provides a service which has to be fully paid through user-charges. The perception of the State Governments and SEBs, perhaps for political reasons, is that provision of electricity is partly a social service. The transfer of funds to NTPC through central appropriations is but another subsidy (whether it comes from GOI or from SEB), and not a direct payment through tariffs (Part I, para. 12.4).

Major lessons learned from this project are summarized below:

a) As a precondition for further Bank loans, more emphasis should be given to improving the commercial arrangements between NTPC and its clients. However, this has proved to be difficult to achieve in practice unless the financial performance of the SEBs is improved (Part I, para. 12.4);

b) To enable NTPC to operate on a purely commercial basis, GOI should allow NTPC to sell to other customers the allocated shares of the SEBs which do not comply with their agreements with NTPC. In cases where technical reallocation (by limiting availability of power to a particular SEB) cannot be implemented, commercial reallocation can be done. This can be done by limiting allocations to a defaulting SEB and charging a stiff penalty for drawals exceeding the reduced allocation (Part I, para. 12.4); and

c) As a result of the changes in the overall economic policy environment within which NTPC is operating, its financial policies need orientation. Under the circumstances, it would be appropriate to change the existing rate of return covenant into a self financing ratio covenant, because it would not only provide a better monitoring mechanism for NTPC's financial performance, but also provide better support to NTPC towards meeting its development challenges (Part I, para. 8.6).

The lessons drawn from this and previous projects implemented by NTPC have been used in the preparation, appraisal and negotiations of the NTPC Power Generation Project, which was approved on June 29, 1993:

a) GOI has adopted new investment and commercial policies and electricity tariffs allowing NTPC to shut-off or restrict power supply if its clients are in default with their bulk supply agreements. These policies are designed to introduce better commercial discipline at SEBs, along with improving NTPC's own operational and financial performance, including improving revenue collection (para. 12.3);

b) NTPC has agreed with the Bank on an internal cash generation covenant (para. 8.6);

c) GOI established POWERGRID to: (i) improve the efficiency in power transmission and systems operations, through an extensive restructuring of the transmission sector; and (ii) complement its policy initiatives to encourage private generation and competition in power generation (para. 2.6); and

d) The Bank and NTPC agreed on standard bidding documents whose use would curtail the procurement period (para. 5.7).

The last two points were also taken into account under Loan 3577-IN for the POWERGRID System Development Project.

PROJECT COMPLETION REPORT

INDIA

CENTRAL POWER TRANSMISSION PROJECT
(LOAN 2283-IN)

PART I: PROJECT REVIEW FROM BANK'S PERSPECTIVE

1. Project Identity

Name	: Central Power Transmission
Loan No	: Loan 2283-IN
RVP Unit	: South Asia Region
Country	: India
Sector	: Energy
Sub-sector	: Power

2. Project Background

2.1 In India, the responsibility for electricity supply is shared constitutionally between the Government of India (GOI) and the states. In addition, India is one of the few developing countries with a vibrant, if small, private sector presence in public power supply. At independence, private utilities and licensed local authorities, located in urban areas, provided about 80% of public electricity supply. GOI opted to embark on an ambitious electrification program to support the development of power-intensive industries for a rapid industrial development and expansion of irrigation. The Electricity (Supply) Act of 1948 (the Act) created the state electricity boards (SEBs) and entrusted the state governments and the boards with primary responsibility for public power supply. The coordination of SEBs' activities within the national power development policy, and the formulation of longer-term plans for power development is the responsibility of Central Electricity Authority (CEA), established in 1950.

2.2 Between 1960 and 1980, power demand grew twice as fast as the economy, and the generating capacity increased almost five-fold from about 5,600 MW to about 32,000 MW. Yet, for the entire period the country faced power shortages, frequent power interruptions, wide variations in system frequency, and large drops in voltage at the consumer level because SEBs could not fulfill their responsibilities. Though set up as autonomous bodies, SEBs have been under the stringent control of their state governments in vital matters such as changes to tariffs and tariff structure, with the result that they have not developed commercial and financial disciplines, and their financial performance generally has been poor, to the extent of depending on the state governments for operational subsidies.

2.3 In mid-1970s, GOI reoriented its strategy in order to supplement efforts of SEBs in increasing installed capacity and establishing high voltage transmission networks. Emphasis was put on: (a) accelerating the development of the hydro power potential and large coal-fired power plants both at pithead and in the proximity of load centers; (b) improving the efficiency of thermal power plants and reducing losses in the transmission and distribution

networks; (c) expanding the rural electrification program; and (d) strengthening the organizational and management capabilities of the SEBs.

2.4 GOI established in 1975 two power generating companies, the National Thermal Power Corporation (NTPC) and the National Hydroelectric Power Corporation (NHPC) to construct and operate large thermal and hydro power stations and associated transmission systems. The rapid increase in generation necessitated to expand the transmission networks and also to increase the voltage level to handle the transfer of large blocks of power from generating stations to load centers. Simultaneously, for the first time a need was felt for power planning and development on a regional basis to ensure the optimum utilization of natural resources which are rather unevenly distributed over the country and also for enhancing the reliability and security of the power transmission systems. The country was divided into five contiguous regions (Northern, North Eastern, Eastern, Western and Southern) with a view to build regional integrated grids. Regional Electricity Boards (REB) were established to integrate the operations of each grid through regional load dispatch centers and to improve collaboration among the SEBs.

2.5 By the time the Central Power Transmission Project was appraised in October 1982, IDA/Bank had financed under nine operations implemented by NTPC, 6,800 MW of pithead coal-fired thermal power plants (TPPs) in four sites (Singrauli, Korba, Ramagundam and Farakka) and associated transmission lines to evacuate the power generated at these power stations into the networks owned and operated by SEBs. The project was the 31st Bank/IDA operation in the sector, and tenth operation with NTPC. As in the previous NTPC projects, India, acting by its President, was the borrower and NTPC the implementing agency. The project was developed from studies conducted by CEA with assistance by Teshmont Inc. consultants from Canada.

2.6 In 1989, GOI established the National Power Transmission Corporation Ltd. (NPTC) to improve the efficiency in power transmission and systems operations, through an extensive restructuring of the transmission sector, and complement its policy initiatives to encourage private generation and competition in power generation. On August 16, 1991, the management of the transmission assets (operation and maintenance of the assets in service and implementation of those still under construction) of NTPC, including the Project, was transferred to NPTC, under a Management Contract signed between the two Corporations. Subsequently, two other GOI-owned utilities (NHPC and the North-Eastern Electric Power Corporation - NEEPCO) which had transmission lines and substations in operation or under construction, signed similar management contracts with NPTC. NPTC was later named Power Grid Corporation of India Ltd. (POWERGRID). On January 8, 1993, an Ordinance providing for all the rights, titles and other interests related to the transmission systems of NTPC, NHPC and NEEPCO, to be transferred to POWERGRID, with effect from April 1, 1992, was promulgated by the President of India. The Bank supports the establishment and development of POWERGRID under the US$350 million Loan No. 3577-IN for the POWERGRID System Development Project, approved on March 23, 1993. At the time of preparation of this PCR, the Bank was working on the finalization of the modifications on the Development Credit, Loan and Project Agreements to formalize the transfer of the Bank loans and IDA credits from NTPC and NHPC to POWERGRID, retroactively with effect from April 1, 1992. With regard to Loan 2283-IN, assets and liabilities for about US$3.4 million remained with NTPC and assets and liabilities for about US$128.1 million have been transferred to POWERGRID. The amounts will be finalized after accounts between NTPC and POWERGRID are settled.

3. Project Objectives and Description

3.1 Project Objectives. The primary objective of the project was to support GOI's strategy to extend and improve power supply through the establishment of centrally owned regional grids and intra-regional connections leading to the promotion of a national grid. To attain this objective, the project provided for:

(a) an increased capacity of power transmission system from NTPC's Ramagundam TTP in the Southern Region, in order to ensure optimal utilization from the installed thermal and hydro capacities in this region;

(b) a strong power transmission tie between the predominantly hydro-based Southern Region and the predominantly thermal-based Western Region; and

(c) an asynchronous inter-tie between the Northern and the Western Regions in order to permit larger exchanges of power between the two regions to meet the growing system demands while ensuring stability of the systems.

As in the previous Bank-financed projects with NTPC, another objective was to improve, in the long run, the operational, institutional and financial performance of the State Electricity Boards (SEBs), by assisting in the development of a financially sound, and technically and institutionally competent centrally-owned power utility which would serve as a model to SEBs.

3.2 Original Project Description. The project, as approved by the Board on May 19, 1983, is detailed in Annex 1 and comprised:

(a) construction of 548 km of double circuit and 564 km of single circuit 400 kV transmission lines;

(b) construction of three new and extension of five 400/220 kV substations associated with the lines mentioned in (a);

(c) construction of a 2x250 MW capacity "back-to-back", high voltage direct current (HVDC) substation at Vindhyachal TPP to provide an asynchronous interconnection between the Northern and the Western Regions;

(d) technical services, for detailed equipment and system engineering and construction supervision of the HVDC back-to-back interconnection;

(e) installation of metering, instrumentation and communication facilities; and

(f) installation of power line carrier communication equipment for voice transmission, line protection and data transmission on each 400 kV transmission line.

3.3 Revised Project Description. After the loan and project agreements were signed, GOI obtained financing for the HVDC back-to-back

station from Sweden. The Bank welcomed this co-financing and at GOI's request, agreed, on January 23, 1985, to reallocate loan funds and thus amend the project description. In 1984, the construction of two large thermal power plant projects (Manguru and Vijayawada projects) to be built in the Southern Region were deferred beyond the Seventh Plan. In addition, CEA and NTPC wanted to avoid forest land and ensure optimum utilization of the facilities with respect to the revised demand and supply scenarios[2]. After protracted discussions between the Southern Region SEBs and NTPC, and with the involvement of CEA, a new transmission system configuration was proposed. Therefore, the project components to be built in the Southern Region (major portion of Parts a and b of the project - para. 3.2) underwent major revision. The proposed changes were found by the Bank technically acceptable and justifiable on the basis of the long-term development of the Southern Region. The Bank thus agreed on the new scheme on November 16, 1986. However, GOI finalized the scheme only in August 1987. The final project description is detailed in Annex 2 and summarized as follows:

(a) construction of 184 km of double circuit and 1,229 km of single circuit transmission lines; and

(b) construction of four new and extension of seven 400/220 kV substations, and of one new switching station associated with the lines mentioned in (a).

Parts (c)-(f) of the project were not amended. The new project description was still within the overall objectives of the project as originally approved by the Board. Thus the Management considered that the approval of the Board for the said changes was not necessary.

4. Project Design and Organization

4.1 Project Design. Unlike the previous Bank operations with NTPC, where the loans were made for the construction of power generation plants and for the associated transmission lines to evacuate the power generated, this project was solely to strengthen the transmission system. NTPC had already acquired adequate experience in the area of 400 kV transmission line and substation design and engineering during the construction of the transmission lines and substations associated with the Singrauli, Korba, Ramagundam and

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[2] Changes in the supply scenario came from GOI's decision to delay the Manguru and Vijayawada power projects beyond the Seventh Plan, due to environmental, resettlement and rehabilitation problems (for the Manguru project) and lack of financial resources. Changes in the demand scenario came from higher priority being allocated to small scale industry and to rural electrification. The Ramagundam-Manguru-Vijaywada transmission line was re-routed via Khammam to minimize the passage through the forests, where Manguru is located. The Vijaywada-Nellore-Red Hills (near Madras) coastal transmission line was discarded because of the severe cyclonic conditions in that area, which would have placed a high risk of damage to the envisaged coastal line.

Farakka power plant projects[3]. The basic and detailed engineering work for the 400 kV transmission lines and substations was carried out by NTPC in-house. The detailed engineering of the HVDC back-to-back transmission link component was carried out by NTPC in cooperation with ABB, Sweden, the equipment supplier. NTPC carried out the preparation of specifications, bidding documents, bid evaluation reports and construction supervision of all the components of the project. To ensure smooth implementation, the execution of the project required co-ordination with a number of major agencies including beneficiary SEBs. This coordination was not always without problems (para. 5.2).

4.2 Project Organization[4]. At the time of appraisal, NTPC had already adopted its current three-tier organizational structure at corporate, regional and project levels. The Corporation is headed by a Chairman and Managing Director (CMD), who is assisted by five full time functional directors, namely, Director (Projects), Director (Operations), Director (Technical), Director (Finance) and Director (Personnel). At the Corporate Office, corporate planning and central procurement functions are headed by Executive Directors reporting to the CMD. For the purpose of the administration and execution of work at the sites, the Corporation is divided into five regions (Northern, Western, Eastern, Southern and National Capital Regions) with headquarters at present located at Allahabad, Nagpur, Patna, Hyderabad and Delhi, respectively. These regions are under the control of Regional Executive Directors who are responsible for the implementation, operation and maintenance of power plants in their respective regions. Each power plant is headed by a General Manager[5]. The structure has shown the advantage of optimizing the span of control of the CMD and provided for the decentralization of line responsibility while retaining centralized systems in areas such as long-term planning, basic engineering, procurement of critical equipment and spares, quality assurance, co-ordination with the World Bank and other financing agencies and inspection. Various parts of the Project were located in the Northern, Western and Southern regions and were managed by the respective regional offices.

5. Project Implementation

5.1 Loan Effectiveness. Loan 2283-IN was approved on May 19, 1983; the Loan and Project Agreements were signed on June 8, 1983. It was expected that the loan would be declared effective by September 9, 1983. Signing of a Subsidiary Loan Agreement between GOI and NTPC, satisfactory to the Bank, and of bulk supply contracts between NTPC and the SEBs for the sale of electricity from the Bank financed Singrauli and Korba power plants, were conditions for loan effectiveness. The Subsidiary Loan Agreement was provided on time. However, delays were experienced in finalizing contractual arrangements with

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[3] All these coal-fired power plant projects were partly funded under IDA credits and Bank loans.

[4] As NTPC was the legal implementing agency of the project during the life of Ln. 2283-IN, NTPC's project organization and management is reviewed in this section.

[5] Until August 16, 1991, NTPC's regional transmission units were also headed by a General Manager (para. 2.6).

SEBs. This had been originally a condition for loan negotiations but subsequently was made a condition for loan effectiveness. The delays led to postponing twice the loan effectiveness date eventually to March 1984. By that time, NTPC could only sign Memoranda of Understanding (MOU) with the concerned SEBs. The Bank noted some deficiencies[6] in these MOUs, but concluded that they fulfilled the purpose of providing an agreement between NTPC and the relevant SEBs and other institutions[7], covering the sale of electricity from the Singrauli and Korba power plants. The loan was declared effective on March 29, 1984, a delay of 6 1/2 months from the date of effectiveness originally determined at signing.

5.2 Project Start-up and Implementation Schedule. At appraisal, the project was expected to be completed by March 31, 1988. The construction of the HVDC back-to-back station proceeded satisfactorily. The station which was projected to be commissioned in March 1988, was put into service in end 1987. On the other hand, NTPC could not proceed with the implementation of the 400 kV transmission lines and substations in the Southern Region (major portion of the Project) until firm agreements were reached with the Southern Region SEBs on the cost recovery arrangements for the transmission facilities to be built

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[6] The deficiencies found by the Bank were summarized as: (i) short remaining validity period of the MOUs, to March 1985; (ii) lack of fixed commitment charge for the SEBs; (iii) lack of definition for profits in tariff calculation; and (iv) lack of calculations of flat rate, variable energy price and transmission charge. NTPC's comments on the above are: (i) MOUs were valid from February 1982 to March 1985; (ii) No commitment charges were provided as NTPC was not in a position to assure delivery of shares to SEBs. The tariff in Rs./kWh basis enabled NTPC to earn higher returns as the actual levels of operation were above the normative levels. Absence of fixed commitment charges did not in any way prove detrimental to NTPC's interests; (iii) Profit by way of return on equity was included in the tariffs as an element of fixed charges; and, (iv) Although the calculations did not form part of the MOUs, the tariffs were based on detailed calculations based on the principles and parameters mentioned in the MOUs.

[7] Delhi Electric Supply Undertaking (DESU) and the Department of Power of the Union Territory of Goa.

under the Project[8]. In the meantime, the generation and transmission plans for the Southern Region and the description of the project were modified (para. 3.3). The SAR envisaged that the bid documents for the first contracts for all the transmission lines (contract packages for the supply and erection of the line towers) would be issued at the latest by September 1983 and the contracts would be awarded by June 1984. The bid documents for these packages were issued in April 1987[9], and the first contract was awarded in March 1988 (four years ten months from Board approval).

5.3 Implementation Process. Once project implementation got under way, there were some delays but these were not of significance - minor delays occurred in the design and fabrication of tower parts for Ramagundam-Khammam line, and supply of some 400 kV circuit breakers. The design, procurement and installation of the metering, instrumentation and communications equipment (para. 3.2, Items d, e and f) were not given the importance they deserved and their commissionings were delayed substantially to 1990-1992.

5.4 Extensions of the Closing Date. The loan was scheduled to be closed on March 31, 1989. Implementation of the project components financed under the loan was really begun in April 1987, almost four years from Board approval. While agreeing to GOI's request to revise the project, the Bank recognized that extension of the loan closing date would be required. A supervision mission estimated in January 1989 that the revised project would only be completed by March 1992, and that completion of the payments would require the extension of the closing date to 1993. However, the Bank reserved the right to review progress under the project and extend the closing date when necessary. The Bank carried out these reviews annually and agreed extending the closing date by one year each time, for a total of 36 months to March 31, 1992. In the meantime, in March 1991, in an effort to accelerate disbursements under the project, the Bank also agreed in principle to finance items of equipment totalling US$27.2 million that were originally planned to be financed by NTPC. The Bank did not extend the closing date of the loan beyond March 31, 1992, but informed GOI that it would be willing to consider to include funding the completion of the ongoing contracts retroactively under the POWERGRID System Development Project. The latter project was approved by

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[8] Even before project negotiations, some of the Southern Region SEBs had questioned NTPC on the utility or the benefit to themselves from the transmission lines being set up under the Ramagundam project, and manifested significant reluctance to agreeing to pay NTPC for the transmission line charges for those lines constructed under the said Ramagundam Project. The discussions/negotiations between NTPC and Southern Region SEBs became protracted partly because these SEBs had not dealt before with a centrally-owned utility in terms of sharing the power generated from the plant, and the cost of that power. It took about four years for the parties involved to develop a consensus on NTPC's tariffs. Although NTPC commented that the last agreement for the Southern Region was signed in April 1985, Bank's files show that this was an issue until the March 22 - April 7, 1987, supervision mission.

[9] It should be noted that at that time, GOI had not yet granted its full clearance for the new transmission development scheme, which it did in August 1987.

the Board on March 23, 1993 (Loan 3577-IN; para. 2.6) and includes US$23.2 million for the completion of the contracts of the Central Power Transmission Project. Disbursements for these expenditures under Loan 3577-IN would be completed during FY94.

5.5 Procurement. The equipment and materials financed under the loan were split into 71 packages, most of which were procured under international competitive bidding (ICB) procedures in accordance with Bank guidelines. Contractors who supplied transmission line tower structure were in charge of the erection of the towers, insulators and hardware, and stringing of the line conductors, on a supply and erect basis. Suppliers of main equipment for the substations were also in charge of the erection of the substations. NTPC procured, always under ICB, the conductors, line material such as insulators and hardware and the electrical equipment including metering and instrumentation and had these equipment erected by the above mentioned contractors. The relatively large number of contracts and the above forms of packaging created a significant workload on NTPC as well as Bank staff to monitor and supervise these contracts. However, the above two characteristics helped NTPC staff to acquire valuable experience in preparing contract documentation, reviewing and evaluating bids, and in managing the engineering of the project, since they were responsible for proper interfacing of project materials and equipment from different suppliers. Most of the said NTPC staff have been transferred to POWERGRID. However, it is noted that the above procurement system applied by NTPC, which required drawing up of specifications for tenders, preparation of bidding documents and carrying out of bid evaluations swamped NTPC staff who at one point had to handle some 1,200 contracts valued at over US$1 billion. On the other hand, dividing the project material/equipment into numerous contract packages, promoted participation from a range of large and medium sized local manufacturers/ suppliers which, in turn, has contributed to the development of local manufacturing industry.

5.6 Of the 71 contracts (total value: US$169 million equivalent) put out for ICB, 12 contracts (valued at US$31 million or about 18% of the total) were awarded to foreign manufacturers/suppliers. Of the two highest value contracts (both for the supply of conductors) one was awarded to a local and the other to a foreign manufacturer/supplier. The local industry was fairly competitive where the size of contract packages was within its manufacturing and/or supply capability. NTPC followed its practice of specifying the qualification requirements of the prospective suppliers on the bidding documents; this was not objected to by the Bank and worked reasonably.

5.7 For all contracts estimated to cost over US$2.5 million equivalent, NTPC submitted for Bank's review and comments the bidding documents and evaluation reports. Bank files show that there were delays in procurement, and on some occasions there was need to amend the bid documents, and also to re-bid in some cases. Based on the available documentation, the average time taken from bid opening to the award of the contract (including Bank acceptance of the proposed award) was generally less than nine months. In an effort to speed up procurement, standard bidding documents will in the future be used by NTPC and POWERGRID. Under the NTPC Power Generation Project[10] and Loan 3577-IN for the POWERGRID System Development Project, NTPC

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[10] This project was approved on June 29, 1993.

and POWERGRID respectively agreed on standard bidding documents, whose use would reduce the procurement period substantially. NTPC and POWERGRID would also give further emphasis to finishing promptly the payments for the contracts, so that the closing dates of new loan(s) would not need to be extended.

5.8 Project Costs (Part III, Table E). The total cost of the original project, including contingencies, taxes and duties, was estimated in the SAR at about Rs. 5,864 million (US$617.3 million equivalent). The actual cost of the revised project was Rs. 5,423 million (US$264.4 million equivalent). In US dollar equivalent, the actual project cost was substantially lower than the appraisal estimate because of the substantial devaluation of the Rupee from Rs.9.5/US$ at appraisal to Rs.25/US$ in March 1992, when the loan was closed. During the implementation period, the weighted average rate was Rs.20.5/US$. While inflation increased project costs in local currency, the devaluation resulted in the loan proceeds generating a substantially larger amount in local currency than had been expected. Despite the inflation, in current Rupee terms, the actual project costs were slightly lower than the appraisal estimates. Although a detailed and realistic cost comparison between the appraisal estimates and the actual costs is not possible due to the major changes to some of the transmission lines and the associated substations, it is concluded that costs at appraisal were overestimated.

5.9 Project Financing. The financing plan was changed substantially. The plan estimated at appraisal and the actual plan are summarized in the following table.

Financing of the Project

Sources	SAR		Actual /a	
	(US$ million)	(%)	(US$ million)	(%)
- Bank Loan	250.7	41	131.5	50
- GOI (as Equity and Loan)	366.6	59	73.8	28
- Credit from Sweden	-	-	59.1	22
Total	617.3	100	264.4	100

/a Excludes US$23.2 million to be disbursed under Loan 3577-IN (para. 2.6).

5.10 Disbursements. The estimated and actual disbursements, and the original and revised allocation of the loan proceeds are given in Part III, Tables E and F, respectively. Due to the fact that the HVDC substation was hived off from Bank financing and the hiatus in the implementation of the lines and substations led to virtually no disbursement of loan proceeds through end 1986. By the time of the original closing date (March 31, 1989), cumulative disbursements were only US$40.5 million, 16% of the original loan amount. The closing date of the loan was extended three times by one year each, to March 31, 1992 (para. 5.4). In December 1991, US$50 million of savings arising mainly of exchange rate variations were cancelled from the loan amount. The loan was closed on March 31, 1992; disbursements were completed on September 8, 1992. The undisbursed balance of US$69.2 million was cancelled on that date. Thus disbursements under the loan were US$131.5 million. India began repaying the proceeds of the loan on September 1, 1988,

and will continue to do so until March 1, 2003. It is noted that by the time the loan was closed, India had already repaid US$64,666,000, almost half of the loan amount utilized.

6. Environment, Resettlement and Rehabilitation

6.1 The project did not create any significant environmental and resettlement and rehabilitation problems. NTPC selected the line routings so as to minimize infringement on forest land. Where trees had to be felled in order to provide access to the lines, trees of a corresponding number were planted in the vicinity. The question of relocation of people affected by the project did not arise because transmission line routes and substation sites were selected in un-inhabitated areas remote from the population centers.

7. Physical Results

7.1 Project Objectives. Overall, the project has achieved its objectives (para. 3.1). The project has been the first major component in the establishment of centrally owned regional grids and intra-regional connections. The power transmission capacity in the Southern Region has been increased in a manner which helps optimal utilization of the installed thermal and hydro capacities in this region and permits for exchanges between the Southern and Western Regions. The asynchronous interconnection between the Northern and the Western Regions is currently used for limited exchanges of power between the two regions and helps the stability of the systems. The project contributed in making NTPC an efficient utility but failed in its sectoral objective in inducing improvements in the operational, institutional and financial performance of SEBs, as seen in the disappointing operational, financial and institutional performances of many SEBs. It is not clear how, if any, NTPC's institutional development helped those performing SEBs, such as the Maharashtra and Andhra Pradesh SEBs whose transmission networks were strengthened by this project. The failure in obtaining improvements at SEBs while supporting the development of NTPC as a model utility can be traced to the fact that the Bank had not fully appreciated the extent of the interference by the state governments in the affairs of SEBs (para. 12.4).

7.2 Physical Results. The individual components of the revised project were commissioned at various dates given in Part III, Table D. The 2x250 MW HVDC component was commissioned in end 1987, compared with the appraisal estimate of March 1988, and has been providing for power exchanges between the Northern and Western Regions (each block of 250 MW is capable of operating independently in either direction). The lines and substations in the Southern Region were, at appraisal, projected to be commissioned during the June-December 1987 period. These lines and substations which were delayed awaiting agreement from the SEBs (para. 5.2) and suffered from NTPC's overload in processing contract documents (para. 5.5), were actually commissioned between May 1991 and March 1992.

7.3 Since their commissioning, the project components have in general functioned satisfactorily. The problems which did arise were invariably of a minor nature and were resolved without seriously affecting the transmission of power. The availability of the individual components has been almost 100% in 1992 (Annex 3). However, the average daily power transmitted through some of the lines is short of its design capacity. The reasons for this underutilization are: (i) suboptimal operation of generating plant on a

regional basis; and (ii) indifferent or unresponsive generation tariff structure. Generation plants are not operated optimally because individual SEBs do not observe cost merit order in power generation. The tariff structure in effect up to November 1992 did not encourage merit order plant dispatch in the regional grids. The actual NTPC tariff in application since November 1992, is on two part basis as per the recommendations of GOI's K.P. Rao Committee. This tariff is conducive to the introduction of merit order operation. POWERGRID is pursuing further tariff improvements in transmission. Assistance is being provided under Loan 3577-IN.

7.4 The Ramagundam-Chandrapur double circuit line linking the Southern and Western Regions was intended for use mainly during emergencies in either region. Only one circuit is presently in regular use carrying power (which is only a fraction of the line's load carrying capacity) from the Western Region directly to some of the northern areas of Andhra Pradesh in the Southern Region. The construction of an asynchronous tie (HVDC back-to-back station similar to the one implemented under the project) to be built at Chandrapur is being examined by POWERGRID to help effect large exchanges of power between the two regions in the future and the loading of the Ramagundam-Chandrapur line will increase. When commissioned, this inter-tie will increase the loading of the Chandrapur-Ramagundam double circuit lines.

7.5 The 400 kV transmission system under the project was intended to improve voltage levels and carry electric power over long distances with low losses. However, in practice voltages in the systems drop sometimes to well below the permissible limits (as low as 300 kV). This problem affects adversely those SEBs which are further away from the sources of generation, and is due to the SEBs nearer the generation sources who draw higher reactive power (MVARs) from the 400 kV systems. Ways to rectify the situation are for SEBs either to install shunt capacitors or to make it obligatory and enforce the installation of capacitors on all large motors, including irrigation pump motors. Five major grid failures were reported in the Southern Region during the period November 1991 to January 1993. In every one of these occasions, low voltages were prevailing in the regional grid, because SEBs were drawing unusually high MVARs over the 400 kV network. The problem was aggravated because of low generation in certain states. However, NTPC/POWERGRID 400 kV network worked satisfactorily during this period and did not contribute to the grid failures.

8. NTPC's Financial Performance

8.1 NTPC started its commercial operation in February 1982, a few months prior to the appraisal of the project. From 1982 to the present, NTPC's financial performance has been satisfactory, except for the large accounts receivable (para. 8.2). NTPC's financial statements for the period FY85 to FY92 are given in Annexes 4.1-4.3 and a summary for the last five years is given in Table 8.1 below. NTPC's operating data reflect the growth the Corporation experienced since 1982. Key financial parameters, e.g., assets in operation, revenue from electricity sales, total operating revenues, and operating income before interest, increased some five-fold since 1987. The rate of return on net average fixed assets (historically valued) for this period was high, generally around 15% (between 13% and 17%), well in excess of the 8% between FY85-FY90 and 9.5% starting from FY91, as was stipulated in the project agreement.

Table 8.1

KEY FINANCIAL INDICATORS

	1985	1986		1987		1988		1989		1990		1991		1992	
	Forecast	Actual	Forecast	Actual	Forecast	Actual	Forecast	Actual	Forecast	Actual	Forecast	Actual	Forecast	Actual	Forecast	Actual
Electricity Sales (Gwh)		8,316	11,492	12,839	13,446	14,408	17,922	17,533	25,934	24,875	35,451	35,421	43,963	40,306	48,759	56,657
Incr. in Elec. Sales				4,523	1,954	1,569	4,476	3,125	8,012	7,342	9,517	10,546	8,512	4,885	4,798	16,351
Elect. Sales Revenue		3,077	4,421	4,829	5,365	5,736	7,257	7,201	10,715	11,460	15,103	16,376	19,317	21,254	22,080	34,347
Incr. in Sales Rev.				1,752	944	907	1,892	1,465	3,458	4,259	4,388	6,916	4,214	2,878	2,783	13,093
Total Operating Revenue	3,210	3,438	4,864	5,294	5,972	6,453	8,145	8,622	12,122	12,748	17,264	20,573	22,363	24,207	25,919	39,928
Incr. in Oper. Rev.				1,856	1,108	1,159	2,173	2,169	3,977	4,126	5,142	7,825	5,099	3,634	3,556	15,722
Accounts Receivable	246	1,626	368	2,284	447	2,828	605	4,058	893	5,981	1,259	11,561	1,610	15,102	1,840	16,086
Incr. in Acc. Recev.			122	658	79	544	158	1,230	288	1,923	366	5,580	351	3,541	230	984
Accounts Receiv. (no of Days)	28	170	27	155	27	158	27	169	27	169	26	202	26	225	26	145
Current Ratio		1.0	5.0	1.6	5.2	1.6	5.7	1.7	5.1	1.8	4.7	1.8	4.2	1.9	4.1	1.5
Rate of Return (%)				17%	9%	17%	7%	16%	8%	15%	7%	15%	10%	13%	11%	15%
Operating Ratio (%)				56%	54%	55%	57%	55%	63%	59%	60%	61%	58%	60%	56%	60%
Contribution to Const. (%)				-1%	9%	10%	9%	40%	12%	-2%	24%	19%	33%	17%	51%	28%
Debt Service Coverage (times)				4.9	2.0	4.0	1.5	3.9	1.4	2.4	1.3	2.5	1.4	2.5	1.5	2.4
(a) Cash and Bank Balance	11	84	13	448	19	134	35	5,973	45	2	53	291	56	684	58	1,742
(b) Ave. Monthly Cash Oper. Exp.	142	148	221	214	204	256	300	344	464	554	645	931	813	1,027	922	1,709
(c) Ratio (a)/(b)	0.08	0.56	0.06	2.09	0.09	0.52	0.12	17.34	0.10	0.00	0.08	0.31	0.07	0.67	0.06	1.02

8.2 Bill collection and accounts receivable have been persistent problems for NTPC, because of the poor financial situation of many SEBs. NTPC's accounts receivable increased at a far greater pace than its revenues and operating income in successive years. The receivables, which represented some 5.2 months of billing in 1987, steadily increased to 7.5 months in 1991, compared to less than one month (27 days) projected in the SAR for the entire period. A covenant specifying the level of accounts receivable not to exceed an amount equivalent to the proceeds of its sales of power for the two preceding months, was first introduced for NTPC under Loan 2555-IN for the Rihand Power Transmission Project approved in May 1985, with effect from the end of FY86. The covenant was repeated in three subsequent Bank loans[11], but NTPC has never been able to comply. In 1991, the increase in accounts receivable (over 1990) was some Rs 3.53 billion, while the corresponding increases in electricity sales revenue and in total operating revenues were Rs 2.88 billion and Rs 3.63 billion respectively; in practical terms, NTPC collected virtually no additional revenue in FY91, even though it sold an additional 4,800 GWh of energy. In 1986, NTPC internal cash generation barely met its debt service requirements and the increase in working capital (Annex 4.2). A liquidity crisis was averted by the cash received by NTPC from its first issue of medium-term bonds. Since then NTPC has been issuing such medium-term bonds every year, mostly to help finance the expansion of its facilities. The level of its accounts receivable have also been increasing every year in absolute terms as well as a percentage of its annual billings. The funds raised from these bonds have helped NTPC to bridge finance its increasing working capital requirements.

8.3 Increasing bill collection and accounts receivable problems led to several interventions by GOI on behalf of NTPC during the period FY88 to FY92. At each of these interventions, GOI assumed the responsibility to clear some of the arrears from SEBs by transferring to NTPC corresponding amounts from its allocations to the respective states. Such payments are carried out over a period of four years. In February 1992, NTPC acquired the Unchahar power station in lieu of arrears of the Uttar Pradesh SEB. As indicated in Table 8.1 above, NTPC has received over Rs 11 billion from the transfers through the central appropriations from 1988 to January 1993. Combined with other bill collection efforts, NTPC was able to reduce its level of accounts receivable despite the rapid increase in sales. At the end of FY93, the overall level of accounts receivable was 3.3 months of sales equivalent, but excluding the amount still to be paid through the central appropriations, it was 1.4 months of sales equivalent. More encouraging is that during the last three months of FY93, 93% of billing was realized directly from the SEBs. During the negotiations of the NTPC Power Generation Project, agreement was reached that NTPC would maintain the level of its accounts receivable at two months of sales equivalent excluding the amount still to be paid through the central appropriations for which a specific payment schedule was also agreed.

8.4 GOI's interventions through the central appropriations helped NTPC avert financial crises and resolve, for limited periods, its accounts receivable problem. These interventions aimed at having NTPC operate efficiently, thus keep the electric energy supply in the country at an

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[11] Ln. 2674-IN for the Gas Based Combined Cycle Power Project (FY86); Ln. 2844-IN for the National Capital Power Project (FY87); and Ln. 2845-IN for the Talcher Thermal Power Project (FY87).

adequate level. It is doubtful that GOI's actions have resulted in SEBs improving their operational efficiency as well as their billing and collection practices from their own customers. What is equally important, but so far received little attention, is the need for energy conservation on the customer (SEBs) side through adoption of appropriate tariffs and tariff structure at SEBs and through end-use efficiencies.

8.5 The accounts receivable as of March 1990 were about Rs 11.5 billion (some US$500 million equivalent, and represented over six months of current billings). It was around the same time that the Bank took the exceptional step of cancelling the processing of a loan of US$375 million to NTPC for a project which had already been negotiated, primarily because of the inability of NTPC to reduce its accounts receivable. Since October 1992, GOI adopted new investment and commercial policies and electricity tariffs for NTPC. They are designed to introduce better commercial discipline at SEBs, along with improving NTPC's own operational and financial performance, including revenue collection. New two part bulk supply tariffs for NTPC coal fired stations became effective in November 1992. Further reforms in bulk power and transmission tariffs will be studied and implemented under Loan 3577-IN. The process of establishing commercial contracts between the SEBs and the central utilities is cumbersome, but progress is being made with strong Bank support under Loan 3577-IN and the NTPC Power Generation Project. The new commercial policies and bulk power supply agreements should enable NTPC to reach a level of bill collection close to 100% during FY94.

8.6 The legal documents of the Loan adopted a sole covenant on NTPC's financial performance, the conventional rate of return (ROR) on average historic fixed assets in operation. An important objective of this conventional ROR indicator is to serve as a measure of the adequacy of revenues compared to the cost of capital. Therefore, it has more appropriate application with mature utilities, and where the investment, which is not included in the rate base, is a fraction of the utility's net fixed assets in operation (or the rate base). Table 8.1 indicates that throughout the entire project implementation period i.e., FY84-FY92, the projected "Works in Progress" (WIP) was a substantially high proportion of the rate base; through 1987, WIP was higher than the Gross Assets in Operation; for practical purposes the rate base was insignificant relative to the annual investment. A utility could well have a very high rate of return performance but be faced with liquidity crisis, and the computation of other standard financial indicators such as operating ratio would not provide meaningful information[12]. One could, readily conclude that such a performance indicator was not appropriate for NTPC at the time. A more appropriate financial indicator under such circumstances is "contribution to the investment", because it targets at generating from internal sources a pre-determined level of funds towards the on-going investment after taking into account debt service and working capital requirements. Under the NTPC Power Generation Project, NTPC agreed that it would produce, starting from FY95, funds from its internal cash generation equivalent to not less than 20% of its capital expenditures on a three-year moving average. The amount for FY94 would be 15% of the average of NTPC's capital expenditures for the FY93-FY95 period.

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[12] The most recent analysis of NTPC's finances is given in the SAR for the NTPC Power Generation Project (Report No. 11827-IN; Dated June 4, 1993).

9. Compliance with Loan Covenants

9.1 The key institutional and cost recovery covenants introduced in the Loan and the Project Agreements and the extent they were complied with are listed in Part III, Table H.

10. Sustainability and Internal Economic Rate of Return

10.1 The project is sustainable, even though at present its components are not yet being fully utilized (paras. 7.3 and 7.4). Sustainability is certainly assured for the future, as the facilities built under the project are integral components of POWERGRID's system development program. However, insufficient generation and transmission tariffs and an unchecked increase of NTPC's and POWERGRID's accounts receivable could endanger such sustainability. The Bank, GOI, NTPC and POWERGRID have been taking actions to avoid such occurrence (paras. 8.5 and 8.6).

10.2 Because of the changes agreed by the parties on the project description, it is not possible to make a reasonable comparison between the internal economic rate of return (IERR) of the original and revised project scopes. The IERR for NTPC/POWERGRID's time-slice investments for the FY84-FY92 period has been estimated at 11%. Under Loan 3577-IN, the IERR for POWERGRID's time-slice investments during the FY93-FY2002 period was estimated as 22%. The difference is explained by improvements in tariff setting parameters[13] and the unusually high inflation encountered in India in late 1980s and early 1990s, which brought down tariff revenues in real terms (Part III, Table G).

11. Bank Performance

11.1 It is difficult to provide a judgement for a project whose description was substantially amended twice, albeit within its original objectives, and was really begun about four years from Board approval. The Bank might have cancelled Loan 2283-IN during the project hiatus in 1984-1987. But it might have lost an opportunity to influence transmission development in India. Instead the Bank opted to continue its dialogue with GOI, CEA, NTPC and POWERGRID on transmission system development and operations. The dialogue has culminated with the recent approval of Loan 3577-IN (para. 2.6).

11.2 On another front, the Bank opted not to suspend disbursements under loans to NTPC, when NTPC fell into default of the accounts receivable covenant and substantial arrears from SEBs began creating problems for this Corporation's financial position and overall future (para. 8.2). Although the accounts receivable covenant was not included in this Loan, the Bank had considerable leverage in refusing to extend the closing date after March 1989, particularly, if the Bank had invoked the accounts receivable covenants in other on-going projects with NTPC. The Bank decided to continue its dialogue to encourage GOI to adopt for NTPC new investment and commercial policies, and electricity tariffs. It alerted GOI and NTPC that the Bank's continued

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[13] The return on equity for projects started before FY90 was 10%; for those projects started in FY91 and FY92 it was 12%. The return has since been adjusted to 16% for future projects. Depreciation was also increased.

funding for their projects would no longer be possible unless actions to correct NTPC's finances are taken. In 1990, the Bank decided not to present to the Board the then-negotiated Regional Power Systems Project, because GOI and NTPC were unable to fulfill the conditions for Board presentation within a reasonable time period. Other multilateral and bilateral agencies followed the Bank in limiting their financing of NTPC projects. All these actions helped GOI to initiate reforms in the power sector and adopt new investment and commercial policies for NTPC. If the Bank had suspended disbursements, it might have lost another opportunity, this time to influence reforms in power generation. In view of GOI's, POWERGRID's and NTPC's recent actions prior to the approval of Loan 3577-IN and negotiations of the NTPC Power Generation Project, the Bank's above decisions bore their fruits.

11.3 Bank's supervision effort was concentrated mainly on the procurement issues, in which area the Bank provided valuable help to NTPC. It covered as well, other important areas such as physical progress including problems in implementation, in disbursements performance, etc. However, visits to the work sites by each mission could not be undertaken because each mission covered supervision of all Bank funded NTPC projects. It is concluded that the Bank's performance under the project was satisfactory.

11.4 Even though contracts amounting to about US$23.2 million equivalent were already committed (but not yet paid) under the project, and there were ample funds still available in the loan account on March 31, 1992, the Bank did not extend the closing date of the loan for a fourth time. Just a year before, the Bank had extended the loan for the third time without stating this was the last extension or any other conditions. At that time the Bank had also agreed on funding contracts which were originally to be financed by NTPC. This might have given GOI and NTPC the impression that the Bank was following the views of the January 1989 mission (para. 5.4). The Bank's 1992 decision not to extend the closing date came as a surprise to GOI and NTPC and increased NTPC's fiscal problems as the utility did not have the local and foreign funds to pay its suppliers and contractors on time. The Bank's action stemmed from (i) its more stringent implementation of the policy on the management of the closing dates; and (ii) its desire to have NTPC reach promptly, an agreement with POWERGRID on the transfer of the transmission assets.

12. Borrower Performance

12.1 The performance of NTPC in the technical and managerial activities was satisfactory. Bank missions have reported delays in preparation of specifications, bidding documents and bid evaluations, and in preparing its quarterly progress reports in a timely manner; these shortcomings, however, have been mainly due to the large workload of NTPC at the time and because the information needs to be collected from various sites which are located in

remote places[14]. The project provided continuing opportunity for NTPC to enlarge its skills and experience in procurement under ICB procedures, in designing the transmission systems and in supervising their implementation and construction. The PCR mission was advised that the services of NTPC staff, involved in implementation of the HVDC substation, were subsequently used by the supplier, on a consultancy basis, in the installation of HVDC substation in another country.

12.2 The only area where NTPC's performance fell considerably short of expectations was in bill recovery. Maintaining a specific level of accounts receivables was not a condition of this loan and it was only introduced in 1985 under Loan 2555-IN for the Rihand Transmission Project. Substantial arrears by SEBs affected NTPC's financial position adversely. NTPC maintained it had little recourse against the defaulting SEBs, because of its understanding that it could not cut off the power supply to the defaulting SEBs even if it wanted to. At present NTPC is carrying out more systematic and aggressive efforts at all levels of the organization (from the regional managers to the CMD) to obtain letters of credit from SEBs for the appropriate amounts of energy sales. These actions include seeking the intervention of the Minister of Power in order to collect dues from SEBs. GOI's new commercial policies and new bulk power supply agreements should enable NTPC to reach a level of bill collection close to 100% during FY94.

12.3 GOI has recently adopted new investment and commercial policies and electricity tariffs allowing NTPC to shut-off or restrict power supply if its clients are in default with their bulk supply agreements. These policies are designed to introduce better commercial discipline at SEBs, along with improving NTPC's own operational and financial performance, including improving revenue collection (para. 8.5).

12.4 There appears to be a difference in the positions of the Bank, GOI and the State Governments. The Bank's position is that the electricity industry provides a service which has to be fully paid for by each customer category (cross-subsidization permitted) through user charges. GOI seems to be moving towards the Bank's position as shown by the measures and incentives taken in recent years including recommendations to the state governments to increase tariffs. The states in general, appear to perceive (sometimes for political purposes) the provision of electricity as a social service and do not allow SEBs to operate independently and in line with commercial practices (para. 2.2). Furthermore, in an economy, where the public perception of a public utility often is to provide primarily a social service, the use of a profit criterion as the sole measure of the utility's financial performance is not generating adequate public support.

13. Performance of Consultants and Contractors

13.1 The performance of consultants engaged in the design and construction of HVDC and 400 kV facilities was satisfactory. There was a

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[14] Furthermore, after the transfer of the management of NTPC's transmission assets to POWERGRID, the information relating to the transmission system are collected from this Corporation. Stabilization of a proper coordination system between the two Corporations has taken some time.

positive transfer of technical know-how from these consultants to NTPC staff. Barring a few problems and some minor delays, overall the performance of the contractors/suppliers was also satisfactory. The packaging of contracts in appropriate sizes promoted participation from local manufacturing industry, and the Bank's and NTPC's involvements resulted in improvement in the quality of the product.

14. Project Relationship

14.1 A good working relationship was maintained between the Bank and GOI and NTPC, and later also with POWERGRID.

15. Project Documentation and Data

15.1 The project's legal agreements adequately reflected the objectives of the project and the Bank's interests. The staff appraisal report provided a relatively useful framework for the Bank and NTPC during project implementation. One of the weaknesses of the SAR was that it did not verify whether there was a full agreement and understanding on the part of the SEBs to pay for the transmission charges (paras. 5.1 and 5.2). Bank supervision missions appear to have been adequate in terms of their frequency. However, most of the missions had to supervise and/or prepare other projects. It is therefore likely that the missions were not able to make visits to some of project sites. Some of the important project documentation (e.g. supervision mission reports, aide-memoires), project progress reports and annual financial statements was not found in the Bank files.

PROJECT COMPLETION REPORT

INDIA

CENTRAL POWER TRANSMISSION PROJECT
(LOAN 2283-IN)

PART II: PROJECT REVIEW FROM BORROWER'S PERSPECTIVE

Comments by NTPC and Endorsed by the Government of India

A. Preface

1. The loan was made to India in May 1983 for on-lending to the National Thermal Power Corporation (NTPC). The two main objectives of the project were: (a) to support GOI's strategy to extend and improve power supply through the establishment of centrally owned regional grids and intra-regional connections leading to the promotion of a national grid; and (b) to improve, in the long run, the operational, institutional and financial performance of the State Electricity Boards (SEBs), by assisting in the development of a financially sound, and technically and institutionally competent centrally-owned power utility which would serve as a model to SEBs. On August 16, 1991, the management of the project was transferred from NTPC to National Power Transmission Corporation Ltd., under a Management contract signed between the two corporations. On January 8, 1993, an ordinance providing for all the rights, titles and other interests related to the transmission systems of NTPC to be transferred to POWERGRID (NPTC was later renamed as Power Grid Corporation of India) was promulgated by the President of India.

B. Comments on the Analysis in Part-I

2. The analysis made by the Bank under Part-I is comprehensive and has covered the important aspects. The analysis is generally in order. Nevertheless, there are certain issues which need to be further examined keeping in view the background of developments as they took place to better appreciate the events. These are as follows:

Project Start-up and Implementation Schedule (reference para. 5.2 of Part-I)

3. Actual dates of signing of BPSA (Bulk Power Supply Agreement) in Southern region are as follows:

APSEB	22.3.1985
KEB	21.3.1985
TNEB	22.3.1985
KSEB	10.4.1985
GOA	17.4.1985

Extensions of the Closing date (reference para. 5.4 of Part-I)

4. The Bank did not accept GOI's request to cover the expenditure on ongoing contracts under the savings available under other ongoing loans to NTPC after loan closing date till POWERGRID System Development Project loan

became effective. The continuity in Bank financing was sought on account of certain problems relating to the deemed export benefits to the contractors and also relating to the import license.

Procurement (reference para. 5.7 of Part-I)

5.1 In an effort to speed up procurement and after having extensive discussions, NTPC had finalized with the World Bank a standard bidding document in April 1992. However, the Bank withdrew its "No-Objection" to this standard bidding document in December 1992 and wanted certain modifications to be included. NTPC has now finalized standard bidding documents with the Bank based on the suggested modifications and further discussions. NTPC will use this document for procurement under the recently negotiated loan for NTPC Power Generation Project. This is expected to reduce the procurement time. Further, the proposed NTPC Power Generation Project, negotiated with the Bank in May 1993 would be under time slice concept which would help in bringing about timely disbursements.

5.2 NTPC has started giving further emphasis to finishing promptly the payments to the contractors.

Project Costs (reference para. 5.8 of Part-I)

6. It has been stated that "that costs at appraisal were over estimated". It is clarified that the basis of costing during the appraisal had been explained in the Staff Appraisal Report. It, inter-alia, states that the estimates for the main items of equipment and material are based on the quotations received since 1980 for similar projects such as the 400 kV links and sub-stations associated with Singrauli, Korba, Ramagundam and Farakka Power Plants with prices updated to mid-1982 price levels. On the other hand, the exchange rate changes have played a major role in bringing down the project cost in dollars terms.

Financial Performance (reference para. 8.2 to 8.5 of Part-I)

7. In the discussions on accounts receivable presented in Section 8 of the Part I, the Bank has included the amount due to NTPC by way of Central Appropriation in the accounts receivables. GOI has in the past ordered Central Appropriation of plan assistance funds to State sectors for offseting their dues to Central sector agencies like NTPC. Such amounts are being paid to NTPC as per agreed schedules and the Bank had been kept informed about the arrangement since August 1990. Considering that these were committed payments from GOI, the amounts were set off against the dues of the SEBs and NTPC's accounts receivable reduced by the total amount of Central appropriation.

As has been mentioned in para. 8.3, during the negotiations of the proposed NTPC Power Generation Project, agreement was reached that NTPC would maintain the level of its accounts receivable at two months of sales equivalent excluding the amount still to be paid through the Central appropriations for which a specific payment schedule was also agreed.

8. The Operations Evaluation Department of the World Bank conducted the performance audit of few Bank-funded projects, namely Korba (Credit 793-IN), Ramagundam (Credit 874-IN and Loan 1648-IN), Singrauli-II (Credit 1027-IN) and Farakka (Credit 1053-IN and Loan 1887-IN). In its report No. 10854

published in February 1993, the Audit Mission has summed up NTPC's financial policy in a paragraph as below:

> "NTPC has reached its large size (it is India's largest corporate entity in terms of fixed assets) in a record time without jeopardizing or compromising its financial viability, even in spite of the accounts receivable issue. This is a performance that very few utilities in the same situation are able to achieve. The performance is even more impressive since NTPC is still in a major investment mode. A good part of NTPC's above-par performance is to be credited to GOI's original design (e.g., debt-equity ratio set at a conservative 1:1; tariff formula to pass on all investment, operation, and financial costs.)"

9. As is common practice in transaction of a commodity like electricity, the agreements allow the beneficiary of its energy supply a period of 30 days from issue of the bills for making payments. Therefore, outstanding should be reckoned after expiry of this period of 30 days.

Bank Performance (reference paras. 11.2 & 11.3 of Part-I)

10. It has been stated that the Bank's decision not to present to the Board the then proposed Regional Power System Project because of GOI and NTPC's inability to fulfil the conditions for Board presentation within a reasonable time period, has helped GOI to promote reforms in the power sector. It is worth mentioning that the sectoral reforms are brought about gradually with time. It is easier to bring out such changes when they are accompanied by large development programmes such as the proposed US$1.2 billion time slice loan operation of World Bank for NTPC Power Generation Project.

Comments by POWERGRID and Endorsed by the Government of India

Environment, Resettlement and Rehabilitation

11.1 In the context of transmission projects there is no significant impact on environment except in the cases where the transmission lines involve any forest area. The impact of transmission line projects on environment is not considered as severe as in case of thermal, hydel, nuclear power projects. This is primarily because the effect on forest due to laying of tranmission lines is reversible and can be nullified by planting more trees.

11.2 With the worldwide concern over the fast depleting forest reserves, due consideration is given to these aspects at the planning and designing stage itself. While identifying the transmission system for CTP-I, detailed surveys were conducted by the executing agency in association with the state forest authorities to identify most suitable route having minimum infringement on forest land. Where trees had to be felled in order to provide access to the lines, trees of a corresponding number were planted in the vicinity as per guidelines from Ministry of Environment and Forest.

11.3 Sites for construction of the sub-stations were generally selected in uninhabitated areas remote from the population centers. Hence, the resettlement and rehabilitation of people did not arise.

Final Payments

12. The loan was originally scheduled to be closed on March 31, 1989. But the project configuration underwent major revision following the reluctance of SEBs to pay the fixed transmission charges associated with this project and also because of changes in load generation scenario in Southern Region than what was envisaged at the planning stage. The revised project configuration was approved in August 1987. Thereafter, Bank decided to extend the loan closing date by one year each time for a total of 36 months to March 1992. The total disbursement of loan till March 1992 was US$131.49 million. Further, the Bank has included funding the balance portion of the on-going contracts retroactively under the new POWERGRID System Development Project (Loan No. 3577-IN).

Procurement

13. GOI approval for the revised project was accorded in August 1987 and immediately thereafter the exercise for placement of award for tower package (for eight transmission lines) was begun. Awarding took 6 to 8 months to complete. This was possible due to advance planning in preparation of bid document. However, this time could have been further reduced by around a month had the Bank approval been obtained in a period of about 15 days. As regards procurement of domestic goods and services, a comprehensive procurement action plan resulted in cutting down of award time, and hence achieved the completion of project without any delays.

Evaluation of the Borrower's Own Performance

14.1 The project has achieved its objectives. With the satisfactory completion of the project, the power transmission capacity, security and reliability in the Southern region has increased. The inter-connection between the Northern and the Western regions is currently used for limited exchange of power between the two regions and helps the stability of the systems.

14.2 Unlike the previous Bank funded power projects, this project was solely for the purpose of transmission system. Since NTPC had already acquired sufficient experience in the area of design and engineering of 400 kV transmission lines and substations, entire basic and detailed engineering work for the 400 kV transmission lines and substations was carried out by NTPC/POWERGRID in-house.

14.3 This project also provided an opportunity for NTPC/POWERGRID to gain valuable experience in procurement under ICB procedures, which was later used for other Bank financed projects. Also the first time introduction of HVDC technology with this project helped NTPC staff to enlarge its skills and to gain valuable experience in the execution of HVDC substation, which was later used, on a consultancy basis, in the installation of HVDC stations in other countries.

PROJECT COMPLETION REPORT

INDIA

CENTRAL POWER TRANSMISSION PROJECT
(LOAN 2283-IN)

PART III: STATISTICAL SUMMARY

A. Related IDA Credits and Bank Loans

Cr./Loan No. and Title	Purpose	Year of Approval	Status	Comments
Cr. 685-IN Singrauli Thermal Power Project	To help reduce the power shortage in the Northern Region through the construction of the 3x200 MW initial phase of the NTPC's first large coal fired thermal power plant with associated 400 kV transmission lines.	April 1977	Closed on June 30, 1984	The project was successfully completed
Cr. 1027-IN Second Singrauli Thermal Power Project	Assist NTPC to mitigate power shortages in the Northern Region through the construction of 2x200 MW and 2x500 MW coal-fired units and associated 400 kV transmission lines.	May 1980	Closed on June 30, 1989	The project was successfully completed.
Cr. 793-IN Korba Thermal Power Project	To help reduce the power shortage in Western Region through the construction of the 3x200 MW coal fired thermal power plant with associated 400 kV transmission lines.	April 1978	Closed on March 31, 1986	The project was successfully completed.
Cr. 1172-IN Second Korba Thermal Power Project	To help reduce power shortages in the Western Region through the construction of 3x500 MW coal-fired units and associated 400 kV transmission lines.	July 1981	Closed on December 31, 1991	The project was successfully completed.

Cr./Loan No. and Title	Purpose	Year of Approval	Status	Comments
Ln.1648-IN & Cr. 874-IN Ramagundam Thermal Power Project	To help: (a) solve rationing in the Southern Region by providing 3x200 MW generating units; (b) assist GOI in achieving its objective of further advancing the regional and ultimately the national integration of the power sub-sector.	January 1979	Closed on June 30, 1987	The project was successfully completed.
Loan 2076-IN Second Ramagundam Thermal Power Project	Alleviation of power shortages in the Southern Region through the construction of 3x200 MW and 3x500 MW coal-fired units and associated 400 kV transmission lines.	December 1981	Closed March 31, 1992	The project was successfully completed.
Sectoral Objectives Common to All the Above Projects				
	In addition to the above project-wide objectives, the sectoral objective was to assist NTPC become an efficient utility (implementation of projects, operation of power plants, institution- and finance-wide) to form a model to the poor performing SEBs.			This purpose was not fully attained

B. Project Timetable

Item	Date Planned	Date	Date Actual
Appraisal Mission			October 1982
Credit Negotiation			April 18-22, 1983
Board Approval			May 19, 1983
Credit Signature			June 8, 1983
Credit Effectiveness	Sept. 9, 1983 /a		March 29, 1984
Credit Closing	March 31, 1989	a) 3/31/90 b) 3/31/91	March 31, 1992
Completion of Disbursements			September 8, 1992

/a At Loan signing.

C. Disbursements (Estimated and Actual)
(US$ million)

	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992
(a) Estimate	3.5	20.0	90.0	180.0	240.5	250.7	250.7	250.7	a/	
(b) Actual	-	0.6	0.6	0.8	19.8	26.1	40.5	84.0	126.7	131.5 b/
Ratio (b)/(a)	-	3%	7%	4%	8%	10%	16%	34%		

a/ US$50 million from the Loan amount was cancelled on December 5, 1991.
b/ The Final Disbursement was in September 1992.

D. Installation and Commissioning of Transmission Lines and Sub-stations/Switchyard (*)

A. Installation of 400 kV AC Transmission Lines	Commissioned in	Length (km)
1. Ramagundam-Khammam (S/C)	March 1992	202
2. Khammam-Vijayawada (S/C)	March 1992	110
3. Vijayawada-Gazuwaka (S/C)	January 1992	317
4. Nagarjunasagar-Gooty (S/C)	July 1991	298
5. Gooty-Bangalore (S/C)	July 1991	302
Total Single Circuit Lines:		1,229
B. 400 kV Inter-Regional System		
1. Ramagundam-Chandrapur (D/C)	February 1991	180
2. Vindhyachal-Singrauli (D/C)	December 1987	4
Total Double Circuit Lines:		184

C. 400 kV AC Sub-stations/Switchyard Extensions	
1. Khammam (new)	March 1992
2. Vijayawada (new)	January 1992
3. Gazuwaka (new)	January 1992
4. Gooty (new)	July 1991
5. Ramagundam (ext)	February 1991
6. Chandrapur (ext)	February 1991
7. Vindhyachal (ext)	December 1987
8. Singrauli (ext)	December 1987
9. Bangalore (ext)	March 1990
10. Nagarjunasagar (ext)	March 1991

(*) Commissioning dates estimated in SAR for the original project are given in Annex 1.

E. Project Costs -- Estimated and Actual

	Estimated		Actual	
	Rs Million	US$ Million	Rs Million	US$ Million
400 kV lines	1,435.10	151.04	2,416.5	128.9
400 kV substations	851.90	89.66	1,092.6	57.0
Back-to-back HVDC substation	813.45	85.62	1,556.4	59.1
Metering and Instrumentation	201.60	21.22	95.6	5.2
PLCC Communications	39.47	4.15	72.9	4.0
Sub-total	3,341.52	351.69	5,234.0	254.2
Physical Contingencies	171.17	18.03	--	--
Price Contingencies	915.96	96.47	--	--
Total	4,428.65	466.19	5,234.0	254.2
Consultancy	23.75	2.50	10.0	0.5
Engineering and Administration	297.45	31.31	178.7	9.7
Total Project Cost (before duties and taxes)	4,749.85	500.00	5,422.7	264.4
Duties and Taxes	617.50	65.00		
Total Project Cost	5,367.35	565.00		
Interest During Construction	490.31	51.58		
Front-End Fee	6.65	0.70		
Total Financing Required	5,864.31	617.28	5,422.7	264.4

F. Allocation of Loan Proceeds
(Original and Actual)
(US$ million)

		Loan Agreement	Actual
(1)	Equipment and Materials	235,000,000	123,721,729.58
(2)	Consultants' Services	2,500,000	-
(3)	Fee	625,187	625,187.00
(4)	Associated civil works and erection	-	7,316,027.03
	Unallocated	12,574,813	-
	Difference due to cross exchange rates on Special Account transactions		(169,045.60)
	Total disbursed		131,493,898.01
	Amount cancelled (Dec. 5, 1991)		50,000,000.00
	Amount cancelled (Sept. 8, 1992)		69,206,101.99
	Original Loan Amount	250,000,000	250,700,000.00

G. Summary of the Internal Economic Rate of Return Computations /a

		OUTFLOW		INFLOW	NET	Discounted @
		Investment	O & M	Revenue	OUTFLOW	11.10%
0	1985-86	3155.8	10.0	135.0	3030.9	3030.9
1	1986-87	1965.8	15.8	214.3	1767.3	1590.7
2	1987-88	2495.6	21.9	286.5	2231.1	1807.4
3	1988-89	2184.9	34.9	359.0	1860.7	1356.7
4	1989-90	1673.3	77.8	773.2	977.9	641.7
5	1990-91	1402.5	86.2	962.9	525.9	310.6
6	1991-92	1254.0	110.4	1370.9	-6.4	-3.4
7	1992-93	207.9	133.4	1740.7	-1399.4	-669.6
8	1993-94	718.8	204.9	2210.4	-1285.7	-553.7
9	1994-95		204.9	2210.4	-2005.5	-777.4
10	1995-96		204.9	2210.4	-2005.5	-699.7
11	1996-97		204.9	2210.4	-2005.5	-629.8
12	1997-98		204.9	2210.4	-2005.5	-566.9
13	1998-99		204.9	2210.4	-2005.5	-510.2
14	1999- 0		204.9	2210.4	-2005.5	-459.2
15	2001- 1		204.9	2210.4	-2005.5	-413.3
16	2002- 2		204.9	2210.4	-2005.5	-372.0
17	2002- 3		204.9	2210.4	-2005.5	-334.8
18	2003- 4		204.9	2210.4	-2005.5	-301.4
19	2004- 5		204.9	2210.4	-2005.5	-271.3
20	2005- 6		204.9	2210.4	-2005.5	-244.1
21	2006- 7		204.9	2210.4	-2005.5	-219.7
22	2007- 8		204.9	2210.4	-2005.5	-197.8
23	2008- 9		204.9	2210.4	-2005.5	-178.0
24	2009-10		204.9	2210.4	-2005.5	-160.2
25	2010-11		204.9	2210.4	-2005.5	-144.2
26	2011-12		204.9	2210.4	-2005.5	-129.8
27	2012-13		204.9	2210.4	-2005.5	-116.8
28	2013-14		204.9	2210.4	-2005.5	-105.2
29	2014-15		204.9	2210.4	-2005.5	-94.6
30	2015-16		204.9	2210.4	-2005.5	-85.2
31	2016-17		204.9	2210.4	-2005.5	-76.7
32	2017-18		204.9	2210.4	-2005.5	-69.0
33	2018-19		204.9	2210.4	-2005.5	-62.1
34	2019-20		204.9	2210.4	-2005.5	-55.9
35	2020-21		204.9	2210.4	-2005.5	-50.3
36	2021-22		204.9	2210.4	-2005.5	-45.3
37	2022-23		204.9	2210.4	-2005.5	-40.8
38	2023-24		204.9	2210.4	-2005.5	-36.7
39	2024-25		204.9	2210.4	-2005.5	-33.0
40	2025-26		204.9	2210.4	-2005.5	-29.7

The internal rate of return of the project is computed as 11.1%.

/a Detail tables have been forwarded to Asia Information Center.

H. Status of Compliance of Covenants

Section	Summary of Undertaking (Covenant)	Status
LA 2.02(b) amended	GOI shall maintain a special account in U.S. Dollars	Complied
LA 3.01(b)	GOI onlending to NTPC under terms acceptable to the Bank (not less than 12% per annum)	Complied
LA 4.03 amended	GOI to furnish audit on special account (due within 6 months of FY end)	Complied
LA 4.04 amended	GOI to furnish audit on SOEs (due within 6 months of FY end)	Received
PA 2.04/3.04	NTPC to take out adequate insurance	Complied
LA 4.02	(a) For goods to be supplied from overseas, GOI to promptly grant permission to import them;	Complied (bureaucratic delays)
	(b) For goods to be manufactured in India, GOI to promptly issue import licenses, make available necessary foreign exchange and allocate materials	Complied (bureaucratic delays)
PA 2.02	NTPC to employ engineering consultants to assist in carrying out Part F of the Project	Complied
PA 4.02	NTPC to have its accounts and financial statements audited and to submit audited reports, within seven months of the end of the year to the Bank	Complied (delays in earlier years)
PA 4.03	NTPC to set tariffs and other actions to achieve a rate of return of not less than 9.5% p.a. from April 1, 1990 and thereafter	Complied

I. Use of Bank Resources

I.1 Staff Inputs

Staff inputs in carrying out the various tasks through the project cycle from preparation in FY83 to completion in FY93 were as follows:

Task	Input (Staff-weeks)
Project Preparation	27.5
Project Appraisal	40.7
Loan Negotiations	04.1
Project Supervision	46.3
Project Administration	00.1
TOTAL	118.7

I.2 Missions

Project Cycle	Month/ Year	Number of Persons	Days in Field	Specialization /a	Performance Rating /b	Type of Problems /c
Through Appraisal						
Identification /d						
Preparation /d						
Pre-appraisal /d						
Appraisal	10/82					
Supervision						
Supervision 1	05/19/85 to 06/17/85	2		E; FA	1	
Supervision 2	02/19/86 to 03/02/86	1		FA	4	
Supervision 3	03/20/87 to 04/01/87	2		E; FA	4	
Supervision 4	01/18/88 to 02/22/88	4		E; E; FA; FA	2	
Supervision 5	08/16/89 to 08/30/89	2		E; EC	2	
Supervision 6	02/17/91 to 02/26/91	1		E	2	
Supervision 7	07/22/91 to 07/30/91	2		E; FA	2	

/a E: Engineer; LO: Loan Officer; FA: Financial Analyst; EC: Economist
/b 1 = No or minor problem; 2 = moderate problem; 3 = major problem
/c I: Implementation delays; PR: Procurement problems and delays
/d Identification was made by GOI in 1974. Preparation and pre-appraisal were made by NTPC in 1978.

Annex 1

INDIA

CENTRAL POWER TRANSMISSION PROJECT
(Loan 2283-IN)

Description of the Original Project

The original project approved by the Board on May 19, 1983, consisted of the following components:

Part A 400 kV AC Transmission Lines (Construction)

	Approximate Length	Estimated in SAR to be commissioned by
Ramagundam-Mangur double circuit line	230 km	June 1987
Mangur-Vijayawada, double circuit line	160 km	December 1987
Vijayawada-Nellore, single circuit line	305 km	June 1987
Nellore-Red Hills, single circuit line	245 km	December 1987
Singrauli-Vindhyachal, single circuit line	14 km	March 1988
Ramagundam-Chandrapur, double circuit line	158 km	March 1988

Part B Sub-stations (400/200 kV) (Construction or Extension)

Ramagundam	-	extension for the 400 kV Ramagundam-Chandrapur line and for the second 400 kV Ramagundam-Mangur circuit (the equipment for the fir circuit was provided under the Second Ramagundam Thermal Power Project)
Mangur	-	new (1x315 MVA)
Vijayawada	-	new (1x315 MVA)
Nellore	-	new (1x315 MVA)
Red Hills	-	extension for the 400 kV Nellore-Red Hills line
Chandrapur	-	extension for the 400 kV Ramagundam-Chandrapur line
Singrauli	-	extension for the 400 kV Singrauli-Vindhyachal line
Vindhyachal	-	extension for the 400 kV Singrauli-Vindhyachal line

In SAR, the sub-stations were estimated to be commissioned with their associated transmission lines.

Part C 500 MW HVDC Sub-station

The construction of a (two 250 MW) back-to-back sub-station at Vindhyachal (estimated in SAR to be commissioned in March 1988).

Part D Metering and Instrumentation

Installation of tariff metering systems and disturbance recorders in important sub-stations of the Northern, Western and Southern Regional grids.

Part E Communications

The acquisition and utilization of power line carrier communication (PLCC) equipment for speech transmission, line protection and data transmission on each 400 kV transmission line.

Part F Technical Services

Utilization of technical services for the carrying out of detailed equipment and system engineerin and supervision during construction, for the High Voltage Direct Current (HVDC) back-to-back inter-tie at Vindhyachal linking the Singrauli and Korba power stations.

Annex 2

INDIA

CENTRAL POWER TRANSMISSION PROJECT

PROJECT COMPLETION REPORT

Description of the Revised Project

After the loan was signed, GOI obtained financing from Sweden for the HVDC sub-station At GOI request, in January 1985, the Bank agreed to make the change in the project description and to t reallocation of the loan funds. NTPC did not initiate the construction of the 400 kV transmission lines an substations in the Southern Region until the SEBs in this region agreed to pay for the transmission charge The last agreement was signed in April 1987, almost four years after the approval of the loan by the ban In the meantime, the project components in the Southern Region transmission system underwent major revision. The reasons for the revision were as follows: (i) Even before the Loan Negotiations, some of th SEBs had been questioning NTPC the usefulness to themselves of the transmission lines being constructe under the Ramagundam project (Loan 2076-IN), and had been expressing reluctance to pay the charges f those transmission lines. The discussions between NTPC and those SEBs became protracted, partly because the SEBs had not dealt before with a centrally-owned utility tariffs which they thought were too high, while at the same time each one of those SEBs had already been allocated a specified share of the power from the Ramagundam plant; (ii) The load generation scenario in the Southern Region had changed substantially from that prepared by CEA in 1982, which was the basis for the transmission system of the subject project. The construction of the Manguru (because of environmental and other problems) and the extension of the Vijayawada thermal power plants were deferred beyond the Seventh Plan period. In addition, there was a change in the power demand scenario, with higher priority being allocated to the development of small-scale industry and to rural electrification in the region; and (iii) The plan to construc the coastal transmission line (Vijayawada-Nellore-Madras) was abandoned because of the increased risk from the serious cyclones on the coast. After lengthy discussion between NTPC, the SEBs and with the involvement of CEA, a new transmission system configuration was proposed. It should be noted that the power from the Ramagundam thermal plant was delivered to its customers, albeit under less than optima transmission conditions, while the above changes were being decided upon.

On November 16, 1986, the Bank agreed on the revision of Parts A and B of the project as per the following:

Status of Transmission Lines and Sub-stations/Switching Stations after Revision

A.	400 kV AC Transmission Lines	Length
	Ramagundam-Khammam (single circuit)	202 km
	Khammam-Vijayawada (single circuit)	110 km
	Vijayawada-Gazuwaka (single circuit)	317 km
	Nagarjunasagar-Gooty (single circuit)	298 km
	Gooty-Bangalore (single circuit)	302 km
	Singrauli-Vindhyachal (double circuit)	4 km
	Ramagundam-Chandrapur (double circuit)	180 km

B. Sub-stations/Switching Stations

Ramagundam (Ext)	Hyderabad-Nagarjunasagar (Ext)	Chandrapur (Ext)
Khammam (New)	Nagarjunasagar (Ext)	Singrauli (Ext)
Vijayawada (New)	Gooty (New)	Vindhyachal (Ext)
Gazuwaka (New)	Bangalore (Ext)	

Other parts of the project were not changed.

- Date of Agreement by the Bank: November 16, 1986
- Date of Finalization by GOI: August 1987

INDIA

CENTRAL POWER TRANSMISSION PROJECT
(Loan 2283-IN)

PROJECT COMPLETION REPORT

Availability of Transmission Lines and Sub-stations in 1992

Line	Jan 92	Feb 92	Mar 92	Apr 92	May 92	Jun 92	Jul 92	Aug 92	Sep 92	Oct 92	Nov 92	Dec 92	Jan-Dec 92
TRANSMISSION LINES													
1. RDM-CPR1	100.00	100.00	100.00	100.00	100.00	100.00	100.00	98.70	100.00	98.81	100.00	100.00	99.8
2. RDM-CPR2	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.0
3. NSR-GTY	99.85	99.85	100.00	99.76	96.60	97.98	98.28	98.06	97.10	100.00	100.00	100.00	99.0
4. GTY-BGL	99.99	99.99	100.00	100.00	96.79	100.00	99.94	98.02	98.92	99.92	100.00	100.00	99.5
5. VJA-GZW a/	-	-	94.83	99.92	100.00	95.39	100.00	55.16	100.00	100.00	100.00	99.18	98.5 b/
6. RDM-KMM a/	-	-	96.14	89.93	95.23	96.38	100.00	92.66	100.00	100.00	100.00	99.69	97.0
7. KMM-VJA a/	-	-	95.51	90.75	97.41	96.18	100.00	92.46	100.00	99.52	93.68	91.88	95.7
SUB-STATIONS													
1. Vijayawada	100.00	96.99	99.52	100.00	100.00	99.83	100.00	12.24	-	95.34	100.00	92.50	98.4 c/
2. Hyderabad	99.59	100.00	83.66	100.00	100.00	100.00	98.70	100.00	100.00	100.00	100.00	100.00	100.0 d/
3. Gazuwaka	100.00	100.00	100.00	99.72	100.00	96.11	100.00	92.54	100.00	100.00	100.00	100.00	99.6 e/
4. Bangalore	100.00	100.00	100.00	89.95	100.00	100.00	99.63	100.00	100.00	99.98	93.68	100.00	99.4 f/
5. Gooty	100.00	100.00	99.79	99.36	99.59	99.09	99.28	93.28	100.00	99.52	100.00	100.00	99.2

a/ Lines commissioned on March 20, 1992
b/ Excluding availability in August 1992

c/ Excluding shutdown in August & September 1992
d/ Excluding shutdown in March 1992
e/ Excluding shutdown in August 1992
f/ Excluding shutdown in April 1992

NATIONAL THERMAL POWER CORPORATION LTD.

INCOME STATEMENTS

(Rs million)

Year ending March 31	1985		1986		1987		1988		1989		1990		1991		1992	
INCOME DESCRIPTION	Forecast	Actual	Forecast	Actual	Forecast	Actual	Forecast	Actual	Forecast	Actual	Forecast	Actual	Forecast	Actual	Forecast	Actual
Electricity Generation (GWh)		9,248		14,174		15,921		19,378		27,296		38,595		43,965		61,197
Less: Aux Cons.(GWh)		932		1,335		1,513		1,845		2,421		3,174		3,659		4,540
Electricity Sales (GWH)	8,133	8,316	11,492	12,839	13,446	14,408	17,922	17,533	25,934	24,875	35,451	35,421	43,963	40,306	48,759	56,657
Av. Bulk Tariff (P/kwh)		37	38	38	40	40	40	41	41	46	43	52	44	53	45	61
Operating Revenues:																
Electricity Sales	2,946	3,077	4,421	4,829	5,365	5,736	7,257	7,201	10,715	11,460	15,103	18,376	19,317	21,254	22,080	34,347
Transmission Charges		148		284		555		1,176		993		1,691		2,404		3,742
Electricity Duty	113	111	231	111	249	87	331	93	479	179	655	294	812	347	901	455
Other Income	151	102	212	70	358	75	557	152	928	116	1,506	212	2,234	201	2,938	1,384
TOTAL OPERATING REVENUES	3,210	3,438	4,864	5,294	5,972	6,453	8,145	8,622	12,122	12,748	17,264	20,573	22,363	24,207	25,919	39,928
Operating Expenses:																
Fuel Cost		1,252		1,952	1,259	2,360	1,849	3,165	2,600	5,285	3,557	8,985	4,461	9,780		16,424
																898
																1,672
Operation and Maintenance		404		483	547	616	729	807	964	1,175	1,180	1,745	1,303	2,105		974
Depreciation		265		377	779	448	1,078	579	2,035	912	2,681	1,398	3,174	2,251	3,343	3,625
Electricity Duty		112		111	272	87	166	93	494	179	629	294	740	347		455
Otherse		10		21		11		69		8		147		113		86
TOTAL OPERATING EXPENSES	1,704	2,042	2,646	2,943	3,225	3,522	4,678	4,712	7,602	7,559	10,423	12,567	12,935	14,577	14,408	24,134
Opr. Income bef. Interest	1,506	1,396	2,218	2,350	2,747	2,931	3,467	3,910	4,520	5,189	6,841	8,006	9,428	9,630	11,511	15,794
Interest	614	492	1,117	570	1,499	866	2,500	1,248	4,035	1,791	5,494	2,730	5,782	3,472	5,686	5,643
Profit before Tax	892	904	1,101	1,781	1,248	2,065	967	2,662	485	3,398	1,347	5,276	3,646	6,158	5,825	10,151
Less:Provision for Taxes				1		1				0						
Profit after Tax	892	904	1,101	1,780	1,248	2,064	967	2,662	485	3,398	1,347	5,276	3,646	6,158	5,825	10,151
Prior Period Income (Net)		(28)		50		53		362		(90)		90		851		69
Net Profit	892	875	1,101	1,830	1,248	2,118	967	3,024	485	3,308	1,347	5,366	3,646	7,009	5,825	10,220
Average Net Fixed Assets		10,957		14,016	29,862	17,209	51,025	23,856	76,048	35,078	91,488	53,567	99,232	75,482	101,077	102,945
Rate of Return on Assets (%)		13%		17%	9%	17%	7%	16%	6%	15%	7%	15%	10%	13%	11%	15%
Return on Capital Employed																
Operating Ratio (%)	53%	59%	54%	56%	54%	55%	57%	55%	63%	59%	60%	61%	58%	60%	56%	60%

* Includes deferred expenses,preliminary expenses,bonds expenses,rebate to costumer and contingencies.

** No tax provision has been made for future projections.

*** As per Annual Report

NATIONAL THERMAL POWER CORPORATION

SOURCES AND APPLICATION OF FUNDS

(Rs million)

Year ending March 31

	1985		1986		1987		1988		1989		1990		1991		1992	
SOURCES DESCRIPTION	Forecast	Actual	Forecast	Actual	Forecast	Actual	Forecast	Actual	Forecast	Actual	Forecast	Actual	Forecast	Actual	Forecast	Actual
SOURCES OF FUNDS																
Operating Income bef. Int.	1,506	1,396	2,218	2,350	2,747	2,931	3,467	3,910	4,520	5,189	6,841	8,006	9,428	9,630	11,511	15,794
Prior Period Income (Net)	0	(28)		50		53		382		(90)		90		851		
Depreciation(*)	387	265	630	377	779	448	1,078	579	2,035	912	2,681	1,396	3,174	2,251	3,343	3,825
Total Internal Cash Gen.	1,893	1,632	2,848	2,777	3,526	3,432	4,545	4,851	6,555	6,011	9,522	9,492	12,602	12,732	14,854	19,419
Equity Contributions	13,574	4,859	8,279	6,808	2,460	5,909	3,007	6,879	3,564	3,682	3,745	6,594	6,569	12,812	0	6,667
Capital Receipt		26		0		114		24		87		21		117		26
Borrowings																
Loans Contracted	6,225	4,416	13,582	5,731	13,423	5,865	9,394	4,836	6,678	11,972	2,524	6,712	693	5,019	4,876	25,437
Bonds		0		1,634		4,300		4,394		1,499		4,346		4,000		7,984
Total Borrowings	6,225	4,416	13,582	7,365	13,423	10,165	9,394	9,230	6,678	13,471	2,524	11,058	693	9,019	4,876	33,421
TOTAL SOURCES	21,692	10,933	24,709	16,950	19,409	19,620	16,946	20,984	16,797	23,251	15,791	27,165	19,864	34,680	19,730	59,533
APPLICATION OF FUNDS																
Total Investment	20,066	10,011	23,388	14,048	17,449	17,806	13,536	17,630	11,657	19,064	8,215	20,397	10,823	26,079	9,908	52,754
Debt Service																
Interest Charged to Oper.	614	492		570	1,499	866	2,500	1,248	4,035	1,791	5,494	2,730	5,782	3,472	5,686	5,643
Amortization of Loans		-		-	300		476	-	785	747	1,697	1,087	2,997	1,542	3,956	2,581
Total Debt Service	614	492		570	1,799	866	2,976	1,248	4,820	2,538	7,191	3,817	8,779	5,015	9,642	8,224
Increase (Dec.) in W. C.		430		2,332	155	845	418	(3,416)	360	3,812	376	1,842	259	3,278	177	(3,838)
Provision for Tax				1		1				0						
TOTAL APPLICATION OF FUNDS	20,680	10,933		16,950		19,620		20,984		25,414		26,056		34,371	19,727	57,141
				606	6	102	16	5,522	10	(2,163)	8	1,109	3	308	2	2,244
Contribution to Constr.				-0.01	9%	10%	9%	40%	12%	-2%	24%	19%	33%	17%	51%	28%
Cont. to Const. (3-yr. Av)																
Debt Service Coverage	3.08	3.32		4.87	1.96	3.96	1.53	3.89	1.36	2.37	1.32	2.49	1.44	2.54	1.54	2.36

(*) Depreciation pertains to operations.

TIONAL THERMAL POWER CORPORATIC

BALANCE SHEETS

(Rs million)

Year ending March 31	1985		1986		1987		1988		1989		1990		1991		1992	
BALANCE DESCRIPTION	Forecast	Actual	Forecast	Actual	Forecast	Actual	Forecast	Actual	Forecast	Actual	Forecast	Actual	Forecast	Actual	Forecast	Actual
ASSETS																
Gross Block	21,064	13,363	26,176	16,047	36,680	20,689	70,341	30,508	90,090	44,784	105,986	69,972	111,433	92,422	116,194	131,138
Less:Depreciation		476	1,286	903	2,047	1,416	3,125	2,069	5,210	3,068	7,891	4,554	11,065	6,877	14,408	10,791
Net Fixed Assets in Ope.	21064.00	12,887	24,890	15,144	34,833	19,273	67,216	28,439	84,880	41,716	98,095	65,418	100,368	85,546	101,786	120,345
Capital Works in Progress		19,656	48,884	31,069	55,629	44,302	35,704	52,187	27,612	57,062	19,931	52,360	25,307	56,039	30,454	70,080
Total Fixed Assets	21064.00	32,543	73,774	46,213	90,462	63,575	102,920	80,626	112,492	98,778	118,026	117,778	125,675	141,584	132,240	190,425
Current Assets																
Cash and Bank Balance	11	84	13	.448	19	134	35	5,973	45	2	53	291	56	884	58	1,742
Short-term deposits		395		637		1,053		737		4,544		5,364		5,279		5,465
Receivables	246	1,626	368	2,284	447	2,828	605	4,058	893	5,981	1,259	11,561	1,610	15,102	1,840	16,086
Inventories	211	704	262	940	369	1,322	703	1,742	901	2,639	1,060	3,632	1,114	5,414	1,162	7,306
Loans & Advances		326		1,972		3,842		783		2,614		1,824		2,088		2,497
Other Cur. Asset/Debtor	2	17	2	13	2	148	2	178	2	104	2	125	2	231	2	399
Total Current Assets	470	3,151	645	6,293	837	9,127	1,345	13,469	1,841	15,884	2,374	22,797	2,782	28,799	3,062	34,495
Misc.Capital Expenditure		19		19		16		17		18		19		41		39
TOTAL ASSETS	21,534	35,713	74,419	52,526	91,299	72,718	104,265	94,112	114,333	114,680	120,400	140,594	128,457	170,424	135,302	224,959
LIABILITIES																
Equity																
Share Capital Issued		20,632		26,685	47,110	32,851	50,117	37,658	53,681	44,073	57,426	49,840	63,995	59,237	63,995	69,841
Share Deposit		236		990		734		2,806		73		1,100		4,314		377
Retained Earnings		1,402		3,231	3,667	5,463	4,634	8,511	5,119	11,906	6,466	17,293	10,112	24,420	15,937	34,526
Total Equity	0	22,270	0	30,906	50,777	39,048	54,751	48,975	58,800	56,052	63,892	68,033	74,107	87,971	79,932	104,744
Total Long-term Debt		10,364		17,729	40,362	27,894	49,280	37,124	55,173	49,848	56,000	59,819	53,696	67,296	54,724	97,766
Current Liabilities	84	3,081	129	3,891	160	5,778	234	8,014	360	8,780	509	12,742	655	15,158	756	22,448
Total Debt	84	13,445	129	21,620	40,522	33,672	49,514	45,138	55,533	58,628	56,509	72,561	54,351	82,454	55,480	120,214
TOTAL EQUITY & LIABILITIES	84	35,715	129	52,526	91,299	72,720	104,265	94,113	114,333	114,680	120,401	140,594	128,458	170,425	135,412	224,958
Debt:Equity Ratio		32/68		36/64		42/58		43/57		47/53		47/53		43/57	41/59	48/52
Current Ratio	5.6	1.0	5.0	1.6	5.2	1.6	5.7	1.7	5.1	1.8	4.7	1.8	4.2	1.9	4.1	1.5
Acc. Receiv. (no. of days)	28	170	27	155	27	158	27	169	27	169	26	202	26	225	26	145

7/02/93

PCR COVER SHEET

Please sign this form upon receipt and return a photo-copy of it to Helen Sioris. Pass the PCR (with this cover sheet) to the Evaluation Officer.

OED ID: L2283 Division: 3
Project Description: Central Power Transmission Project
Country: IND Country Name: India

Sector: 02 Sector Name: Power
Subsect: 02.03 Subsector Name: Transmission
SAL:

Associated Loans or credits: L2283

Closing Date: ~~3/31/92~~ 9/8/92 Date PCR Received: 6/30/93

Signed: [signature]
Date: 7/21/93

Cover memo is missing

[signature]

NOTE

July 14, 1993

TO: Mr. Alvaro Covarrubias (o/r)

Alvaro:

Re: INDIA: Central Power Transmission Project (Loan 2283)

Please find attached the above Project Completion Report for your kind attention. Please pass it through and let me know if you recommend auditing.

Please also check the cover sheet for accuracy (sector code, project title) and correct as necessary; sign it, return it to Helen Sioris and give one copy to Aracely.

Jozsef B. Büky, Acting Chief

Attachment: 1 copy of PCR

For Information/Action:

cc: Mrs. Barahona-Strittmatter (Power Sector - rec'd 6/30/93)
cc: Mrs. Sibblies (No Original PCR received; 3 cc's)

THE WORLD BANK / IFC / MIGA

OFFICE MEMORANDUM

cc: Mr. Albouy
JFL
plse handle -
4A
10/27

DATE: October 27, 1993

TO: Mr. Hans-Eberhard Kopp, Director, OED

FROM: Javad Khalilzadeh-Shirazi, Acting Director, India Department
JKS

EXTENSION: 80352

SUBJECT: INDIA : Central Power Transmission Project (Ln. 2283-IN)
Project Completion Report

1. We refer to your Memorandum dated October 21, 1993, about OED Review Note for the above mentioned PCR.

2. We do not have any comments on OED's findings on overall assessment, sustainability and institutional development.

3. However, we would prefer that OED points out, in the Review Note, to NTPC's bill collection performance and accounts receivable which are the main weaknesses of the Corporation. Under Ln.2283-IN for the Central Power Transmission Project the sole covenant adopted for NTPC's financial performance was the conventional rate of return (ROR) on average historic fixed assets. This indicator has proved to be less appropriate for a fast growing utility where the utility's major concern is to ensure the availability of adequate funds for investment. Furthermore, when the revenues collected are substantially lower that the revenues accrued (due to large accounts receivable), the financial performance indicators such as ROR, operating ratio, etc., are less meaningful. A covenant specifying the level of accounts receivable not to exceed an amount equivalent to the proceeds of its sales of power for the two preceding months, was first introduced for NTPC under Loan 2555-IN for the Rihand Power Transmission Project approved in May 1985, with effect from the end of NTPC's fiscal year 1986. NTPC was never able to comply with this covenant until March 1993. NTPC's non-compliance with the accounts receivable covenant prevented the Bank to lend to this Corporation from 1987 to 1993. It was after the Government of India and NTPC took remedial actions, based on the lessons drawn for the Central Power Transmision and other previous projects implemented by NTPC, that Loan 3632-IN for NTPC Power Generation Project was approved on June 29, 1993. The said actions were summarized in page (v) of the PCR. Therefore, mentioning NTPC's weakness in financial performance and the Bank's insistance on remedial actions in the Evaluation Summary would give a more balanced picture of the Bank-NTPC dialogue.

We could mention A/Rs as a problem area with the SEBs and the Bank's remedial strategy. Since we do not conclude that NTPC finances are weak, no need to elaborate further in my view.

4. We received the Government's comments in August 1993 and communicated them to OED with our Memorandum dated August 20, 1993. We would greatly appreciate that Part II is included into the version of the PCR to be distributed to the Executive Directors and the President. A copy of the said Memo (with its annexes) is enclosed for your easy reference.

plse note

Attachment (1): Copy of SA2DR Memo dated August 20, 1993, to OED; with its annexes, which included the following documents:

1. PCR on Central Power Transmission Project;
2. PCR on Rihand Power Transmission Project;
3. Copy of POWERGRID's letter dated June 18, 1993; and,
4. Copy of GOI's fax message of August 2, 1993.

Cleared with and cc (w/o Attchs.):
Messrs. Humphrey (SA2DR); Pollak, Storm (SA2EG)

cc (w/o Attachments):
Messrs./Mmes. Vergin (SA2DR, o/r); Dolenc (SA2CI); Bauer (o/r), Fujii, Nyman, Betre (SA2EG); Mejia, Gulati (SA2ND)
SA2EG Project Black Book
Asia Information Center

ACeyhan: Document Name: PCR93.03

cc: Mr. Landau

THE WORLD BANK / IFC / MIGA

OFFICE MEMORANDUM

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SA2EG Project Black Book
Asia Information Center

ACeyhan: Document Name: PCR93.03

Re INDIA
The Region sent out.
- Part III - on Central Power Transmission.

on Aug. 20

(the TN says the PCR has no Part II)

Have we not received it??
and given it to JFL?

Sent to Region by
Special Messenger
on 10/21/93

10/25

P-1880

THE WORLD BANK/IFC/MIGA
MESSAGES

DATE 10/25

TIME 10:25

TO ~~Mr. Alborney~~

FROM MR. CEYHAN

DEPT./OFFICE India Dept.

PHONE EXTENSION 81884

- [x] CALLED
- [ ] CAME TO SEE YOU
- [ ] RETURNED YOUR CALL
- [x] CALL BACK
- [ ] WILL CALL AGAIN
- [ ] REQUESTS APPOINTMENT
- [ ] URGENT

REMARKS

Dooley / Maryanne
see back

RECEIVED BY A.

THE WORLD BANK/IFC/M.I.G.A.

ROUTING SLIP	DATE: 10/15/93
NAME	ROOM NO.
	F-13-035
MR. H. Eberhard Köpp, Director	T-9-025

	URGENT		PER YOUR REQUEST
	FOR COMMENT		FOR ACTION
X	FOR SIGNATURE	X	FOR APPROVAL/CLEARANCE

RE: PCR on INDIA: Central Power Transmission Project (Loan 2283-IN)

REMARKS:

Please find attached for approval, the above PCR together with the Project Information Form, draft Review Note from you to the Board, and a draft memo from the Director, OED, to the Country Director concerned.

FROM:	ROOM NO.:	EXTENSION:
Y. Albouy, Chief, OEDD3	T-9079	36190

THE WORLD BANK
Washington, D.C. 20433
U.S.A.

Corrected 11.02.93

Office of Director-General
Operations Evaluation

MEMORANDUM TO THE EXECUTIVE DIRECTORS AND THE PRESIDENT

SUBJECT: Project Completion Report on India
Central Power Transmission Project (Loan 2283-IN)

Attached is the "Project Completion Report on India - Central Power Transmission Project (Loan 2283-IN)" prepared by the South Asia Region. Part II was ~~not~~ provided by the Borrower.

The US$250.7 million loan increased the capacity of the transmission grid feeding power from the National Thermal Power Company (NTPC) to the regional power companies. The Bank approved a revision in the project scope which was fully justified under the original project objectives. Almost half of the loan amount was canceled (US$119.2 million) partly because of foreign currency savings. There were three extensions and the project was not fully completed at loan closing.

All the project objectives were substantially obtained albeit with substantial delays. The re-estimated economic rate of return is 11% (not directly comparable with the initial figure because of the change in scope). NTPC maintained its good financial performance. The project strengthened NTPC's transmission planning and project management capacity. The know how thus acquired was transferred to POWERGRID, the recently created national transmission company.

Overall, the project outcome is rated as satisfactory, its sustainability as likely, and its institutional impact as substantial. The PCR gives a thorough account of project preparation and implementation which was mostly uneventful except for the initial delays. No audit is planned.

THE WORLD BANK/IFC/MIGA

OFFICE MEMORANDUM

DATE: October 21, 1993

TO: Mr. Heinz Vergin, Director, SA2

FROM: H. Eberhard Köpp, Director, OED

EXTENSION: 31700

SUBJECT: INDIA: Central Power Transmission Project (Ln 2283-IN)
Project Completion Report

1. Attached is the Review Note from the Director General, Operations Evaluation, on the above PCR. It is scheduled to be sent together with the PCR to the Print Shop two weeks from today, for release to the Executive Directors and the President.

2. Based on OED's reading of the PCR, we intend to include in the Annual Review database, the following ratings of the operation:

Overall Assessment:	Satisfactory
Sustainability:	Likely
Institutional Development:	Substantial

3. Should the project be audited at a later date, the ratings will be reevaluated at that time.

4. I would like to bring to your attention the fact that no comments were received from the Government.

Attachment