VALUATION OF DERATED THERMAL POWER PLANT FOR IMPAIRMENT OF ASSETS UNDER INDIAN ACCOUNTING STANDARD – 28 (AS 28)

By

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Cash Generating Unit, Discounted Cash Flow

ABSTRACTS

The author was engaged by the State Electricity Authorities to value the assets of the 280 MW Thermal Power Plant (TPP), de-rated to 220 MW, for the purpose of Impairment of Assets to comply with Indian Accounting Standard – 28 (AS-28). The two methodologies of valuation followed as per AS-28, one to determine "Recoverable Amount" and the other to determine "Value in Use" of the Assets.

To arrive at the Recoverable Amount, considered the original cost of the assets as per the asset registers maintained under the Electricity (Supply) Annual Accounts Rules 1985, annual additions and deletions in the assets, worked out Present Day Replacement Cost (PDRC) applying relevant cost inflation indices and current market prices of Modern Equivalent Assets (MEA), adjusted the PDRC to get Optimized Depreciated Replacement Cost (ODRC) with due consideration to economic life of the assets, expected future life, technological and commercial/ economical obsolescence, etc. To arrive to the ODRC, means the Present Realizable Value (PRV), due weightage was given to

the life span as specified by the Electricity (Supply) Act, International comparison of useful life of assets and depreciation rates as per fair life of the assets. The present realizable value certified to be US$ 57.38 million.

To arrive at the “Value in Use”, the power plant being “Cash Generating Unit (CGU)”, with appropriately justified explicit assumptions the future cash flow projections were made and discounted to present value of the future net cash flow using Discounted Cash Flow Method. The “Value in Use” certified to be US$ 76.73 million.

The valuation procedure practically followed is presented in this paper. For sake of confidentiality the details, the valuation figures and the parameters considered in this paper have been modified suitably to attempt explaining the practical approach and methodology for the benefit of the practicing valuers.

LOCATION OF THE THERMAL POWER PLANT UNDER VALUATION

The 280 MW Thermal Power Plant (TPP), derated to 220 MW capacity, is located at XXXX in the District of YYYY of the State of ZZZZ.

TECHANICAL DETAILS OF THE SUBJECT THERMAL POWER PLANT

The said TPP consisting of 2 units of 140 MW each was commissioned in 1972-73, the same was derated to 2 x 110 MW effective from April 2007. the technical details were noted as under:

Sr. No.	Particulars	Units	Design
(A)	**BOILER:-**		
1.	Drum Pressure (design)/ OPERATING	Kg./cm^2.	151.2/142.3
3.	Super heater outlet pressure	Kg./cm^2	133.6
4.	Super heater steam flow.	Mts/hr.	459.0
5.	Max. steam generating capacity (for 8 continuous hours)	N	480.816

6.	Super heater outlet temp.	°c	540
7.	Cold reheat steam pressure	Kg./Cm^2.	34.22
8.	Hot reheat steam pressure	U	35.3
9	Cold reheat steam temp.	°C	367
10.	Hot reheat steam temp.	°c	540
11.	Feed water flow	Kg/Cm^2.	461.1
12.	Economiser inlet water pressure	u»	152.9
13.	Economiser water temp. inlet/Outlet	°C	246.1/278
15.	Fuel oil supply header pressure	Kg/Cm^2.	12.5
16.	Fuel oil flow	Mts./hr	31.5
17.	Total air flow	°c	496.7
18.	Air outlet temp. from APH	o_c	280
19.	Gas inlet temp, to APH	°C	351.6
20.	Gas outlet temp from APH	°c	140.6
21.	Excess air (design)	%	12
22.	Heat rate	KCAL/KWH	2126
(B)	**TURBINE :-**		
T.	Rating of turbine	MW	140
2.	Turbine inlet steam pressure	°c	537.7
3.	Cold reheat steam pressure	Kg/Cm^2	35.3
4.	Hot reheat steam pressure	U	31. e
5.	Hot reheat steam temp.	°C	537.7
6.	Turbine exhaust pressure	Hg.absolute	3.5'
7.	Turbine exhaust hot well temp	°C	49
8.	Normal working speed	RPM	3000
9.	Sheet expansion	MM	30
10.	Differential expansion (high)	MM alarm / Trip	14.7 / 17
11.	Differential expansion (low)	MM alarm / Trip	4.2 / 2
12.	TG Set bearing No:1,2,3,4&5Max Vibration (shaft	MM	0.19
13.	Steam rate.	kg/KWH	3.24
14.	Over all Heat Rate.	KCAL/KWH	2428

(C)	**GENERATOR :-**		
1.	Capacity	MW	140
2.	Terminal voltage	KV	15
3.	Power factor		0.85
4.	Synchronous speed.	RPM	3000
5.	Excitation voltage	V.DC	375
6.	Hydrogen pressure	Psig	30
7.	Stator amperes.	Amp	6737
8.	MVA rating	MVA	175
9.	Field amperes.	Amp	966
10.	Stator winding temp not to exceed.	°c	100
11.	Rotor winding temp. not to exceed.	°c	120
12.	Maximum cold gas temp.	Oc	46
13.	Maximum hot gas temp.	O_c	55
(D)	**EXCITER (DC GENERATOR):-**	MAIN	AMPLIDYNE
1.	Capacity in kW.	400	1.6
2.	Voltage	375	125
3.	Ampere.	1067	12.8
4.	RPM	1085	1450
(E)	**GENERATOR TRANSFORMER :-**		
1.	Capacity.	MVA	170
2.	Voltage ratio	KV	15/138.6
3.	Ampere ratio	Amp	7086/708
4.	Type of cooling.		OFB/OB/ON
(F)	**Efficiency - data**		
	*(i) Boiler efficiency .	%	87.96
	(ii) Turbine efficiency	%	40.4
	(iii) Overall efficiency	%	35.4
	(iv) Turbine heat rate	KCAL/KWH	2126
	(y) Over all heat rate	KCAL/KWH	2428
	(vi) Boiler ratio (Steam/ Oil)		14.4
	(vii) Steam rate		3.24
	(viii) Oil flow (Without gas)	MT/Hr.	31.5

PERFORMANCE OF THE THERMAL POWER PLANT

Since the past and present performance level of the 2 x 140 MW TPP under valuation was to be considered and particularly while optimizing DRC and working out "Value in Use", the study of major performance parameters was must.

Sr. No.	Performance Parameter	Unit		TOTAL/ AV TPS
		1	2	
A.	**ACTUAL GENERATION (MWH)**			
	2006-07	502670	547772	1050442
	2005-06	404524	429069	833593
	2004-05	656359	522509	1178868
	2003-04	393508	337566	731074
	2002-03	490998	319150	810148
	AVERAGE	**489612**	**431213**	**920825**
B.	**PLANT LOAD FACTOR (%)**			
	2006-07	40.99	44.67	42.83
	2005-06	32.98	34.99	33.99
	2004-05	58.49	46.56	52.52
	2003-04	32.09	27.52	29.72
	2002-03	40.04	26.02	33.03
	AVERAGE	**40.92**	**35.95**	**38.42**
C.	**PLANT AVAILABILITY FACTOR (%)**			
	2006-07	86.30	71.92	79.11
	2005-06	68.99	83.16	76.07
	2004-05	87.58	79.04	83.31
	2003-04	63.77	65.69	64.73
	2002-03	85.02	58.97	72.00
	AVERAGE	**78.33**	**71.76**	**75.05**
D.	**AUXILIARY ENERGY CONSUMPTION (MWH)**			
	2006-07	48924	55745	104669
	2005-06	46279	50777	97056
	2004-05	63639	53982	117621
	2003-04	42715	39859	82574
	2002-03	50417	34096	84513
	AVERAGE	**50395**	**46892**	**97287**

E.	**UNITS SENT OUT (MWH)**			
	2006-07	450893	488553	939446
	2005-06	356376	376526	732902
	2004-05	579536	457259	1036795
	2003-04	346398	294375	640773
	2002-03	438083	284040	722123
	AVERAGE	**434257**	**380151**	**814408**
E.	**NET HEAT RATE (kCal/kWh)**			
	2006-07	2919	2958	2940
	2005-06	3040	3033	3037
	2004-05	2957	2950	2954
	2003-04	3172	3204	3187
	2002-03	3036	3038	3037
	AVERAGE	**3025**	**3037**	**3031**

PLF : is defined in relation to any period, **the ratio**, expressed as a percentage, of

(a) Total kWh generated at generator terminal

To

(b) Installed capacity in kW multiplied by number of hours

PAF : is defined in relation to any period, **the ratio**, expressed as a percentage, of

(a) Total number of hours in the relevant period less hours the generator was not generating for any reasons like shutdown, breakdown, maintenance, etc.

To

(b) Total number of hours in the relevant period

AEC : is defined in relation to any period, **the ratio**, expressed as a percentage, of

(a) Gross Energy in kWh generated at generator terminals minus net energy in kWh delivered at the switchyard

To

(b) Gross Energy in kWh generated at generator terminals

GHR : is defined as heat energy, in kCal, to generating station to deliver one kWh at the generator terminals

NHR : is defined as heat energy, in kCal, to generating station to deliver one kWh at the switchyard terminals

VALUATION METHODOLOGY/ APPROACH

The valuation of the assets of derated 2 x 110 MW capacity TPP, being CGU along with other infrastructural facilities, was to be made as per the Indian Accounting Standard 28 (AS 28) on the basis of “Recoverable Value” which is defined as “ Higher of Net Selling Price or Value in Use”. The Net Selling Price is defined as “Sale Proceeds of Assets at an arm’s length transaction between knowledgeable and willing parties less cost of disposal (except finance and income tax expenses)”. The “Value in Use” is defined as “Value of estimated discounted future cash-flow expected to arise from continuous use of an asset being under examination of impairment, during the reasonable period out of its useful life plus its discounted value of disposal proceeds at the end of useful life.”

Since these kind of specialized assets/ plants are seldom sold in active market, no evidences were available for similar transactions; the method followed was the best Realizable Value based on estimates item wise. For the purpose of arriving **Realizable Value**, in lieu of Net Selling Price, the Optimized Depreciated Replacement Cost (ODRC) was worked out, based on remaining life and present performance level/ serviceability, as the TPP was being in continuous use and specialized property by its nature.

To arrive at the “Value in Use”, the power plant being “Cash Generating Unit (CGU)”, with appropriately justified explicit assumptions the future cash flow projections were made and discounted to present value of the future net cash flow using Discounted Cash Flow Method.

Finally these values, Realizable Value and Value in Use were compared with the “Carrying Value” of the assets in the books of accounts for the purpose of recognizing Impairment Loss. Carrying Value is defined as “the amount at which an asset is recognized in the balance sheet after deducting any accumulated depreciation (amortization) and accumulated impairment losses thereon”.

VALUATION OF REPLACEMENT COST (RC) OF THE ASSETS

Each class of assets was valued for its “Replacement Cost”.

LAND

The land was valued at current market value, keeping in view the economic developments, registered land sale transactions in recent past of 5 years. Further due consideration was given to the restrictions of easy disposal and/ or to put the land is alternative use.

BUILDINGS OTHER THAN PLANT BUILDINGS

The plant buildings are considered specialized buildings and the valued similarly to plant and machinery. The other buildings like office buildings, residential colonies, guest houses, schools, hospitals and other amenities were valued on plinth area basis applying current costs of constructions.

MISCELLANEOUS ASSETS

These miscellaneous, like Vehicles, Furniture, Fixtures, Fittings and Office Equipments were value at their current cost of replacement on obtaining information from the market.

PLANT AND MACHINERY AND EQUIPMENTS

The plant and machinery including plant buildings were considered specialized assets, in view of following characteristics:

1. Owned by the Government Company.
2. Used for monopoly business of generation of electricity.
3. Not sellable in the open market, except as part of the business entity, this was not possible in near future.
4. The revenue generated was based on state regulations which could not be derived from open market and for which no open market evidences existed, except comparing with other state(s) owned similar power plants.

While determining Modern Equivalent Assets (MEA) with due regard to certain factors :

(a) Number of shut downs.
(b) Major accidents occurred resulting into downtime.
(c) Proven reliability of power plant based on designed parameters
(d) Operational Compliance with the norms fixed by Statutory Bodies, like Ministry of Power, Central Electricity Authority, Electricity Regulatory Commissions, etc.
(e) Least lifetime costs.

The Reserve Bank of India (RBI) publishes Whole Sale Price Indices of various classes of assets. The same were applied wherever no current prices or cost estimated were available.

To crosscheck the accuracy of indexing, to the extent possible cost estimates were obtained from manufacturers or suppliers or cost of construction of similar plants in recent past. Necessary appropriate adjustments were made wherever necessary.

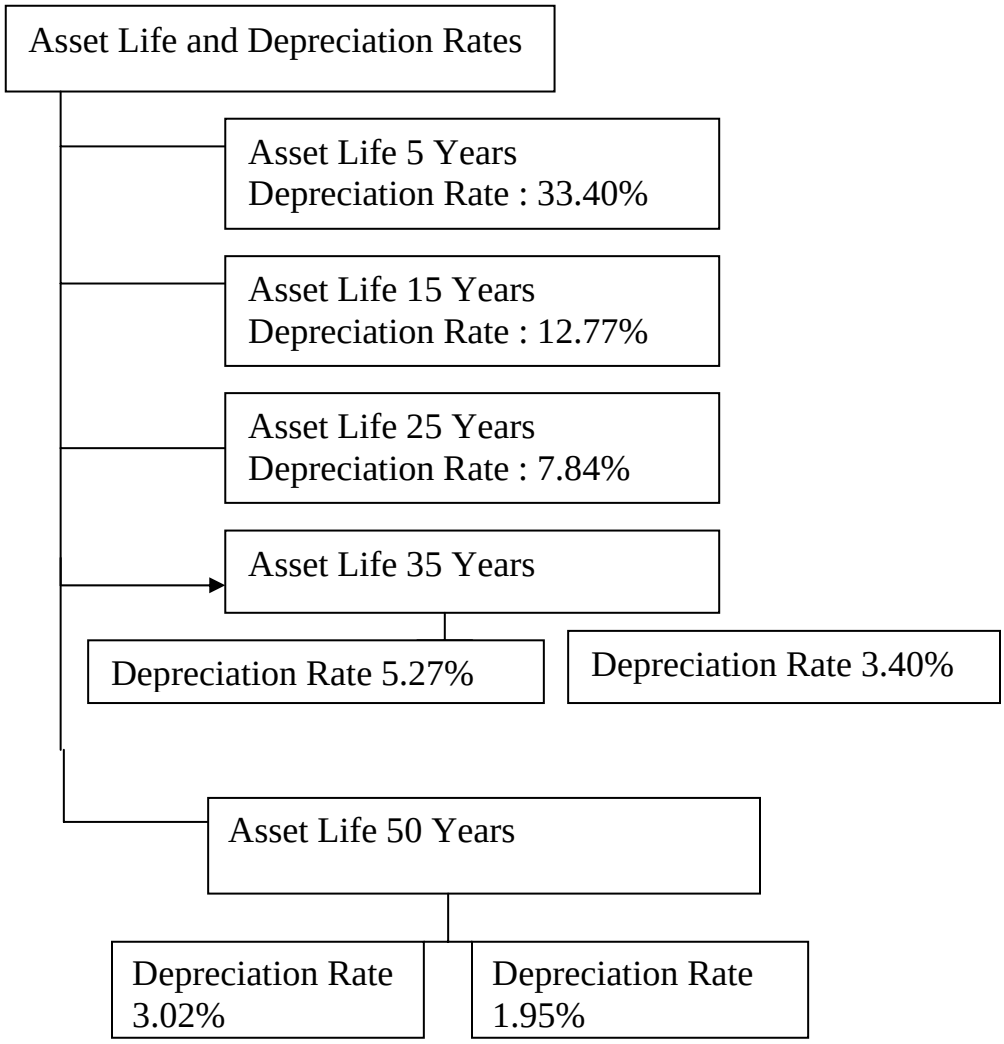
VALUATION OF FIXED ASSETS AT DEPRECIATED REPLACEMENT COST (DRC)

The Replacement Cost (RC) derived is depreciated to derive Depreciated Replacement Cost (DRC), for which two important parameters were to be considered – one depreciation rates and the Useful Life (UL) as well as Remaining Life (RL) of the Assets. Based on the reasonable assessment of RL, the DRC was derived.

The depreciation rates of state owned monopoly electrical business are governed by The Electricity (Supply) Act 1948.

Prior to 1992, assets could be classified into 12 groups based on the fair life and 19 based on the depreciation rates. From 1992 it reduced the number of groups to 7 on both aspects of fair life and depreciation rates. This was done by reducing the fair life and increasing the depreciation rates. Further, in 1994, the fair life of assets remained unchanged while

the depreciation rates increased. All the assets could be classified into the categories listed below based on their depreciation rate and their useful life.



Further Ministry of Finance under the Indian Companies Act as well as the Income Tax Act also defines the depreciation rates based on certain assumptions. However these rates are for the specific purposes under the respective laws.

For the purpose of valuation we compared Indian Practice of Useful Life for depreciation of assets with International those with intentional Practices as under:

INTERNATIONAL COMPARISION OF USEFUL LIFE FOR DEPRECIATION OF ASSETS

Asset Description	As per Indian Electricity Supply Act, 1948	National Grid, United Kingdom	United Networks Ltd., New Zealand	Manitoba Hydro Canada	Scottish Hydro Electric Plc, United Kingdom	Snowy Mountains Hydro-Electric Authority Australia	Hydro - Electrical Corporation Australia	National Power United Kingdom
Civil Works	35-50			100		30-100		
Freehold & Leasehold	Infinity under lease (period lease)	upto 40	50-100 (Freehold	100		10-30		Not Depreciated
Other Building	25-50			75				40 (Non-Operational Building)
Generating Assets	15.35			50 (Turbines & Generators) 35-40 (accessory Station Equipment)	20-60	20-70 (Electrical & Mechanical Equipment)	50 (Generation)	20 (CCGT) 20-40 (Other Stations)
Power Station								7 (Power Station
Towers	25-35	40 or 60		45-80				under operating
Substation Plant					40-80			lease)
Overhead Lines & Cables	25-50	40 or 50		30			23	
Protection and Control Equipment		15 or 25	16-70 (Reticulation System)	20	15-25	5-15 (Mobile Plant)	(Transmission) 20 (Distribution)	
Cross-Channel Link	15-25	25			(other Transmission Distribution buildings, Plant & Equipment)	5-15 (Electric Equipment)	6	4 4-5 (Fixtures, Fitting Tools & Equipment
Telecommunication Equipment	15	3-25	3-10	20				
Motor Vehicles &	5-15	3 or 5	(Plant, Vehicles	7-17	3-10	3-15	6	3-5
Office Equipment			equipment)			(Intangibles)	(Others)	

DEPRECIATION RATES ADOPTED

Based on above information and practices, adopted following Depreciation Rates for major class of assets as under:

$$\text{Depreciation Rate} = \frac{\text{Asset Value -- Residual Value (10\%)}}{\text{Economic Life}}$$

Asset	**Rate (%)**
Main Plant	
Steam electric NHRS & Waste heat recovery boilers	2.57
Diesel electric & gas plant	6.00
Cooling Towers and Circulating water systems	3.60
Building & Civil engineering works of a permanent character not mentioned above	
Offices and showrooms	1.80
Containing thermo-electric generating plant	2.57
Temporary erections such as wooden structures	18.00
Roads other than temporary roads	1.80
Others	1.80
Transformers, kiosk, sub-station equipment & other fixed apparatus (including plant foundation)	
Transformers including foundations having rating of 100 KVA and over	3.60
Others	3.60
Switch Gear including cable connections	3.60
Lighting Arrestors	
Station Type	3.60
Pole Type	6.00
Synchronous Condenser	2.57
Batteries	18.00
Underground cable including joint boxes	2.57
Overhead Lines including cable support systems	
Lines on fabricated steel operating at terminal voltages higher than 66 KV	2.57
Lines on steel supports operating at terminal voltages higher than 13.2 KV but not exceeding 66 KV	3.60
Lines on steel or reinforce concrete support	3.60
Lines on treated wood support	3.60
Meters	6.00
Self Propelled Vehicles	18.00

Air – Conditioning Plants	
Static	3.60
Portable	6.00
Office Furniture & Finishing	6.00
Office equipment	6.00
Internal wiring including heating and apparatus	6.00
Communication Equipment	
Radio and high frequency system	6.00
Telephone lines and telephones	6.00

VALUATION OF FIXED ASSETS AT OPTIMISED DEPRECIATED REPLACEMENT COST (ODRC)

The DRC is further optimized to get Optimized Depreciated Replacement Cost (ODRC). This is only applicable to plant and machinery. It may be noted that the owner is going on capacity addition at the same place, so it is obvious that the other facilities like colony, roads, offices, establishments, manpower, common amenities, etc. would continue to be in service/ use and with these facilities would not any way will get retire in near future. However the P & M constituted more than 90% of the cost of total fixed assets, it has great importance on the final valuation for given purpose. For specialized assets, particularly the thermal power plants, following possible degrees of optimization considered

1. Reproduction of Existing Assets

   Since the Replacement Cost is worked out on the basis of Present Day Replacement/ Reproduction Cost (PDRC) of similar kind and capacity new plant, no optimization required.

2. Elimination of Surplus Assets:

   Since the power plant is valued in situ, and no major assets found to be surplus, no optimization required.

3. Over Design:

While valuing the Replacement Cost due consideration was given to the derating of the TPP.

4. Obsolescence Eliminated:

Obsolescence may arise from factors such as outdated design and/ or functionality of an asset or changed code requirement. This element of optimisation was checked comparing the performance parameters of existing plant with those operating norms or benchmarks sets by the Regulatory bodies, like Ministry of Power, Central Electricity Authorities, Central/ State Electricity Regulatory Commissions, etc. Since being specialized assets and being State owned monopoly business this was the appropriate base of optimisation. Comparison was also confirming the long-term commercial viabilities of the plant.

The actual average performance of 5 years of the subject TPP was compared with the set operating norms as under:

Sr. No.	Operating Parameter	Unit of measure	Norms set	Actual Average of recent past 5 years
1.	Plant Load Factor (a) Daily (b) Annual	%	 > 50 > 75	 38.42
2.	Net Heat Rate Coal at 80% PLF and steam pressure @ 170 kg/ cm^2	KCal per kWh	2460 – 2500 Avg. **2480**	3031
3.	Auxiliary Fuel Consumption for coal/ lignite as fuel	%	9.00	10.56

The above analysis showed that the only parameter attracted optimization of lower side was excessive heat rate, which was higher by about 22.22% compared to that set optimum operating norms. In other words, the plant is less energy efficient and hence it is likely to generate less output, ultimately less revenue, during its remaining useful life in comparison to similar modern equivalent plants or expected by the regulations. For the subject TPP the cost of fuel (oil) for generation of electricity is worked out to be Rs. 2.31 per kWh. This means the cost of generation by existing plant is more by Rs. 0.5133 per kWh at optimum operating norms for existing level of generation. This being revenue expenditure for remaining life of plant, there is no implication on valuation of Plant & Machineries valued under regulated power tariff mechanism for the assets of public sector power plant for given purpose. However this parameter should not be neglected for valuation of ongoing business under deregulated power tariff mechanism and for any other purpose of valuation like sale of or disinvestments from business entity.

VALUATION OF "VALUE – IN – USE"

To arrive the "Value in Use" of derated 2x110 MW TPP, as the sole product is power generation the same is considered as single Cash Generating Unit (CGU). With certain market driven explicit assumptions, the future cash flows projections were worked out and the Present Value of the cash flow was arrived using Discounted Cash Flow (DCF) method. Major assumptions made for working out the cash flows are as under:

- The de-rated to 2X110 MW capacity was expected to keep on generating with availability of fuel. Hence its maximum generating capacity would be 1927 Million Units (MUs) at 100% PLF..

- The remaining life of the plant assessed and considered 10 years.

- The annual sale of electricity was 1117 MUs in 2006-07 considering 60% PLF and after 12% of auxiliary consumption. In subsequent years of projection it is expected to run/ perform at the same heat rate. However considering the age of the plant it was expected to reduce at 0.5% p.a.

- Sales price of generated electricity was realized @ Rs. 3.1479 per unit and @ Rs. 4.60 per unit in 2005-06 and 2006-07 respectively, of course tariff regulated. For future projections, the base price taken was @ Rs. 3.25 per unit with annual increase @10% considering average tariff realized from all the power plants of the state.

- Considering the international price fluctuations in oil prices and the same compensated by strong rupee value against US $, the inflation in fuel oil price is considered @ 2.5% p.a.

- Repair and Maintenance Cost was expected to follow the trend of increase @ 2.5% p.a. considering base as 2006-07.

- Employee Cost was expected to increase @ 7.5% p.a.

- Administrative Cost was expected to increase @ 2.5% p.a.

- Financing cost was not incurred much in previous two years, but for fuel inventory of 30 days, interest cost @ 10% p.a. was considered.

- Depreciation during projected period was provided by amortization over remaining life, irrespective of any depreciation rates provided by any authority or law or commission. This was required to reasonably put the said TPP comparable to competitive TPPs.

- Future projected cash flow was to be discounted to present value considering necessary inflation and risk factor. Discounting rate is taken as 10%.

“VALUE IN USE” OF DERATED 2X110 MW TPP; CASH GENERATING UNIT (CGU)

Sr. No.	Description	Unit	2007 - 08	2008 - 09	2009 - 10	2010 - 11	2011 - 12	2012 - 13	2013 - 14	2014 - 15	2015 - 16	2016 - 17
A.	REVENUE											
1	Generating Capacity	MU	1927.20	1927.20	1927.20	1927.20	1927.20	1927.20	1927.20	1927.20	1927.20	1927.20
2	Plant Load Factor	%	60.00	59.00	58.00	57.00	56.00	55.00	54.00	53.00	52.00	51.00
3	Units Generated	MU	1,156.32	1,137.05	1,117.78	1,098.50	1,079.23	1,059.96	1,040.69	1,021.42	1,002.14	982.87
4	Units Sole/ Billed	MU	1,017.56	1,000.60	980.29	963.39	942.17	925.35	905.40	878.42	851.82	825.61
5	Sales Rate / Unit	Rs.	3.25	3.58	3.93	4.33	4.76	5.23	5.76	6.33	6.97	7.66
6	Sales Value	Rs. Million	3,307.08	3,577.15	3,854.99	4,167.38	4,483.15	4,843.40	5,212.90	5,563.31	5,934.36	6,326.94
7	Other Income	Rs. Million	4.96	5.37	5.78	6.25	6.72	7.27	7.82	8.34	8.90	9.49
8	Total Cash Inflow	Rs. Million	3,312.04	3,582.52	3,860.77	4,173.63	4,489.87	4,850.67	5,220.72	5,571.66	5,943.26	6,336.43
B.	EXPENSES											
1	Fuel Consumption	Rs. Million	2,430.70	2,700.75	2,987.62	3,308.90	3,649.28	4,039.40	4,430.96	4,728.81	5,044.21	5,377.90
2	Repairs	Rs. Million	49.61	55.45	61.68	68.76	78.46	89.60	99.05	108.48	121.65	136.03
3	Employees Cost	Rs. Million	193.25	207.74	223.32	240.07	258.07	277.43	298.24	320.60	344.65	370.50
4	Administrative Expense	Rs. Million	17.84	18.28	18.74	19.21	19.69	20.18	20.69	21.20	21.73	22.28
5	Finance Cost	Rs. Million	13.90	15.44	17.08	18.92	20.87	23.10	25.34	27.04	28.84	30.75
6	Total Cash Outflow	Rs. Million	2,705.29	2,997.66	3,308.44	3,655.86	4,026.37	4,449.71	4,874.27	5,206.14	5,561.09	5,937.45
C.	Profit before Depreciation	Rs. Million	606.75	584.86	552.33	517.77	463.51	400.96	346.45	365.51	382.18	398.98
D.	Depreciation	Rs. Million	48.30	48.30	48.30	48.30	48.30	48.30	48.30	48.30	48.30	48.30
E.	Salvage Estimate	Rs. Million										500.00
E.	NET CASH FLOW	Rs. Million	558.45	536.56	504.03	469.47	415.21	352.66	298.15	317.21	333.88	350.68
F.	**PRESENT VALUE OF NET CASH FLOW**							**Rs.**	**3165.17**	**Million**		

VALUES DERIVED AND CERTIFIED FOR GIVEN PURPOSE

REALISABLE VALUE:

The Realizable Value of the assets and corresponding Impairment Loss were certified to be Rs. 2367.39 million as summarized below:

Rs. million

Sr. No.	A/C Head	Description	OC	CA	RC	**RV**	IL
A.	10.1	LAND & RIGHTS	1.47	1.47	221.41	221.41	0.00
B	10.4	PLANTATION	11.14	11.14	13.14	13.14	0.00
C	10.2	BUILDINGS	56.45	16.79	409.34	163.94	0.13
D	10.3	HYDRAULIC WORKS	295.43	100.22	1292.62	428.90	0.00
E	10.4	OTHER CIVIL WORKS	35.33	5.52	64.14	24.94	0.00
F	10.5	PLANT & MACHINERY	1096.74	365.99	4174.28	1502.64	0.33
G	10.6	LINES AND CABLE NET-WORK	3.56	1.15	15.07	4.32	0.00
H	10.7	VEHICLES	5.59	2.32	13.07	3.84	0.31
I	10.8	FURNITURE, FIXURES & FITTINGS	2.33	0.79	3.76	1.69	0.00
J	10.9	OFFICE EQUIP.	5.34	1.06	3.93	2.57	0.13
TOTAL			1513.38	506.45	6210.76	**2367.39**	0.90

Note: OC = Original (Historical) Cost
CA = Carrying Amount
RC = Replacement Cost
RV = Realizable Value
IL = Impairment Loss

Note: The Impairment Loss seen is because of some of the individual items. Otherwise as a group of assets or CGU, there is no Impairment Loss.

VALUE IN USE:

The Value In Use certified to be **Rs. 3165.17 million.**

RECOVERABLE AMOUNT:

The Recoverable Amount is higher of Realizable Value and Value in Use. Thus for the CGU as a whole, the Recoverable Amount is **Rs. 3165.17 million.**

OPINION ON IMPAIRMENT:

Since the Recoverable Amount, is higher than Carrying Amount, there is no Impairment Loss. Reviewing individual asset items, there exists nominal loss, but considering CGU as whole, these minor items of loss may be ignored.

VALUATION CONSTRAINS

The above fixed asset valuation methodology essentially estimates the cost of replacing the tangible specialized assets of the business. The replacement cost takes into account the market value of various assets or the expenditure required to create the infrastructure exactly similar to that of an entity being valued. Since the replacement cost assumes the value of business as if we were setting a new business, this methodology may not be relevant in a going concern, however, this methodology can also assume the amount which can be realized in case of liquidation / closure of the business by selling off all the tangible assets of an entity and paying off the liabilities. Hence for the specialized assets, like Thermal Power Plants, and that too for monopoly tariff regulated state owned business, this methodology is acceptable to derive ODRC, in lieu of Net Selling Price, for the purpose of Impairment of Assets, i.e. AS 28.

The said valuation approach suffers from certain problems and limitations. These are detailed below:

(i) Practically, it is extremely specialized job to determine the exact replacement cost of the specialized assets. This is so on account of number of reasons, such as :

(a) Changes in technology over a period of time (resulting in certain assets not being produced at all or being produced with far more efficiencies than earlier).
(b) Absence of a marketplace where such assets are or can be traded.
(c) Inabilities of the seller to be able to actually realize the value of assets in one go should the assets be liquidated.
(d) Changes in the duty structure (like excise, import duties etc.), which may impact the value of the asset over different periods of time.
(e) Ignores the operational problems.
(f) Non- consideration of updated plant / machineries for replacement cost due to large price variation.

(ii) The initial cost components capitalized are mostly either overstated or understated in the fixed asset register, which needs appropriate adjustments, due to reasons like :

(a) The initial supplies by the contractors and manufactures are quoted higher having known that most of the public sector / government projects are delayed.
(b) The cost of capital, i.e. interest, during construction period capitalized on higher side due to delayed construction activities.
(c) Being government projects, certain imports as well as domestic supplies are duty/ tax-free.
(d) Certain preliminary expenses and preoperative expenses need careful scrutiny.
(e) Some major repairing expenses capitalized in books of accounts instead of revenue expenditure.

(iii) Depreciation

The depreciation rates decided by regulatory authorities on cost recovery parameters keeping in view administered pricing of services to the society. This does not commensurate on the basis of actual life of the assets.

(iv) Assets' Remaining Life

Deciding this parameter calls for expert technical assessment and best judgment based on the remaining serviceability of the assets, which should not be overlooked.

(v) In depth study of technical parameters of the existing system configuration and compare the same with latest developments is must.

(vi) In depth analysis of performance of the plant and compare the same with the operating norms set by the regulatory bodies. Ignoring operating characteristics in the valuation of assets would certainly lead to overvaluation.

(vii) Relying on indices in all categories of assets should not reflect true value since the indices set by the Authorities (RBI) may not cover all the items together in an integrated systems.

(viii) Other methods such as "Net Selling price" cannot be employed.

(ix) "Value in use" is based on explicit assumptions and depending on number of variable parameters.