Parsons Brinckerhoff Associates

Asian Appraisal Company, Inc.
professional business and property consultants

ASSET VALUATION
FOR PRIVATELY OWNED DISTRIBUTION UTILITIES
SUBJECT TO PERFORMANCE BASED REGULATION

FINAL REPORT
MANILA ELECTRIC COMPANY
VALUATION DATE: 30 JUNE, 2006

FOR

ENERGY REGULATORY COMMISSION

ENERGY REGULATORY COMMISSION
ERC
PHILIPPINES

TABLE OF CONTENTS

Sections

APPENDICES:

1. EXECUTIVE SUMMARY

1.1 SUMMARY OF VALUATION

PB Associates (PBA) and Asian Appraisal Company, Inc. (AACI) have been retained by ***Energy Regulatory Commission (ERC)*** to conduct and prepare an appraisal of the fixed assets exhibited to us as being owned by ***Manila Electric Company*** (herein referred to as "MERALCO"). We confirm that we have conducted the necessary inspection, made relevant inquiries and obtained such further information available for the purpose of providing you with our opinion of the value of the Fixed Assets.

It is our understanding that this appraisal will be used as support for rate setting and you wish us to render an opinion of the ***Appraisal Values*** of Meralco's Fixed Assets as of ***June 30, 2006.***

The valuation was performed in accordance with the standards issued by the Energy Regulatory Commission under the ERC Asset Valuation Guidelines. The methodology adopted is consistent with the internationally accepted appraisal standards as stated in the Uniform Standards of Professional Appraisal Practice (USPAP) and with the International Valuation Standards, Sixth Edition 2003, issued by the International Valuation Standards Committee in London, United Kingdom.

Premised on the accompanying narrative descriptive information, valuation methodology, and summary of values, our opinion of the Appraisal Values of the existing Fixed Assets as of June 30, 2006 for continued use as part of a going concern, is fairly and reasonably represented as follows:

	Depreciated Historical Cost	Replacement Cost	Optimised Replacement Cost	Optimised Depreciated Replacement Cost
Totals	48,819,313,786	169,072,111,739	155,257,925,205	96,640,693,811

Table 1 presents our opinion of the Optimised Depreciated Replacement Cost (ODRC) valuation of the Meralco distribution utility as at June 30, 2006 based on the DHC and ODRC valuation approaches explained within this report.

As per the requirements of clause 4.8 of the DWRG the tables contained in Appendix A of this report present the above values subtotalled by asset category.

1.2 OPTIMISED DEPRECIATED REPLACEMENT COST (ODRC)

1.2.1 Valuation of Electrical System Fixed Assets

PB Associates employed the following process:

Step 1 – Determine Information Gaps

PB Associates began with the extraction of the Distribution Utility's /Regulated Entity's Fixed Asset Register (FAR). The FAR is an accounting register and must be conformed to an ODRC register based on defined asset subcategories.

PB Associates identified all assets in the Regulated Entity's FAR as well as the availability of data required to perform an ODRC valuation.

The data required from the FAR was as follows:

1. Asset description;
2. Physical count (assets in use);
3. Historical cost (installed cost);
4. Installation date;
5. Physical location; and
6. Electrical location.

After due examination of financial and technical data repositories, PB Associates concluded the following:

None of the Regulated Entities were able to provide the physical or electrical locations without conducting an extensive and time consuming mapping process. The timeframe required for such mapping, to be robust, is years not months. Accordingly it was concluded that adjustment of replacement costs by specific location multipliers was not feasible for this valuation.

Step 2 – Transform the Regulated Entity FAR to an ODRC Register

PB Associates guided the development of the Regulated Entity FAR, working with the Regulated Entity's commercial and technical staff as they transformed their FAR into a "worked" register suitable for entry into PB Associates ODRC register format.

This process comprised many iterations as the Regulated Entity FAR's were used for accounting purposes and required a substantial allocation effort to conform to the requirement of the ODRC register.

This step required listing all asset types found in the Regulated Entity register.

Step 3 – Verify the ODRC Register data

The ERC Position Paper called for the following approach to asset verification:

Substation Assets – For major and minor substations, the verification was to a 100% inspection standard.

Repetitive Assets – For repetitive assets the verification was to a sampling process. The sampling approach employed was based on sampling theory taking into account a finite population correction factor. Details of the verification results are provided in Section 3.2.2.

Step 4 – Determine Standard & Non-Standard Assets (materiality)

Once the 'worked' registers were verified, PB Associates analysed the physical counts and historical costs to determine the common or standard assets according to a 5% materiality threshold. The analysis determined which assets should be given a standard replacement cost (material asset types) and which assets would need to be valued using indexed historical costs or MEA valuation methods.

Step 5 – Finalise the Replacement Cost Register

The assets in the verified register were classified according to the valuation methodology i.e. assets for RC valuation, assets for indexed historical cost valuation and assets for replacement with Modern Equivalent Assets (MEA).

Step 6 – Finalise the ODRC Register

This step involves entering the following settings into the register

- Standard Asset Lives (from ERC Asset Valuation Guidelines)
- Standard Replacement Costs
- Indexation Factors

The Standard Replacement Costs and Indexation Factors are provided in Appendix B in the form of a stand-alone companion paper.

Step 7 – Determine Optimisation

The rules pertaining to optimisation are specified in the ERC's Asset Valuation Guidelines. The basis for optimisation of Meralco's Fixed System Assets is provided in Appendix C in the form of a stand-alone companion paper.

Step 8 – Perform the ODRC Valuation

Step 8a – For standard assets, depreciate according to the RC and remaining life to a 5% Optimised Replacement Cost residual value.

Step 8b – For non-standard assets, apply indexation, then depreciate according to the remaining life to a 5% Optimised Replacement Cost residual value.

Step 8c - Optimise the ODRC Register by making adjustments as single line entries in accordance with the recommendations in Appendices A to C of this companion paper.

In practice Steps 8a and 8b are carried out automatically by the logic embedded in the ODRC register.

Step 8c is carried out manually. This is because different techniques are required to optimise assets valued by RC and assets valued using indexed historical costs. In some cases individual line entries are identified for

optimisation while in other cases a random selection of assets must be made and this is performed manually.

This completes an explanation of the process employed by PB Associates to value the electrical system fixed assets of Meralco.

1.2.2 Land & Buildings

The process employed for valuing land and improvements is described in Section 4.2.

1.2.3 Specialised & Non-Specialised Assets

The process employed for valuing specialised and non-specialised assets is described in Section 4.3.

1.2.4 Valuation Settings

Materiality of 5% has been applied during the valuation process.

GST (VAT) has been included in replacement costs as Meralco is not VAT exempt. VAT was also included in the previous valuation.

2. MERALCO ASSET REGISTERS

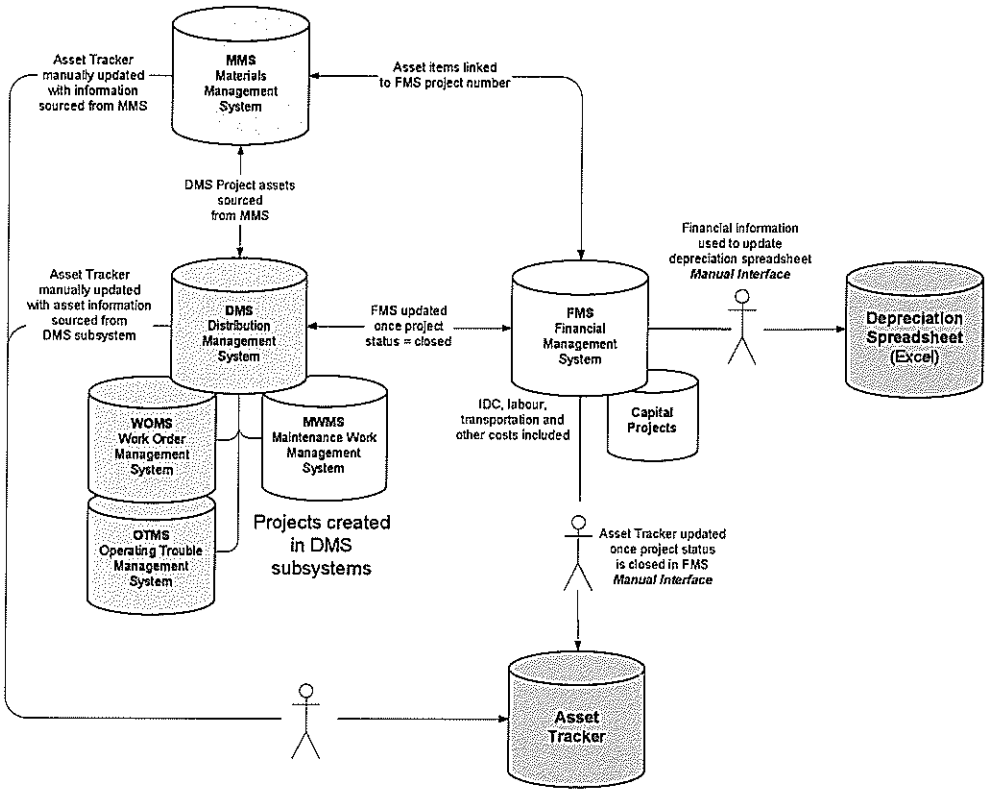
In this Section we discuss the existing valuation records for Meralco, fixed asset registers, accounting manual, engineering information and other documents that were used to develop an Optimized Depreciated Replacement Cost (ODRC) register.

2.1 FINANCIAL DATA SYSTEMS

2.1.1 Fixed Asset Registers

Meralco use a number of systems to manage and maintain asset information and associated cost and depreciation data.

Figure 1: Meralco Systems Overview



A summary diagram of the key systems involved is shown above in Figure 2.

The functionality of each of the key systems is explained as follows:

2.1.2 Materials Management System

The Material Management System (MMS) contains a list of all asset categories and subcategories used by Meralco.

Each asset category / subcategory has a unique identifier code associated. This is not interfaced automatically to the Asset Tracker system nor added manually.

The current process is for the "Description" field of the asset type to be manually added to the line item when updated in the Asset Tracker system rather than using the unique identifier code. This means that the accuracy of the data is unknown because there is no validation step that ensures a one-to-one mapping to the asset codes held in MMS.

The MMS is not directly relevant to the purpose of developing the valuations.

2.1.3 Financial Management System

The Financial Management System (FMS) is the main accounting and general ledger system for the maintenance of capital project cost information.

Capital project cost information is interfaced from the DMS subsystems listed above. It is also possible to create a capital project within FMS itself which covers capital projects not initiated in WOMS, OTMS or MWMS. It also covers approved proposals for Non Electric Capital Project (NEP) and Other Capitalised Items (OCI).

All projects involving those assets which can be capitalised are stored within FMS.

Associated data is only high level cost information; it is the Asset Tracker that is used to create the separate line items for each capitalised assets involved in the project.

The Capital Projects module of FMS comprises the FAC (Fixed Asset Classification) code which identifies the asset after the closing of the project and the ELA[1] code which identifies the physical location of the asset.

Manual reports of all new capital projects are extracted from FMS, which are then used to update the Asset Tracker system.

The FMS is a source of project cost data which will be useful as an input to the process of determining replacement costs.

2.1.4 Asset Tracker

The most important information system for valuation purposes is Meralco's FAR which is known as the Asset Tracker.

The Asset Tracker is a very large database, comprising several hundred thousand line entries. It is a stand alone system that is manually updated. It is built from data sourced from various technical and financial data and information repositories.

The Asset Tracker has the functionality to produce the historic cost valuation which is used for financial reporting purposes (annual report, etc).

The Asset Tracker is updated manually by accounting staff from Meralco's Fixed Asset Accounting team. Reports are manually extracted from FMS which contain details of projects which have involved capitalised assets and hence require the Asset Tracker to be updated with the appropriate information. The depreciation spreadsheet only deals with high level cost information; there is no detail at an asset level, only at a FMS "account" category level.

[1] A Spanish abbreviation denoting location

The information required to be stored in the Asset Tracker is not available from FMS, hence the accountant must interrogate the source DMS system, MMS and potentially with the team involved in order to find out which assets were involved and the cost allocations required.

Assets are categorised into UPA (Utility Plant Account) categories currently in the Asset Tracker. The UPA categories map to the categories specified in the regulation guidelines.

The Asset Tracker was the source of asset data for the purpose of development of the ODRC register.

2.1.5 Accounting Manual & UPA categories

The Meralco accounting manual provided details of the plant accounts and allocation rules for capitalization and operating expense.

Transmission:

350 Land & Land Rights
351 Clearing Land & Rights of Way
352 Structures & Improvements
353 Station Equipment
354 Towers & Fixtures
355 Poles & Fixtures
356 Overhead Conductors & Devices
357 Underground Conduit
358 Underground Conductors & Devices

Distribution:

360 Land & Land Rights
361 Structures & Improvements
362 Station Equipment
364 Poles, Towers & Fixtures
365 Overhead Conductors & Devices
366 Underground Conduit
367 Underground Conductors & Devices
368 Line Transformers
369 Services
370 Meters
371 Installation on Customers' Premises
372 Leased Property
373 Street Lighting & Signal Systems

General:

389 Land & Land Rights
390 Structures & Improvements

391 Office Furniture & Equipment

392 Transportation Equipment

- Passenger Car, Motorcycle
- Pick-up, FX, Van
- Truck, Shuttle Bus
- Trailers

393 Stores Equipment

394 Tools, Shop & Garage Equipment

395 Laboratory Equipment

396.1 Power Operated Equipment

396.2 Mounted Equipment

397 Communication Equipment

398 Miscellaneous Equipment

399.1 Computer & Peripherals

399.2 Specialized Engineering Computer Equipment

Each line item in Asset Tracker is associated with an account which only loosely translates to an Asset Category. Therefore when building the ODRC register each line item must be mapped to a standard asset category in order for the correct valuation costing / depreciation to occur.

2.1.6 Depreciation Spreadsheet

The Appraisal and Depreciation team manually maintain an excel spreadsheet to calculate depreciation. The source data for the depreciation spreadsheet and the Asset Tracker is from FMS. There is no reconciliation between the Asset Tracker and the depreciation spreadsheet. The depreciation spreadsheet only deals with high level cost information, so there is no detail at an asset level, only at a FMS "account" category level.

Manual reports are extracted from FMS which accountants use to update the depreciation spreadsheet on a monthly basis with the appropriate movements in asset depreciation values for each UPA.

The level at which depreciation is calculated is the UPA level. The UPA is an accounting grouping or categorisation of asset types. An extract from the depreciation spreadsheet is shown in Figure 2.

Figure 2: Monthly Depreciation Spreadsheet

ADDITIONS AS OF		*MD-1005.XLS*							
	JANUARY	FEBRUARY	MARCH	APRIL	MAY	JUNE	JULY	AUGUST	SEPT.
310									
350							122,332		
351			1,936,422	207,330	815,215				
352	217,511				177				
353	3,957,210	-195,145	10,257,949	26,468,847	5,053,143	441,479	388,461	9,175,894	2,600,486
354				200,089		21,428	513	158,806	75,572
355	4,702,360	40,608,894	11,750,734	57,469,867	89,007,914	123,183,563	50,229,013	20,893,143	63,047,218
356	587,904	872,140	271,871	2,560,445	5,114,793	5,481,341	3,308,003	4,385,770	6,475,370
357									
358									
360	-170,441	-304,373	5,544,625	1,640,075	356,733	-714,060	1,473,750		-536,364
361	409,611	30,609	-257,451	581				44,896	41,659
362	51,116,447	145,717,647	153,483,200	-88,915,247	3,967,933	75,199,568	25,983,349	22,919,836	87,263,079
364	70,295,393	-569,637,116	63,877,240	85,241,688	73,920,386	55,048,205	25,365,323	53,825,069	58,801,865
365	25,939,104	29,683,635	39,915,185	38,483,747	3,901,619	236,829,578	26,661,741	20,798,437	33,297,780
366	22,616	615,971	-304,339	87,318	39,070,542	567,574		-737,474	233,405
367	2,480,543	21,874,188	1,623,345	22,299,080	3,846,577	16,629,995	1,841,369	5,921,118	12,471,505
368	181,445,245	-740,521	82,978,169	78,547,589	77,053,942	142,179,360	82,701,681	133,871,414	227,308,901
369	16,920,264	8,630,446	6,387,180	5,456,616	4,925,508	11,576,857	21,413,535	31,674,813	12,260,824
370	127,578,173	80,270,792	53,374,770	193,266,675	80,506,048	153,012,462	57,442,112	163,047,278	17,767,687
371									
372									
373	5,690,915	8,802,555	2,839,970	12,002,327	4,778,796	453,322	790,237	1,681,864	2,889,888
389									
390		30,013,816	429,512	11,647					
391		879,134		4,856	198,434				
392		460,752					-42,796		
393									
394		7,640,270	-2,188,159	606,472	1,275,665	-64,509		471,545	
395		4,099,108	-1,952,726	68,406					
396.2									
396.1									
397	6,285,383	29,195,912	33,774,825	83,940		581,894	32,392,885	22,173,603	13,805,805
398		327,147	-111,789	60,478	-489,080				
399.1		164,851,254		39,809					
399.2				790,898					
TOTAL	497,478,238	3,697,115	463,630,533	436,683,533	393,304,345	820,428,057	330,071,508	490,306,012	537,804,680

2.2 TECHNICAL DATA SOURCES

2.2.1 Distribution Management System

The Distributed Management System (DMS) consists of a number of modules or subsystems (refer to Figure 1).

The DMS is the source of capital project data, which is subsequently used to update the FAR using Asset Tracker. The key subsystems of the DMS are:

- WOMS – Work Order Management System for all construction work covering the Subtransmission and Distribution networks.
- OTMS – Operating Trouble Management System for all capitalizable operating trouble resolution of network facilities.
- MWMS – Maintenance Work Management System used to manage all capitalizable maintenance activities of network facilities.

Capital projects are set up and managed in each of the three subsystems.

The DMS is not directly relevant to the purpose of developing a valuation.

2.2.2 Automated Mapping / Facilities Mapping (AM / FM)

Meralco maintains an Automated Mapping / Facilities Management (AM / FM) system that is linked to a Geographic Information System (GIS)

The AM / FM system contains detailed information for system fixed assets including physical location, category, subcategory. However, the system does not hold the installed date for the majority of assets.

Meralco has entered operations maps and drawings into the GIS system, but has not entered asset details. Such details are contained on electronic maps that reside in a separate system (e.g. Pole Maps). These maps were used as an input to the asset verification processes.

Meralco undertook a reconciliation process to determine the difference in physical counts contained within the Asset Tracker and AM / FM system as at 31 December 2005.

The discrepancies between the physical counts were explained to PB Associates / AACI and the following table contains a summary of the final results:

Table 1: Reconciliation of Asset Tracker and AM/FM Counts

Asset Type	Asset Tracker Count	AM / FM Count	Asset Tracker cf AM / FM count	
			Difference in percent	Difference in Count
Distribution Transformers	158,543	150,746	5.09%	8,067
Distribution Poles	648,898	614,747	5.26%	34,151
Subtransmission Lines (km)	3,812	3,627	4.86%	185
Primary & Secondary Lines (km)	66,815	70,427	.41%	-3,611
Service Drop Lines (km)	80,688	N/A	100%	80,688
Capacitors	6305 (unit)	1521 (Bank)	75.88%	4,784
Line Cut-outs	7,232	6,650	8.05%	582
Line Switch	4,075	4,167	(2.26%)	(92)
Service Meters (unit)	4,574,692	4,377,023	4.32%	197,669

For the major categories, the Asset Tracker counts are higher than the count in the AM / FM system by 4 - 5%. However PB Associates considers that the differences in the manner in which assets are counted in the AM / FM system (by asset grouping) compared to the Asset Tracker (by asset characteristic) means that a discrepancy of 5% is not significant enough to warrant an adjustment.

In the case of meters, distribution line transformers, poles and overhead conductor, spares are included in the Fixed Asset Register - these are not included in the AM / FM system. In any case optimization of these assets has reduced the quantity of assets deemed to have excessive counts.

In the case of the minor repetitive assets, a difference of 5% in count is not material to the valuation.

Accordingly, given that the discrepancy is 5% on average, PB Associates does not propose to make an adjustment to the asset counts in the Fixed Asset Register.

3. OPTIMISED DEPRECIATED REPLACEMENT COST (ODRC) REGISTER

The ODRC Register was developed from the Meralco Fixed Asset Register data. This approach supports reconciliation between the Historical Cost, Reproduction Costs, New and the ODRC valuation.

3.1 ODRC REGISTER DEVELOPMENT

3.1.1 Substations

The ODRC register for substation equipment was not built from the Fixed Asset Register. The account has a very large number of items of a different nature and the items are not identified with standard descriptions. PB Associates determined that it was not possible to verify an ODRC register built through a cleansing and sorting of the historical substation equipment data.

A superior method was employed whereby the ODRC register for major substations (79 off) and minor substations (44 off) was developed using standard modules (comprising of standard items). Each of the major substations (79 off) and minor substations (44 off) were classified in terms of standard modules and a count of standard items was given based on single line diagrams (SLDs).

The installation date of each item was captured during site inspections from equipment nameplate information. Where such information was missing, an estimate was made based on adjacent equipment, taking into account the type and condition of the item of interest.

Taking this approach to register development, the substation equipment register could be readily verified from site inspection. The module counts and composition were verified as part of the site inspection process described in Section 3.2.

3.1.2 Repetitive Assets

In the case of the repetitive assets, the ODRC register was developed from Meralco's Fixed Asset Register data using a cleansing and sorting process. This approach was supported by a high degree of uniformity of standard asset descriptions in the repetitive asset accounts.

3.2 VERIFICATION OF ODRC REGISTER

3.2.1 Substations

PB Associates / AACI have conducted 100% ocular inspection on the following:

- Lands – which are located at 194 sites;
- Structures & Improvements – which are located at 202 sites; and
- Station Equipment – which are located at 122 substations.

PB Associates / AACI captured asset details using a systematic inspection process, using nameplate data. The data captured included installation dates.

Extensive photographic records were taken and recorded in electronic form for purposes of verification.

The ODRC register was verified using the site inspection information. No adjustments were necessary as the Single Line Diagrams proved to be accurate records of the substation equipment in use.

3.2.2 Repetitive Assets

Ocular inspection was carried out for 100% of the Land and Buildings and Structures and Improvements (A1 and A2 categories).

The remaining fixed assets, which are repetitive in nature, were inspected using Sampling Method. PB Associates and AACI used the Meralco AM / FM system and GIS system to develop a physical inspection schedule for the repetitive assets. The sampling percentages adopted considered the factors of location, volume, peso materiality and type of assets.

As the materiality of repetitive asset categories A4, A6, A12 and A16 is very high compared to the other categories, only these sub-categories of assets were inspected to a 99% confidence level. The remaining assets were inspected to a 95% confidence level.

Table 2: Sampling Statistics

Types of Assets		Total No. of Locations	Sampled Locations (Confidence)
A4	Towers, Poles and Fixtures	648,161	271 (99%)
A6	Overhead Conductors and Devices	38,772,662	271 (99%)
A8	Underground Conduit		0
A10	Underground Conductors and Devices	753,857	0
A12	Line Transformers	147,930	271 (99%)
A14	Power Conditioning Equipment	4,670	94 (95%)
A15	Services	30,888	271 (99%)
A16	Meters, Instruments & Metering Transformers	5,686,791	271 (99%)
A20	Street Lighting and Signal System	3,815	94 (95%)
B3	Furniture and Office Equipment	1,395	90 (95%)
B4	Transportation Equipment	66	39 (95%)
B5	Stores Equipment		
B6	Tools, Shop and Equipment		
B7	Laboratory Equipment		
B8	Computer Equipment and Peripherals	412	78 (95%)
B9	Power Operated Equipment		
B10	Communications Equipment		
B11	Miscellaneous Equipment	462	80 (95%)

It was not possible to verify the assets inspected in the field because there is no location identifier in the Meralco Fixed Asset Register (Asset Tracker).

This verification problem is linked to the current maturity of the Meralco fixed asset registers, and can only be addressed over time through a systematic field inspection program. (This approach was taken in New Zealand and Australia in the 1990s. For a small company servicing 180,000 customers, the process took

three years to complete; it is a major undertaking that sits outside the scope of this valuation).

Reliance on other records for verification introduces a 'circularity' problem. Purchase vouchers used as the data source for data entry into the fixed asset register cannot be considered as useable – such records verify that the asset was correctly entered into the fixed asset register, but this is not a sound basis for verifying that the asset exists in the field.

To overcome this problem PB Associates adopted a proxy method.

First, PB Associates verified that the physical counts in the Meralco Fixed Asset Registers reconciled to the counts in the ODRC register.

Second, we verified by ocular inspection the location of assets found in the field against those recorded in the system maps and plans forming part of the AM / FM system.

The verification of age (or installed date) of repetitive assets is also impossible to verify through field inspections as the assets are not tagged with installation dates. Condition assessment in the field through ocular inspection is unreliable as the environmental conditions in the Philippines result in rapid ageing. For verification purposes, PB Associates relied on an examination of age profiles (computed from the ODRC register data) and matched the profile to externalities such as phases of economic growth accompanied by periods of rapid network expansion. PB Associates cross-checked the age profiles of the major repetitive assets (by count) in the ODRC register against those produced from the AM / FM system and found a consistent match.

The results of the field inspections of repetitive assets were as follows:

(i) Meralco Electrical System Assets

South Region - Location: San Pedro Substation to Carmona

Table 3: Sampling Results

Asset	No of Samples	No of Correct Samples	No Wrong Sample	% Error	% Correct	Comment
Transmission Poles	174	173	1	0.57%	99.43%	Not indicated on pole map
Transmission Conductor	10.1km	10.1km	0	0%	100%	
Distribution Poles	100	87	13	13%	87%	Error in description, height and construction
Distribution Overhead Conductor	9.7km	9.7km	0	0%	100%	
Meters	123	123	0	0%	100%	
Line Switches	51	51	0	0%	100%	
Streetlights	22	21	1	4.55%	95.45%	Sodium not mercury luminaire

Table 4: Condition Assessment

Asset Type	Condition Rating
Steel Poles	Good
Concrete Poles	Good
Wood Poles	Fair
Conductors	Good / Some polluted
Line Transformers	Fair to Good
Meters	Fair to Good
Capacitors	Good
Line Switches	Good

North Region - Location: Tabang Substation to Baliuag Substation

Table 5: Sampling Results

Asset	No of Samples	No of Correct Samples	No Wrong Sample	% Error	% Correct	Comment
Transmission Poles	419	418	1	0.24%	99.76%	Error in pole tag no.
Transmission Conductor	16.1km	16.1km	0	0%	100%	
Distribution Poles	102	98	4	3.92%	96.08%	Error in pole type
Distribution Overhead Conductor	10km	10km	0	0%	100%	
Meters	115	115	0	0%	100%	
Line Switches	45	45	0	0%	100%	
Streetlights	25	23	2	8%	92%	Error in bulb type, others for replacement

Table 6: Condition Assessment

Asset Type	Condition Rating
Steel Poles	Good
Concrete Poles	Good
Wood Poles	Fair
Conductors	Good / Some polluted
Line Transformers	Fair to Good
Meters	Fair to Good
Capacitors	Good
Line Switches	Good

Central Region - Location: Transmission Lines: Rockwell to Taguig 115kV line; Distribution Lines: 45XA circuit – Las Pinas to Baclaran

Table 7: Sampling Results

Asset	No of Samples	No of Correct Samples	No Wrong Sample	% Error	% Correct	Comment
Transmission Poles	115	115	0	0%	100%	Good condition
Transmission Conductor	7km	7km	0	0%	100%	Good condition
Distribution Poles	111	105	6	5.41%	94.59%	Fair to Good; Some poles already

Asset	No of Samples	No of Correct Samples	No Wrong Sample	% Error	% Correct	Comment
						replaced but not reflected in register
Distribution Overhead Conductor	5.91km	4.08km	1.83km	30.96%	69.04%	Fair to Good; Some conductor already replaced but not reflected in register
Meters	57	57	0	0%	100%	
Line	47	47	0	0%	100%	
Streetlights	33	32	1	3.03%	96.97%	Fair
Line Switches	12	12	0	0%	100%	Good

No adjustments to the count were necessary as the inspections demonstrated a 100% match between the asset in the field and in the Meralco AM / FM system. Adjustment for incorrect asset types were not made e.g. poles replaced as these cases were of varied type.

(ii) Meralco Non-Electrical System Assets

Table 8: Sampling Results

Plant Account	No of Samples	No of Correct Samples	No Wrong Sample	% Error	% Correct	Comment
B3 – Furniture & Office Equipment	114	95	19	16.67%	83.33%	Some items (a) not found on site (b) not included on list
B11 – Miscellaneous Equipment	70	54	16	22.86%	77.14%	Some items (a) not found on site (b) sent for disposals
B8 – Computer Equipment & Peripherals	142	116	26	18.31%	81.69%	Some divisions were reorganized and re-assigned to other districts
B5 – Stores Equipment	79	79	0	0%	100%	
B6 – Tools Shop & Garage Equipment	109	99	10	9.17%	90.83%	Some items were junked as per inspection
B7 – Laboratory Equipment	99	94	5	5.05%	94.95%	Some items noted to be with retired employees
B4 – Transportation Equipment	94	84	10	10.64%	89.35%	Vehicles retired
B9 –Power Operated Equipment / Mounted Equipment	85	56	29	34.12%	65.88%	Some items did not match on list since always on the move
B10 – Communication Equipment	91	91	0	0%	100%	

No adjustments were made.

3.2.3 Statement of Verification

On completion of the adjustments, the Consultant considered the Fixed Asset Register to be verified to within a statistical accuracy of 99% for substation equipment and to 95% for repetitive assets.

4. RECONCILIATION BETWEEN ODRC & PREVIOUS VALUATIONS

This section describes the previous valuation methodologies that have been applied to the Regulated Entities and how they relate to the ODRC methodology; in particular we highlight the main similarities and differences between the different valuation methods. Reconciliation is performed between the ODRC valuation, Historical Costs and Appraised Values as at December 31, 2004.

4.1.1 Background

Asian Appraisal Company Inc (AACI), Philippines, undertook Cost of Reproduction, New and Sound Value/Fair Market Value In Continued Use valuations for the Regulated Entities in 2004 for the purpose of rate setting.

The methodologies adopted were in accordance with the internationally accepted appraisal standards as stated in the Uniform Standards of Professional Appraisal Practice (USPAP).

4.1.2 Definitions

For the system fixed assets of the Regulated Entity, the Cost of Reproduction, New and Sound Value valuations were prepared as at the 31 December 2004. The two types of asset valuation approaches are defined below:

Cost of Reproduction, New: This value is defined as the estimated amount of money needed to acquire in like kind and in new condition an asset or group of assets, taking into consideration current prices of materials, labour, manufactured equipment, contractor's overhead, profit and fees, and all other attendant costs associated with its acquisition and installation in place, without provision for overtime or bonuses for labour, and premiums for materials.

Sound Value/FMV in Continued Use: This value is the Cost of Reproduction, New less accrued depreciation as evidenced by the observed condition of assets in comparison with new units of like kind tempered by consideration given to extent, character and utility of the property which is to be continued in its present use as part of a going concern, but without specific reference to earnings.

The Cost of Reproduction, New and the Sound Value/FMV in Continued Use valuations are a useful input into preparing the ODRC valuation, but there are some key differences to note.

4.1.3 Comparison with the ODRC

For a point of reference between previous valuations methods and ODRC the Cost of Reproduction, New is similar to the Replacement Cost input to the ODRC and the Sound Value/FMV in Continued Use is similar to the Depreciated Replacement Cost. The major differences being:

- the way the asset depreciation is calculated, and
- the removal of excess network capacity through optimisation.

For the Cost of Reproduction, New valuations prepared as at 31 December 2004, the undepreciated replacement costs were determined on an individual equipment item basis. Functional obsolescence was considered and this

approach is conceptually consistent with the Modern Equivalent Asset (MEA) approach used in the ODRC.

For the Cost of Reproduction, New depreciation is not applied, except for the case of some repetitive assets (everything expect zone substations).

For the Sound Value method, physical wear and tear or condition is included as an input in the valuation and hence the calculation of the depreciation is calculated on the remaining life which had been assessed as part of the valuation process. Assessing the remaining life is not a requirement of the ODRC method whereby asset condition is dealt with by determining a standard asset life. The advantage of using "Standard Asset Lives" under the ODRC method is that there is no subjectivity introduced between different appraisers. For major plant items it is very difficult to determine the condition without conducting an "intrusive" inspection of some type and this is clearly outside the boundaries of a valuation exercise.

4.2 LAND & BUILDINGS

For the land and buildings a valuation was prepared as of 31 December 2004.

4.2.1 Land

Land was valued on the basis of "Fair Market Value" which is the amount in terms of money which the property would bring in a competitive and open market under all conditions requisite to a fair sale, the buyer and the seller, each acting prudently, knowledgeable and assuming the price is not affected by undue stimulus. As a result the Fair Market Value acknowledges that if the land was not used for network purposes it could be put to an alternative use.

The Market Data Approach method of valuation wherein actual sales and offered listings of properties within the vicinity was compared with the property under appraisal on the factors of location, size, shape of the lot, time element, utilization, improvements, terrain, bargaining allowance and other market constraints.

Historical Cost Indexation was used to arrive at the prevailing market value and was used if there was no available adequate market data on sales and offered listings that could be gathered on the property subject of appraisal.

AACI has employed the Fair Market Value approach for valuing of land as at June 30, 2006.

4.2.2 Improvements (Buildings and Other Land Improvements)

For the December 31, 2004 valuation, the value of the improvements was estimated by the use of the Cost Approach. Under this approach, an estimate was made on the current Cost of Reproduction, New of the improvements in accordance with the prevailing market prices for materials, labor, and contractor's overhead, profit and fees. Adjustments are then made to reflect depreciation resulting from the observed physical deterioration.

In estimating the Cost of Reproduction, New of the improvements, the Modified Quantity Survey Method was used. This method required an analysis of the improvements by breaking them down into major components such as foundation, columns, beams, floorings, walls, roofing, etc., using workable units as lineal meter, square meter, cubic meter or other appropriate basic unit.

Equally given importance were the interior finishes, i.e. floor finishes, wall finishes, ceiling finishes, etc.

Bills of quantities for each building component were developed on the basis of current costs of materials, labor, plant and equipment prevailing in the locality to arrive at the direct costs of the improvements, whereupon indirect costs such as contractor's profits, overhead, taxes and fees and other related expenses are then added.

AACI has employed the Cost Approach for valuing of improvements as at June 30, 2006.

4.3 SPECIALISED AND NON-SPECIALISED ASSETS

Non-system assets were listed and classified as either Non-Specialised Assets or Specialised Assets.

- Non-Specialised Assets are those assets that are not specific to the industry and would be readily acquired and disposed of in the ordinary course of business.

- Specialised Assets are those that exist for a purpose which is of particular advantage and may be unique to the industry, and/or those assets which are not normally traded in a secondary market place (except as part of a total entity by reason of their physical characteristics).

The valuation of Non Specialised Assets depends upon the manner in which the assets are acquired. The ERC Asset Valuation Guidelines state that where assets are normally acquired in a secondary market, the price of a second-hand asset is relevant in determining the value. Where assets are not normally acquired in a secondary market, the price of a new asset (adjusted to take account of service potential and the impact of other obsolescence factors) is relevant in determining the value.

For specialised plant, as there is no trading market for such assets, the appropriate value based upon the guidelines is the lower of the current replacement cost and the current reproduction cost. This is consistent with the Optimised Depreciated Replacement Cost method.

Having determined the appropriate classification and categorisation of the assets under the deprival value concept the following approaches were adopted:

Table 9: Valuation Approach

Categorisation	Valuation Approach
Non-Specialised	Market Comparison Approach or Income Approach or Depreciated Replacement Cost Approach depending on availability of data
Specialised	Lower of the current replacement cost and current reproduction cost

These approaches were employed for the December 31, 2004 valuation.

The non-network assets were valued in accordance with the following categorization:

General Plant (Non-network Assets)

- Structures and Improvements (non-network related)
- Office Furniture and Equipment
- Transportation Equipment
- Stores Equipment
- Tools, Shop and Garage Equipment
- Laboratory Equipment
- Information systems equipment (non-network related)
- Power-operated Equipment
- Communication Plant and Equipment
- Miscellaneous Equipment

4.4 RECONCILIATION

The following Table contains a comparison of the ODRC valuation as at June 30, 2006 and the Reproduction, New and Sound Value valuations as at December 31, 2004.

Table 10: Reconciliation

	Valuation Method	Dec 31, 2004 Php Billion	Valuation Method	Jun 30, 2006 Php Billion
Distribution Plant	Reproduction Cost, New	98.7	Replacement Cost	139.3
	Sound Value	67.4	ODRC	76.7
General Plant	Reproduction Cost, New	29.7	Replacement Cost	29.8
	Sound Value	23.9	ODRC	19.9
Total	Reproduction Cost, New	128.4	Replacement Cost	169.1
	Sound Value	91.3	ODRC	96.6

4.4.1 Distribution Plant

In total the Distribution Plant asset valuation has increased by **41.1%** (RC / RCN Values) and **13.8%** (ODRC / Sound Value).

In the Philippines, CPI increases have averaged around 8% per annum, so it is to be expected that the increase, between Dec, 2004 and June, 2006, would be at least as high as **12%** (Php11.8B) due to this factor.

Another factor affecting replacement costs, as discussed in Section 3.3 of the Replacement Costs report (refer Appendix B), is the substantial increase in commodity metals prices in the 12 months from mid 2005. PB Associates has not passed this price increase through to 2006 replacement costs in full, but has allowed an escalation in keeping with CPI.

And finally, Meralco has been investing capital at a rate of ~ Php6 Billion per annum. Accordingly, we would expect to see an increase in value of the Reproduction Cost, New of ~Php9 Billion.

In total we would expect to see a Distribution Plant RCN to RC increase of Php20.8 Billion or **21%**. The actual increase is **41.1%** or a net increase of **20%**.

The reason for a result that is **20%** above expectation is that the ODRC valuation is a "brown-fields" valuation. The benchmarks applied by PB Associates against cost estimates for repetitive assets allow longer installation times than those used for the 2004 valuation. PB Associates consider that the 2004 valuation was a green-fields valuation and under this ODRC method, the install times were relaxed to allow for more difficult construction conditions.

4.4.2 General Plant

In total the General Plant RC has not changed (RC / RCN Value), however ODRC has fallen by **16.7%** (ODRC / Sound Value). The decrease shows that the straight line depreciation method employed results in a greater amount of depreciation than previously.

4.4.3 Factors

a) Depreciation Allowance - 5% residual on ORC

This new depreciation residual was not applied for the end 2004 valuation. It is meant to ensure that assets with service potential are not retired at the expiry of their economic life, in which case the DU would need to invest new capital. This factor acts to increase the ODRC result by more than 5% if sufficient assets have reached the end of their economic life. A figure higher than 5% implies that the asset lives are too short.

b) Longer Asset Lives

Some asset lives have been lengthened, but this change has not resulted in a material impact on the valuation total. Note that the Sound Value is an appraised value that takes into account observed condition; it has the effect of adjusting depreciation such that it is no longer a straight line approach. The increase in appraised values (lower depreciation) demonstrate that the asset lives used for the 2004 valuation (tax lives) were considered shorter than the economic lives.

APPENDIX A
DWRG – APPENDIX G

		Depreciated Historical Cost	Replacement Cost	Optimised Replacement Cost	Optimised Depreciated Replacement Cost
A.	**Distribution Plant**				
A1	Land and Land Rights (Distribution Purpose)	623,380,096	6,593,099,000	6,593,099,000	6,593,098,996
A2	Structures and Improvements (Distribution Purpose)	444,327,192	863,246,000	856,193,000	584,672,358
A3	**Station Equipment**				
A3A	Power transformers	58,096,582	8,403,614,426	8,403,614,426	5,309,652,432
A3B	Switchgear	1,715,016,961	9,403,497,775	8,770,191,186	4,996,851,904
A3C	Protective equipment	10,272,117	1,657,530,397	1,657,530,397	705,851,913
A3D	Metering & control equipment	0	677,640,093	677,640,093	344,098,203
A3E	Communicatio ns equipment	1,552,646,122	4,979,150,631	4,979,150,631	1,769,299,769
A3F	Other station equipment	58,355,553	2,228,762,446	2,228,762,446	1,133,158,053
A4	Poles, Towers and Fixtures - Distribution	10,730,253,695	20,102,442,485	20,102,442,485	11,710,799,118
A5	Poles, Towers and Fixtures - Customer	0	0	0	0
A6	Overhead Conductors and Devices - Distribution	4,539,798,335	10,743,618,144	10,743,618,144	6,928,829,308
A7	Overhead Conductors and Devices - Customer	0	0	0	0
A8	Underground Conduits - Distribution	113,926,384	175,049,169	175,049,169	114,030,437
A9	Underground Conduits - Customer	0	0	0	0
A10	Underground Conductors and Devices - Distribution	533,116,753	800,491,450	800,491,450	713,284,524
A11	Underground Conductors and Devices - Customer	0	0	0	0
A12	Line Transformers - Distribution	8,748,433,208	25,099,788,250	25,099,788,250	14,467,010,956
A13	Line Transformers - Customer	0	0	0	0
A14	Power Conditioning	463,021,872	1,790,174,045	1,790,174,045	866,703,516

		Depreciated Historical Cost	Replacement Cost	Optimised Replacement Cost	Optimised Depreciated Replacement Cost
	Equipment				
A15	Services	3,223,347,544	12,802,896,476	12,802,896,476	6,726,804,638
A16	Meters, Instruments & Metering Transformers-distribution	7,819,966,782	26,148,005,140	15,586,787,195	10,957,036,805
A17	Meters, Instruments & Metering Transformers - customer	0	0	0	0
A18	Information technology equipment (distribution)	142,279,065	681,677,540	681,677,540	92,330,143
A19	Regulated Entity Property on Consumers' Premises	1,307,655,650	3,220,467,603	3,220,467,603	1,612,592,808
A20	Street Lights and Signal Systems	584,962,975	2,967,188,772	2,967,188,772	1,075,926,487
A21	Submarine Cables	0	0	0	0
B	**General Plant**				
B1	Land and Land Rights (non-network)	1,668,000,172	17,195,328,000	14,953,964,000	14,953,963,992
B2	Structures and Improvements (non-network)	1,073,794,905	4,947,532,000	4,576,287,000	1,579,632,781
B3	Office Furniture and Equipment	14,267,915	127,448,950	127,448,950	12,901,170
B4	Transportation Equipment	64,992,363	188,284,000	188,284,000	22,475,663
B5	Stores Equipment	18,689,988	62,017,800	62,017,800	23,421,780
B6	Tools, Shop and Garage Equipment	176,655,598	522,255,800	522,255,800	223,649,845
B7	Laboratory Equipment	222,355,479	497,464,500	497,464,500	266,966,651
B8	Information systems equipment (non-network)	491,763,113	2,356,101,160	2,356,101,160	319,123,257
B9	Power-operated Equipment	450,530,432	1,011,914,100	1,011,914,100	514,389,114
B10	Communication Plant and Equipment	266,292,634	853,968,665	853,968,665	303,450,663
B11	Miscellaneous Equipment	76,969,144	345,311,766	345,311,766	92,541,369
C.	**Materials and Supplies (including spares)**	1,626,145,158	1,626,145,158	1,626,145,158	1,626,145,158
D.	**Transferred subtransmissi**	0		0	

		Depreciated Historical Cost	Replacement Cost	Optimised Replacement Cost	Optimised Depreciated Replacement Cost
	on assets				
E.	Allocated Overheads Capitalized	0	0	0	0
	Totals	48,819,313,786	169,072,111,739	155,257,925,205	96,640,693,811

APPENDIX B
MERALCO REPLACEMENT COST REPORT

APPENDIX C
MERALCO OPTIMISATION REPORT