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

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ENERGY REGULATORY COMMISSION

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1. INTRODUCTION

1.1 GENERAL

The purpose of this Asset Valuation Guidelines ("The Guidelines") is to provide practical guidance for the valuation of the network assets of privately owned Distribution Utilities (DUs) that are subject to performance based regulation (PBR). The Guidelines describe a consistent and transparent approach to network asset valuation based on independently determined and generally accepted valuation principles, using the optimized depreciated replacement cost (ODRC) approach as described in the Distribution Wheeling Rate Guidelines (DWRG)[1] . The Guidelines will be used in the preparation of valuations as part of the application to the Energy Regulatory Commission (ERC) in its determination of regulated network prices for DUs subject to PBR.

[1] ERC document titled "*Guidelines on the Methodology for Setting Distribution Wheeling Rates : Privately Owned Distribution Utilities*" dated December 10, 2004

2. GENERAL PRINCIPLES

2.1 INTRODUCTION

The purpose of the Guidelines is to provide practical guidance for the valuation of network assets of electricity DUs for regulatory pricing purposes under PBR. The Guidelines are designed to achieve a consistent and transparent application of the ODRC[2] approach to asset valuations.

2.1.1 Background

Due to the capital-intensive nature of electricity networks, capital-related costs represent a significant proportion of the DU's annual revenue requirement (ARR). Return on and return of capital typically constitutes over 70% of electricity distributors' base revenue requirement. The value of the Regulatory Asset Base is, therefore, a critical input into the determination of regulated charges and provides an important signal for efficient pricing and future investment.

A well-defined asset valuation methodology is required in order that the regulatory objectives of transparency and consistency are achieved.

The aim of the ERC is to adopt a regulatory process which eliminates monopoly pricing, provides a fair return to network owners, and creates incentives for managers to pursue ongoing efficiency gains through cost reductions.

Regulators permit DUs to earn a reasonable (risk adjusted) return on their investment capital, provided that the market continues to value the services produced with that capital. It is therefore necessary to assess the value of system and non-system network supply assets so that an appropriate return on assets can be calculated.

The arrangements for the valuation of the RAB are set out in the DWRG. The terms of reference for the DWRG are pursuant to Section 43(f) of Republic Act No. 9136, otherwise known as the Electric Power Industry Reform Act of 2001 (EPIRA), and Rule 15, Section 5(a) of the Implementing Rules and Regulations issued pursuant to that Act.

The DWRG establishes the procedure for determining the ARR of each distribution network provider and sets out the requirements for valuing the initial capital base.

2.1.2 Regulatory Framework

The objective of the PBR regulatory framework is to balance the interest of network owners and users. The framework is based on establishing a price cap determined using the building block approach which involves estimating the overall cost of service to the entity. This framework ensures positive incentives

[2] The Optimised Depreciated Replacement Cost (ODRC) is also referred to as the Depreciated Optimised Replacement Cost (DORC) approach.

for owners and protects the value of businesses in line with the objectives of the DWRG.

The building block approach that has been adopted by the ERC is described in the DWRG (section 4.6 of the DWRG). The return on capital, which requires the valuation of the RAB, is one of the key building blocks described.

The Guidelines have been formulated to calculate the value of the initial asset base component for the regulatory process. This includes the valuation of network system assets, non-system assets, land, easements and capital contributions as at the date of the Initial Re-valuation (described in section 4.8 of the DWRG).

2.1.3 Valuation Methodologies

For most standard asset valuations, the International Valuation Standards as published by the International Valuation Standards Committee (IVSC) outlines a number of approaches.

The three most commonly used approaches are;

i) the market comparison approach

ii) the income approach (or cash flow approach)

iii) the (optimised) depreciated replacement cost approach.

The market comparison approach seeks to determine the current value of an asset by reference to recent comparable transactions involving the sale of similar assets. The market comparison approach is not suitable for an electricity distribution network as such networks in their entirety are not bought and sold on a regular basis.

Where it is not possible to determine values for assets using a market comparison approach the valuer seeks to replicate the thought processes of an informed potential purchaser acting without compulsion in assessing the market value of the assets (the income approach). The income approach is not particularly suitable for an electricity distribution network as the forecast of income is problematic.

The ODRC is a valuation approach used to assess the value of assets where:

- The base value of assets can be based on historical asset costs, indexed replacement costs or on a modern equivalent asset base (MEA); and

- An optimization component is introduced to ensure that assets are constructed in the most efficient manner possible while maintaining required service standards.

The ODRC is an approach normally applied to specialised assets such as electricity transmission and distribution networks.

It is also a methodology considered consistent with the building block approach used for rate setting purposes, and is the method specified under the DWRG.

2.1.4 Valuation of Assets Under DWRG

The DWRG provides guidance and sets out requirements for the valuation of assets. The base valuation methodology is specified in Clauses 4.8.4 and 4.8.5 of the DWRG as follows:

Clause 4.8.4. For the purposes of the Initial Re-valuation in relation to a Regulated Distribution System, and in the circumstances specified below in connection with them, the following methods of re-valuation may be used for different Asset Categories (as specified in, or in accordance with, Section 4.8.5):

(a) **Indexation** - this method is appropriate for assets where there has been little technological change and most, if not all, direct costs that have been incurred and capitalised in respect of those assets would have to be incurred if they were replaced. This method has the feature that the valuation is directly linked to the historical value of the relevant assets, thereby ensuring that all relevant costs are included in the valuation.

(b) **Absolute valuation by replacement cost analysis** - this method of valuation involves valuing the relevant assets at their current unit prices multiplied by their volumes. Such prices may be verified by reference to the purchase price of like assets within the last twelve (12) months or by reference to recent documented arm's length quotations for the sale of those (or similar) assets. Such prices should include the discounts available from purchasing in the volumes which have been used in the normal course of business and must be increased to cover relevant costs arising from design, procurement, mobilisation, construction and commissioning. This approach may be used in valuing an asset where there has not been significant technological change and where it has not been possible to develop an appropriate index for the valuation of that asset for the purposes of the re-valuation method referred to in paragraph (a).

(c) **Absolute valuation using modern equivalent asset analysis** – this method of valuation involves valuing the relevant assets at the cost of a modern equivalent asset with similar service potential (for example, an asset which replicates at least their current capacity and functionality). It may be used when it is not possible to determine the current replacement cost for an asset, e.g. because that asset is no longer manufactured.

With regard to (c), the modern equivalent asset can be considered as an asset that has not been introduced as a DU standard, but is considered elsewhere as a proven technology that is more cost efficient with similar service potential.

Each of the above methods can be used to determine the Gross Current Replacement Costs of an asset (refer Section 3.2).

According to the DWRG, the Gross Current Replacement Costs must also be depreciated and optimized, so that the final form of the valuation is the Optimised Depreciated Replacement Cost (ODRC) valuation.

2.1.5 Regulatory Period

An asset revaluation must be undertaken for each Regulated Distribution System, which will culminate in an Initial Revaluation Report for each Regulated Distribution System. This is to be completed at least eleven (11) months before the start of the Second Regulatory Period, on 1 July 2007. Accordingly, the asset revaluation must be completed before **1 August 2006.** However, to allow the DUs sufficient time to prepare their rate applications under PBR and for the public consultation process to follow, the ERC requires the Initial Re-valuation to be completed on June 30, 2006.[3]

Following the Initial Revaluation Report, the Regulatory Asset Base for a Regulated Distribution System for any Regulatory Year will be derived from a roll-forward calculation of the value of each Asset Category.

[3] This is the date accepted in the ERC's "*Position Paper on the Regulatory Reset Process for the Second Regulatory period"*, dated December 9, 2005, following a public consultation process on an "I*ssues Paper"* published by the ERC on September 30, 2005.

3. OPTIMISED DEPRECIATED REPLACEMENT COST (ODRC)

3.1 CONCEPTUAL FRAMEWORK

The ODRC is calculated based on the gross current replacement cost (GCRC) of assets (which can be similar to historically used assets where there has been little technological change) that are adjusted for over-design, over-capacity and/or redundant assets, less an allowance for depreciation.

The ODRC valuation approach is used to determine a hypothetical value of the assets. This hypothetical value is a surrogate for market value in circumstances where it is not possible to determine values for specialised assets using a market comparison approach.

It follows therefore that the valuation approach should seek to reflect market behaviour, or put another way, the application of the approach should seek to replicate the thought process that would be followed by an informed potential purchaser acting without compulsion.

Where market evidence is readily available it is possible to establish a relationship between market value and replacement cost. Where market evidence is available for the same broad asset at varying ages, it becomes possible to establish a loss in value or depreciation profile. By its very nature, such a profile takes into account supply/demand characteristics and the impact of all other factors on value.

Conversely, in the absence of suitable market data, the valuer should seek to construct a loss in value or depreciation profile by measuring by other means, the various factors that impact on value.

In respect of the optimisation part of this measurement process, the valuer attempts to assess value by reference to the concept of substitution. It is logical to assume that the maximum amount a potential purchaser would be prepared to pay for an asset is represented by the purchaser’s lowest alternative cost to replicate the asset. In assessing what represents the lowest alternative cost, consideration must be given to the optimum set of assets that would be required to provide the reasonably foreseeable services required to be delivered by the assets, at reasonably expected quality levels.

If the existing asset does not represent the lowest cost alternative asset to provide the reasonably foreseeable services, then the potential purchaser will adopt the replacement cost of the lowest cost alternative in place of the reproduction cost of the existing asset.

The ODRC of electricity transmission and distribution assets has been described as representing the minimum cost of replacing or replicating the service potential embodied in the network with modern equivalent assets in the most efficient way possible from an engineering perspective, given the service requirements, the age and condition of the existing assets and replacement in the normal course of business.

This concept is consistent with the principles of fairness and equity required in assessing access charges in that users only pay for those assets that are required in a commercial context and therefore are not required to pay for any excess capacity or over-engineering embodied in the existing assets.

As outlined above, the ODRC approach involves three main steps:

1. Establishing the GCRC of the gross service potential embodied in the existing assets (with consideration to modern equivalent assets).

2. Adjusting the gross current replacement cost determined above for over-design, over-capacity and redundant assets.

3. Depreciating this value to reflect the anticipated effective working life of the asset from new, the age of the asset and the estimated residual value at the end of the asset's working life.

3.2 ESTABLISHMENT OF GROSS CURRENT REPLACEMENT COST

The GCRC can be established:

- By reference to historical costs, adjusted for inflationary increases since construction (the indexation method);
- By comparison with recent costs of similar assets (the replacement cost method);
- By reference to technologically advanced assets in use elsewhere (the modern equivalent asset method).

Where the indexation method is used, a suitable index must be employed (using a Retail or Consumer Price Index).

Where the GCRC is based on the replacement cost method, the efficient current cost is determined by contacting suppliers, manufacturers or their agents, or by reference to recently published prices.

Where the GCRC is based on modern equivalent assets, it is determined by reference to the current market buying price, current reproduction cost or replacement cost of modern equivalent assets.

In respect of specialised assets, such as most network infrastructure, the appropriate cost is the lower of the current replacement cost and the current reproduction cost of the gross service potential of the existing asset.

3.2.1 Modern Equivalent Asset

A commonly accepted principle in determining replacement costs is that the replacement cost to be used is the "lowest cost per unit at which the gross service potential could be obtained in the normal course of business".

GCRC of a modern equivalent asset is defined as:

"The minimum that it would cost, in the normal course of business, to replace the existing asset with a technologically modern equivalent new asset with the same service potential, allowing for any differences in the quantity and quality of output and in operating costs".

The statement above requires the valuer to measure the gross service potential of an existing asset by reference to its modern equivalent asset. Reference to the modern equivalent asset is only made so as to obtain a current replacement cost for the asset already held, regardless of whether the modern equivalent asset will ever be purchased, or whether the existing assets will ever be replaced.

Further:

"In determining current cost with reference to the most appropriate modern facility the capacity of that facility should not be such as would exceed materially … the scale of the entity's existing operations. The modern facility should be of commercially available technology and should not require a redesign or re-engineering of an entity's existing plant ".

3.2.2 Expected Capacity in Use

The replacement costs of individual assets should be based on the "expected capacity in use" of the existing assets. "Expected capacity in use" is the required level of service potential or output consistent with both the future growth in demand and the objective of minimising the whole of life cost of assets under 'total asset management' concepts and business planning horizons. As systems expand and change a degree of suboptimality at any one time is inevitable and is part of the total cost of output.

Where the modern equivalent asset has a different capacity, a pro-rata adjustment is necessary to value the expected capacity in use of the existing asset.

This determination of the modern equivalent asset that would replace existing individual components of the network should not be confused with the process of optimisation.

3.2.3 Cost Basis

Current costs can be determined on a 'Greenfields' or 'Brownfields' basis. The 'Greenfields' cost basis assumes construction occurs in an area free of development. The 'Brownfields' cost basis assumes construction occurs around all existing infrastructure and development.

The 'Brownfields' cost basis has been adopted by the ERC and is considered appropriate because it is consistent with the concept of establishing the potential purchaser's lowest alternative cost to replicate the network (i.e., a duplicate network would need to be built in the existing environment). The current cost estimates should reflect the current state of land use development.

The 'Brownfields' cost structure is widely used for ODRC valuations including electricity, gas and water infrastructure assets in most countries adopting ODRC or ODV valuation method.

3.2.4 Direct Costs

The direct costs applied include any applicable indirect taxes in accordance with current tax legislation. The Value Added Tax (VAT) is to be excluded from the valuation.

3.2.5 Indirect Costs

Due allowance must be made for indirect costs associated with the acquisition and/or creation of the asset such as on-costs, design and engineering costs, freight, duty, local delivery, interest during construction, etc.

3.3 OPTIMISED REPLACEMENT COST ADJUSTMENTS

Because the ODRC of the network assets is based on determining the value of the service potential embodied in the assets, it is necessary to adjust the gross replacement cost of the existing assets for overdesign, overcapacity and redundant assets.

The Independent Pricing & Regulatory Tribunal of New South Wales, Australia (IPART) states that *"an optimised system is a reconfigured system using modern technology designed to serve the current load with current technology, with some allowances for growth. This method excludes any unused or under utilised assets and allows for potential cost savings that may have resulted from technological improvement."*[4]

Therefore, when adopting the ODRC approach the valuer must establish whether the asset in its current form represents the optimum replacement given technological and functional changes since construction. By way of example optimisation may be required in situations where:

- the existing asset has a greater capacity than is required for existing and reasonably foreseeable use;
- the capacity or service potential embodied in the existing asset could be replaced more cheaply than the cost of reproduction of the existing asset due to improvements in construction techniques, economies of scale, etc.

In assessing the level of optimisation, it is important to recognise that it is not intended that a complete redesign or "greenfields optimisation" of the network be undertaken. Instead "incremental optimisation" is adopted, which allows progressive optimisation to the extent that it occurs in the normal course of business.

Incremental optimisation places a limiting constraint on the extent of optimisation. It denies a valuation based on optimal replacement of an entity's entire asset network. This latter approach is known as "greenfields optimisation".

The incremental ODRC approach recognises that there is always some degree of suboptimality and allowance for growth in future demand, and it reflects the historical development of the existing business, the time lag in asset planning and construction, the very long lives of the assets, and the replacement of its

[4] IPART, Aspects of the NSW Rail Access Regime, Draft Report, February 1999

components, in the normal course of business. As systems expand and change, a degree of suboptimality at any point of time is inevitable and is part of the total cost of output.

The issue of re-designing the complete network layout is not considered appropriate for ODRC valuations of infrastructure. This is consistent with ODRC valuations undertaken for regulatory pricing purposes in respect of the electricity transmission and distribution networks in Australia, United Kingdom and New Zealand.

3.3.1 Identifying Over-Capacity

The optimisation should be based on the reasonably expected level of use of the asset. The reasonably expected level of use will be determined by reference to the required level of service potential or output consistent with both the reasonably foreseeable future demand and the objective of minimising the whole of life costs of assets.

Whilst reliably projecting load growth has its own problems, the issue of what represents a reasonable timeframe is also problematic. This is because both elements have a degree of subjectivity in their determination.

Given the fact that many infrastructure assets are long lived and have a high capital cost, adopting an artificially short timeframe can have a distorting effect on the valuation. Furthermore the incremental cost of providing additional capacity at initial construction rather than on an incremental basis in response to actual demand growth often makes good commercial sense when considered over the longer term.

Under the DWRG, the basic rules established by the ERC for the optimized network are that it should:

a) provide a quality of supply similar to that which currently exists, except where this exceeds the approved standard quality of supply criteria; and

b) have a capacity similar to that of the existing network, except where this exceeds allowed future load growth over the forecast periods allowed.

3.3.2 Identifying Over-Engineering

One of the key features to consider in respect of whether a distribution network is over-engineered is the required reliability and security of the power system supplies.

The reliability of supply in a power system is a measure of its ability to survive a contingency (such as the failure of a generator) without interrupting supply to customers. Power system supply reliability is therefore related to the amount of spare or reserve capacity available to cover contingencies and the probability of contingencies occurring.

The required level of service for distribution networks is defined in terms of currently accepted service standards in the electricity supply industry in Philippines and countries with similar conditions.

3.3.3 Over-Designed, Excess Capacity, Redundant and Standby Assets

Where assets are over designed, have excess capacity, or are redundant, then an adjustment needs to be made to the valuation. The adjustment is made so the resulting valuation reflects the cost of replacing the existing service potential of the assets based on an efficient set of modern equivalent assets to achieve the required level of service output ("capacity in use") within the entity's planning horizon.

Overcapacity or redundant assets may be defined as assets with a greater service capacity than is necessary to meet the service delivery outputs within the entity's business and total asset management planning horizon.

Severable components of an integrated network that are redundant should be regarded as surplus assets and excluded from the valuation. Non-severable components, which are redundant or represent overcapacity, should also be excluded from the valuation.

Overdesigned assets are assets with features unnecessary for the goods or services the assets provide. Measuring the service potential embodied in these assets, based on modern equivalent assets, automatically excludes attributing any value to the overdesigned features.

Standby assets are assets kept as back up to an operating asset in the normal course of business to minimise disruption of production when prime assets are temporarily out of service. As such, they are an integral part of the operating asset and should be valued in the same way as other assets subject to service and quality standards.

3.4 DETERMINING THE ODRC OF ASSETS

3.4.1 Introduction

The optimised gross replacement cost of an asset must be depreciated where the existing asset's remaining useful life is less than the life of a new asset. Depreciation recognises the limited remaining useful life of an asset.

3.4.2 Principles in Determining Depreciation

The principles to be applied in determining depreciation are detailed in Section 4.10.1 of the DWRG. The fundamental principle is that straight-line depreciation is to be adopted.

3.4.3 Establishment of Effective Lives

The effective working life of an asset is its estimated life, assuming continued use in its present function as part of a continuing business. It is considered to be at an end when profitability is exceeded by operating and maintenance costs.

The standard and frequency of maintenance is a significant factor in the determination of effective lives. All other things being equal, a regularly and wellmaintained asset will have a longer effective life than an identical asset, which is subjected to poor and infrequent maintenance.

Some of the factors, which must be considered when assessing effective lives, are:

- Service utility of the assets;
- Maintenance levels implemented by the owner or operator;
- The environment in which the assets reside;
- External factors such as supply/demand characteristics, changes in legislation, etc;
- Physical, technological, functional and economic obsolescence.

In addition to these generic factors that impact on effective lives, assets of the same type within a network may have different lives due to different service conditions. Such factors might include:

- Environmental conditions;
- Level of use;
- Level of maintenance.

3.4.4 Residual Values

The residual value of an asset must be estimated to perform a depreciation calculation. This residual value reflects the fact that the asset may no longer be an economic proposition in its present role, however, it may remain in use but with profitability impaired due to increased maintenance costs and lack of efficiency compared with more modern assets. Alternatively it may be possible to sell the assets to a secondary user or for salvage value.

In principle when an asset reaches the end of its category or class life it has zero value under the straight-line depreciation method. Assets however remain in service beyond this period. It is reasonable to allocate a value to these assets in order to recognise their value to the network and to provide an incentive for DUs to extend the useful lives of assets. In the Position Paper[5] the approach was adopted to allocate a residual value of 5% of the optimised replacement cost of assets used beyond their regulatory lives to such assets.

Note that while the residual value will be included in the RAB for the purposes of calculating the return on assets building block, there will be no further depreciation of the asset once it reaches the end of its regulatory life.

3.4.5 Obsolescence

There are four forms of obsolescence that can impact upon the value of an asset. They are:

- Physical

[5] Supra note 3

- Technological
- Functional
- Economic

Infrastructure assets are often considered to be less susceptible to the last three forms of obsolescence than other assets, however in reality, at some stage in an asset's life these forces can and do impact on value.

Physical obsolescence measures the consumption of service potential. It can be measured by using straight-line depreciation, that is, life consumed over total life.

Technological obsolescence results from changes in the design and materials of construction of currently available assets. As manufacturing techniques, materials and processes improve; manufacturers are able to construct assets with equivalent or improved output at lower cost levels. This form of obsolescence is particularly apparent in new or emerging technologies.

Improvements in technology and construction techniques commonly impact on infrastructure assets, especially because they are often long-lived. Normally infrastructure assets experience organic growth that matches the growth of a community over time. Assets are often built to a size that matches the needs of the community at the time. As the community grows the asset becomes outgrown by the needs of the community it serves. Additional assets are created that meet those additional needs. When viewed from the standpoint of current needs, the composite group of assets can often represent an inefficient set of assets for the task at hand.

Functional obsolescence also results from changes in the design and materials of construction of currently available assets, however the impact on value is measured by reference to changes in operating and maintenance costs, or improvement in service quality (including reduction in lost income due to unserved energy), rather than reductions in capital costs.

As discussed above, the size, capacity and or performance of a particular type of asset may have been constrained due to design and manufacturing techniques and materials of construction available at the time of construction. As these design and manufacturing techniques and materials of construction are developed and improved over time, it often becomes possible to create assets of a greater size and/or capacity than had been possible in the past. A small number of large assets usually attract lower operating and maintenance costs than a large number of small assets with an equivalent combined capacity or service potential. Also, it often becomes possible to improve the service quality which may match with customer expectations.

Economic obsolescence results from external economic factors. It is defined as the impairment of desirability or useful life arising from economic forces, such as changes in optimum use, legislative enactments which restrict and impair the right to use the assets for their intended use, and changes in supply and demand relationships.

3.5 MATERIALITY

Valuations are to be determined having regard to the principles of materiality defined as follows:

"Materiality means, in relation to information, that information which if omitted, misstated or not disclosed has the potential to adversely affect decisions about the allocation of scarce resources made by users of the financial report or the discharge of accountability by the management or governing body of the entity".

Materiality in the context of valuations is generally considered to be of the order of ± 5% in gross asset value.

3.6 VALUE ADDED TAX (VAT)

The Value Added Tax (VAT) should be excluded from all regulatory asset base valuations.

4. APPLICATION GUIDELINES FOR DISTRIBUTION UTILITIES

4.1 OVERVIEW

These Application Guidelines provide the specific methodology to be followed by DUs in determining the ODRC values of their network assets.

The application of the ODRC valuation methodology involves the following steps:

(a) defining and identifying the network system assets;

(b) assessing the replacement cost of those assets (GCRC);

(c) optimising the network configurations and its components asset and

(d) determining the "optimised depreciated replacement cost (ODRC)" value of the assets.

The ODRC is based on the engineering optimisation of the network configurations and its component assets following which an appropriate allowance is made for depreciation. It measures the minimum cost of replicating the system in the most efficient way possible, from an engineering perspective, given its service requirements and the age of the existing assets. The valuation is built up as the sum of the values of individual asset groups. The valuation should be based on an optimal network, built to modern efficient designs, that:

- meets the same service requirements as the existing network; and
- is depreciated to the same remaining life as the existing network

4.2 DEFINING AND IDENTIFYING NETWORK SYSTEM ASSETS

The first step in determining the valuation of network system assets is to determine the quantities of the assets (lines, substations etc).

4.2.1 Boundaries for Identifying Network Assets

For the purpose of the Guidelines, network assets exclude those assets used for the generation of electricity.

Within the Philippines the DUs operate subtransmission and distribution networks generally at voltages of 220kV or less and are responsible for the delivery of energy in their franchise areas as well as the connection of any embedded generators in these areas.

For the purpose of the Guidelines, DUs are to exclude any Generation, or Ancillary business assets not forming part of their network activities.

For the purpose of determining the interface with generation plant, the high voltage terminals of the generating unit transformer are considered to be the point at which energy enters the network. Any equipment between the point of entry and to the point in the network which is shared with others is considered as dedicated generator entry equipment.

For the purpose of determining the interface with customer equipment, the connection to the customer's assets or customer's premises is considered to be the point at which power exits from the network. Equipment beyond this point is considered as dedicated customer connection equipment.

The boundary between TransCo and the DUs is to be determined in accordance with the ownership of the assets.

4.2.2 Types of Network Assets

The principal network assets of a DU are the network of power lines, transformers, associated switchgear and ancillary items linking customers to the points of supply where the DU takes delivery of the electricity. The system assets include control and communications systems and emergency spares. Depots, motor vehicles, office buildings, furniture and equipment, information technology systems for asset control, tools, plant, machinery and inventories are non-system assets. Valuation of non-system assets is dealt with in section 5 of the Guidelines.

Network assets are classified according to the function that they perform as follows:

Connection Assets – comprise assets as follows

- Connections assets supporting the provision of capability at a Connection Point in respect of a Regulated Distribution System to deliver electricity to or take electricity from that Connection Point. At a Connection Point, the following assets shall be treated as network assets where they are the property of the DU - service fuses, service connections, meters and load control relays.

- Connection Assets spares.

Network Assets – comprising the following asset subsystems:

- EHV Network - comprising systems operating at voltages of 220 kV and above.

- EHV Network spares.

- Subtransmission Networks - comprising systems operating at voltages of 115kV, 34.5 kV to 69 kV, except for those assets supporting the meshed EHV network.

- Subtransmission Network spares.

- Distribution Networks comprising:

High Voltage Distribution Networks - operating at 13.8 kV or possibly 34.5 kV and distributing power throughout the area supplied. Many large customers take direct supply at this level.

Distribution Substations and Transformers - erected on poles or ground mounted, installed along the lines to break the voltage down for reticulation at Low Voltage. Some distribution substations are installed in or on customers' premises and in these cases the transformers and other items of equipment may be owned by the customer.

Low Voltage Distribution Networks - operating at 440/220V and providing supply to the great majority of customers.

Public Lighting Assets - may include street lighting where owned by the DU.

Ancillary Equipment - forming part of the network or its operating hardware. These include system control facilities, communications equipment and lines, substation buildings and rights of way (easements).

Distribution Network **Spares**

Network owners are to be responsible for determining the elements of their system that fall into these categories.

4.2.3 Minimum Classifications

As a minimum, the ERC has specified that the fixed asset registers of DUs include the following network system asset categories:

Distribution Plant

- Land and Land Rights (dedicated to distribution purposes)
- Structures and Improvements (dedicated to distribution purposes)
- Station Equipment
    - Power transformers
    - Switchgear
    - Protective equipment
    - Metering and control equipment
    - Communications equipment
    - Other station equipment
- Poles, Towers and Fixtures – Distribution; Customer
- Overhead Conductors and Devices – Distribution; Customer
- Underground Conduits – Distribution; Customer
- Underground Conductors and Devices – Distribution; Customer
- Line Transformers – Distribution; Customer

- Power conditioning equipment
- Services
- Meters, Metering Instruments & Metering Transformers – Distribution, Customer
- Information technology equipment (dedicated to distribution purposes)
- Regulated Entity property on Consumers' Premises
- Street Lights and Signal Systems
- Submarine Cables

Materials and Supplies, including spares

Transferred Subtransmission Assets – assets transferred as of the valuation date must be included as a separate category.

The Initial Revaluation Report must indicate the weighted average age of the assets in each asset category.

With regard to connection assets, the following extract from Section 4.1.3 of the Position Paper should be noted:

> *"Distribution Connection Service will eventually be an excluded service, after the promulgation of the OADS Rules. Hence Distribution Connection Assets will eventually be excluded from the Regulatory Asset Base. For the present however, these assets are to remain included under the Regulatory Asset Base on which Regulated Entities are entitled to a return under the PBR."*
>
> (Note that following the publication of the Position Paper, the title of the OADS rules were changed to the Distribution System Open Access Rules (DSOAR), but the principle remains the same.)

4.2.4 Asset Categories & Subcategories

Network assets can be grouped for costing purposes. Proposed categories and subcategories are set out in Appendix A to these Guidelines.

4.2.5 Minimum Data Requirement

To conduct an accurate and valid valuation it is considered the following are the minimum data requirements.

- Asset register database. There may be more than one database to cover different asset types. There should be verifiable processes used to populate and keep the database up to date.

- The asset register database should contain as a minimum the asset categories outlined in this Guideline and sufficient attributes and other data available to value and assign residual lives.

- The minimum attributes classification of assets necessary for valuations are material types, sizes, quantities, year constructed/refurbished and condition.

- External attributes impacting on construction and asset performance should also be recorded. They are typically ground type, development density, failure histories and operating environment.

4.2.6 Data Verification

To ensure the information available in the database is accurate and complete, records should be verified by sampling.

The key components of the verification process should include:

- Verification of asset records for location and length.

- Completeness of records in relation to timing of assets being added or removed.

- Assessment of construction date and capitalised rehabilitation.

The number of samples is usually selected so as to provide analysis results with 95% confidence.[6] The significance of items should also be considered in terms of its effect on accuracy and materiality of the overall valuation.

4.3 ASSESSING THE REPLACEMENT COST OF NETWORK SYSTEM ASSETS

The second step in determining the ODRC of network system assets is to ascertain the replacement cost of the identified assets, not on the basis of the particular assets installed, but on the basis of replacement with modern equivalent assets.

The following Guidelines on standard replacement costs are provided to achieve a consistent and cost efficient approach to valuation.

4.3.1 Standard Costs

Each of the asset groups and subgroups should be allocated a per unit replacement cost for its modern equivalent.

Since cost efficiency and consistency of valuation between DUs is an important objective, it is appropriate that a common set of standard costs be applied by all DUs. The standard costs that should be applied in the valuations are set out in Appendix B to these Guidelines. Appendix B includes explanatory notes on how

[6] This confidence level is applied in New South Wales, Australia (NSW Government Treasury Guidelines). In New Zealand (Commerce Commission Optimisation Handbook) a statistically robust method must be applied and in practice it is observed that a 95% confidence level is adopted.

the standard costs should be used. The standard costs should be applied unless there is good reason to do otherwise. Justifications for all departures from the standard costs should be documented with a clear audit trail.

4.3.2 Non Standard Costs

The standard costs do not cover every type of construction and site condition, but their use should allow the majority of the assets to be assessed. Appendix B provides guidance on how costs should be determined for those assets for which no standard costs are given.

4.3.3 Variation of Costs

There may be considerable variation in the unit costs of lines depending on the region, general topography, diversity of development and accessibility. The costing methodology outlined in Appendix B indicates how to make allowance for such variations.

4.3.4 Valuation of Land and Easements

Land and easements are is to be valued in accordance with Section 5 of these Guidelines.

4.4 OPTIMISATION OF THE NETWORK CONFIGURATION AND ITS COMPONENT ASSETS

4.4.1 Introduction

The third step in determining the ORDC Valuation is to undertake an optimisation of the network configurations and its components asset to enable the optimised replacement cost value (ORC) of the network system assets to be derived. The purpose is to ensure the valuation reflects the replacement costs of an efficient set of modern equivalent assets able to achieve the required level of service.

An "incremental optimisation" approach is to be followed in which the existing network is examined and changes made to ratings, configurations, designs or materials to optimise the network configuration and its component assets having regard to such issues as excess capacity, redundancy and over-design. Distribution utilities adopt standard sizes / ratings on the basis of least cost considerations and optimisation also take this practice into account.

The optimisation for purpose of ODRC valuation is not concerned with improving the system from its current state. Optimisation cannot result in an increased network system asset replacement cost.

The steps in the optimisation process are specified by the ERC:

a) exclude stranded assets;

b) optimize the configuration of the network;

c) optimize the capacity of elements in the network;

d) optimize network engineering; and

e) optimize stores and spares.

Guidance regarding the optimisation process, its standards, constraints and scope follows in this section.

4.4.2 Optimisation Principles

The capacity of a subtransmission and distribution networks may depend on thermal, voltage and stability considerations. Individual network elements cannot be considered in isolation from each other. A rigorous review of optimisation of the network therefore requires detailed computer analysis of the network and knowledge of the operational difficulties applicable to the system. Optimisation studies are usually performed by the asset owner and subsequently reviewed by the valuer.

The optimisation should be based on the reasonably expected level of use of the asset, which is determined by reference to the required level of service potential or output consistent with both the reasonably foreseeable future demand and the objective of minimising the whole of life costs.

The optimisation should also be based on the required reliability and security of the power system supplies.

The optimisation should assume the following constraints:

- The location of generating plants and points of bulk supply should be assumed as fixed.
- The location of customers should not be varied.
- The existing boundaries of other network businesses should not be varied.
- Only existing easements, line and cable routes should be assumed.
- The optimised network should have an import/export capacity similar to that of the existing system.
- The optimised system should have inherent stability, reactive power support and fault level ratings sufficient for the business planning and Total Asset Management planning period but not more than the existing system.

The required level of service for distribution networks will be defined in terms of currently accepted service standards in the electricity supply industry in Philippines and countries with similar conditions. The level of services include:

- acceptable reliability of supply based on industry accepted indices for proportions of customers subject to interruptions, the number and duration of outages and types of customers affected

- safety requirements where these influence the choice of materials or type of construction
- voltage stability and other quality of supply issues
- degree of security of supply considered appropriate in different circumstance such as urban and rural, residential and industrial. This is assessed by reference to the level of in-built redundancy such as n, n-1, n-2 etc

In assessing the levels of optimisation consideration needs to be given to efficiencies undertaken by the DU such as:

- the economic value placed on electrical losses
- least cost considerations, taking into account operating and maintenance costs as well as capital costs
- the cost of demand not served
- energy not supplied

System designs, particularly those related to long lead times, are usually completed in steps in anticipation of load forecasts. The design follows the system augmentation steps, usually with a long planning horizon of at least 10 years. Optimisation should be based on the 'excess capacity' available through over design, i.e. 'the excess augmentation steps'. This is illustrated in the following diagram.

ASSET OPTIMIZATION

Optimisation should be based on the asset configuration and size necessary to meet the load predicted in the tariff period or the 'planning horizon' necessary for that asset type having regard to the largest predicted load.

The planning horizons for the network components are:

Network Components	Planning Horizon
Sub-transmission lines Substations (excluding transformers) Primary distribution circuits Points of connection to transmission network	15 years
Substation Transformers	10 years
Secondary distribution circuits Low voltage network	5 years

Network Components	Planning Horizon
Other distribution assets	

In practical terms, optimisation is to take into account the growth in demand over the planning horizon and the installed capacity (after allowing for security of supply considerations).

Figure 1 is a stylised example of the relationship between demand growth and capacity – the capacity subject to optimisation is shown at the end of the planning horizon (the red vertical line).

While this example shows that capacity may be optimised out, such optimisation must take into account the next lowest unit of capacity. In practical terms, the next lowest unit may be insufficient to meet the projected demand, in which case the asset would is not to be optimised out.

An asset that is optimised out may be optimised in at a subsequent valuation.

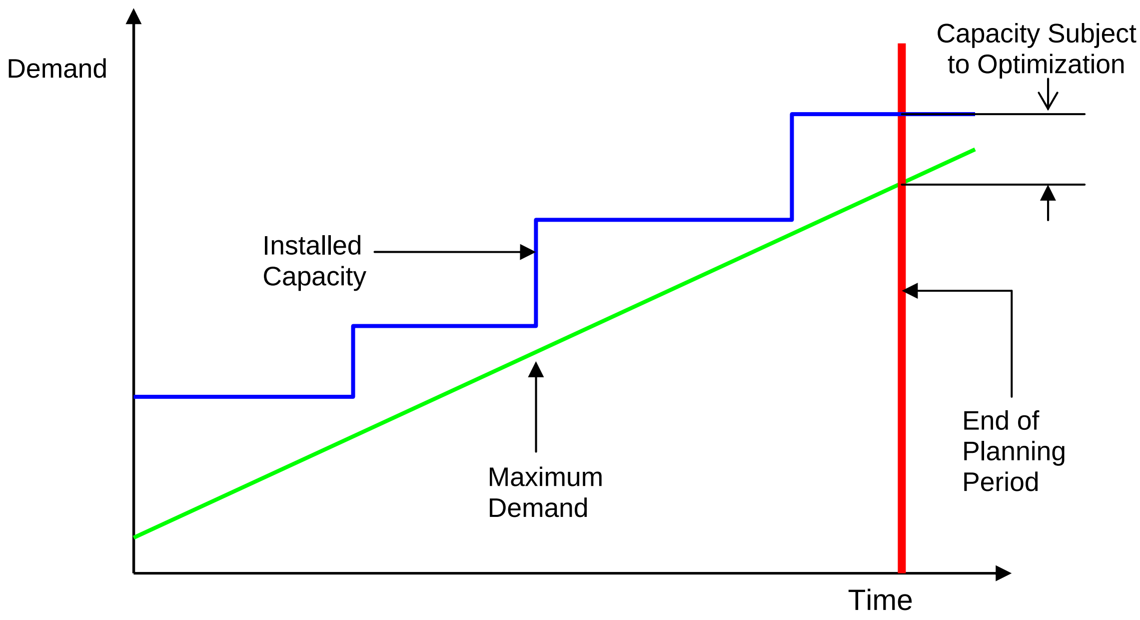

Figure 1: Capacity Subject to Optimization

4.4.3 Optimisation Network Configurations and Assets

The following criteria are to be applied to determine the optimisation to be applied for the ODRC valuation. An overriding criterion is that the value of the optimised system cannot be greater than the value of the existing network.

Quality Levels

A key component of the optimization methodology is the planning horizon allowed for various distribution network components when considering future load growth.

Quality Category	Network Components	Quality Level
Degree of Network Security	• Points of connection to transmission network • Sub-transmission network • Substations Primary Switching stations • Primary distribution feeders	N - 1
	• Secondary distribution feeders • Low Voltage network	N - 0
Power Factor	• All	> 85% lagging
Voltage variations	• All	> 90% of nominal voltage level <110% of nominal voltage level
Signal distortion	• All	Total Harmonic Distortion < 5%
Technical System Losses	• All	< = 6.5% of energy conveyed

The quality levels may provide additional justification for assets (for previous capital investment), and they are not to be used to optimize assets such that minimum quality standards are met.

Substations

Each substation is to be examined for optimisation:

- Reliability criteria

This will be based on the requirements to meet reliability criteria as defined in the table above.

- Redundancy

Any substations considered redundant should be excluded (notwithstanding N-1 considerations).

- Transformer capacity

Based on the accepted planning horizon, supportable load growth projections, voltage stability, fault levels, reliability criteria and cyclic ratings, each transformer shall be examined for suitable rating.

Where the existing rating exceeds the predicted rating, the transformer shall be optimised down to the nearest modern equivalent standard rating.

As a guide, the projected maximum demand on each substation at the end of the chosen planning period should not be less than 70% of the total installed capacity of the substation.

- Spare equipment

Any spare equipment such as circuit breakers shall be optimised out where they will not be required in the accepted planning horizon.

- Configuration

Any bus configuration that is above the required reliability criteria shall be optimised to an applicable configuration eg a double bus selectable configuration originally built for n-1 criteria that no longer applies would be optimised to single bus configuration.

Any equipment that becomes redundant due to sub transmission line/cable optimisation shall be excluded.

- Buildings

Optimise if over-designed for the application. In assessing the over-design, take into account that community expectations and local regulations often require the buildings to be designed to fit into the surrounding environment, resulting in physical configurations that may not be the optimum engineering design.

Subtransmission Lines and Cables

Using the maximum demand growth projections, planning horizon, fault level and thermal ratings as well as considering reliability criteria and voltage performance / stability, the conductor shall be optimised to the nearest rating standard size that is suitable for the optimised rating.

Where a line has been built to a higher voltage configuration but energised at a lower voltage it shall be optimised to the lower voltage if the higher voltage will not be needed in the accepted planning horizon. Any circuits considered unnecessary should be excluded.

Distribution Transformers

The method of optimisation will depend on the availability of data within the DU.

Method 1 – Where there is insufficient data on customers and transformers

The total installed distribution transformer capacity should be optimised down if considered excessive. As a guide, the aggregated utilisation of distribution transformers expressed as system maximum demand in MVA (excluding the demand of HV customers) divided by total installed distribution transformer capacity in MVA should not be less than 45% in urban areas and 30% in rural areas.

Method 2 – Where there is sufficient data on customers and transformers

This method is further separated into two alternatives according to the availability of robust historical utilization data.

Where robust historical utilization data is available, the threshold for the aggregated utilisation of distribution transformers for urban and rural areas shall be set based on computed historical aggregated DT utilization factors.

Where robust historical utilization data is not available, the method used to compute the aggregated utilization of transformers recognises that the overall system diversity (used in method 1), is not the most appropriate factor to be included in the distribution transformer optimisation process. Diversity increases as the load is aggregated, that is, the lowest diversity occurs at the LV customer service. Maximum diversity occurs at the transmission network point of connection. The diversity at the distribution transformer level is closer to the customer connection point than that at the network connection point.

The following transformer groups also distort the overall diversity as they are for one off customers and reflect minimum economic sizing. They should be removed from any calculations and not optimised:

- minimum economic size eg transformers for single rural customers
- transformers with one or a small number of customers where the rating is required for maximum demand eg irrigation pumps required only for a small number of months in a year.

Due to different load factors and utilisation it is appropriate to optimise on separate energy utilisation targets for urban and rural distribution transformers. Energy utilisation of the DU is determined by the following formula and compared with the targets as determined by their system parameters. When optimising using this method the DU shall justify their targets. Where the utilisation does not meet the targets, the number of distribution transformers should be optimised down. This would typically be done on a PhP/kVA basis.

$$\text{Energy Utilisation} = \frac{\text{LV Customers Annual (in MWh)}}{\text{Installed Dist Transformer Capacity (in MVA)} * 8760}$$

In order to determine the appropriate energy utilisation targets for a DU the following needs to be calculated. The targets are dependent on the after diversity maximum demand (ADMD) used by the DU, controllable loads, customer annual consumption and distribution transformer utilisation.

Typically these factors would be:

- ADMD would be in a kVA range related to people’s use of electricity.
- Transformer utilisation of 70 - 80% for urban transformers and 50 - 60% for rural transformers.

- Controllable loads such as hot water should not be included in calculations of diversified load factor as they are run at off peak times.

By way of an example for an urban ADMD of 3.5kVA, customer annual consumption (excluding controllable hot water) of 6000kWh at a 0.95 power factor and transformer utilisation of 80%, the Energy Utilisation target would be 16.5%. This is calculated from

$$\text{Diversified Load Factor} = \frac{\text{Annual consumption (in kWh)}}{\text{ADMD (in kVA)} * \text{pf} * 8760}$$

Energy utilisation target = Diversified Load factor * Transformer Utilisation

Distribution Feeders

Ideally distribution feeders would be optimised on an individual basis along similar lines to subtransmission feeders. As this is not practical due to the number of feeders and the operational requirements that can change loads on a frequent basis, optimisation is to be carried out on a sample basis. The framework for the optimisation is:

- DUs to stipulate the planning and design criteria for the distribution feeders, including planning horizon, voltage stability, fault levels, reliability criteria, switching criteria, losses, thermal ratings and current levels. These criteria are to be assessed for reasonableness.

- An audit of a sample of actual feeders based on the criteria in the above point. This would use loads projected to the planning horizon using known demand growth rates for the zone substation that the feeder is connected to.

- The factor of optimisation determined from the above process would be then applied to all the DU's distribution feeders.

Underground Reticulation

In developed countries, underground reticulation is largely driven by community environmental expectations (aesthetics). As such, local planning guidelines and prudent commercial operators reticulate systems underground.

Accordingly, any existing underground reticulation should be valued on the basis of replacement cost of underground assets. Valuing underground assets at the replacement cost of equivalent overhead reticulation should only be carried out where it can be clearly demonstrated that community standards would accept overhead assets.

Optimisation for ducts will need to take into account economic and outside body constraints e.g. local Government requirements in city areas requiring installation of ducts ahead of the planning horizons nominated above.

Spare Equipment

An assessment should be made of spares where these are material to the overall valuation. Those assets which are of inappropriate type, or which for whatever reason are unlikely to be used by the DU within the relevant planning horizon, should be optimised or written off. The likelihood of use will be referenced to such classifications as critical contingency spares (for N-1 security), emergency spares and routine spares (for maintenance) and their associated lead times for operational purposes. The stores history pertaining to spares will be taken into account when assessing reasonable levels of spares.

4.5 DETERMINING THE ODRC ASSET VALUE

The fourth step in determining the ODRC valuation is to depreciate the optimised replacement cost value of the network assets where the existing asset's remaining useful life is less than the useful life of a new asset. The depreciation recognises the limited remaining useful life of the asset.

4.5.1 Standard Effective Lives

Since cost efficiency and consistency of valuation between DU's is an important objective, it is appropriate that a set of standard asset effective lives be applied by all DU's. The standard effective lives which should be applied in the valuations are given in Appendix B to these Guidelines.

These standard effective lives have been determined in accordance with the ERC requirement that a weighted average regulatory life must be determined for each asset category (Clause 4.10.1(a) of the DWRG). This should be the weighted average economic life of assets, where the economic life of an asset is deemed to expire when the costs of maintenance and repair of that asset exceed the efficient replacement cost of it on a project comparison basis, using a forward-looking discounted cash flow analysis.

The regulatory asset life must be the same for the same asset category for each Regulated Distribution System. Determining the regulatory lives of asset categories will therefore require that the experience with assets in all the Regulated Distribution Systems, operated by all Regulated Entities, is taken into account.

The estimate of regulatory asset lives will be based on the economically efficient life of each asset category, based on considering the manner in which such assets are applied in the various Regulated Distribution Systems, the experience of Regulated Entities with regard to the lifespan of assets and the reasonable balance between refurbishment, operating and maintenance expenditure and life-time replacement expenditure.

As the lifespan of assets within an asset category may vary, the weighted average lifespan will be calculated. This will be done by using a weighting proportional to the optimized replacement cost for the assets within that asset category as of the date of the Initial Revaluation.

The weighted average life per asset category thus determined will be used as the standard asset life for that category. These standard lives will be used not only to depreciate the existing asset base as of the start of the Second Regulatory Period, but also for assets acquired thereafter.

Where significant differences exist between the lifespan of assets making up a category, further subcategories will be developed, each of which would then have its own standard (weighted) lifespan. This categorization will be recommended to the ERC by the Valuation Expert.

These Guidelines are intended to provide reliable effective lives for the assets and as a general principle DUs are to use the lives given in Appendix B. However there will always be exceptions. Even identical infrastructure assets decay at different rates and these figures represent an appropriate mean. Some assets will decay at an accelerated rate due to one or more of the following impacts:

- Design faults
- Material faults
- Manufacturing or construction faults
- Inadequate maintenance
- Overstressed operations
- Operating environments
- Accidents or other events

In these instances, where evidence is available that the effective life will deviate significantly from the listed standard effective live, or a standard life does not exist in the schedule DUs can self assess and propose a more appropriate effective life (residual).

In some instances, assets will last significantly longer than the scheduled life because of the nature of the asset and its operating environment.

There are 3 cases where self-assessment will apply:

1. A new technology asset that does not exist in the Guidelines schedule. In this instance, the DU will use manufacturer or other supportable data to establish an effective life for this asset type.

2. Existing assets that will have a predicted shorter life than scheduled e.g. early manufactured XLPE cable, which allowed water ingress. In this instance, the DU will continue to depreciate the asset in accordance with effective lives until the date of replacement. At this point this asset will be written off.

3. Existing assets that have a predicted longer life than the Guidelines schedule allows. In this instance, the DU will extend the effective life at the point of self-assessment and write the balance off over the residual life determined.

Cases 2 and 3 are illustrated in the following diagram. It should be noted that the diagram relates to the handling of asset life, not asset revaluation.

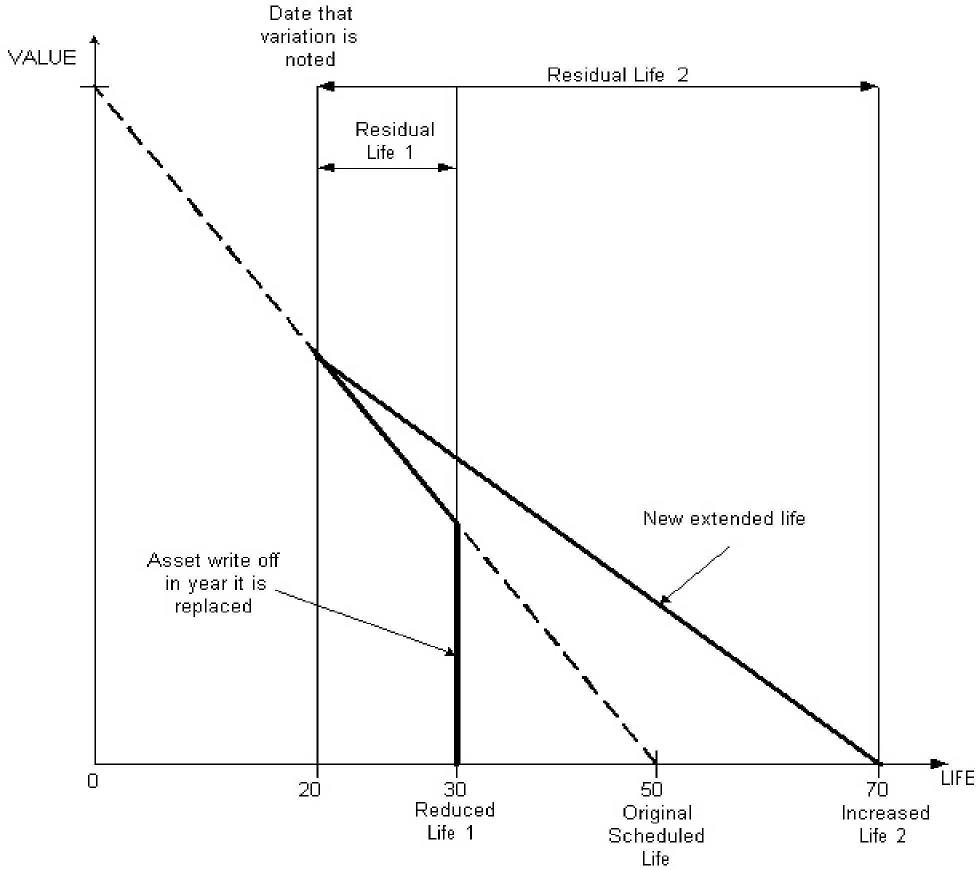

Figure 2: Effect of Life Extension

In all instances the DUs need to qualify the basis of their claim and provide adequate information to support their self-assessment.

4.5.2 Determining Asset Remaining Useful Lives and Ages

The age of an asset should be the actual age taken from the asset register database or the best estimate thereof.

The remaining useful life of an asset should be either:

- the total useful life less the life expired to date (the age of the asset); or
- the best estimate of the time to expiry of the total useful life of the asset (only where the life expired to date cannot be accurately determined).

For the purpose of valuations prepared in accordance with these Guidelines, the first method referred to above is preferred.

Where an estimate of the remaining useful life of an asset or group of assets is made, it should be based on:

- the condition of the asset;

- any refurbishment work that has been carried out; and
- the level of past maintenance (from service records and the views of the DU's technical staff).

4.5.3 Determination of Ages

It may be difficult to establish the history of some assets, thus making it difficult to assign ages for depreciation purposes. It will be necessary to use whatever information the DU can provide including annual expenditures on some items. It may be necessary to carry out field surveys of the condition of selected assets to ensure that the input data is sufficient to produce reliable results.

4.5.4 Minimum Remaining Life

The ERC has specified that assets used beyond their standard regulatory life-span will retain a book value (for the purposes of calculating the value of the Regulatory Asset Base) of five percent (5%) of the ORC of the asset. Once assets are depreciated to this level, their depreciated value would not fall below that, for as long as they remain in full operation.

Where a particular asset is expected to be retired early from service because it will become redundant as part of a development of the system, this should not be taken into account in assessing the remaining life of that asset but should be adjusted for as part of the valuation process. However, where a subcategory of assets is routinely replaced as part of the evolution of the system before its technical life expires then this should be taken into account in assessing the total useful life for that subcategory of assets.

4.5.5 Depreciation of Group Assets

In some cases, it may be necessary to group assets for costing purposes. For example, distribution transformers may be grouped and described by the quantity of each kVA rating. They may be of varying ages.

Possible approaches in such cases are:

- An estimate could be made of the average age and therefore remaining life of the category of assets as a whole. The estimate could be based on a sample of records, annual statistics of new construction or other methods. The average should be weighted if the category includes assets with different replacement costs.
- The category could be completely disaggregated into individual assets, or partly disaggregated into subcategories, each depreciated based on its known age.

The most appropriate method for dealing with categories and subcategories of assets will depend on data availability, calculation complexity and the materiality of the group's value in relation to the value of the whole network. The method used will also be defensible in ensuring consistent life/age treatment in subsequent revaluations.

4.5.6 Depreciation Issues

- Where optimisation notionally replaces an existing asset with an optimised modem equivalent (eg of smaller rating), then the optimised asset should be depreciated as if it was the existing asset.

- Where a category (or subcategory) of assets are notionally replaced with reconfigured assets, the depreciation of the reconfigured assets is less straightforward. In these circumstances the reconfigured assets should be depreciated as a category (or subcategory) to effect the same overall depreciation proportion (ie remaining life/total life) as the category (or subcategory) of existing assets.

4.6 INDEPENDENT OPINIONS

The ODRC valuation of each DU must be supported by independent opinions that the valuation complies with these Guidelines. The ODRC valuation is to be supported by the opinion of an independent engineer and/or qualified asset valuer.

5. NON SYSTEM ASSETS

5.1 BACKGROUND

The framework to enable the consistent approach to the valuation of non-current assets is provided by various accepted accounting principles, standards and guidelines.

5.2 ACCOUNTING STANDARDS

Philippine Accounting Standard (PAS) 16, which corresponds to International Accounting Standard (IAS) 16 – Property, Plant and Equipment, is the primary accounting standard governing the valuation basis adopted for financial reporting.

5.3 SPECIALISED ASSETS AND NON-SPECIALISED ASSETS

In the application of these policy guidelines, the non-system assets are to be 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 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 approach.

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

Categorisation	Valuation Approach
Non-Specialised	Market Comparison Approach or Income Approach or Depreciated Replacement Cost Approach depending on availability of data
Specialised	Optimised Depreciated Replacement Cost Approach

5.4 CATEGORISATION OF NON-SYSTEM ASSETS

As a minimum, the ERC has specified that the fixed asset registers of DUs include the following non-system asset categories:

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

The Initial Revaluation Report must indicate the weighted average age of the assets in each asset category.

The Non-network Assets will constitute part of the Regulatory Asset Base and have to be included in the revaluation report.

6. VALUATION OF LAND AND EASEMENTS

6.1 LAND VALUATION

Land that is held by a Distribution Utility can be categorised as follows:

1. Land that will continue to be used by the agency for the foreseeable future in support of its business operations (Land in Use by the Distribution Utility).
2. Land that is no longer required to support the agency's business operations (Surplus Land).

6.1.1 Land in Use by the Distribution Utility

Where land is held for continued use and would be replaced if the Distribution Utility was deprived of it, the basis of valuation under the deprival value concept is the current market value for the existing use.

Where land is valued on the basis that it will continue to be used for the existing purpose, there are a number of inherent assumptions:

- The existing use of the land will continue to support the business operations thereon;
- The future service potential of the land will not diminish in the foreseeable future; and
- The business operated on the land is profitable and will continue to be profitable for the foreseeable future.

On the basis of the above criteria, there is no intention that the land would be made available for an alternate use, irrespective of whether an alternate use would provide a higher value.

6.1.2 Land with Limited Use to the Distribution Utility

Land with limited future service potential, that is, the existing use of the land will be discontinued in the relatively near future (say, the next five years) should be valued on the following basis:

- The present value of future net cash inflows for the remaining term of the existing use; and
- The deferred value of the alternate use of the land.

The present value of the future net cash inflows would only be assessed over the anticipated remaining life of the existing use. In those circumstances where cash inflows cannot be clearly identified from the land, then an appropriate yield should be assessed that reflects the continued use by the Distribution Utility. The present value of the potential net income should then be determined for the remainder of the existing use. The alternate use value should be deferred until the existing use is discontinued. The sum of these two assessments would be the value of the land subject to a limited use requirement by the Distribution Utility.

6.1.3 Surplus Land

Land that is surplus to the current or anticipated needs of a Distribution Utility should be valued at current market value.

Irrespective of the category of the land holding outlined above, the valuation should take into account the nature of the parcel, the legal restrictions on use, the opportunities for and impediments to development that are inherent to the specific parcel of land, other constraints that exist in respect of that land and any other special attributes that the land may possess.

6.2 EASEMENT VALUATION

This is a right, privilege or interest to a specific purpose that one party has in the land of another.

The historical costs charged on this account are the costs of securing permits from local government units and the actual payments if there are any for the right-of-way to landowners, which is covered under Grants of Right-of-way Documents.

Valuation will be based on indexation of the historical easement cost.

6.3 STRUCTURES & OTHER LAND IMPROVEMENT VALUATION

These will be classified as system fixed assets or non-system assets.

Assets that are classified as non-system assets may be further defined as specialized or non-specialized assets.

Appendix A: Definitions - Asset Categories, Subcategories and Types

Network assets can be grouped for costing purposes into categories, subcategories and types. The DWRG specifies the asset categories to be used. The sub-categories and types cascade from the DWRG asset categorisation.

Unless otherwise stated all assets are assumed to be valued on a current replacement cost basis. All values are based on the installed cost, including labour, materials and overheads.

To make the valuation as transparent and as reproducible as possible, the following subcategories are to apply for each asset category:

CATEGORY A3 – STATION EQUIPMENT

Category A3A - Power Transformers

Power transformers are grouped by voltage level and power ratings. The cost also includes foundations, conductors between the HV line and the transformer terminals, HV, LV and control cable terminations at the transformer and transformer earthing.

Category A3B - Switchgear

The switchgear category is broken into two sub-categories: circuit breakers and disconnectors.

Circuit breakers are grouped by type, voltage and size. The replacement cost per circuit breaker will vary depending on type. In the case of conventional outdoor circuit breakers the replacement cost includes foundations, control cable terminations and control, metering and protection tests. The equipment costs are based on SF_6 circuit breaker costs. The circuit breaker cost excludes the cost of any control panels as these are valued separately. It is assumed that for a breaker and a half scheme there will be 1 control panel per bay (controlling three circuit breakers), for a ring bus there will be 1 control panels per bay (controlling two circuit breakers) and there will be 1 control panel per 2 circuit breakers in a single bus scheme.

Metalclad switchgear (34.5 kV and below) will be costed on a modular basis using a standard configuration of seven circuit breakers. This allows for one incomer, five feeder circuit breakers (one to be used for capacitors) and one bus-tie (that can be used as an additional feeder). For calculating the cost of a switchboard with a different number of circuit breaker than the standard unit, the cost will be pro-rated based on the total number of panels. The cost includes foundations, enclosures, protection and 1 control panel for every 3 breakers.

Conventional outdoor disconnectors are valued as separate items and are grouped based on voltage and rating. For the metalclad switchgear the disconnectors are included in the overall cost of the switchgear.

Category A3C - Protective Equipment

This category is further divided into sub-categories for current transformers (CTs), potential transformers (PTs), lightning arresters and protection schemes.

CTs. PTs and lightning arresters costs will include all foundation, stands, conductor to the main circuit and all cable and conductor terminations.

Electro-mechanical relays will be replaced on a modern equivalent asset basis with electronic based equivalents and the replacement cost for electro-mechanical relays will reflect this.

Category A3D - Metering and Control

This contains all of the substation metering equipment that is used for power quality and revenue metering. Metering boxes and control panels are included in the metering and control cost. Metering PTs and CTs costs are not included in this section, but in the previous section (Protective Equipment).

Control panels include all equipment for the operation of circuit breakers from the control room. It also includes IED devices for monitoring circuit loads and voltages.

Category A3E - Communications Equipment

All SCADA and communications equipment will be based on a historical index basis.

Category A3F - Other Substation Equipment

Batteries and chargers are sub-categorized based on capacity and ratings.

The structure and busbar replacement cost includes all structures and bus work costs for a given substation configuration. Standard replacement costs are given for structure and busbar modules based on voltage and configuration. Where a structure does not fit one of the standard configurations a historic indexation valuation approach will be taken.

A sub-category exists for miscellaneous substation equipment which consists of any substation items that cannot be associated with any particular piece of equipment, such as substation earthing. The valuation approach for these items will be based on a substation configuration basis where possible. If this cannot be used a historical indexation approach will be used.

CATEGORY A4 & A5 – TOWERS, POLES & FIXTURES (DISTRIBUTION & CUSTOMER)

This category is sub-categorized based on poles and pole top hardware.

Poles are sub-divided based on construction material and height. Due to the unavailability of new woods in the Philippines it is assumed that wood poles will be replaced with concrete poles of an equivalent height and this is reflected in the replacement cost for wood poles. The replacement cost of the pole will include all cost for installing the pole (e.g. foundations, guys, etc).

Pole top hardware encompasses cross-arms, insulators, braces, clamps, nuts and bolts for securing the cross-arms and insulators to the pole. It also includes any materials required to secure the conductors to the insulators.

CATEGORY A6 & A7 – OVERHEAD CONDUCTORS & DEVICES

This category is sub-categorized based on overhead conductors and devices.

The overhead conductors sub-category is further divided based on conductor material and cross sectional area. The conductor replacement cost is based on a per km rate and includes the conductor and installation costs only.

The overhead distribution devices subcategory includes fuse cut-outs, surge arresters, line switches, line sectionalizers and reclosers. All cost associated will installing the above equipment is included in the costs.

CATEGORY A8 & A9 – UNDERGROUND CONDUITS (DISTRIBUTION & CUSTOMERS)

The replacement cost for underground conduits is based on historical indexation.

CATEGORY A10 & A11 – UNDERGROUND CONDUCTORS & DEVICES (DISTRIBUTION & CUSTOMERS)

This category is sub-categorized based on underground conductors and devices.

Underground conductor sub-categories are based on conductor type. The replacement cost for underground cables includes cable joints and terminations along with all trenching and reinstatement. This is based on a per km basis.

Underground devices include ground mounted switching devices, further sub-divided based on voltage and rating. The replacement cost includes the foundations, cable terminations and earthing costs.

CATEGORY A12 & A13 – LINE TRANSFORMERS (DISTRIBUTION & CUSTOMERS)

Line transformers are sub-categorized based on voltage and rating. The distribution transformer cost includes the brackets for mounting on poles (or foundations if ground mounted), the conductor between the fuse unit and the transformer terminals, all connectors and terminations and the transformer earthing costs.

CATEGORY A14 – POWER CONDITIONING EQUIPMENT

Power conditioning equipment includes capacitors and voltage regulators. Capacitors are categorized as substation capacitors and line capacitors. Substation capacitors are installed in sub-transmission and distribution substations and generally of a larger capacitor. The cost for these items includes all foundations, structures, earthing, switching reactors and potential transformers.

Line capacitors are installed on distribution circuits and include the cost for all control equipment (if switched), brackets for installation on the poles, and conductors required

CATEGORY A15 – SERVICES

Service cables are grouped based on cross sectional area and are valued on a per km basis. This also includes termination costs for the cable at the transformer and the customer premises.

CATEGORY A16 – METERS, INSTRUMENTS & METERING TRANSFORMERS (DISTRIBUTION)

This category includes all meters used at customers metering point. This sub-categorization is performed per metering point basis. A metering unit replacement cost includes the cost of the meter, instrument transformers (if any), metering cabinets, sockets and seals.

CATEGORY A17 – METERS, INSTRUMENTS & METERING TRANSFORMERS (CUSTOMER)

This category includes all meters used owned by the customer. This sub-categorization is performed per metering point basis. A metering unit replacement cost includes the cost of the meter, instrument transformers (if any), metering cabinets, sockets and seals.

CATEGORY A18 – INFORMATION TECHNOLOGY EQUIPMENT (DISTRIBUTION)

This category is valued as a specialised asset in accordance with Section 5 of the Guidelines.

CATEGORY A19 – REGULATED ENTITY PROPERTY ON CONSUMER PREMISES

This category includes any regulated entity property on consumer premises.

CATEGORY A20 – STREET LIGHTS & SIGNAL SYSTEMS

This category is further sub-divided according to voltage for cables and wattage for street lights. For each standalone streetlight pole the replacement cost consists of a pole, an outreach arm and a fitting complete with luminaire. For the street lights installed on existing power poles the replacement costs consist only of an outreach arm and fitting with luminaire.

CATEGORY A21 – SUBMARINE CABLES

There are no submarine cables in the Philippines DUs to be valued as of 30 June 2006.

Appendix B: Standard Replacement Costs and Asset Lives

This Appendix sets out standard replacement costs and asset lives and gives guidance as to their application. It also sets out the methodology to be followed for items where no standard cost is given.

Standard Cost Methodology

B.1 Standard replacement costs have been compiled for most of the asset types found within the DWRG asset categories and are shown in Table 1. Replacement costs for substation structures are given in Table 2. Standard replacement costs for large power transformers are included in Table 3.

B.2 The standard replacement costs shall be based upon indexed historical costs, current replacement costs or modern equivalent assets costs in accordance with the principles in the DWRG.

B.3 Subject to the additional factors permitted in this Appendix, the costs in Table 1 are the standard costs that shall as a general principle be used in the valuation. However, DUs may use their self-assessed values in place of the standard values provided there are justifiable reasons. Where an asset is made up of a number of items that have differing lives, a weighted average life is to be applied. The reasons shall be stated and adequate information shall be provided to support the self-assessment.

Components of Standard Costs

B.4 The standard replacement costs are based on industry observed costs and best achievable practice in the Philippines and include the following elements:

a. costs of materials delivered to store inclusive of any taxes paid.

b. direct labour including survey, design and construction and labour on-costs incorporating holiday pay, actual sick leave (not sick leave allowances), training, other unproductive time, workers compensation payments, superannuation, and payroll tax.

c. transport and plant costs for delivery and erection.

d. overhead costs as defined in Clause B.5.

B.5 For the purpose of network valuation, overhead costs should be limited to all corporate and administrative costs associated with the capital planning process and should include all costs associated with

- Preparation of strategy plans
- Use of consultants
- Capital rationing processes; project approval and budgeting
- Contract Administration
- Site Supervision

- Construction related corporate administration overhead; asset register data processing including new asset data input, retirements for replaced assets and associated procedures

Overhead costs for support systems and tools should not be included in network valuations since these systems may be capitalised at time of purchase, implementation or redevelopment. They should be valued as non-system assets.

Application of Standard Costs

Developing the Unit Rate

B.6 The standard unit rates shall be based on efficient costs. While the DWRG specifies that the valuation is to apply at the level of component assets, e.g. poles, conductors, the standard unit rate shall not be the average replacement cost of a single component or conductor span so determined. In consideration of efficiency, the standard rates are to be determined by reference to materiality. In practical terms the standard unit rate would be that applicable to 1) the replacement of a quantity of repetitive assets totalling at least 3% of the value of the asset type under consideration; 2) the construction of a complete standard substation.

B.7 The standard rates in Table 1 are base rates determined on average conditions of construction difficulty.

B.8 The unit rate to be applied in valuing the DU assets needs to reflect the diversity of ground/terrain conditions, the construction difficulty associated with the different environments and geographic / locational factors.

The adopted unit rate then equals:

Adopted unit rate = Base Rate (Table 1) x Composite Adjustment Factor (clause B.9).

B.9 Where environmental conditions affect the base rate, the DU can propose to adjust the standard rates. The basis for adjustments and the final rates needs to be supported by the DU. Where environmental conditions apply this would normally be achieved by overlaying geographical / terrain areas on a Geographic Information System map and extracting the pertinent quantities of assets to which adjustments would apply. Where a composite adjustment factor is applicable it shall be computed by multiplying individual adjustment factors as relevant for each area within the distribution and subtransmission networks.

Costs for Items for Which No Standard Costs Given

B.10 In assessing costs for asset categories for which no standard costs are shown in Table 1, 2 or 3 or where the valuer's assessed value is lower than the standard cost the following rule shall apply:

Costs shall be fixed on the basis of competitive pricing or estimates thereof; not necessarily the cost of self construction, and shall reflect 'brownfields' construction. The cost elements set out in clauses B.4 & B.5 shall be included in accordance with the following clauses.

B.11 Where information on competitive prices is not available, costs may be constructed on the basis of prime costs plus on-costs in accordance with the following formula:

Replacement Cost

= [Direct materials + Plant costs + Direct Labour (1 + LOC)] / (1 – OH)

Where: LOC = Labour on-cost

OH = Overhead cost

B.12 The LOC should not reflect any labour market conditions to which private construction contractors are not subjected.

B.13 As a guide, the LOC should be less than or equal to 50% and the OH should be less than or equal to 20%.

B.14 A profit margin should be incorporated only to the extent that the LOC and OH and all other elements in the replacement cost make-up represent industry best practice and competitive market conditions.

B.15 The value of land and easements should be fixed in accordance with Section 5 of the Guidelines.

Standard Asset Effective Lives

B.16 Standard asset effective lives are given in Table 1[7].

B.17 Lives for assets not listed in Table 1 or where lives can be otherwise justified should be established in accordance with Section 4.5.3 above in the Guidelines.

B.18 The life of each asset commences when the equipment is commissioned for the first time or refurbished. If the year of first commissioning or refurbishment is unknown, a reasonable estimate shall be made.

B.19 Where life extension is applied eg. pole pinning (staking) the cost of the life extension work shall be capitalised and added to the valuation. The asset shall be depreciated at the same rates as before life extension.

B.20 No added life shall be assigned in the calculation of remaining life except as provided for in clause B.19.

B.21 The life of an asset shall be reduced by the valuer where it is considered that the remaining economic, safety or technical life so warrants.

Periodic Updating of Table 1

B.22 The standard costs and asset lives shown in the Tables will be updated periodically in consultation with the industry to reflect changing costs and technological advances.

[7] Standard asset lives were determined by the ERC upon recommendation of an independent expert consultant.

Table 1: Table of Standard Replacement Costs and Standard Lives

DWRG Cat'y	Asset Category/Sub-Category/Type	Unit	Standard Value - Meralco (PhP k)	Standard Value - Cepalco (PhP k)	Standard Value - Decorp (PhP k)	Std Life (Yrs)
A1	**LAND & LAND RIGHTS (DISTRIBUTION PURPOSE)**					
	To be valued using market comparison as highlighted in Section 5 of these Guidelines					
A2	**STRUCTURES & IMPROVEMENTS (DISTRIBUTION PURPOSE)**					
	To be valued using indexed historical costs as explained in Section 5 of these Guidelines					
A3	**STATION EQUIPMENT**					
A3A	**POWER TRANSFORMERS**					
	Refer to Table 3 below					
A3B	**SWITCHGEAR**					
A3B	**Circuit Breakers (See Notes 1, 2 and 3)**					
A3B	SF_6 Dead Tank Circuit Breaker, 230 kV Outdoor, 3-pole, 2000 A, 31.5 kA	no.	-	-	-	30
A3B	SF_6 Dead Tank Circuit Breaker, 230 kV Outdoor, 1-pole, 2000 A, 40 kA	no.	-	-	-	30
A3B	SF_6 Dead Tank Circuit Breaker, 230 kV Outdoor, 3-pole, 2000 A, 40 kA	no.	-	-	-	30
A3B	SF_6 Dead Tank Circuit Breaker, 230 kV Outdoor, 1-pole, 3000 A, 40 kA	no.	5,711,280	-	-	30
A3B	SF_6 Dead Tank Circuit Breaker, 230 kV Outdoor, 3-pole, 3000 A, 40 kA	no.	-	-	-	30
A3B	SF_6 Live Tank Circuit Breaker, 115 kV Outdoor, 3-pole, 2000 A, 25 kA	no.	-	-	-	30
A3B	SF_6 Live Tank Circuit Breaker, 115 kV Outdoor, 3-pole, 2000 A, 40 kA	no.	3,702,031	-	-	30
A3B	SF_6 Live Tank Circuit Breaker, 115 kV Outdoor, 3-pole, 3150 A, 40 kA	no.	-	-	-	30
A3B	SF_6 Dead Tank Circuit Breaker, 115 kV Outdoor, 3-pole, 2000 A, 40 kA	no.	-	-	-	30
A3B	SF_6 Dead Tank Circuit Breaker, 69 kV Outdoor, 3-pole, 1200 A, 25 kA	no.	2,583,750	-	-	30
A3B	SF_6 Dead Tank Circuit Breaker, 69 kV Outdoor, 3-pole, 1200 A, 31.5 kA	no.		2,731,000	2,791,250	30
A3B	SF_6 Dead Tank Circuit Breaker, 69 kV Outdoor, 3-pole, 1200 A, 40 kA	no.	3,000,000	-	-	30
A3B	SF_6 Dead Tank Circuit Breaker, 69 kV Outdoor, 3-pole, 1200 A, 64 kA	no.	-	-	3,000,000	30
A3B	SF_6 Dead Tank Circuit Breaker, 69 kV Outdoor, 3-pole, 2000 A, 25 kA	no.	-	-	-	30
A3B	SF_6 Dead Tank Circuit Breaker, 69 kV Outdoor, 3-pole, 2000 A, 31.5 kA	no.	-	2,400,000	-	30
A3B	SF_6 Dead Tank Circuit Breaker, 34.5 kV Outdoor, 1200 A, 25 kA	no.	1,342,223	1,342,223	-	30
A3B	SF_6 Dead Tank Circuit Breaker, 34.5 kV Outdoor, 1200 A, 31.5 kA	no.	-	-	-	30
A3B	SF_6 Dead Tank Circuit Breaker, 34.5 kV Outdoor, 1200 A, 40 kA	no.	-	-	-	30

DWRG Cat'y	Asset Category/Sub-Category/Type	Unit	Standard Value - Meralco (PhP k)	Standard Value - Cepalco (PhP k)	Standard Value - Decorp (PhP k)	Std Life (Yrs)
A3B	SF_6 Dead Tank Circuit Breaker, 13.8 kV Outdoor, 1200 A, 25 kA	no.	617,000	617,000	617,000	30
A3B	SF_6 Dead Tank Circuit Breaker, 13.8 kV Outdoor, 1200 A, 40 kA	no.	-	-	-	30
A3B	Metalclad Switchgear 34.5 kV, 7 Vacuum Circuit Breakers (1 Incomer, 5 Feeder and 1 Bus Coupler)	no.	9,448,190	-	-	30
A3B	Metalclad Switchgear 13.8 kV, 7 Vacuum Circuit Breakers (1 Incomer, 5 Feeder and 1 Bus Coupler)	no.	5,610,000	-	-	30
A3B	Metalclad Switchgear 13.8 kV, 7 Vacuum Circuit Breakers, Indoor, 1200A	no.	-	800,000	800,000	
A3B	Metalclad Switchgear 6.24 kV, 7 Vacuum Circuit Breakers (1 Incomer, 5 Feeder and 1 Bus Coupler)	no.	5,610,000	-	-	30
A3B	***Disconnectors***					
A3B	Disconnector, 230 kV, 2000 A	no.	1,426,000	-	-	30
A3B	Disconnector, 230 kV, 2000 A with earth switch	no.	2,070,000	-	-	30
A3B	Disconnector, 115 kV, 2000 A, ground mounted with support structure	no.	782,000	-	-	30
A3B	Disconnector, 115 kV, 2000 A, mounted on bus structure supports	no.	314,556	-	-	30
A3B	Disconnector, 115 kV, 600 A, ground mounted with support structure	no.	-	-	-	30
A3B	Disconnector, 115 kV, 600 A, mounted on bus structure supports	no.	-	-	-	30
A3B	Disconnector, 115 kV, 1200 A, ground mounted with support structure	no.	-	-	-	30
A3B	Disconnector, 115 kV, 1200 A, mounted on bus structure supports	no.	-	-	-	30
A3B	Disconnector, 69 kV, 1200 A, ground mounted with support structure	no.	408,750	406,000	408,750	30
A3B	Disconnector, 69 kV, 1200 A, mounted on bus structure supports	no.	239,000	239,000	-	30
A3B	Disconnector, 34.5 kV, 600 A, ground mounted with support structure	no.	-	-	-	30
A3B	Disconnector, 34.5 kV, 600 A, mounted on bus structure supports	no.	-	-	-	30
A3B	Disconnector, 34.5 kV, 1200 A, ground mounted with support structure	no.	213,171	-	-	30
A3B	Disconnector, 34.5 kV, 1200 A, mounted on bus structure supports	no.	150,745	-	-	30
A3B	Disconnector, 34.5 kV, 1600 A, ground mounted with support structure	no.	-	-	-	30
A3B	Disconnector, 34.5 kV, 1600 A, mounted on bus structure supports	no.	-	-	-	30
A3B	Disconnector, 34.5 kV, 2000 A, mounted on bus structure supports	no.	-	196,000	-	30
A3B	Disconnector, 34.5 kV, 2000 A, ground mounted with support structure	no.	-	239,000	-	30
A3B	Disconnector, 13.8 kV, 400 A, mounted on bus structure supports	no.	-	-	-	30
A3B	Disconnector, 13.8 kV, 600 A, mounted on bus structure supports	no.	-	-	-	30
A3B	Disconnector, 13.8 kV, 800 A, mounted on bus	no.	-	-	140,000	30

DWRG Cat'y	Asset Category/Sub-Category/Type	Unit	Standard Value - Meralco (PhP k)	Standard Value - Cepalco (PhP k)	Standard Value - Decorp (PhP k)	Std Life (Yrs)
	structure supports					
A3B	Disconnector, 13.8 kV, 800 A, mounted on bus structure supports, motorised	no.	-	-	214,552	30
A3B	Disconnector, 13.8 kV, 1200 A, ground mounted with support structure	no.	-	239,000	-	30
A3B	Disconnector, 13.8 kV, 1200 A, mounted on bus structure supports	no.	-	196,000	190,000	30
A3C	**PROTECTIVE EQUIPMENT**					
A3C	***Current Transformers (See Note 4)***					
A3C	Current Transformer, 230 kV, 2 cores, 2000:5 A, Post	no.	546,820	-	-	30
A3C	Current Transformer 115 kV, 2 cores, 1000/500:5	no.	401,210	-	-	30
A3C	Current Transformer 69 kV, 2 cores, 1200/600:5	no.	317,417	317,417	317,417	30
A3C	Current Transformer 34.5 kV, 2 cores, 1200/600:5	no.	-	260,000	-	30
A3C	Current Transformer 13.8 kV, 2 cores, 1200/600:5	no.	-	-	-	30
A3C	***Potential Transformers* (See Note 5)**					
A3C	Potential Transformers, 230 kV, Outdoor, 2000/1200:1	no.	456,285	-	-	30
A3C	Potential Transformers, 115 kV, Outdoor, 2000/1200:1	no.	418,397	-	-	30
A3C	Potential Transformers, 69 kV, Outdoor, 600/350:1	no.	251,875	251,875	251,875	30
A3C	Potential Transformers, 34.5 kV, Outdoor, 350/175: 1	no.	106,328	106,000	-	30
A3C	Potential Transformers, 13.8 kV, Outdoor, 120/70:1	no.	-	82,344	82,344	30
A3C	***Lightning Arresters***					
A3C	Lightning Arrester, 192 kV, Station Class (230 kV system voltage)	no.	-	-	-	30
A3C	Lightning Arrester, 102 kV, Station Class (138 kV system voltage)	no.	-	-	-	30
A3C	Lightning Arrester, 96 kV, Station Class (115 kV system voltage)	no.	117,057	-	-	30
A3C	Lightning Arrester, 72 kV, Station Class (69 kV system voltage)	no.	-	-	93,119	30
A3C	Lightning Arrester, 60 kV, Station Class (69 kV system voltage)	no.	68,280	68,280	68,280	30
A3C	Lightning Arrester, 34.5 kV, Station Class (34.5 kV system voltage)	no.	-	39,000	24,937	30
A3C	Lightning Arrester, 15 kV, Station Class (13.8 kV system voltage)	no.	-	21,200	-	30
A3C	Lightning Arrester, 28 kV, Distribution Class (34.5 kV system voltage)	no.	27,029	-	-	30
A3C	Lightning Arrester, 15 kV, Distribution Class (13.8 kV system voltage)	no.	-	-	3,445	30
A3C	Lightning Arrester, 12 kV, Distribution Class (13.8 kV system voltage)	no.	3,020	-	3,445	30
A3C	Lightning Arrester, 6 kV, Distribution Class (6.24 kV system voltage)	no.	2,109	-	-	30

DWRG Cat'y	Asset Category/Sub-Category/Type	Unit	Standard Value - Meralco (PhP k)	Standard Value - Cepalco (PhP k)	Standard Value - Decorp (PhP k)	Std Life (Yrs)
A3C	***Protection Schemes/Relays* (See Note 6)**					
A3C	230 kV Line Protection Scheme Main 1 and 2 with Breaker Fail Protection (1 panel per line)	no.	1,266,711	-	-	30
A3C	115/69 kV Line Protection Scheme Main and Backup Protection with Breaker Fail Protection (1 panel per line)	no.	466,658	1,150,257	-	30
A3C	230/115/69/34.5 kV Bus Differential Protection Scheme (Single Bus) (1 panel for each different voltage level)	no.	984,019	984,019	-	30
A3C	230/115/69 kV Bus Differential Protection Schemes (Breaker and a Half) (1 panel for each voltage level and each busbar)	no.	1,500,117	1,500,117	-	30
A3C	230/115/69 kV Bus Differential Protection Schemes (Ring Bus) (1 panel for each voltage level and each busbar)		1,500,117	1,500,117	-	30
A3C	230/115/69 kV Transformer Differential Protection Scheme (1 panel per transformer)	no.	988,941	988,941	988,941	30
A3C	34.5 kV (and below) Transformer Differential Protection Scheme (2 transformer per panel)	no.	1,118,895	1,118,895	-	30
A3C	34.5 kV (and below) Feeder Protection (3 feeders per protection panel)		982,046	982,046	982,046	30
A3C	Over & Under Frequency Relays / Per Unit Cost	no.	109,984	109,984	109,984	30
A3D	**METERING AND CONTROL (See Note 7)**					
A3D	230/115/69 kV Control and Metering Panel – Breaker and a Half (1 panel per bay) – with IED.	no.	756,430	897,590	897,590	30
A3D	230/115/69 kV Control and Metering Panel – Breaker and a Half (1 panel per bay) – without IED.	no.	709,624	709,624	709,624	30
A3D	230/115 kV Control and Metering Panel – Ring Bus (1 panel per bay) – with IED	no.	781,234	781,234	781,234	30
A3D	230/115 kV Control and Metering Panel – Ring Bus (1 panel per bay) – without IED	no.	593,268	593,268	593,268	30
A3D	115/69/34.5 Control and Metering Panel – Single Bus (3 circuit breaker per panel) - with IED	no.	625,785	927,853	593,268	30
A3D	115/69/34.5 Control and Metering Panel – Single Bus (3 circuit breaker per panel)- without IED	no.	645,904	645,904	645,904	30
A3E	**COMMUNICATIONS EQUIPMENT**					
A3E	***SCADA & Other Comm's Eqpt***					
	Valuation to be based on indexed historical costs					15
A3F	**OTHER STATION ITEMS**					
A3F	***Substation Structures***					
	Refer to Table 2					
A3F	***Battery/Chargers***					
A3F	Storage Batteries, Lead Acid 80 AH; 4 – 12V Cells; 48 VDC	no.	-	-	-	30
A3F	Storage Batteries, Lead Acid 92 AH; 4 – 12V Cells; 48 VDC	no.	80,973	-	80,973	30
A3F	Storage Batteries, Lead Acid 120 AH; 4 - 12V Cells; 48 VDC (2V cells)	no.	-	-	1,056,188	30

DWRG Cat'y	Asset Category/Sub-Category/Type	Unit	Standard Value - Meralco (PhP k)	Standard Value - Cepalco (PhP k)	Standard Value - Decorp (PhP k)	Std Life (Yrs)
A3F	Storage Batteries, Lead Acid 800 AH; 60 Cells; 48 VDC	no.	-	-	-	
A3F	Storage Batteries, Lead Acid 180 AH; 60 - 2V Cells; 120 VDC	no.	-	257,000	-	30
A3F	Storage Batteries, Lead Acid 350 AH; 60 - 2V Cells; 120 VDC	no.	388,461	-	-	30
A3F	Storage Batteries, Lead Acid 470 AH; 60 - 2V Cells; 120 VDC	no.	-	457,000	-	30
A3F	Storage Batteries, Lead Acid 600 AH; 60 - 2V Cells; 120 VDC	no.	-	-	-	30
A3F	Storage Batteries, Lead Acid 800 AH; 60 - 2V Cells; 120 VDC	no.	-	-	-	30
A3F	Battery Charger 100 A, 120 VDC	no.	-	-	-	30
A3F	Battery Charger 40 A, 120 VDC	no.	156,290	-	-	30
A3F	Battery Charger 15 A, 48 VDC	no.	-	-	-	30
A3F	Battery Charger 100 A, 48 VDC	no.	-	-	520,511	30
A3F	Battery Charger 12 A, 120 VDC	no.	-	228,000	-	30
A3F	Battery Charger 40 A, 48 VDC	no.	-	-	208,204	30
A3F	***Distribution Boxes***					
A3F	Outdoor DC Main Distribution Box	no.	-	-	-	30
A3F	Outdoor AC Main Distribution Box	no.	-	-	-	30
A4	**TOWERS, POLES & FIXTURES (DISTRIBUTION)** **(See Note 8)**					
A4	***Wood Poles***					
A4	Pole, Wood; 7.5 M (25 FT)	no.	8,775	6,452	4,060	20
A4	Pole, Wood; 9.0 M (30 FT)	no.	8,775	-	7,165	20
A4	Pole, Wood; 10.5 M (35 FT)	no.	12,350	-	-	20
A4	Pole, Wood; 12.0 M (40 FT)	no.	13,195	15,400	12,807	20
A4	Pole, Wood; 13.5 M (45 FT)	no.	15,210	29,700	16,898	20
A4	Pole, Wood; 15.0 M (50 FT)	no.	20,475	34,100	16,857	20
A4	Pole, Wood; 16.5 M (55 FT)	no.	22,685	-	19,176	20
A4	Pole, Wood; 18.0 M (60 FT)	no.	25,220	-	27,023	20
A4	Pole, Wood; 19.5 M (65 FT)	no.	26,065	-	-	20
A4	Pole, Wood; 21.0 M (70 FT)	no.	26,910	-	-	20
A4	Pole, Wood; 22.5 M (75 FT)	no.	27,755		-	20
A4	Pole, Wood; 24.0 M (80 FT)	no.	127,660	123,039	-	20
A4	Pole, Wood; 25.5 M (85 FT)	no.	132,050	-	-	20
A4	Pole, Wood; 27.0 M (90 FT)	no.	136,435	-	-	20
A4	***Concrete Poles***					
A4	Pole, Concrete, 7.5 M (25 FT)	no.	8,775	6,452	4,060	45
A4	Pole, Concrete, 9.0 M (30 FT)	no.	8,775	-	7,165	45
A4	Pole, Concrete, 9.5 M (32 FT)	no.	9,295	15,400	-	45
A4	Pole, Concrete, 10.5 M (35 FT)	no.	12,350	29,700	11,575	45
A4	Pole, Concrete, 12.0 M (40 FT)	no.	13,195	34,100	13,090	45
A4	Pole, Concrete, 13.5 M (45 FT)	no.	15,210	-	17,775	45
A4	Pole, Concrete, 15.0 M (50 FT)	no.	20,475	-	16,646	45
A4	Pole, Concrete, 16.5 M (55 FT)	no.	22,685	51,800	19,759	45
A4	Pole, Concrete, 18.0 M (60 FT)	no.	25,220	53,900	23,413	45

DWRG Cat'y	Asset Category/Sub-Category/Type	Unit	Standard Value - Meralco (PhP k)	Standard Value - Cepalco (PhP k)	Standard Value - Decorp (PhP k)	Std Life (Yrs)
A4	Pole, Concrete, 20M (65 FT)	no.	26,065	65,800	-	45
A4	Pole, Concrete,21.4M (70 FT)	no.	26,910	79,800	-	45
A4	Pole, Concrete, 23M (75 FT)	no.	27,755	-	-	45
A4	Pole, Concrete, 24.5M (80FT)	no.	127,660	6,452	-	45
A4	Pole, Concrete, 27.5M, ROUND	no.	136,435	-	-	45
A4	***Steel Poles***					
A4	Pole, Steel; 4.5 M (15 FT)	no.	-	-		
A4	Pole, Steel, 6.0 M (20 FT)	no.	-	-	7,010	
A4	Pole, Steel; 7.5 M (25 FT)	no.	-	-	7,010	50
A4	Pole, Steel, 9.0 M (30 FT)	no.	9,360	-	11,142	50
A4	Pole, Steel, 10.5 M (35 FT)	no.	10,566	11,174	11,142	50
A4	Pole, Steel, 12.0 M (40 FT)	no.	11,772	-	-	50
A4	Pole, Steel, 13.5 M (45 FT)	no.	23,322	-	13,090	50
A4	Pole, Steel, 16.5 M (55 FT)	no.	26,472	23,592	-	50
A4	Pole, Steel, 18.0 M (60 FT)	no.	28,048	-	-	50
A4	Pole, Steel, 21.0 M (70 FT)	no.	-	93,400	-	50
A4	Pole, Steel, 22.5 M (75 FT)	no.	31,103	-	-	50
A4	Pole, Steel, 24 M (80 FT)	no.	-	115,443	-	50
A4	Pole, Steel, 27.5 M (90 FT); Octagonal (0-3 Deg)	no.	280,202	144,200	-	50
A4	Pole, Steel, 27.5 M (90FT); 4-30 Deg, Octagonal	no.	280,202	-	-	50
A4	Pole, Steel, 27.5 M (90FT); 31-60 Deg, Octagonal	no.	280,202	-	-	50
A4	Pole, Steel, 27.5 M (90FT); 61-90 Deg, Octagonal	no.	280,202	-	-	50
A4	Pole, Steel, 32.0 M (105FT); 0-3 Deg, Octagonal	no.	358,202	-	-	50
A4	Pole, Steel, 32.0 M (105FT); 4-30 Deg, Octagonal	no.	358,202	-	-	50
A4	Pole, Steel, 32.0 M (105FT); 31-60 Deg, Octagonal	no.	358,202	-	-	50
A4	Pole, Steel, 32.0 M (105FT); 61-90 Deg., Octagonal	no.	358,202	-	-	50
A4	Pole, Steel, Stub; 9.144 M (30 FT); SP30	no.	9,360	-	-	50
A4	Pole, Steel, Stub; 12.195 M (40 FT); SP4	no.	11,772	-	-	50
A4	Pole, Steel, Ornamental , Street Lights,9M	no.	-	-	-	50
A4	Pole, Steel, Ornamental, Street Lights,11M	no.	-	-	-	50
A4	***Pole Top Hardware***					
A4	138 kV Pole Top Hardware - 3 phase	no.	-	-		30
A4	115 kV Pole Top Hardware - 3 phase	no	88,790	86,085	-	30
A4	69 kV Pole Top Hardware - 3 phase	no	94,884	91,993	-	30
A4	34.5 kV Pole Top Hardware - 3 phase	no	13,161	11,373	-	30
A4	34.5 kV Pole Top Hardware - 2 phase	no	3,999	3,577	-	30
A4	13.8 kV Pole Top Hardware - 3 phase	no	7,551	6,395	6,074	30
A4	13.8 kV Pole Top Hardware - 2 phase	no	2,116	1,792	5,040	30
A4	6.24 kV Pole Top Hardware - 3 phase	no	-	-	-	30
A4	6.24 kV Pole Top Hardware - 2 phase	no	-	-	-	30
A4	4.8 kV Pole Top Hardware - 2 phase	no	-	-	-	30
A4	2.4 kV Pole Top Hardware - 2 phase	no	-	-	-	30
A4	220 V Pole Top Hardware - 3 phase	no	1,153	837	922	30
A4	220 V Pole Top Hardware - 2 phase	no	1,093	780	761	30

DWRG Cat'y	Asset Category/Sub-Category/Type	Unit	Standard Value - Meralco (PhP k)	Standard Value - Cepalco (PhP k)	Standard Value - Decorp (PhP k)	Std Life (Yrs)
A4	***Sub-Transmission Steel Towers* (See Note 9)**					50
A5	**TOWERS, POLES & FIXTURES (CUSTOMER) (See Note 8)**					
A6	**OVERHEAD CONDUCTORS & DEVICES (DISTRIBUTION) (See Note 8)**					
A6	***Overhead Conductors (See Note 9*)**					
A6	795 MCM Bare ACSR Conductor	m	306.00	225.00	-	35
A6	477 MCM Bare ACSR Conductor	m	139.00	142.00	-	35
A6	336.4 MCM Bare ACSR Conductor	m	143.00	119.00	135.00	35
A6	#4/0 AWG Bare ACSR Conductor	m	88.00	86.00	85.00	35
A6	#3/0 AWG Bare ACSR Conductor	m	69.00	-	-	35
A6	#2/0 AWG Bare ACSR Conductor	m	-	35.00	35.00	35
A6	#1/0 AWG Bare ACSR Conductor	m	57.00	32.00	-	35
A6	#2 AWG Bare ACSR Conductor	m	47.00	21.00	-	35
A6	#4 AWG Bare ACSR Conductor	m	-	-	-	35
A6	#6 AWG Bare ACSR Conductor	m	-	-	-	35
A6	#4/0 AWG Bare Copper Conductor	m	273.00	-	273.00	35
A6	#2/0 AWG Bare Copper Conductor	m	179.00	-	179.00	35
A6	#1/0 AWG Bare Copper Conductor	m	142.00	135.00	-	35
A6	#2 AWG Bare Copper Conductor	m	100.00	-	100.00	35
A6	#4 AWG Bare Copper Conductor	m	73.00	-	73.00	35
A6	#6 AWG Bare Copper Conductor	m	-	12.00	63.00	35
A6	#8 AWG Bare Copper Conductor	m	-	8.00	63.00	35
A6	#10 AWG, Bare Copper Conductor	m	-	-	-	35
A6	AAAC, 394.5 MCM	m	153.00	-	-	35
A6	AAAC, 195.7 MCM	m	76.00	-	-	35
A6	#336.4 MCM , AAC, Conductor	m	-	-	-	35
A6	#4/0 AWG, AAC, Conductor	m	-	-	-	35
A6	#3/0 AWG, AAC, Conductor	m	-	-	-	35
A6	#1/0 AWG, AAC, Conductor	m	57.00	-	-	35
A6	#2 AWG, Bare AAC, Conductor	m	-	-	-	35
A6	#4 AWG, Bare AAC, Conductor	m	40.00	-	-	35
A6	#6 AWG, Bare AAC, Conductor	m	-	-	-	35
A6	#8 AWG, Bare AAC, Conductor	m	-	-	-	35
A6	Tree Wire, 336.4MCM ACSR	m	173.00	-	-	35
A6	Tree Wire, #3/0 AWG ACSR	m	94.00	-	-	35
A6	Tree Wire, #1/0 AWG ACSR	m	75.00	-	-	35
A6	Tree Wire, #4/0 AWG Copper	m	434.00	-	-	35
A6	Tree Wire, #1/0 AWG COPPER	m	217.00	-	-	35
A6	Tree Wire, #2 AWG COPPER	m	162.00	-	-	35
A6	Overhead Shield Wire, 3#5 COPPERCLAD STEEL	m	50.00	32.00	20.00	35
A6	Overhead Shield Wire, 7#8 ALUMCLAD STEEL	m	50.00	32.00	20.00	35
A6	Guy Wire, Size 9.5mm (3/8")	m	-	28.00	-	35
A6	Guy Wire, Size (7/16")	m	-	5.00	-	35
A6	Guy Wire, Size 14.29mm (9/16")	m	-	-	-	35
A6	Wire, Spinning; CU; SOLID; AWG NO 1	m	42.00	-	-	35
A6	Wire, Spinning; CU; SOLID; AWG NO 11	m	42.00	-	-	35

DWRG Cat'y	Asset Category/Sub-Category/Type	Unit	Standard Value - Meralco (PhP k)	Standard Value - Cepalco (PhP k)	Standard Value - Decorp (PhP k)	Std Life (Yrs)
A6	***Overhead Distribution Devices (See Note 10)***					
A6	***Fuses***					
A6	Cut-out Fuse, Distribution Type, 7.8 kV & below	no.	1,969	-	-	35
A6	Cut-out Fuse, Distribution Type, Rated 15 kV	no.	4,305	3,700	-	35
A6	Cut-out Fuse, Distribution Type, Rated 27 kV	no.	7,580	-	-	35
A6	Power Fuse, 100 E AMP; 34.5KV	no.	-	-	-	35
A6	Power Fuse, 200 E AMP; 34.5KV;SMD-20	no.	-	-	-	35
A6	Power Fuse, 300 E AMP; 34.5KV; SM-5	no.	23,206	-	-	35
A6	Fuse, Backup Current Limiting, 20 kV	no.	-	-	-	35
A6	***Switches***					
A6	Switch, Load Interrupter, 115 KV, 1200 A	no.	-	398,464	-	35
A6	Switch, Load Interrupter, 69 KV, 1200 A	no.	-	408,000	-	35
A6	Switch, Load Interrupter, 34.5 KV, 1200 A	no.	189,700	189,691	-	35
A6	Switch, Load Interrupter, 34.5 KV, 600 A, Manual	no.	-	-	-	35
A6	Switch, Load Interrupter, 34.5 KV, 600 A, Remote Controlled	no.	-	-	-	35
A6	Switch, Load Interrupter, 34.5 KV, 400 A	no.	89,250	-	-	35
A6	Switch, Load Interrupter, 13.8 KV, 600 A, MANUAL	no.	-	-	-	35
A6	Switch, Load Interrupter, 13.8 KV, 600 A, Remote Controlled	no.	-	-	-	35
A6	Switch, Load Interrupter, 13.8 KV, 400 A, MANUAL	no.	-	66,937	214,454	35
A6	Switch, Voltage Regulator Bypass, 15.5 KV, 600 A, 40 KA	no.	-	-	-	35
A6	***Circuit Reclosers***					
A6	Circuit Recloser, 34.5KV; 560AMP; 3-Phase	no.	1,158,816	-	-	35
A6	Circuit Recloser, 34.5kV, 140AMP, 3-Phase	no.	-	-	-	35
A6	Circuit Recloser, 34.5kV, 25AMP, 3-Phase	no.	-	-	-	35
A6	Circuit Recloser, 20KV; 400AMP; 1-Phase	no.	186,500	-	-	35
A6	Circuit Recloser, 13.8KV; 560AMP; 3-Phase	no.	-	-	-	35
A6	Circuit Recloser, 13.8KV; 400AMP; 1-Phase	no.	-	-	-	35
A6	Circuit Recloser, 13.8KV; 400AMP; 3-Phase	no.	751,230	-	751,231	35
A6	Circuit Recloser, 13.8KV; 200AMP; 3-Phase	no.	-	-	485,602	35
A6	Circuit Recloser, 13.8 KV; 70AMP, 3-Phase	no.	-	-		35
A7	**OVERHEAD CONDUCTORS & DEVICES (CUSTOMER) (See Note 8)**					
A8	**UNDERGROUND CONDUITS (DISTRIBUTION & CUSTOMERS) (See Note 8)**					
A9	**UNDERGROUND CONDUITS (CUSTOMER) (See Note 8)**					
A10	**UNDERGROUND CONDUCTOR & DEVICES**					

DWRG Cat'y	Asset Category/Sub-Category/Type	Unit	Standard Value - Meralco (PhP k)	Standard Value - Cepalco (PhP k)	Standard Value - Decorp (PhP k)	Std Life (Yrs)
	(DISTRIBUTION) (See Note 8)					
A10	***Subtransmission Underground Cables***					
A10	***115 kV Underground Cables***					
A10	1000 MCM Copper XLPE Insulated	m	-	-	-	35
A10	***69 kV Underground Cables***					
	Not in use in the Philippines DUs valued as at 30 June 2006.	m	-	-	-	35
A10	***Distribution Underground Cables***					
A10	***34.5 kV Underground Cables***					
A10	1000 MCM Copper, XLPE Insulated, Tape Shield	m	1,973.57	-	-	35
A10	500 MCM Copper, XLPE Insulated, Tape Shield	m	1,207.01	-	-	35
A10	250MCM Copper, XLPE Insulated, Tape Shield	m	770.21	-	-	35
A10	#1/0 Copper, XLPE Insulated, Tape Shield	m	579.02	-	-	35
A10	#3/0 Copper, XLPE Insulated, Copper Wire Screen	m	990.31	-	-	35
A10	#1/0 Copper, XLPE Insulated, Copper Wire Screen	m	175.00	-	-	35
A10	750 MCM Aluminium, XLPE Insulated, Copper Wire Screen	m	1,004.50	-	-	35
A10	#4/0 Aluminium, XLPE Insulated, Copper Wire Screen	m	287.00	-	-	35
					-	
A10	***13.8 kV Underground Cables***				-	
A10	500 MCM Copper, XLPE Insulated, Tape Shield	m	1,030.00	-	-	35
A10	#4/0 Copper, XLPE Insulated, Copper Wire Screen	m	627.00	-	-	35
A10	#3/0 Copper, XLPE Insulated, Copper Wire Screen	m	328.00	-	-	35
A10	***Underground Devices***					
A10	Padmounted Switchgear, 15kV, 3¢, 600A, 3-Way; with Fused Protection	no.	-	-	-	35
A10	Padmounted Switchgear, 15kV, 3¢, 600A, 4-Way; with Fused Protection	no.	-	-	-	35
A10	Padmounted Switchgear, 15kV, 3¢, 600A, 3-Way; with Vacuum Fault Interrupter	no.	-	-	-	35
A10	Padmounted Switchgear, 15kV, 3¢, 600A, 4-Way; with Vacuum Fault Interrupter	no.	-	-	-	35
A10	Padmounted Switchgear, 34.5kV, 3¢, 600A, 3-Way; with Fused Protection	no.	-	-	-	35
A10	Padmounted Switchgear, 34.5kV, 3¢, 600A, 4-Way; with Fused Protection	no.	-	-	-	35
A10	Padmounted Switchgear, 34.5kV, 3¢, 600A, 3-Way; with Vacuum Fault Interrupter	no.	1,417,531	-	-	35
A10	Padmounted Switchgear, 34.5kV, 3¢, 600A, 4-Way; with Vacuum Fault Interrupter	no.	1,595,052	-	-	35
A11	**UNDERGROUND CONDUCTOR & DEVICES (CUSTOMER) (See Note 8)**					

DWRG Cat'y	Asset Category/Sub-Category/Type	Unit	Standard Value - Meralco (PhP k)	Standard Value - Cepalco (PhP k)	Standard Value - Decorp (PhP k)	Std Life (Yrs)
A12	**LINE TRANSFORMERS (DISTRIBUTION) (See Note 11)**					
A12	DT, 15KVA; 19.92KV-240/120V; 1PH; Pole Mounted	no.	37,000	44,170	-	30
A12	DT, 25KVA; 19.92KV-240/120V; 1PH; Pole Mounted	no.	57,402	50,158	-	30
A12	DT, 37.5KVA; 19.92KV-240/120V; 1PH; Pole Mounted	no.	60,813	61,000	-	30
A12	DT, 50KVA; 19.92KV-240/120V; 1PH; Pole Mounted	no.	81,330	72,212	-	30
A12	DT, 75KVA; 19.92KV-240/120V; 1PH;Pole Mounted	no.	102,201	-	-	30
A12	DT, 100KVA; 19.92KV-240/120V; 1PH; Pole Mounted	no.	127,438	121,288	-	30
A12	DT, 167KVA; 19.92KV-240/120V; 1PH; Pole Mounted	no.	173,104	216,900	-	30
A12	DT, 250KVA; 19.92KV-240/120V; 1PH; Pole Mounted	no.	266,260	-	-	30
A12	DT, 333KVA; 19.92KV-240/120V; 1PH; Pole Mounted	no.	368,684	-	-	30
A12	DT, 100KVA; 19.92KV-240/480V; 1PH; Pole Mounted	no.	127,438	121,288	-	30
A12	DT, 150KVA; 19.92KV-240/480V; 1PH; Pole Mounted	no.	173,104	216,900	-	30
A12	DT, 167KVA; 19.92KV-240/480V; 1PH; Pole Mounted	no.	173,104	-	-	30
A12	DT, 250KVA; 19.92KV-240/480V; 1PH; Pole Mounted	no.	266,260	-	-	30
A12	DT, 333KVA; 19.92KV-240/480V; 1PH; Pole Mounted	no.	368,684	-	-	30
A12	DT, 5KVA; 7.62KV-240/120V; 1PH; Pole Mounted	no.	-	-	-	30
A12	DT, 10KVA; 7.62KV-240/120V; 1PH; Pole Mounted	no.	28,000	-	25,664	30
A12	DT, 15KVA; 7.62KV-240/120V; 1PH; Pole Mounted	no.	36,000	-	25,664	30
A12	DT, 25KVA; 7.62KV-240/120V; 1PH; Pole Mounted	no.	57,971	54,280	38,029	30
A12	DT, 37.5KVA; 7.62KV-240/120V; 1PH; Pole Mounted	no.	64,000	-	45,964	30
A12	DT, 50KVA; 7.62KV-240/120V; 1PH; Pole Mounted	no.	72,000	81,630	60,379	30
A12	DT, 75KVA; 7.62KV-240/120V; 1PH; Pole Mounted	no.	116,645	-	79,182	30
A12	DT, 100KVA; 7.62KV-240/120V; 1PH; Pole Mounted	no.	156,208	141,985	114,246	30
A12	DT, 167KVA; 7.62KV-240/120V; 1PH; Pole Mounted	no.	172,579	204,800	145,618	30
A12	DT, 200KVA; 7.62KV-240/120V; 1PH; Pole Mounted	no.	-	-	232,970	30
A12	DT, 250KVA; 7.62KV-240/120V; 1PH; Pole Mounted	no.	187,940	-	246,503	30
A12	DT, 333KVA; 7.62KV-240/120V; 1PH; Pole Mounted	no.	205,213	-		30
A12	DT, 10KVA; 7.62KV-240/480V; 1PH; Pole Mounted-	no.	28,000	-	-	30

DWRG Cat'y	Asset Category/Sub-Category/Type	Unit	Standard Value - Meralco (PhP k)	Standard Value - Cepalco (PhP k)	Standard Value - Decorp (PhP k)	Std Life (Yrs)
A12	DT, 15KVA; 7.62KV-240/480V; 1PH; Pole Mounted-	no.	36,000	-	-	30
A12	DT, 25KVA; 7.62KV-240/480V; 1PH; Pole Mounted-	no.	57,971	-	-	30
A12	DT, 37.5KVA; 7.62KV-240/480V; 1PH; Pole Mounted	no.	64,000	-	-	30
A12	DT, 50KVA; 7.62KV-240/480V; 1PH; Pole Mounted-	no.	72,000	-	-	30
A12	DT, 75KVA; 7.62KV-240/480V; 1PH; Pole Mounted-	no.	116,645	-	-	30
A12	DT, 100KVA; 7.62KV-240/480V; 1PH; Pole Mounted	no.	156,208	-	-	30
A12	DT, 167KVA; 7.62KV-240/480V; 1PH; Pole Mounted	no.	172,579	-	-	30
A12	DT, 250KVA; 7.62KV-240/480V; 1PH; Pole Mounted	no.	187,940	-	-	30
A12	DT, 333KVA; 7.62KV-240/480V; 1PH; Pole Mounted	no.	205,213	-	-	30
A12	DT, 10KVA; 3.6KV-240/120V; 1PH; Pole Mounted	no.	42,000	-	-	30
A12	DT, 15KVA; 3.6KV-240/120V; 1PH; Pole Mounted	no.	53,000	-	-	30
A12	DT, 25KVA; 3.6KV-240/120V; 1PH; Pole Mounted	no.	62,007	-	-	30
A12	DT, 37.5KVA; 3.6KV-240/120V; 1PH, Pole Mounted	no.	76,000	-	-	30
A12	DT, 50 KVA; 3.6KV-240/120V; 1PH; Pole Mounted	no.	86,065	-	-	30
A12	DT, 75KVA; 3.6KV-240/120V; 1PH; Pole Mounted	no.	111,096	-	-	30
A12	DT, 100KVA; 3.6KV-240/120V; 1PH; Pole Mounted	no.	176,983	-	-	30
A12	DT, 167KVA; 3.6KV-240/120V; 1PH; Pole Mounted	no.	190,594	-	-	30
A12	DT, 250KVA; 3.6KV-240/120V; 1PH; Pole Mounted	no.	211,608	-	-	30
A12	DT, 333KVA; 3.6KV-240/120V; 1PH; Pole Mounted	no.	230,290	-	-	30
A12	DT, 100KVA; 3.6KV-240/480V; 1PH; Pole Mounted	no.	176,983	-	-	30
A12	DT, 5KVA; 4.8KV-240/120V; 1PH; Pole Mounted	no.	-	-	-	30
A12	DT, 10KVA; 4.8KV-240/120V; 1PH; Pole Mounted	no.	-	-	-	30
A12	DT, 15KVA; 4.8KV-240/120V; 1PH; Pole Mounted	no.	-	-	-	30
A12	DT, 25KVA; 4.8KV-240/120V; 1PH; Pole Mounted	no.	23,028	-	-	30
A12	DT, 37.5KVA; 4.8KV-240/120V; 1PH; Pole Mounted	no.	28,471	-	-	30
A12	DT, 50KVA; 4.8KV-240/120V; 1PH; Pole Mounted	no.	65,718	-	-	30
A12	DT, 75KVA; 4.8KV-240/120V; 1PH; Pole Mounted	no.	70,980	-	-	30
A12	DT, 100KVA; 4.8KV-240/120V; 1PH; Pole Mounted	no.	120,440	-	-	30
A12	DT, 167KVA; 4.8KV-240/120V; 1PH; Pole	no.	160,990	-	-	30

DWRG Cat'y	Asset Category/Sub-Category/Type	Unit	Standard Value - Meralco (PhP k)	Standard Value - Cepalco (PhP k)	Standard Value - Decorp (PhP k)	Std Life (Yrs)
	Mounted					
A12	DT, 15KVA; 2.4KV-240/120V; 1PH; Pole Mounted	no.	-	-	-	30
A12	DT, 25KVA; 2.4KV-240/120V; 1PH; Pole Mounted	no.	19,152	-	-	30
A12	DT, 37.5KVA; 2.4KV-240/120V; 1PH; Pole Mounted	no.	30,989	-	-	30
A12	DT, 50KVA; 2.4KV-240/120V; 1PH; Pole Mounted	no.	43,006	-	-	30
A12	DT, 100KVA; 2.4KV-240/120V; 1PH; Pole Mounted	no.	91,615	-	-	30
A12	DT, 250KVA; 2.4KV-240/120, Pole Mounted	no.	-	-	-	30
A12	***Special Voltage Transformers***					
A12	DT, 75KVA; 19.92KV-4.8KV; 1PH; Pole -SVT	no.	-	-	-	30
A12	DT, 100KVA; 19.92KV-4.8KV; 1PH; Pole -SVT	no.	-	-	-	30
A12	DT, 167KVA; 19.92KV-4.8KV; 1PH; Pole -SVT	no.	-	-	-	30
A12	DT, 250KVA; 19.92KV-4.8KV; 1PH; Pole - SVT	no.	-	-	-	30
A12	DT, 333KVA; 19.92KV-4.8KV; 1PH; Pole -SVT	no.	214,900	-	-	30
A12	DT, 100KVA; 19.92KV-3.6KV; 1PH; Pole -SVT	no.	-	-	-	30
A12	DT, 167KVA; 19.92KV-3.6KV; 1PH; Pole -SVT	no.	-	-	-	30
A12	DT, 250KVA; 19.92KV-3.6KV; 1PH; Pole -SVT	no.	-	-	-	30
A12	DT, 333KVA; 19.92KV-3.6KV; 1PH; Pole -SVT	no.	-	-	-	30
A12	DT, 100KVA; 19.92KV-2.4KV; 1PH; Pole -SVT	no.	-	-	-	30
A12	DT, 167KVA; 19.92KV-2.4KV; 1PH; Pole -SVT	no.	-	-	-	30
A12	DT, 250KVA; 19.92KV-2.4KV; 1PH; Pole -SVT	no.	-	-	-	30
A12	DT, 333KVA; 19.92KV-2.4KV; 1PH; Pole -SVT	no.	-	-	-	30
A12	DT, 500KVA; 19.92KV-2.4KV; 1PH; Pole - SVT	no.	-	-	-	30
A12	DT, 333 KVA; 20 KV-7.62 KV; Pole -SVT	no.	-	-	-	30
A12	DT, 333KVA; 19.92-7.97KV; 1PH; Pole -SVT	no.	-	-	-	30
A12	DT, 333KVA; 7.62-2.4/4.8KV; 1PH; Pole - SVT	no.	141,660	-	-	30
A13	**LINE TRANSFORMERS (CUSTOMER) (See Note 8)**					
A14	**POWER CONDITIONING EQUIPMENT**					
A14	***Substation Capacitors (See Note 12)***					
A14	115 kV, 50 MVAr, Capacitor Switcher Unit		4,719,320	-	-	35
A14	34.5 kV, 14.4 MVAr Capacitor Bank		-	-	-	35
A14	34.5 kV, 7.2 MVAr Capacitor Bank		1,082,850			35
A14	34.5 kV 7.2, MVAr Capacitor Bank (Capacitors Only)		-	-	-	35
A14	13.8 kV, 14.4 MVAr Capacitor Bank, connected to tertiary winding of a power transformer		2,809,930	-	-	35
A14	13.8 kV, 7.2 MVAr Capacitor Bank, connected to tertiary winding of a power transformer		1,587,000	-		35
A14	13.8 kV, 3.6 MVAr Capacitor Bank		-	-	-	35
A14	13.8 kV, 3.6 MVAr Capacitor Bank (Capacitors Only)		-	-	-	35
A14	***Line Capacitors (See Note 13)***					
A14	CAPACITOR UNIT, LINE; 50 kVAR, 1PH - 3.6 or 4.8 kV	no.	22,500	-	6,644	35

DWRG Cat'y	Asset Category/Sub-Category/Type	Unit	Standard Value - Meralco (PhP k)	Standard Value - Cepalco (PhP k)	Standard Value - Decorp (PhP k)	Std Life (Yrs)
A14	CAPACITOR UNIT, LINE; 100 kVAR, 1PH - 4.8 or 7.96 kV	no.	23,750	21,000	20,546	35
A14	CAPACITOR UNIT, LINE; 200 kVAR, 1PH - 19.92 kV	no.	31,250	27,000	22,761	35
A14	CAPACITOR BANK, LINE; 300 kVAR, 3PH - 6.24 kV	no.	158,750	-	-	35
A14	CAPACITOR BANK, LINE; 600 kVAR, 3PH - 6.24 kV	no.	187,500	-	-	35
A14	CAPACITOR BANK, LINE; 750 kVAR, 3PH - 6.24 kV	no.	-	-	270,737	35
A14	CAPACITOR BANK, LINE; 600 kVAR, 3PH - 4.8 kV or 13.8 kV	no.	201,250	-	-	35
A14	CAPACITOR BANK, LINE; 1200 kVAR, 3PH - 19.92 kV	no.	277,625	-	-	35
	Capacitor Bank, Line, 1800KVAR;					
A14	**VOLTAGE REGULATORS**					
A14	Regulator, Voltage; 20KV; 833KVA	no.	1,071,058	-	-	35
A14	Regulator, Voltage; 20KV; 400KVA; 1Phase; With SCADA	no.	-	-	-	35
A14	Regulator Voltage, 300A, 432KVA, 1 phase	no.	-	-	1,076,636	35
A14	Regulator Voltage, 200A, 288KVA & below (W/O SCADA) 1 phase?	no.	-	-	273,250	35
A15	**SERVICES (See Note 14)**					
A15	Single 1000MCM Copper Cable, 600V	m	1,137.00	-	1,137	30
A15	Single 750MCM Copper Cable, 600V	m	991.00	-	-	30
A15	Single 500MCM Copper Cable, 600V	m	658.00	-	687	30
A15	Single 250MCM Copper Cable, 600V	m	405.00	-	-	30
A15	Single #4/0 AWG Copper Cable, 600V	m	364.00	-	364	30
A15	Single #2/0 AWG Copper Cable, 600V	m	290.00	-	281	30
A15	Single #1/0 AWG Copper Cable, 600V	m	250.00	-	-	30
A15	Single #2 AWG Copper Cable, 600V	m	185.00	-	-	30
A15	Single #4 AWG Copper Cable, 600V	m	-	-	103	30
A15	Single #6 AWG Copper Cable, 600V	m	-	-	80	30
A15	Single #8 AWG Copper Cable, 600V	m	-	-	63	30
A15	Single #10 AWG Copper Cable, 600V	m	-	-	40	30
A15	Single #12 AWG Copper Cable, 600V	m	-	-	17	30
A15	Single #2 AWG AAC Cable, 600V	m	-	-	16	30
A15	Single #10 AWG AAC Cable, 600V	m	-	-	15	30
A15	Cable, Duplex, Copper, Size #1/0 AWG	m	282.00	-	-	30
A15	Cable, Duplex, Copper, Size #2 AWG	m	219.00	-	-	30
A15	Cable, Duplex, Copper, Size #4 AWG	m	200	-	-	30
A15	Cable, Duplex, Copper, Size #6 AWG	m	159	-	-	30
A15	Cable, Duplex, Copper, Size #8 AWG	m	121	-	-	30
A15	Cable, Triplex, Aluminium , Size #3/0 AWG	m	235	-	-	30
A15	Cable, Triplex, Aluminium , Size #1/0 AWG	m	152	-	-	30
A15	Cable, Triplex, Aluminium , Size #2 AWG	m	93	-	-	30
A15	Cable, Triplex, Aluminium , Size #6 AWG	m	62	-	-	30
A15	Cable, Triplex, Copper, Size #1/0 AWG	m	535	-	-	30
A15	Cable, Triplex, Copper, Size #2 AWG	m	323	-	-	30
A15	Cable, Triplex, Copper, Size #8 AWG	m	123	-	-	30
A15	Cable, Quadruplex, Aluminium, Size #3/0 AWG	m	305	-	-	30
A15	Cable, Quadruplex, Copper, Size #1/0 AWG	m	704	-	-	30
A15	Cable, Quadruplex, Copper, Size #2 AWG	m	547	-	-	30
A15	Cable, Quadruplex, Copper, Size #4 AWG	m	277	-	-	30

DWRG Cat'y	Asset Category/Sub-Category/Type	Unit	Standard Value - Meralco (PhP k)	Standard Value - Cepalco (PhP k)	Standard Value - Decorp (PhP k)	Std Life (Yrs)
A15	Cable, Quadruplex, Copper, Size #6 AWG	m	218	-	-	30
A15	Wire, CU, #6 AWG, WP	m	67	-	-	30
A15	Wire, ACSR, #4/0 AWG, WP	m	106	-	106	30
A15	Wire, ACSR, #2/0 AWG, WP	m	-	-	80	30
A15	Wire, ACSR, #1/0 AWG, WP	m	70	-	-	30
A15	Wire, ACSR, #2 AWG, WP	m	55	-	55	30
A15	Wire, ACSR, #4 AWG, WP	m	46	-	46	30
A15	Conductor, Single, Insulated, Size #3/0 AWG AL. Cable	m	-	-	-	30
A16	**METERS, INSTRUMENTS & METERING TRANSFORMERS (DISTRIBUTION) (See Note 8)**					
A16	Single-Phase, Plain Residential Metering	no.	2,645	1,413	2,530	25
A16	Low Voltage Self-Contained Metering	no.	17,149	15,901	-	25
A16	Low Voltage Secondary Metering	no.	25,155	-	23,870	25
A16	High Voltage Primary Metering	no.	76,588	74,114	-	25
A16	Sub-transmission Voltage Primary Metering	no.	-	-	-	25
A17	**METERS, INSTRUMENTS & METERING TRANSFORMERS (CUSTOMERS) (See Note 8)**					
A18	**INFORMATION TECHNOLOGY EQUIPMENT (DISTRIBUTION)**					
A19	**REGULATED ENTITY PROPERTY ON CONSUMER PREMISES**					
A20	**STREET LIGHTS & SIGNAL SYSTEMS**					
A20	Luminaire, 70 Watts HPS W/ Mast Arm Only	no.	-	-	-	30
A20	Luminaire, 150 Watts HPS W/ Mast Arm Only	no.	-	-	-	30
A20	Luminaire, 250 Watts HPS W/ Mast Arm Only	no.	-	-	-	30
A20	Luminaire, 70 Watts HPS W/ Mast Arm and Pole	no.	-	-	-	30
A20	Luminaire, 150 Watts HPS W/ Mast Arm and Pole	no.	-	-	-	30
A20	Luminaire, 250 Watts HPS W/ Mast Arm and Pole	no.	-	-	-	30
A21	**SUBMARINE CABLES**					
	Not used in the Philippine as of 30 June 2006		-	-	-	

Notes

1. All 230, 115 and 69 kV dead tank circuit breaker costs include two protection class and one metering class current transformers per phase. For dead tank circuit breakers rated 34.5 kV and below the cost includes one protection and one metering class current transformer per phase.
2. All oil circuit breakers will be valued as and SF_6 circuit breaker with the nearest equivalent rating. As the live for oil circuit breaker and SF_6 circuit breakers are the same oil circuit breakers are not included in the above list.
3. GIS valuation should be done in accordance with Clause C6.
4. Current transformer costs included in this section are for standalone current transformers. Each CT has one metering and one protection core.
5. All potential transformers are costed per individual single phase unit.
6. Protection costs are based on a protection rather that individual relays costs. The schemes include all relay costs and a pre-wired protection panel.
7. Control and Metering panels are a standard configuration based on the switchyard configuration. A panel with an IED is a device that can relate feeder load and voltage directly to the SCADA system for control purposes.
8. The DWRG calls for separate valuation of distribution and customer assets. For the 2006 valuation the separation has not been made due to constraints imposed by the DU fixed asset registers. The customer asset values have been included in the corresponding distribution asset sub-categories / types.
9. All steel transmission towers will be valued using historic cost indexation.
10. Cost for line disconnectors and sectionalizers will be the same as the disconnectors (mounted on bus support structures) of the same rating as given in the substation switchgear section.
11. All transformers are single phase transformers. The voltage the transformers are listed by is the equivalent phase to earth voltage at the nominal taps. For example 13.8, 13.2 and 7.62 kV transformers will be categorised as 7.62 kV transformers. Also transformer with a secondary or 120/240 and 138.5/277 are consider the same for valuation purposes. Transformers with multiple tapped secondaries (120/240 and 138.5/277) are reduced to a single secondary voltage tapping at 120/240.
12. The standard rates allow for substation capacitor bank with inrush reactors, control equipment and potential transformer except where noted. The 13.8 kV 14.4 MVAr and 7.2 MVAr capacitor banks are connected via the tertiary winding of the power transformer. The 3.6 MVAr banks are connected via a circuit breaker on the 13.8 kV switchboard.
13. Line capacitors do not have inrush reactors. All line capacitors rated 34.5 kV and below are assigned the same replacement cost.
14. Some conductors used for services are included in the Overhead Conductor & Devices category.

Table 2: Standard Rates for Substation Structures

Structures and Busbars	Unit	Standard Value - Meralco (PhP)	Standard Value - Cepalco (PhP)	Standard Value - Decorp (PhP)	Standard Life (years)
230 kV Ring Bus	no.	8,750,000	8,750,000	8,750,000	30
230 kV Breaker and a Half	no.	7,187,000	7,187,000	7,187,000	30
230 kV Single Bus	no.	1,950,000	1,950,000	1,950,000	30
115 kV Ring Bus	no.	6,125,000	6,125,000	6,125,000	30
115 kV Breaker and a Half	no.	5,030,000	5,030,000	5,030,000	30
115 kV Single Bus	no.	1,365,000	1,365,000	1,365,000	30
69 kV Ring Bus	no.	4,290,000	4,290,000	4,290,000	30
69 kV Breaker and a Half Bus	no.	3,520,000	3,520,000	3,520,000	30
69 kV Single Bus	no.	955,000	955,000	955,000	30

Notes

1. The substation structure unit rate, building block approach allows each substation structure to be valued by combining the corresponding number of building block components. However it needs to be recognised that in using standard rates they may need to be varied to cover factors such as:

   - construction difficulties due to location
   - remote area additional labour and material costs
   - more extensive earthing requirements
   - more complex protection scheme
   - less complex arrangements than standard building block definition.

   It should be noted that these factors may result in actual costs varying significantly from the standard unit rates. Accordingly these costs should be valued in accordance with clause C6 using the standard building block costs as a guide.

Table 3: Standard Asset Values for Power Transformers

Voltage	MVA	Classification	Unit Price Meralco PhP	Unit Price Cepalco PhP	Unit Price Decorp PhP	Standard Life (years)
230/115/13.8 kV	300	OLTC	117,085,000	-	-	50
230/115/13.8 kV	300	Off Load Tap Changer	-	-	-	50
230/115/13.8 kV	150	OLTC	75,082,500	-	-	50
230/69/13.8 kV	150	OLTC	76,750,000	-	-	50
230/34.5/13.8 kV	50	OLTC	-	-	-	50
115/34.5/13.8 kV	133	OLTC	-	-	-	50
115/34.5/13.8 kV	13	Off Load Tap Changer	-	-	-	50

Voltage	MVA	Classification	Unit Price Meralco PhP	Unit Price Cepalco PhP	Unit Price Decorp PhP	Standard Life (years)
115/34.5/13.8 kV	10	OLTC	-	-	-	50
115/34.5/13.8 kV	100	Off Load Tap Changer	-	-	-	50
115/34.5/13.8 kV	83	OLTC	44,968,750	-	-	50
115/34.5/13.8 kV	83	Off Load Tap Changer	-	-	-	50
115/34.5/13.8 kV	50	OLTC	-	-	-	50
115/34.5/13.8 kV	25	Off Load Tap Changer	-	-	-	50
115/13.8 kV	33/35	OLTC	32,677,500	-	-	50
115/13.8 kV	33/35	Off Load Tap Changer	-	-	-	50
69/34.5 kV	33	Off Load Tap Changer	-	21,836,250	-	50
69/34.5 kV	10	Off Load Tap Changer	-	-	-	50
69/13.8 kV	33	OLTC	21,836,250	-	-	50
69/13.8 kV	33	Off Load Tap Changer	-	-	21,836,250	50
69/13.8 kV	15/20	OLTC	16,412,500	-	-	50
69/13.8 kV	15/20	Off Load Tap Changer	-	16,412,500	16,412,500	50
69/13.8 kV	10/12.5	OLTC	13,420,000	-	-	50
69/13.8 kV	10	Off Load Tap Changer	-	12,870,000	12,870,000	50
69/13.8 kV	5	Off Load Tap Changer	9,000,000	-	6,250,000	50
34.5/13.8/2.77 kV	0.883	Off Load Tap Changer	-	-	-	50
34.5/13.8 kV	12.5	Off Load Tap Changer	13,020,000	-	-	50
34.5/13.8 kV	6.25/7	Off Load Tap Changer	-	-	-	50
34.5/13.8 kV	4/5	Off Load Tap Changer	8,500,000	-	-	50
34.5/6.24/3.6 kV	12.5	Off Load Tap Changer	13,020,000	-	-	50
34.5/6.24/3.6 kV	6.25	Off Load Tap Changer	-	-	-	50
34.5/6.24/2.4 kV	20	Off Load Tap Changer	-	-	-	50
34.5/6.24/2.4 kV	12.5	Off Load Tap Changer	-	-	-	50
34.5/6.24 kV	20	Off Load Tap Changer	-	-	-	50
34.5/6.24 kV	11.2/12.513/14	Off Load Tap Changer	-	-	-	50
34.5/6.24 kV	6.25	Off Load Tap Changer	-	-	-	50
34.5/6.24 kV	1.75	Off Load Tap Changer	-	-	-	50
34.5/4.8 kV	1.5	Off Load Tap Changer	-	-	-	50
34.5/2.77 kV	1	Off Load Tap Changer	-	-	-	50
13.8/4.8 kV	3	Off Load Tap Changer	-	-	-	50
13.8/2.77 kV	1	Off Load Tap Changer	-	-	-	50