NATIONAL ENERGY REGULATOR

TARIFF METHODOLOGY FOR THE SETTING OF TARIFFS IN THE PETROLEUM PIPELINES INDUSTRY

5th Edition

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# TABLE OF CONTENTS

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Abbreviations</td>
<td>3</td>
</tr>
<tr>
<td>1 Introduction</td>
<td>6</td>
</tr>
<tr>
<td>2 Legal basis</td>
<td>6</td>
</tr>
<tr>
<td>3 Allowable Revenue (AR)</td>
<td>7</td>
</tr>
<tr>
<td>4 Regulatory Asset Base (RAB)</td>
<td>8</td>
</tr>
<tr>
<td>5 Weighted Average Cost of Capital (WACC)</td>
<td>13</td>
</tr>
<tr>
<td>6 Expenses (E)</td>
<td>18</td>
</tr>
<tr>
<td>7 Tax (T)</td>
<td>21</td>
</tr>
<tr>
<td>8 Depreciation and amortization of inflation write-up (D)</td>
<td>22</td>
</tr>
<tr>
<td>9 Approved Revenue Addition to Meet Debt Obligations (F)</td>
<td>23</td>
</tr>
<tr>
<td>10 Clawback Adjustment (C)</td>
<td>24</td>
</tr>
<tr>
<td>11 Tariff Design</td>
<td>30</td>
</tr>
<tr>
<td>12 Review and Modification of the Tariff Methodology</td>
<td>34</td>
</tr>
<tr>
<td>Note 1: Joint Costs</td>
<td>35</td>
</tr>
<tr>
<td>Note 2: Asset and Liability Categories</td>
<td>35</td>
</tr>
<tr>
<td>Note 3: Methodology for the Determination of Beta ($\beta$)</td>
<td>38</td>
</tr>
<tr>
<td>Note 4: Method to Determine Depreciation</td>
<td>40</td>
</tr>
</tbody>
</table>
## Abbreviations and Acronyms

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>AaOC</td>
<td>Actual average operating cost</td>
</tr>
<tr>
<td>AR</td>
<td>Allowable revenue</td>
</tr>
<tr>
<td>C</td>
<td>Clawback adjustment</td>
</tr>
<tr>
<td>CAPM</td>
<td>Capital asset pricing model</td>
</tr>
<tr>
<td>CPI</td>
<td>Consumer price index</td>
</tr>
<tr>
<td>CPIA</td>
<td>Consumer price index adjustment</td>
</tr>
<tr>
<td>CPI\textsubscript{f}</td>
<td>Consumer price index forecast</td>
</tr>
<tr>
<td>D</td>
<td>Depreciation and amortisation of inflation write-up</td>
</tr>
<tr>
<td>Da</td>
<td>Depreciation actual</td>
</tr>
<tr>
<td>Dp</td>
<td>Depreciation projected</td>
</tr>
<tr>
<td>DA</td>
<td>Depreciation adjustment</td>
</tr>
<tr>
<td>d</td>
<td>Accumulated depreciation and accumulated amortisation of inflation write-up</td>
</tr>
<tr>
<td>da</td>
<td>Actual accumulated depreciation and amortisation of inflation write-up</td>
</tr>
<tr>
<td>dp</td>
<td>Projected accumulated depreciation and amortisation of inflation write-up</td>
</tr>
<tr>
<td>Dya</td>
<td>Actual number of days from the commencement of the financial year in which the new operating asset became used</td>
</tr>
<tr>
<td>Dyp</td>
<td>Projected number of days from the commencement of the financial year in which the new operating asset was forecast to become used</td>
</tr>
<tr>
<td>Dtp</td>
<td>Debt premium</td>
</tr>
<tr>
<td>DSCR</td>
<td>Debt service cover ratio</td>
</tr>
<tr>
<td>dtax</td>
<td>Deferred tax</td>
</tr>
<tr>
<td>Dt</td>
<td>Debt</td>
</tr>
<tr>
<td>E</td>
<td>Expenses: maintenance and operating for the tariff period under review.</td>
</tr>
<tr>
<td>EaOC</td>
<td>Estimated average operating costs</td>
</tr>
<tr>
<td>EBIT</td>
<td>Earnings before interest and taxes</td>
</tr>
<tr>
<td>EBITDA</td>
<td>Earnings before interest, taxes, depreciation and amortisation</td>
</tr>
<tr>
<td>Eq</td>
<td>Equity</td>
</tr>
<tr>
<td>F</td>
<td>Projected revenue addition to meet debt obligations for the tariff period under review</td>
</tr>
<tr>
<td>Symbol</td>
<td>Description</td>
</tr>
<tr>
<td>--------</td>
<td>-------------</td>
</tr>
<tr>
<td>FA</td>
<td>Projected revenue addition to meet debt obligation adjustment</td>
</tr>
<tr>
<td>Fa</td>
<td>Actual revenue addition to meet debt obligations</td>
</tr>
<tr>
<td>GA</td>
<td>General adjustment</td>
</tr>
<tr>
<td>Kd</td>
<td>Cost of debt</td>
</tr>
<tr>
<td>KdA</td>
<td>Cost of debt adjustment</td>
</tr>
<tr>
<td>Ke</td>
<td>Cost of equity</td>
</tr>
<tr>
<td>KeA</td>
<td>Cost of equity adjustment</td>
</tr>
<tr>
<td>MRP</td>
<td>Market return premium</td>
</tr>
<tr>
<td>NRBTA</td>
<td>Net revenue before tax allowance</td>
</tr>
<tr>
<td>OeA</td>
<td>Operating efficiency adjustment</td>
</tr>
<tr>
<td>Opex</td>
<td>Operating and maintenance expense</td>
</tr>
<tr>
<td>OpexA</td>
<td>Operating and maintenance expense adjustment</td>
</tr>
<tr>
<td>Opexa</td>
<td>Operating and maintenance expense actual</td>
</tr>
<tr>
<td>Opexp</td>
<td>Operating and maintenance expense projected</td>
</tr>
<tr>
<td>RAB</td>
<td>Regulatory asset base</td>
</tr>
<tr>
<td>RABA</td>
<td>Regulatory asset base adjustment</td>
</tr>
<tr>
<td>Rf</td>
<td>Riskfree rate of interest</td>
</tr>
<tr>
<td>Rf&lt;sub&gt;i&lt;/sub&gt;</td>
<td>The average monthly marked-to-market real riskfree rate of interest for the preceding period indicated</td>
</tr>
<tr>
<td>T</td>
<td>Tax expense</td>
</tr>
<tr>
<td>TD</td>
<td>Tariff Design</td>
</tr>
<tr>
<td>t</td>
<td>Prevailing corporate tax rate of the licensee</td>
</tr>
<tr>
<td>Tff(s)</td>
<td>Tariff(s)</td>
</tr>
<tr>
<td>TOC</td>
<td>Trended original cost</td>
</tr>
<tr>
<td>Tr</td>
<td>Tax rate of relevant country</td>
</tr>
<tr>
<td>V</td>
<td>Value of operating property, plant, vehicles and equipment</td>
</tr>
<tr>
<td>(V-d)&lt;sub&gt;new assets&lt;/sub&gt;</td>
<td>Value of new operating property, plant, vehicles and equipment</td>
</tr>
<tr>
<td>(V-d)&lt;sub&gt;A&lt;/sub&gt;</td>
<td>Value of operating property, plant, vehicles and equipment adjustment</td>
</tr>
<tr>
<td>Vola</td>
<td>Volumes actual</td>
</tr>
<tr>
<td>Volp</td>
<td>Volumes projected</td>
</tr>
<tr>
<td>VolA</td>
<td>Volumes adjustment</td>
</tr>
</tbody>
</table>
\( w \) Net working capital

\( \text{WACC} \) Weighted average cost of capital

\( \text{WA} \beta \) Weighted average \( \beta \) of the proxy firms' asset betas

\( \beta \) Beta: The systematic risk parameter for regulated entities providing pipeline, storage and loading facility services
1 Introduction

This methodology must be used to set tariffs for petroleum pipelines.

It is intended to accommodate existing assets in the industry that are of long standing, the need for large new investment required in the industry, the diversity in the nature and size of the expected investors, anticipated competition and the limited size and nature of the petroleum pipelines market in South Africa.

Clarifications of some aspects of this Methodology are given on NERSA’s website in the form of Frequently Asked Questions.

2 Legal Basis

The legal basis for this tariff methodology lies in the Petroleum Pipelines Act, 2003 (Act No. 60 of 2003). Section 28 (2) of the Act requires that tariffs must be:

(i) based on a systematic methodology applicable on a consistent and comparable basis;
(ii) fair;
(iii) non-discriminatory;
(iv) simple and transparent;
(v) predictable and stable; and
(vi) such as to promote access to affordable petroleum products.

Further, Section 28(3) of that Act requires that

The tariffs set or approved by the Authority must enable the licensee to:

(a) recover the investment;
(b) operate and maintain the system; and
(c) make a profit commensurate with the risk.
Naturally the Energy Regulator mandate flows from the entire Act including the objectives and powers and duties and not merely the two subsections quoted above.

Regulations also influence the way in which tariffs are set. The current Regulations in terms of the Petroleum Pipelines Act, 2003 (Act No. 60 of 2003), were published in Government Notice R342 GG 30905 of 4 April 2008.

3 Allowable Revenue (AR)

3.1 Allowable revenue must be determined by applying the Allowable Revenue formula.

3.2 The following formula must be used to determine the Allowable Revenue:

\[ AR = (RAB \times WACC) + E + D + F \pm C + T \]

Where:
- \( AR \) = Allowable revenue
- \( RAB \) = Regulatory asset base
- \( WACC \) = Weighted average cost of capital
- \( E \) = Expenses: operating and maintenance expenses for the tariff period under review
- \( D \) = Depreciation and amortisation of inflation write-up: the charge for the tariff period under review
- \( F \) = Approved revenue addition to meet debt obligations for the tariff period under review
- \( C \) = Clawback adjustment: to correct for differences between actuals and forecasts in formula elements from a preceding tariff period in relation to the actuals for that tariff period
- \( T \) = Tax expense: estimated tax expense for the tariff period under review
Further detail on each of the elements of this formula are provided below.

4 Regulatory Asset Base (RAB)

The following formula must be used to determine the value of the regulatory asset base:

\[ \text{RAB} = (V - d) + w \pm \text{dtax} \]

Where:

- \( V \) = Value of operating property, plant, vehicles and equipment
- \( d \) = Accumulated depreciation and accumulated amortisation of inflation write-up for the period up to the commencement of the tariff period under review
- \( w \) = Net working capital
- \( \text{dtax} \) = Deferred tax

Any deferred tax arising from accelerated wear and tear allowances is treated as neither equity nor debt. A deferred tax asset is added to the RAB and a deferred tax liability is deducted from the RAB.

In this formula only items relating to the timing difference of depreciation and wear and tear allowances will be allowed to be deducted/added as deferred tax.

The addition or deduction of a deferred tax asset or liability only applies when the notional tax method is used. There is no addition or deduction of a deferred tax liability or asset when the flow-through tax method is used.
4.1 **Value of Operating Property, Plant, Vehicles and Equipment (V-d)**

4.1.1 The value of prudently acquired property, plant, vehicles and equipment that are used or will be used in the tariff period under review comprises only non-current assets plus a pro rata portion (see paragraph 4.1.8) of new or additional property, plant, vehicles and equipment that will be used during the tariff period under review. (For categories of non-current assets see Note 2: Asset and Liability Categories, ‘Non-Current Assets’).

4.1.2 Non-current operating assets, reduced by the values contemplated in sections 4.1.10 to 4.1.13, are to be valued on the trended original cost (TOC) basis or in accordance with sub-regulation 4(7)(b) of the Regulations made in terms of the Petroleum Pipelines Act, 2003 (Act No. 60 of 2003) (GN R342 GG 30905 of 4 April 2008).

4.1.3 Inflation adjustments must be based on the CPI and the same CPI data must be used to convert nominal to real values.

4.1.4 Non-current operating assets are calculated for each asset category and summed to arrive at the value for V.

4.1.5 Plant, property and equipment under construction are excluded from the RAB.

4.1.6 Non-current operating assets must/will be used in the tariff period under review, and of a long term economic lifespan (more than one year).

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1 Regulation 4(7)(c) states that “The regulatory asset base contemplated in Regulation 4 (6) (e) must-

(a) ........

(c) include only those assets that are prudently acquired.”

NERSA interprets "prudently acquired" to mean that a prudent process of acquiring an asset was followed such as being duly licensed and employing an "arm’s length" competitive bidding or market testing process.
4.1.7 Capital expenditure is admitted to the Regulatory Asset Base when the asset concerned is/will be used in the tariff period under review.

4.1.8 Non-current operating assets expected to be used during the forthcoming tariff period are admitted to the Regulatory Asset Base in proportion to the share of the tariff period under review during which they will be used. If the period for which an asset is admitted to the Regulatory Asset Base is different to the period estimated when the tariff was set, a clawback adjustment is made in a subsequent tariff period after the information becomes available (see clawback adjustment paragraph 10.6).

4.1.9 Other costs of an unusual/infrequent nature, for example major storm damage repairs not insurable and recoverable from insurance may be included in the Regulatory Asset Base if the licensee decides to capitalise these costs.

4.1.10 Non-refundable contributions by customers to the licensee are deducted from V.

4.1.11 Contributions to a licensee such as equity, grants and deposits, will be deducted from V. This deduction will take the relevant taxation, if any, into account, and only the after-tax portion will be deducted. For the purposes of this paragraph ‘contributions’ mean contributions collected by means of Government imposed taxes, levies and the like that are collected only from customers of that licensee and or only from petroleum consumers that utilise or will utilise petroleum transported by that licensees pipeline/s.

4.1.12 Any volumes of petroleum contracted for a pipeline by means of a ‘ship-or-pay’ agreement or the like will be included when determining the projected volumes for a tariff period under review and when determining a Volume Adjustment contemplated in paragraph 10.1. The proceeds of such a ‘ship-or-pay’ agreement or the like will not be treated as ‘contributions’ contemplated in paragraph 4.1.11.
4.1.13 The cumulative values of the F-factor (revenue addition to meet debt obligations for the tariff period under review) from previous tariff review periods will be deducted from V.

4.1.14 Contributions received in lieu of connection charges representing non-refundable funds contributed by customers are deducted from V.

4.1.15 Leasehold improvement costs borne by the licensee means an investment in a right to use property and is admitted to the RAB.

4.1.16 Operating reserves such as cost-free funds used to support the regulatory asset-base investment, are excluded from the RAB.

4.2 **Accumulated historic depreciation and accumulated amortisation of inflation write-up for the period up to the commencement of the tariff under review (d).**

4.2.1 Accumulated historic depreciation and accumulated amortisation of inflation write-up is the cumulative depreciation against operating property, plant, vehicles and equipment in service (See Note 4 where an example is given on how to calculate the depreciation).

4.3 **Net Working Capital (w)**

4.3.1 Net working capital refers to various regulated activities or business operations funding requirements other than property, plant, vehicles and equipment in service. These funding requirements include inventories, pre-payments, minimum bank balances, cash working capital and other non-plant operating requirements. Working capital funding requirements funded by investors are legitimate Regulatory Asset Base allowances on which a return may be granted. See also Note 2: Asset and Liability Categories, ‘Current Assets’.
4.3.2 The following formula must be used to determine net working capital:

\[
\text{Net working capital} = \text{inventory} + \text{receivables} + \text{operating cash} + \text{minimum cash balance} - \text{trade payables}.
\]

4.3.3 Operating cash refers to the amount of investor-supplied funds needed to finance day-to-day operations. This is finance to bridge the gap between the time expenditures are made to provide service and the time collections are received for that service. It is the cash supplied by investors to finance operating costs during the time lag before revenues are collected.

4.3.4 Measurement of required operating cash must be based on the licensee’s standard practice subject to a maximum 45 days’ operating expenses, excluding depreciation and deferred taxes.

4.3.5 If an applicant has carried out an adequate lead-lag study to determine the net difference, in terms of days, between the point at which service is rendered and revenues are collected from customers, and the point at which costs are incurred until they are paid, the Energy Regulator may use this determination rather than the approach set out in the paragraph above.

4.3.6 Minimum cash balance refers to a requirement by a lending institution for a licensee to hold a minimum cash balance. Proof of such a requirement will be required and, if provided, such amount will be included in the net working capital determination less interest earned thereon.

4.3.7 Trade payables refers to current liabilities for which the amount to be settled is usually known rather than uncertain (as for provisions).
5 Weighted Average Cost of Capital (WACC)

5.1 The following formula must be used to determine the WACC based on the capital structure of the licensed activity:

\[
WACC = \left[ \frac{\text{Eq}}{\text{Dt} + \text{Eq}} \right] \times \text{Ke} + \left[ \frac{\text{Dt}}{\text{Dt} + \text{Eq}} \right] \times \text{Kd}
\]

Where:

\begin{align*}
\text{Eq} & = \text{Shareholders equity} \\
\text{Dt} & = \text{Interest bearing debt} \\
\text{Ke} & = \text{Post-tax, real cost of equity}^2 \text{ derived from the capital asset pricing model (CAPM)} \\
\text{Kd} & = \text{Post-tax, real}^3 \text{ cost of debt}
\end{align*}

Note:
Deferred tax is excluded from the capital structure for the purposes of this calculation.

5.2 The actual interest bearing debt and the equity pertaining to the regulated assets for the tariff period under review must be used subject to the Energy Regulator finding the licensee’s debt to equity ratio reasonable.

5.3 Reasonableness checks for the debt to equity ratio may include:

(a) consulting financiers for their assessment of a reasonable debt to equity ratio for the applicant;

(b) taking expert advice;

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2 Note: Market return indices published by the JSE reflect after-tax returns.
3 First convert from pre- to post-tax and then from nominal to real.
(c) comparing the licensee’s cost of debt with its cost of equity;

(d) considering the remaining service life of the asset; and/or

(e) benchmarking the debt to equity ratio against similar enterprises.

5.4 If after making reasonableness checks the Energy Regulator finds the debt to equity ratio to be unreasonable, the Energy Regulator must assume a reasonable debt to equity ratio.

5.5 It will be assumed that the licensee will have a minimum debt to total capital level of 30 per cent.

5.6 **Cost of equity (Ke)**

5.6.1 The cost of equity capital must be determined according to the capital asset pricing model (CAPM), in real terms, as described below and the result must be subjected to reasonableness checks.

5.6.2 In the case of new investments the cost of equity will be kept constant over the service life of the core assets, until such time that a review is triggered by:

5.6.2.1 the licensee requesting a tariff review and as a result thereof the Energy Regulator sets different tariffs; or

5.6.2.2 in the Energy Regulator’s opinion there has been a change in the economic environment, external to the licensee, such that the cost of equity previously set as a constant by the Energy Regulator has changed by 25 per cent or more, measured by the preceding 36 month rolling average.
5.6.3 The cost of equity must be determined by the capital asset pricing model (CAPM), in real terms, by applying the following formula:

\[ Ke = (Rf + CRA) + (MRP \times \beta) + SSP + \alpha + LP \]

Where:
- \( Ke \) = Post-tax, real cost of equity
- \( Rf \) = Real riskfree rate of interest. This is the average of the real monthly marked-to-market riskfree rate for the preceding 300 months for all government bonds\(^4\) with at least a 10 year maturity as at 12 months before the commencement of the tariff period under review.
- \( CRA \) = Country risk adjustment. The real CRA will be added to riskfree rate. The CRA is for assets in another country outside South Africa that are an integral part of the same asset/s within South Africa. The adjustment is for the other country concerned.
- \( MRP \) = Post-tax, real market risk premium. The proxy used for the market is the Johannesburg Stock Exchange (JSE) All Share Total Return Index (ALSI) for the preceding 300 months as at 12 months before the commencement of the tariff period under review.
- \( \beta \) = ‘Beta’ is the systematic risk parameter for regulated entities providing pipeline, storage and loading facility services. The beta must be determined by proxy. As a proxy the average of at least six pipeline companies listed on stock exchanges must be used. The methodology to be used to determine the beta is set out in Note 3.
- \( SSP \) = Small stock premium. An adjustment to compensate for the small size of a licensee if warranted.
- \( \alpha \) = Project specific risk if the circumstances warrant such an adjustment.
- \( LP \) = Liquidity premium to accommodate companies which are not publicly traded if the circumstances warrant such an adjustment.

\(^4\) Data on government bonds are sourced from the South African Reserve Bank and published by NERSA.
5.6.4 Any other appropriate model.

5.7 **Cost of debt (Kd)**

5.7.1 The actual cost of debt is the cost of interest bearing debt incurred by the licensee.

5.7.2 The cost of debt used must be after-tax, real values determined as follows:

\[
K_{d\text{post-tax, nominal}} = \frac{1 + [K_{d\text{pre-tax, nominal}} \times (1 - t)]}{1 + \text{CPI}_{f}} - 1
\]

Where:

- \(K_{d\text{pre-tax, nominal}}\) = Projected cost of debt, pre-tax, nominal, for the tariff period under review.
- \(t\) = Prevailing corporate tax rate of the licensee.
- \(\text{CPI}_{f}\) = Consumer price index forecast: most recent forecast for the tariff period under review.

5.7.3 The actual cost of interest bearing debt incurred by the licensee converted from pre to post-tax values and from nominal to real values, must be used subject to the Energy Regulator finding it reasonable through the application of reasonableness tests.

5.7.4 The actual percentage cost of debt must be determined in the following ways:

5.7.4.1 By estimating the weighted average interest charged on debt or the actual weighted average interest achieved by the licensee for its regulated assets for the tariff period under review, where known. Where actual interest rates are not known (for
example where interest rates fluctuate) the lender’s estimate of interest rates for the forthcoming tariff period must be used.\(^5\) At the end of the tariff period the actual interest rates achieved must be compared with the estimated interest rates and any adjustment necessary must be made in the allowable revenue at the first tariff review after the information becomes available (see clawback adjustment). Where the licensee has business activities that are not regulated by the Energy Regulator and the licensee raises corporate debt on behalf of the regulated activity/business the actual cost of debt charged to the regulated activities must fairly reflect causality with the regulated activity and the cost of debt associated with the assets in this risk class as well as the benefits received and is subject to approval by the Energy Regulator;

5.7.4.2 By testing the actual weighted average cost of debt achieved by the licensee for reasonableness in the following four ways:

(a) employing the real projected cost of debt formula based on an average of the preceding 120 months riskfree rate and the following formula must be used:

\[
K_{d\text{post-tax,real}} = \left( \frac{\sum_{t=1}^{120\text{months}} R_{ft}}{120\text{months}} \right) + D_{tp}
\]

Where:

\(K_{d\text{post-tax,real}}\) = Post-tax, real cost of debt. The consumer price index forecast independently sourced by NERSA as at 12 months before the commencement of the tariff period under review will be used to convert nominal to real values.

\(R_{ft}\) = Real riskfree rate of interest. This is the average monthly marked-to-market riskfree rate of interest for the preceding 120 months for all Government bonds with at least a ten (10) year maturity period as at twelve (12) months before the

\(^5\) Tariff applicants must provide the estimates made by their lenders in writing.

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5th Edition Tariff Methodology for Pipeline tariffs – approved on 31 March 2011.

Page 17 of 41
commencement of the tariff period under review and calculated by using the following formula:

\[ \frac{1 + [(R\text{from})^* (1 - t)]}{1 + \text{CPI}} - 1 \]

Government bond data will be sourced from the South African Reserve Bank and published by NERSA.

\( D\text{tp} \) = Debt premium expected for the tariff period under review, the actual value to be approved on a case-by-case basis by Energy Regulator after having been tested for reasonableness. For reasonableness checks see sub-paragraphs (b) to (d) below;

(b) corporate loans with binding bids for balance sheet funding must be compared with the proposed debt premium;

(c) if a tariff application is made for a facility that is project financed, the debt premium sought must be compared with at least three bids from financiers (all costs to be included); and

(d) such other reasonableness tests as may be appropriate.

6 Expenses – Operating and Maintenance (E)

6.1 Regulation 4(2) states that:

*The tariffs set by the Authority must enable an efficient licensee to—*

(a) recover the reasonable operational and maintenance expenses of the pipeline in the year in which they are incurred;
Such expenses will be allowed. The reasonableness of such expenses will, subject to paragraph 6.3, be determined by the Energy Regulator on a case-by-case basis.

6.2 These expenses are to be categorised in accordance with the regulatory reporting manuals.

6.3 The fully-allocated cost attribution approach for the allocation of costs is used. This approach is as per the methodology contemplated in the regulatory reporting manuals.

6.4 **Principles regarding Expenses**

6.4.1 Expenses are those planned for the efficient operation and maintenance of the core business.

6.4.2 The efficiency gain system requires that customers and regulated entities each receive 50 per cent of the efficiency gains in approved areas (see clawback adjustments).

6.4.3 Procurement practices must meet the criteria of being competitive, at 'arm's length' and prudent.

6.4.4 Internal expenses must meet the criteria of being competitive in comparison with appropriate benchmarks.

6.4.5 Research and development expenses are permitted, subject to adequate justification.

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6 Note: The Energy Regulator has approved the regulatory reporting manuals. Volumes one and four of these manuals apply to the petroleum pipelines industry. These Manuals are intended for general regulatory reporting by licensees and outline the format and content of information required to inform tariff applications.
6.4.6 Reasonable joint costs⁷, (see Note 1: Joint Costs) may be permitted, subject to adequate justification and in accordance with the regulatory reporting manuals⁶.

6.4.7 Provision for land rehabilitation costs are permitted, subject to adequate justification. These funds must be kept in accordance with the Petroleum Pipelines Act 2003 (Act No. 60 of 2003) sub-regulation 9 of the Regulations made in terms of the Act published under GN R342 in *Government Gazette* 30905 of 4 April 2008.

6.4.8 Operating costs which are not related to the operations of the regulated assets that are used or will be used in the tariff period under review are not allowed.

6.4.9 Costs relating to corporate social responsibility and donations are not allowed, unless it can be shown that these costs benefit tariff paying customers.

6.4.10 Litigation costs incurred in the production of income in accordance with South African Revenue Services rules are allowed. The costs of litigation arising from the transgression of laws are not allowed.

6.4.11 The justifiable costs of marketing are allowed but only those relating to the marketing of regulated activities.

6.4.12 Maintenance costs for mothballed plant that the licensee plans to bring back into use in the near future are admitted as expenses. The licensee must have a plan to use them in future.

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⁷ Although not precisely the same, joint costs are sometimes referred to as shared services, corporate costs or common costs.
7 Tax Expense (T)

7.1 Each licensee must make a once off election between the use of either (a) “flow-through” (actual tax) payment, or (b) “notional” tax payment. Once that choice has been made, the option selected will be used in future for all that licensee’s assets.

7.2 If the licensee opts for the ‘flow-through’ or actual tax payment method, the estimate of the actual tax payment for the tariff period under review will be used. This tax expense will be the actual tax liability for the tariff period under review. The calculation is to be performed by applying the following formula:

\[ \text{Tax} = \frac{(\text{NRBTA})}{(1-t)\times t} \]

Where:
\[
\text{NRBTA} = \text{Net revenue before tax allowance} = \{(\text{RAB}\times\text{WACC}) + E + \text{D(historic & write up)} + F \pm C\} - \{E + \text{D(historic)} + \text{Kd(nominal)}\}. \\
\text{t} = \text{Prevailing corporate tax rate of the licensee}
\]

7.3 Notional tax refers to a licensee’s estimated notional tax expense with respect to the regulated activity for the tariff period under review. If the licensee opts for the notional tax approach, the calculation is to be performed by applying the following formula:

\[ \text{Tax} = \frac{(\text{NRBTA})}{(1-t)\times t} \]

Where:
\[
\text{NRBTA} = \text{Net revenue before tax allowance} = \{(\text{RAB}\times\text{WACC}) + E + \text{D(historic & write up)} + F \pm C\} - \{E + \text{D(historic)}\}. \\
\text{t} = \text{Prevailing corporate tax rate of the licensee}
\]

7.4 Tax penalties and interest on tax due are not allowed.
8 Depreciation and Amortisation of Inflation Write-Up (D)

8.1 The depreciation amount calculated on a straight line basis over the service life of each of the assets or classes of assets in the regulatory asset base for the tariff period under review is included in the allowable revenue.

8.2 The only form of accelerated or decelerated depreciation that is allowed is when there is a change approved by the Energy Regulator in the estimated service life of the asset.

8.3 An appropriate depreciation rate must be used when computing depreciation charges to reflect the different estimated service lives of the respective assets in each class of plant accounts, or each plant account, or each class of assets within a plant account.

8.4 The depreciation rate must be based on the estimated service life of the plant, as developed by a study of the company's history and experience (taking into account all relevant factors including variations in use, increasing obsolescence or inadequacy) and such engineering, economic or other depreciation studies and other information as may be available with respect to future operating conditions.

8.5 When a licensee makes a tariff application, it must include information on depreciation rates for each of the assets or classes of assets and be accompanied by a statement on their basis and the methods employed in their computation.

8.6 Depreciation and amortisation of write-up is to be calculated by using the method given in the example in Note 4: Method to Determine Depreciation.
9  Revenue Addition to Meet Debt Obligations (F)

9.1  The Energy Regulator may approve additional revenue to meet debt obligations in accordance with this methodology.

9.2  An application for a tariff adjustment must state whether or not the applicant wishes the Energy Regulator to consider an addition to revenue to meet debt obligations (F). If the applicant does not seek such an adjustment the Energy Regulator will not consider such an adjustment. If the applicant does seek such an adjustment the adjustment will be determined as explained in the paragraph below.

9.3  If the allowable revenue excluding the F-factor does not enable the applicant’s regulated activity to operate with a debt service cover ratio (DSCR) acceptable to the Energy Regulator, then additional revenue may be allowed.

9.4  When considering acceptable funding requirements and debt servicing requirements, the Energy Regulator will consider various financial ratios such as the debt service cover ratio and the interest cover ratio.

9.5  Acceptable ratios contemplated in paragraph 9.4 must be determined by the Energy Regulator after making appropriate comparisons and investigations where necessary. The level of such ratios for a suitable period before the tariff period in question as well as for a suitable period after the tariff period in question.

9.6  The Debt Service Cover Ratio is defined as:

\[
\text{DSCR} = \left( \frac{\text{EBITDA}}{\text{principal debt due plus interest thereon payable in the tariff period under review}} \right)
\]

Where:

\begin{align*}
\text{DSCR} &= \text{Debt service cover ratio} \\
\text{EBITDA} &= \text{Earnings before interest, taxes, depreciation and amortisation}
\end{align*}
9.7 The Interest Cover Ratio is defined as:

\[
\text{Interest Cover Ratio} = \left( \frac{\text{EBIT}}{\text{interest payable in the tariff period under review}} \right)
\]

Where:

EBIT = Earnings before interest and taxes

9.8 The Energy Regulator will publish an interest cover ratio range from time to time that will target investment grade risk ratings. Target ratios are intended to be used in determining the value of the F-factor unless NERSA determines that different ratios would be more appropriate.

9.9 Approved additional revenue (F) will be treated as described in paragraph 4.1.13.

10 Clawback Adjustment (C)

The following formula must be used to determine the clawback adjustments:

\[
\text{Clawback adjustment} = \text{VolA} + \text{DA} + \text{OeA} + \text{FA} + \text{KdA} + (\text{V-d})A + \text{CPIA} + \text{GA}
\]

Where:

VolA = Volume adjustment
DA = Depreciation adjustment
OeA = Operating efficiency adjustment (only if more efficient)
FA = Revenue addition to meet debt obligations (F) adjustment
KdA = Cost of debt adjustment
(V-d)A = Value of operating property, plant, vehicles and equipment adjustment
CPIA = Consumer price index adjustment
GA = General adjustment for any remaining differences between projected allowable revenue and actual allowable revenue not resulting from efficiency gains including tax.

Note:
The adjustments need to be made according to the following formulas:

10.1 **Volumes adjustment (VolA)**

10.1.1 The volume adjustment compensates licensees and customers for differences between volume projections made when the tariff is set and the actual volumes shipped during the tariff period. The following formula applies:

\[
\text{VolA} = (\text{Vol}_a - \text{Vol}_p) \times \text{Tff(s)}
\]

Where:
- \(\text{VolA}\) = Volume adjustment
- \(\text{Vol}_p\) = Volumes projected
- \(\text{Vol}_a\) = Volumes actual
- \(\text{Tff}\) = Tariff(s)

10.1.2 Any adjustment in allowable revenue due to volume will be applicable in the tariff period subsequent to the licensee’s audited financial statements of the applicable tariff period becoming available.

10.1.3 Projected volumes used in performing the calculation must be those used to determine the allowable revenue for the tariff period concerned.

10.1.4 Any unexpected deviations from projected volumes and the factors that have led to such deviations must be explained by the licensee.
10.2 **Depreciation adjustment (DA)**

10.2.1 The depreciation adjustment provides for the differences between the projected depreciation made at the time the allowable revenue was determined and the actual depreciation for the specific tariff period. The following formula must be applied:

\[
DA = Da - Dp
\]

Where:

- \( DA \) = Depreciation adjustment
- \( Da \) = Depreciation actual
- \( Dp \) = Depreciation projected

10.3 **Operating Efficiency Adjustment (OeA)**

10.3.1 This clawback has two steps. Step 1 is to determine the clawback on operating and maintenance expense and Step 2 is to determine the clawback on the operating efficiency.

10.3.2 Step 1: Operating expense adjustments (OpexA). The OpexA compensates licensees and customers for differences between operational expense projected when the tariff was set and the actual operational expense for the tariff period and is calculated by applying the following formula:

\[
\text{OpexA} = \text{Opexp} - \text{Opexa}
\]

Where:

- \( \text{OpexA} \) = Operating and maintenance expense adjustment
- \( \text{Opexa} \) = Operating and maintenance expense actual
- \( \text{Opexp} \) = Operating and maintenance expense projected.
10.3.3 Step 2: The operating efficiency is an incentive to licensees to increase operating efficiencies. It rewards licensees and customers for improvements in operating efficiency. This is determined as the difference between operating efficiency projections made when the tariff is set and the actual operating efficiency achieved during the tariff period. The following formula must be used to determine an adjustment to the operating efficiency:

\[ \text{OeA} = (\text{EaOC} - \text{AaOC}) \times \text{actual volumes} \times 50\% \]

Where:
- \( \text{OeA} \) = Operating efficiency adjustment
- \( \text{AaOC} \) = Actual average operating costs (Actual operating expenditure \( \div \) volumes)
- \( \text{EaOC} \) = Estimated average operating costs (estimated operating expenditure \( \div \) estimated volumes).

10.3.2 Only improvements in efficiency are rewarded. Decreases in efficiency are not deducted.

10.4 Revenue addition to meet debt obligations adjustment (FA)

10.4.1 The FA caters for differences between the revenue adjustment to meet debt obligation projections made when the allowable revenue was determined and the actual debt obligations payments made for that period. The following formula must be used to determine the revenue addition to meet the debt obligations adjustment:

\[ \text{FA} = (\text{Fa} - \text{F}) \]

Where:
- \( \text{FA} \) = Projected revenue addition to meet debt obligations adjustment
- \( \text{Fa} \) = Actual revenue addition to meet debt obligations
- \( \text{F} \) = Projected revenue addition to meet debt obligations
10.5 **Cost of Debt Adjustment (KdA)**

10.5.1 If there is a difference between the estimated cost of debt in the allowable revenue and the actual cost of debt for that tariff period then the allowable revenue must be recalculated using the actual cost of debt and the difference added to or subtracted from the clawback adjustment. The following formula must be used to determine the KdA:

\[
KdA = \text{Allowable Revenue recalculated using actual cost of debt} - \text{Allowable Revenue calculated using projected cost of debt}
\]

10.6 **Value of new operating property, plant, vehicles and equipment adjustment (V-d)A.**

10.6.1 The operating asset adjustment compensates licensees and customers for differences in timing between the estimated date of a new asset becoming used and the actual date that asset became used. The following formula must be used to determine the operating asset adjustment:

\[
\text{Operating asset adjustment} = (V-d)_{\text{new assets}} (D_{\text{ya}} - D_{\text{yp}})/365 \times \text{WACC}
\]

Where:

\[
(V-d)_{\text{new assets}} = \text{The value of the operating assets that will become used during the tariff period under review and which will be added to the RAB in the course of the tariff period under review}
\]

\[
D_{\text{ya}} = \text{the actual number of days from the commencement of the financial year when the new operating asset became used}
\]

---

8 Note: All other factors and quantum in estimated Allowable Revenue remain the same.
Dyp = the projected number of days from the commencement of the financial year when the new operating asset was projected to become used.

10.7 **CPI Adjustment (CPIA)**

10.7.1 The inflation adjustment compensates licensees and customers for differences between forecast and actual inflation rates and should be determined by following the following formula:

\[ CPIA = CPIa - CPIp \]

Where:

- **CPIA** = Consumer Price Index Adjustment
- **CPIa** = Consumer Price Index actual
- **CPIp** = Consumer Price Index projected.

10.8 **General adjustment (GA)**

10.8.1 Provision is made for a general adjustment. This adjustment is for any remaining differences between projected allowable revenue and actual allowable revenue not resulting from efficiency gains, eg. Tax expenses adjustments.
11 Tariff Design (TD)

Tariff design will consider the following five steps:

11.1 Cost of Service

11.1.1 The first task is to determine the licensee's overall cost of service. The licensee's cost of service is the total revenues needed to cover the licensee's operations, recover the investment including a profit commensurate with risk.

11.2 Functionalisation

11.2.1 The second step is functionalisation of the pipeline's costs by determining which of the licensee's various operations or facilities the costs belong to. These functional facilities could be pipeline, storage, loading and/or unregulated facilities. This functionalisation of activities/facilities is a basic regulatory principle aimed at avoiding cross-subsidisation between different types of services.

11.3 Classification of Cost

11.3.1 The third step is the categorization (classification) of the costs assigned to each function or facility as fixed costs, which do not vary with the volume of petroleum transported as distinct from those that change with the short-term usage of the system (variable costs). This classification is particularly important for a two-part tariff design. This classification allows assigning the fixed costs to the reservation (capacity) and variable costs to usage (commodity) charges of the licensee's pipeline tariffs. Classification is a formal way of matching the structure of prices with the structure of costs.
11.4 Allocation of Costs to Customers

11.4.1 The fourth step is the allocation of costs to customers. Costs must be allocated to customers fairly and be based on the usage pattern of each customer. It is the allocation of directs costs that are directly assignable to the users that should pay for them. It is the intention to present customers with the cost consequences of their consumption decisions. The fully distributed cost allocation approach should be applied to ensure that some customer groups are not unfairly burdened with shared costs.

11.4.2 Distance and volumes are the two principal factors that affect how transportation costs are incurred by customers. Therefore the allocation process must determine which costs vary with volume/distance and which costs do not. This allocation step is illustrated in the following diagram.

Illustration of the Allocation Process for Petroleum Pipelines
11.5 Billing Determinants and Design of Tariffs

11.5.1 The fifth and last step is designing tariffs for each service or facility for billing purposes. Tariff design is the process of deriving tariffs for different services and different distances from the allowable revenue and throughput or contracted quantities.

11.5.2 The tariff is determined by dividing the allocated costs of service (allowable revenue) by billing determinants to derive the final prices. Billing determinants are the units upon which prices are actually levied.

11.5.3 The billing determinant for transportation charges is the annual throughput (reserved volumes and annual volumes) for the pipeline system in question.

11.5.4 A tariff is designed for each pipeline system by dividing the costs (allowable revenue) between the various functions performed by the pipeline system.

11.5.5 The tariffs designed should generate sufficient revenue to recover approved costs, and at the same time fairly allocate charges to users in relation to the costs and benefits of different services. The basic principle is “the user pays”.

11.5.6 An all volume-distance based tariff is determined for each pipeline system by dividing costs of service (allowable revenue) by total forecasted volume petroleum products throughput.

11.5.7 Given these subsets of costs, the following measures must be used to allocate costs to customers on the basis of how the fixed and variable costs are incurred:

- Distance based capacity costs: Mega litre-km.
- Non-distance based capacity costs: Mega litre-km
- Distance variable costs: Mega litre-km
- Non-distance variable costs: Mega litre-km
The way the licensee will determine the tariff required to recover the Allowable Revenue for each tariff period (year) at the system throughput level in the following three steps.

a) determine the allowable revenue for the pipeline system under review

b) determine the total litre-kilometre for pipeline system throughput (Mega-Litre-km)

\[ = \sum [(\text{distance between source and depot}) \times (\text{forecasted volume for that source-depot})] \]

c) determine the throughput product tariff in cents per litre per km (c/ℓkm)

\[ = \frac{\text{Allowable revenue}}{\text{Total litre km}} \]

11.6 **Additions to an Existing Pipeline System**

11.6.1 **With additions to an existing pipeline system, there may be tariff issues concerning** whether expansion costs should be rolled into a single, existing regulatory asset base and charged to all shippers equally (rolled-in methodology) or kept separate and charged only to particular shippers (incremental methodology).

11.6.2 **In** deciding such matters, the Energy Regulator will consider the specific circumstances in each case and the provisions of the Petroleum Pipelines Act when deciding which approach is appropriate.

11.7 **Transitional arrangements**

11.7.1 Operating licensees that prior to the commencement of this tariff methodology do not charge tariffs determined as per this tariff methodology must within six months of the commencement of this methodology consult their customers and submit to NERSA for approval their proposed tariffs based on this methodology. Pipeline tariffs set
may be maximum tariffs and discounting below maximum tariff levels may be allowed.

12 Review and Modification of the Tariff Methodology

12.1 The Energy Regulator will conduct a review of the Methodology every 3 years to ensure that the contents of the Methodology reflect the regulatory circumstances existing at the time of the review. The Energy Regulator also recognizes that special circumstances may arise that may necessitate changes to be effected, perhaps sooner than the envisaged 3 years formal review cycle. This provision for a review after 3 years would therefore not preclude on-going incorporation by the Energy Regulator of justifiable changes that are considered necessary to immediately capture clarity, transparency and regulatory efficiency benefits.

12.2 The Energy Regulator will give decisions on the interpretation of the various clauses of the Methodology, but any party will be entitled at any stage to take decisions of the Energy Regulator on review or appeal as contemplated in the enabling legislation.

************
NOTES

Note 1: Joint Costs

1 Joint Costs – are those costs which do not have a specific, identifiable causal relationship with a particular entity or affiliate, but which benefit all affiliates/business units, or more than one. Joint costs are also referred to as common costs, and include corporate costs.

2 To the maximum extent possible, joint costs should be assigned directly to licensee/affiliates on the basis of causation or usage, and where cost causation cannot be easily ascertained or established cost drivers should be selected based on benefits received.

***************

Note 2: Asset and Liability Categories

Further clarity on the meaning of non-current assets can be gained from the Regulatory Reporting Manual which gives the following classifications:

ASSETS AND OTHER DEBITS

Current Assets

100 Cash and Cash Equivalents
110 Accounts Receivable
110.003 Accounts Receivable-Trade
110.004 Accounts Receivable-Other
115 Accumulated Provision for Doubtful Debts
120 Inventory
120.001 Materials and Operating Supplies
120.003 Petroleum Inventory
Deferred Debits
142 Preliminary Surveys and Investigation Charges
147 Other Deferred Debits

Non-Current Assets
171.001 Plant in Service
171.002 Accumulated Depreciation-Plant in Service
172.001 Plant under capital leases and Improvements to leased facilities
172.002 Accumulated Depreciation—Leased Plant and Improvements
176 Line Fill
195.002 Other Intangible Assets

LIABILITIES AND OTHER CREDITS

Current Liabilities
200 Bank Overdraft
205 Accounts Payable
206 Account Payable to Affiliated Companies
212 Obligations under Capital Leases – Current Portion
216 Interest Payable and Accrued
220 Dividends Payable
230 Accrued Income Taxes Payable
235 Other Current Liabilities

Deferred Credits
<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>238</td>
<td>Unamortized Debt Premium and Expenses</td>
</tr>
<tr>
<td>241</td>
<td>Other deferred credits</td>
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</table>

**Non-Current Liabilities**

<table>
<thead>
<tr>
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<th>Description</th>
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</thead>
<tbody>
<tr>
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<td>Provision for Pension and Benefits</td>
</tr>
<tr>
<td>255</td>
<td>Long-Term Debt</td>
</tr>
<tr>
<td>256</td>
<td>Long-Term Debt-Advances from Affiliated Companies</td>
</tr>
<tr>
<td>265</td>
<td>Other Non-Current Liabilities</td>
</tr>
<tr>
<td>265.001</td>
<td>Obligations under capital lease- non-current</td>
</tr>
<tr>
<td>265.002</td>
<td>Accumulated provision for self insurance</td>
</tr>
</tbody>
</table>

**Owners’ Equity**

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<tr>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
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<td>Equity Issued</td>
</tr>
<tr>
<td>275.001</td>
<td>Ordinary shares issued</td>
</tr>
<tr>
<td>275.002</td>
<td>Preference shares issued</td>
</tr>
<tr>
<td>280</td>
<td>Contributed Surplus</td>
</tr>
<tr>
<td>285</td>
<td>Reserves including excess of appraisal value over depreciated plant cost</td>
</tr>
<tr>
<td>290</td>
<td>Retained Earnings</td>
</tr>
</tbody>
</table>

***************
Note 3: Methodology for the Determination of Beta ($\beta$)

For licensees that are not publicly listed and where there are insufficient publicly listed competitors the equity beta is derived from a proxy beta. To make adjustments for differences in gearing between the proxy and the licensee the process involves ‘un-levering’ and ‘re-levering’ as follows:

- Obtaining the equity beta for the proxy company;
- Un-levering the beta of the proxy company by the gearing level of the proxy company. This unlevered beta is known as the asset beta;
- Calculating the weighted average of the asset betas for the chosen proxy companies;
- Re-levering the average asset beta by the (approved) gearing of the licensee

Note
1. The Harris and Pringle formula which excludes the tax shields in the notation will be used.
2. The following steps must be followed:

Step 1 – Calculate asset beta (or un-levered beta) for proxy firms

The following formula must be used to determine the asset beta:

$$\beta_{a1} = \beta_1 / [1 + D_t/E_q]$$

Where:

- $\beta_{a1}$ = Asset beta for proxy company 1
- $\beta_1$ = Beta of proxy company 1
- $D_t$ = Debt of proxy company 1
- $E_q$ = Equity of proxy company 1

Note:
1. Repeat step 1 for each of the 6 (or more) chosen proxy firms.
2. Market values for proxy companies will be used where such market values exists.
   Where no market values exist for proxy companies, book values will be used.
Step 2 – Calculate weighted average asset beta of proxy firms

Weight each of the 6 (or more) proxy firm asset betas by their proportion of the total debt plus equity of the 6 (or more) proxy firms and sum the results using the following formula –

\[ \beta_{aE} = \sum_{n=1}^{n} \left( \frac{(Dt + Eq)^{n}}{\sum_{n=1}^{n}(Dt + Eq)^{n}} \right) \beta_{an} \]

Where:

- \( \beta_{aE} \) = Weighted average asset beta of the proxy companies
- \( (Dt + Eq)^{n} \) = Sum of the debt and equity for a specific proxy company
- \( (\beta_{a})^{n} \) = Asset beta of the corresponding specific proxy company
- \( \sum_{n=1}^{n}(Dt + Eq)^{n} \) = Sum of debt and equity for all proxy companies
- \( n \) = Number of proxy companies

Step 3 – Calculation of beta (\( \beta \)) for licensee. (Re-levering of beta)

The following formula must be used to determine the beta for the licensee:

\[ B_{L} = \beta_{aE} \times [1 + D_{t}/E_{q}] \]

Where:

- \( B_{L} \) = Beta for the licensee
- \( \beta_{aE} \) = The weighted average beta of the proxy firms asset betas from Step 2. The Energy Regulator may adjust this factor to take account of a difference in country risk ratings between the host country of the proxy firms and South Africa.
- \( D_{t} \) = The interest bearing debt of the licensee subject to a minimum gearing level of 30%
- \( E_{q} \) = The equity of the licensee

***************
NOTE 4: METHOD TO DETERMINE DEPRECIATION

This example of the method to determine depreciation is based on the following assumptions –

a) historic cost of asset is R100 which is 100% of its value;
b) inflation is 5% per annum;
c) depreciation is on a straight line basis over 10 years;
d) the service life of the asset is 10 years;

The table below demonstrates how depreciation must be calculated.

<table>
<thead>
<tr>
<th>Trending of Asset Value (TOC)</th>
<th>Formula for year 2 (column &quot;C&quot;)</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
<th>G</th>
<th>H</th>
<th>I</th>
<th>J</th>
<th>K</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tariff Period</td>
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<tr>
<td>Useful Life</td>
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<tr>
<td>Depreciated Original cost b/f</td>
<td>+B3-B4</td>
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<td></td>
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<td></td>
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<tr>
<td>Depreciation (historic)</td>
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<td></td>
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</tr>
<tr>
<td>Depreciated original cost (V-d) RAB Bal c/f</td>
<td>+C3-C4</td>
<td></td>
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<tr>
<td>Inflation write-up balance</td>
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<td>Current period inflation write-up</td>
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<td>5.00</td>
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<tr>
<td>Amortization of write-up</td>
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<tr>
<td>Write-up bal net of amortization carried forward</td>
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<td>1.03</td>
<td>1.58</td>
<td>2.16</td>
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<tr>
<td>TOC Opening Balance (b/f) balance to inflate</td>
<td>+B13</td>
<td>100.00</td>
<td>94.50</td>
<td>88.20</td>
<td>81.03</td>
<td>72.93</td>
<td>63.81</td>
<td>53.60</td>
<td>42.21</td>
<td>29.55</td>
<td>15.51</td>
<td>0.00</td>
</tr>
<tr>
<td>Total amount on which WACC should be earned</td>
<td>=C3+C10</td>
<td>105.00</td>
<td>99.23</td>
<td>92.61</td>
<td>85.09</td>
<td>76.58</td>
<td>67.00</td>
<td>56.28</td>
<td>44.32</td>
<td>31.03</td>
<td>16.29</td>
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