Aspects of the NSW Rail Access Regime

Final Report

INDEPENDENT PRICING AND REGULATORY TRIBUNAL
OF NEW SOUTH WALES

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Final Report

Review Report No 99-4

28 April 1999

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FOREWORD

The NSW Rail Access Regime was established in August 1996 to encourage competition in the provision of train services. IPART has been asked to examine some specific aspects of the regime so that some elements of the Regime might be modified to better achieve this objective. The terms of reference require IPART to report on:

- definitions of some economic cost terms used in calculating price levels
- an appropriate asset valuation and depreciation methodology
- an appropriate maximum rate of return.

The Regime will automatically incorporate IPART's recommendations relating to these matters.

During February 1999, the key stakeholders to this Review sought a further opportunity to provide input on some major issues prior to IPART's recommendations being directly incorporated into the Regime. IPART obtained the Premier's approval for this additional consultation period and consequently released a draft report on 1 March 1999.

The draft report reflected our preliminary assessment of the appropriate maximum rate of return, the asset valuation and depreciation methodologies and the definitions of cost terms which best balance the competing interests of RAC and its customers, having regard to the objectives of the Regime.

This final report has had the benefit of further submissions from the major stakeholders which have better clarified the key issues before IPART. The draft report has undergone some refinements and clarifications which are reflected in this final report.

In particular, in this final report IPART has :

- Increased the maximum rate of return to 8 percent (real pre tax) from the 7.5 percent in the draft report
- Endorsed an interim DORC value for the purpose of determining the ceiling test. This interim value is subject to an adjustment once the independently determined DORC valuation has been finalised.
- Recommended an "unders and overs" account to average minor deviations from the maximum rate of return in any one year.
- Clarified the treatment of expenditure on major periodic maintenance.

The finalisation of this report has been greatly assisted by the major stakeholders who have provided considerable assistance to IPART during the review process.

Thomas G Parry
Chairman
28 April 1999

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EXECUTIVE SUMMARY

The Independent Pricing and Regulatory Tribunal (IPART) has been requested by the NSW Premier to Review specific aspects of the NSW Rail Access Regime (the Regime). This Regime enables third party train operators to negotiate use of the Rail Access Corporation (RAC) rail track for an access charge. RAC was established to manage and provide access to the track in NSW (the RAC Network).

Schedule 3 of the Regime contains a set of pricing principles which RAC must use to calculate the minimum (floor test) price and the maximum (ceiling test) price for access. RAC and access seekers negotiate final prices within these bounds.

The terms of reference for this Review (see Appendix A) require IPART to:

- define economic cost terms used in the floor and ceiling tests
- determine the most appropriate asset valuation and depreciation methodologies to be used in the ceiling test
- set the maximum rate of return on RAC's assets to be used in the ceiling test.

On 1 March 1999, IPART released a draft report which sought views on a set of preliminary recommendations and related issues. Following consideration of the submissions to the draft report and other information, IPART has made some revisions to its recommendations and updated the text of the final report to reflect recent changes.

IPART's recommendations relating to the terms of reference will automatically take effect 60 days after this Report is provided to the Premier. The complete set of recommendations are contained at the end of this final report (see page 77). Appendix B contains a suggested way in which IPART's recommendations relating to the terms of reference can be incorporated into the Regime.

The key changes since the draft report

The key changes that have been made since the draft report include:

- Endorsing the continued expensing of a levellised annual estimate of major periodic maintenance expenditure (MPM).
- Segmenting MPM expenditure into fixed and variable components and permitting the recovery of variable (track usage driven) MPM in the direct cost floor test.
- An increase in the maximum rate of return from 7.5 percent to 8.0 percent (real pre tax). This half a percent rise was to reflect factors including:
  - additional compensation for some diversifiable risks faced by RAC including the regulatory risk of applying a ceiling test to groups of customers
  - a lower inflation forecast and an increase in the real risk free rate due to a change in the method of estimating this component
  - a rise in the market's risk free rate (10 year Commonwealth Bonds)

- Prior to the finalisation of a depreciated optimised replacement cost (DORC) asset value, IPART endorsed the temporary use of a discounted replacement cost value. Subsequently, RAC provided an interim DORC value which IPART endorses as the asset base prior to a retrospective adjustment following the finalisation of an independently determined DORC asset valuation. Customers will also receive interest from RAC on the adjustment amount if the final DORC value is lower than the interim DORC value. This change was made to minimise price shocks to RAC customers.
- The establishment of an unders and overs account system to average minor deviations around the maximum rate of return.

Cost Definitions

The Regime uses three economic terms to describe the floor test and a further two economic terms to describe the ceiling test. IPART recommends that all RAC access prices should be based on both forward looking (forecast) and efficient cost levels.

IPART has recommended the following definitions for inclusion in the Regime:

- Direct costs (or the minimum charge payable) are the costs which vary with the usage of a single operator within a 12 month period, plus a levellised charge for variable MPM costs, but excluding depreciation.
- Full incremental costs are all costs that could be avoided if a Sector was removed from the RAC Network.
- Full Economic Costs are Sector specific costs including a permitted rate of return and depreciation and an allocation of non-Sector specific costs such as train control and overheads including a rate of return and depreciation on non-Sector specific assets. All included items are to be assessed on a stand alone basis. A stand alone basis requires calculation based on the optimal configuration of the existing rail infrastructure to serve all operators including an allowance for five years demand growth.

The terms of reference also require definitions of 'fixed costs' and 'incremental fixed costs' which are provided for completeness, but not as recommendations. IPART has simplified the floor and ceiling tests by defining each test without reference to 'fixed costs' or 'incremental fixed costs'. This approach results in these two terms becoming redundant from the Regime.

The asset valuation methodology

The appropriate asset valuation methodology depends on a number of factors including the objectives for which asset valuations are sought. What may be an appropriate methodology for RAC may be unsuitable for other industries. In this Review IPART has performed a very different role to that which it performs as a pricing regulator for declared monopoly services. For these reasons, it is inappropriate for the asset valuation method recommended for RAC to be applied by reference to other utilities regulated by IPART.

For access pricing purposes under the Regime, the assets owned by RAC should be valued using a depreciated optimised replacement cost (DORC) methodology.

Factors influencing the choice of DORC as the asset valuation methodology include:

- IPART is setting a ceiling rate of return, that is, the maximum payable by a small number of end customers. Final prices are negotiated to be less than or equal to the ceiling test.
- Although DORC generally produces higher values than some other approaches for setting asset values, DORC values are not unreasonable for the purpose of setting the ceiling test (maximum price), which is subject to commercial negotiations.
- A DORC based valuation is supported by all RAC's major customers.

The DORC asset value should be determined by an independent consultant for each line sector. A draft final DORC valuation should be published and stakeholder comments invited. Stakeholder comments must be considered by the consultant prior to a final DORC value being established. Prior to finalising the final DORC value being established, RAC should utilise the interim DORC valuation (discussed in Chapter 5). The DORC value should be revised every five years and between revisions, indexed using the consumer price index.

The depreciation methodology

IPART recommends that the depreciation charge should be based on the assumption that there is an average of 40 years of remaining coal mine life from 1999. This equates to a depreciation charge of 2.5 percent per annum on existing assets to be levied on a straight line basis on the DORC asset valuation. The estimated remaining mine life should also be revised every five years in conjunction with any revision of the DORC asset valuation.

IPART supports charging customers for major periodic maintenance expenditure (MPM) using an estimate of the annual levellised expense. IPART has recommended that RAC provide detailed information to access seekers on the calculation of the levellised MPM expense for the line sectors utilised.

The maximum rate of return

IPART recommends that the maximum rate of return for the NSW Rail Access Regime be set at 8 percent (real, pre tax). This rate was set following consideration of factors including:

- IPART's estimate of RAC's cost of capital which is between 5.3 percent and 8.8 percent.
- The limitations imposed by the Regime's ceiling test on RAC's ability to earn a rate of return above the ceiling test.
- A steady growth of 6.6 percent per annum (with low volatility) in coal tonnages moved by rail in NSW between 1972/73 and 1997/98.
- The risk profile of RAC compared to other utilities and comparable rail entities.
- The fact that the majority of Hunter Valley coal mines are required to use rail transport under the terms of their mining leases or development consents.

This rate of return is based on current market conditions and IPART has recommended that the Government should nominate a process for reviewing the maximum rate of return at three yearly intervals.

1 INTRODUCTION

The NSW Rail Access Regime (the Regime) enables access seekers[1] to access the NSW Rail Network (RAC Network) for the purpose of operating trains.[2] The RAC Network was vested in the Rail Access Corporation (RAC). The Regime contains pricing principles which are designed to assist in price negotiation between RAC and those seeking access to the track to operate trains.

The Regime was initially established by the NSW Government in August 1996. In June 1997, it was submitted to the National Competition Council (NCC) for a recommendation that the Regime was 'effective', meaning that it satisfies the terms of the *Competition Principles Agreement*.[3] The NCC released a Draft Recommendation[4] in April 1998, seeking various amendments and clarification of specific terms which are used in the Regime. In response to the NCC's recommendations, and during the course of this Review, the NSW Government gazetted amendments to the Regime in February 1999.

The Independent Pricing and Regulatory Tribunal (IPART) has been requested by the Premier[5] to examine specific aspects of the pricing principles of the Regime.[6] The terms of reference of this Review are contained in Appendix A.

The terms of reference for this Review restrict IPART to considering only certain matters contained in Schedule 3 of the Regime, ie the pricing principles. These principles outline the basis of calculation of minimum (floor) and maximum (ceiling) prices for track usage. RAC negotiates with access seekers to agree on an access charge between the floor and ceiling price levels. Provided prices are within the floor and ceiling boundaries, usage will be encouraged and cross subsidies (where abnormally high profits from one customer are used to pay the direct or avoidable costs of another) will be prevented.

IPART has examined certain economic cost terms contained in Schedule 3 and provided revised definitions of these terms. Greater certainty in the meaning and application of these terms may give access seekers more confidence in negotiating with RAC.

IPART has also been asked to determine the appropriate maximum rate of return and the methodology for the asset base to which this return will be applied. IPART has also recommended a frequency and method for periodic revisions of the asset base and rate of return.

The recommendations of this final report which relate to the terms of reference are automatically included in the Regime 60 days after this report is provided to the Premier. Hence, the recommendations take effect within the Regime from 28 June 1999.[7]

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1 According to the Regime an Access Seeker means a rail operator, a prospective rail operator, an access purchaser, a prospective access purchaser and the Australian Rail Track Corporation (ARTC). A rail operator is a person responsible for the operation of trains. An access seeker is a person who has contracted with a rail operator in respect of train operations. The ARTC is a Commonwealth Government body established in February 1998 to manage Commonwealth owned track and to act as agent with State governments to provide a single purchase point to assist interstate access seekers.

2 The NSW Rail Network is defined as Rail Infrastructure Facilities as defined in Table 1 of the Regime. These facilities include the rail track, tunnels, culverts, signals, sleepers, etc.

3 Specifically the Regime must conform with the principles in sub-clauses (3) and (4).

4 *Application for Certification of the NSW Rail Access Regime, Draft Recommendation*, NCC, April 1998.

5 The Premier requested the review under S12A of the *Independent Pricing and Regulatory Tribunal Act (1992).*

6 The NSW Rail Access Regime was established August 1996 and amended on 19 February 1999 (see NSW Government Gazette no. 22, 19 February 1999, pp 903-929) in accordance with section 19B of the *Transport Administration Act 1988* as amended.

1.1 Review process

The terms of reference (contained in Appendix A) for this Review require IPART to report on:

- appropriate asset valuation and depreciation methodologies for the Regime
- an appropriate maximum return on assets for the Regime
- appropriate definitions for the following cost terms used in the Regime:
  - direct costs
  - incremental fixed costs
  - fixed costs
  - full economic costs
  - full incremental costs
  - stand alone economic costs.

The terms of reference also require consideration of "the assets used for the carriage of coal." This Report makes use of technical and rail industry terminology (when necessary). These terms and any acronyms used, are explained in a Glossary at the rear of this report.

In conducting a public review, IPART seeks to ensure all interested parties have adequate opportunity to express their perspective on the relevant issues. Consequently, IPART completed an extensive public consultation process, featuring release of an issues paper, public submissions on the issues paper, public hearings, a draft report and a final report.[8]

In October 1998, IPART released an issues paper which explained the process of this Review, gave background to the industry, highlighted the issues to be covered in the Review and invited submissions from interested persons. The issues paper also identified areas where IPART sought input and public comment. Copies of the issues paper and this final report are available from IPART and the IPART website at www.ipart.nsw.gov.au.

Table 1 Consultations for this Review

Milestone	Date
Issues paper released	28 October 1998
Submissions on issues paper closed	27 November 1998
Public hearings	14 and 15 December 1998
Release of draft report	1 March 1999
Submissions on draft report closed	19 March 1999
Release of final report	28 April 1999

[7] See Schedule 3 clauses (iii) and (iv) of the NSW Rail Access Regime established on 19 February 1999 as published in the NSW Government Gazette no. 22, 19 February 1999, p 920.

[8] The minimum public consultation process for an IPART review is specified in Part 4 of the *Independent Pricing and Regulatory Tribunal Act 1992.*

2 THE NSW RAIL SYSTEM

The RAC Network forms an integral part of the NSW transport system. Often rail competes with services provided by other modes of transport (eg road transport and air services). Rail services provide a key link for the movement of passengers and goods within and between States and Territories. However, for the delivery of some goods such as coal, rail is often the only authorised[9] means of transportation.

2.1 Structure and ownership

Prior to July 1996, government rail services in NSW were owned and operated by the State Rail Authority (SRA).[10] The SRA was the track owner, as well as the provider of passenger and freight services. The SRA previously completed maintenance of the track, overhead wires, signals and rolling stock (ie locomotives and carriages).[11] The SRA was operated as an integrated monopoly and was generally not subject to direct competition.

Until June 1996 SRA had a number of divisions including:

- CityRail - metropolitan passenger services in Sydney, Newcastle and Wollongong.
- Countrylink – long distance passenger services.
- Freight Rail - transportation of goods such as wheat, coal and manufactured goods.

In July 1996, the NSW Government passed the *Transport Administration Amendment (Rail Corporatisation and Restructuring) Act 1996* which created the RAC. This Act required the establishment of the Regime which was completed in August 1996. The RAC Network was transferred to RAC. RAC is required to provide third parties access to the RAC Network as provided for in Regime. At the same time, FreightCorp was corporatised and rail maintenance services were transferred to a new entity, Rail Services Australia,[12] which was subsequently corporatised in July 1998. As a result of these reforms, SRA focused on train operations which are divided into business units trading as CityRail and Countrylink.

2.2 RAC Network

The RAC Network consists of over 12,000km of track. It covers a route length of 8,500km. An average of 2,345 train services (paths) per day use the RAC Network. About 2,210 of these are CityRail passenger services with a further 25 daily train services provided by Countrylink.[13] Table 2 contains the breakdown of the RAC Network usage on a gross tonne kilometre basis (GTK). GTK is the rail industry standard measure of track usage or output. GTK is the product of the tonnage carried (gross tonnes) and the distance travelled (kilometres). The RAC Network had usage of 46.68b GTK in 1997/98, a rise of 0.4 percent from 1996/97. In 1997/98 RAC earned access revenue of $590.7m. This included $24.0m in electricity charges for certain rolling stock which use electricity to operate.[14]

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9 See RAC submission to IPART, March 1999, pp 18-19. The majority of NSW coal mines are required by local government development consent conditions to utilise rail transport with some being permitted to use road haulage to the nearest rail loader. A small number of mines have approval to road haul to Port.

10 Some services, even then, were operated by others such as National Rail Corporation (NRC) which is jointly owned by the NSW, Victorian and Commonwealth governments. Also, BHP owns networks of track around it's NSW plants and operates its own trains on this track.

11 Privately provided maintenance was also available and the SRA outsourced part of these functions.

12 Formerly known as Railway Services Authority between 1 July 1996 and 30 June 1998.

13 Information provided by RAC, January 1999.

14 RAC Annual Report 1997/98, p 74.

Table 2 RAC Network Usage & Revenue (1997/98)

Purpose	Av number of train paths per day (paths)	Train paths used as a proportion of train paths sold by RAC (%)	Usage by GTK (%)	Contribution to RAC Access Revenue (%)
Countrylink	25	1.1	4	2
CityRail	2,210	94.2	21	58
Minerals	7	0.3	2	1
Grain*	20	0.9	13	2
General Freight	24	1.0	5	2
Interstate Freight	15	0.6	24	6
Coal	44	1.9	31	29
Total	2,345	100	100	100

Source: RAC January 1999.
Notes: Relative usage assessed on a gross tonne kilometre basis.
Revenue does not including offsetting funding from the line CSO or bulk electricity charges.
*Average during the grain transport season (or up to 5 months from December through to April).

Train paths are a more difficult product to define as they are not homogeneous, varying by location and over time. In fact, the definition of a train path depends on the particular origins and destinations identified, on the direction and on the quality and extent of the RAC Network involved. A train path cannot be stored and cannot be physically transferred to alternative locations or to alternative times. In addition, a train path is influenced by the type of operator using the path, as the path required varies with operating speed and train length.

In 1997/98, FreightCorp hauled 82.1m tonnes of freight over the RAC Network with coal accounting for 84.2 percent of this tonnage.[15] During 1997/98, RAC's principal passenger operator, SRA, completed 269m passenger journeys. Of this total, CityRail completed 266.5m journeys (an average of 900,000 passenger journeys per weekday) and Countrylink completed 2.5m long distance passenger journeys (equating to 6,850 per day).[16]

Although the RAC Network is controlled by one organisation, RAC, the above table indicates the different nature of rail services. The RAC Network features two relatively dense sub-networks - the Sydney CityRail passenger network and the Hunter Valley coal network - and three thinner transport networks - intrastate freight (which in tonnage terms is dominated by grain), interstate freight and long distance passenger (Countrylink and Great Southern Railway).

[15] FreightCorp Annual Report 1997/98, p 3.
[16] State Rail Authority of NSW Annual Report 1997/98, p 14.

3 THE NSW RAIL ACCESS REGIME

In 1995, Commonwealth and State Governments agreed to implement reforms designed to open domestic markets by removing unnecessary barriers to trade and competition. The *Competition Principles Agreement* (CPA) requires all Governments to implement third party access regimes (see Box 1) for access to services provided by the use of significant infrastructure facilities to permit effective competition in downstream markets.

Box 1 Access Regimes

An access regime is a set of procedures for allowing a third party to use services provided by significant infrastructure facilities owned or operated by another party on fair terms. This usage may then promote competition in other markets. Common types of infrastructure facilities include electricity transmission lines, gas pipelines, telecommunication networks and rail track. For example, energyAustralia can sell electricity to a customer located in another distribution area owned by, say, Integral Energy. Similarly, in rail this means allowing public and privately owned access seekers to provide services over track they do not own. Essential infrastructure facilities display monopoly characteristics as it would be uneconomic to invest the vast capital required to duplicate them.

Allowing new service providers access to infrastructure will encourage competition in the provision of services. The common benefits of competition are lower prices, choice of service provider, more innovative and better quality services and a more efficient utilisation of a network. Competition will improve productive efficiency as service providers minimise their operating costs to provide services at the lowest possible price. In turn this will increase the competitiveness of the downstream goods and services markets that use the infrastructure. Downstream market beneficiaries may include agricultural producers, mining companies, manufacturers and users of rail passenger transport.

The prices at which service providers can offer services depend heavily on the level of access charges applied to them by infrastructure owners. More often there is no competitive market in infrastructure, that is, service providers usually have no choice of which pipeline or rail track to use. However, most of the benefits of competition in the operation of multiple services on infrastructure may be achievable through a fair and reasonable access regime.

The aim of separating rail track ownership from service provision was to promote competition in markets suitable for multiple providers, ie freight and passenger train services. Prospective access seekers can negotiate with RAC on the same basis as existing rail operators.

The NCC has concluded that the RAC Network is a natural monopoly because it is a significant infrastructure facility which is not feasible to duplicate, and access to this network is necessary for competition in other markets.[17] Duplicating the vast majority of RAC's Network would be uneconomic given the current level of demand for train services and the vast capital cost required. The market power of rail is generally limited by competition from road transport, with highways often paralleling rail lines. However, most coal haulage from the Hunter Valley is captive to rail as in most cases coal mine approval and mining leases are granted on the condition that transport is primarily by rail.[18]

3.1 Who does this regime apply to?

The NSW Rail Access Regime applies only to track vested in RAC and located within NSW. It does not apply to any other track, whether owned privately or by the government. This Regime is different to the gas, electricity and telecommunication regimes operating in

[17] NCC, *Application for Certification of The NSW Rail Access Regime, Draft Recommendation*, April 1998, pp 5-6.

[18] NSW Minerals Council submission to IPART, 27 November 1998, p 15.

Australia which are generally asset specific in that they apply to all assets of a particular type and hence to an array of owners.

The Regime does not apply to track that:

- RAC has divested or sold to any other entity
- RAC owns (or is vested) which is located in any other state / territory other than NSW
- is owned by coal mines, Speedrail, RSA, BHP, FreightCorp, NRC, TNT or other private organisations.

As the NSW Rail access Regime is yet to be declared effective by the NCC, all track in Australia (including the RAC Network) can be the subject of an application for access under the national access regime created by Part III of the *Trade Practices Act 1974* (TPA).

3.2 The pricing of access under the Regime

RAC's interpretation of Schedule 3 of the Regime is set out in RAC's *Access Pricing Policy*.[19] RAC's policy states that "Prices will be negotiated between RAC and rail operators, subject to Schedule 3 of the Regime". The Regime requires prices to be set such that they are consistent with the so called *floor test* and *ceiling test* in the Regime.

The description of the 'floor and ceiling' approach to pricing was initially designed to prevent cross subsidies. The approach is described in Box 2.

Box 2 Summary of the Baumol band approach for monopoly pricing

The 'floor/ceiling' approach to pricing regulation is associated with the work of Professor William Baumol. It sets a band within which prices can be negotiated. Prices cannot fall below or rise above this band. This approach has two overarching purposes:

- The ceiling is based on stand alone costs and aims to prevent the regulated firm from extracting monopoly profits; and
- The floor is based on avoidable costs[20] and aims to ensure that prices are not set so low that some rail operators do not pay for the costs of the services they use.

The floor/ceiling approach reflects the boundaries of pricing which would exist if the market was open to competition and so provides an economically defensible method of regulation.

The stand alone cost test encompasses the situation where a single service is provided to a rail operator or rail operators and also the situation where a group of services is provided. In this case, the 'combinatorial' stand alone cost test is that the revenue from a group of operators cannot exceed the economic cost of the services provided to them if they were provided on a stand alone basis. Therefore, where there are multiple users of a line sector(s), it will be impossible to charge all operators above the stand alone costs of their individual operations and still pass the combinatorial test.

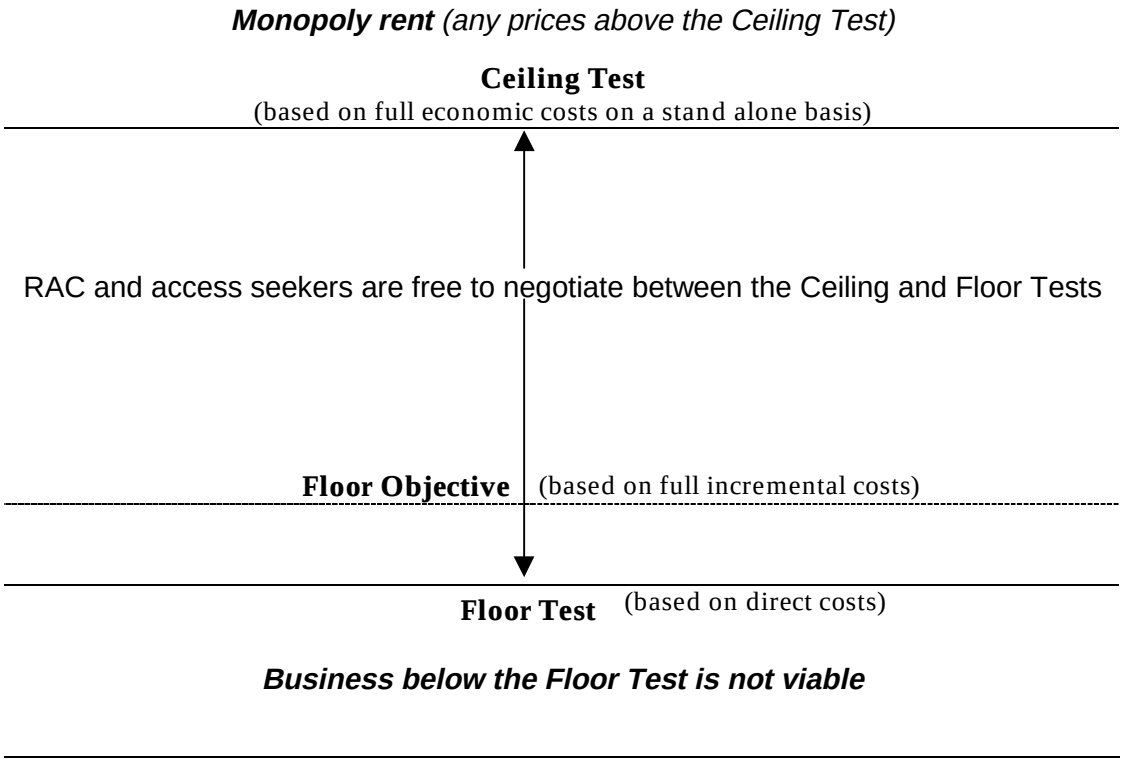
Source: KPMG, Report for the NCC, *The pricing principles contained in the NSW Rail Access Regime*, September, 1997, p 32.

IPART has outlined diagrammatically in the figure below the main themes of the 'floor and ceiling' approach to pricing in the Regime.

[19] RAC, September 1996.

[20] It should be noted that the Floor Test in the Regime is actually based on two components: train operators have to meet, as a minimum, their direct costs and as an objective their full incremental costs.

Figure 1 Summary of the Floor and Ceiling Tests of the Regime



RAC's legislated objectives include business success and maximising the net worth of the State's investment in rail track.[21] However, since RAC is the only provider of the RAC Network, the ceiling test of the Regime seeks to constrain RAC from earning excessive profits whilst encouraging it to promote greater usage of the community's rail assets.

The Minerals Council has repeatedly expressed the concern that (in the absence of a regulator) to ensure the price tests are complied with, the floor test needs to be carried out in conjunction with the ceiling test.[22] However, provided all operators pay their direct costs and no operators pay above the ceiling test then cross subsidies are prevented and the tests can be completed independently of one another. Requiring RAC to provide actual floor and ceiling test prices to each access seeker would unduly hinder RAC's ability to negotiate.

This report contains recommendations which improve the transparency of information RAC provides operators. This should provide greater comfort that the price tests are complied with. Recommendations include publishing specific asset values by Sector, a nominated depreciation charge, a maximum rate of return and a breakdown of the levellised MPM expenditure calculation.

3.3 Floor Test

In the Regime, the floor test is defined as

a) Access revenue from every Access Seeker must at least meet the Direct Cost imposed by that Access Seeker. In addition, for any Sector or group of Sectors, revenue from Access Seekers together with Line Sector CSOs should, as an objective, meet the Full Incremental Costs of those Sectors ('**floor test**');

[21] *Transport Administration Act* 1988 - Section 19D (1) (c) (ii).

[22] Minerals Council submission to IPART, March 1999, p 11.

The floor test is a two limb test requiring that,

1. RAC's revenue from every access seekers be at least the ***direct costs*** of their usage.
2. Revenue from any Sector or group of Sectors be, as an objective, no less than the ***full incremental costs*** of providing those Sectors.

The floor test requires estimates of an individual operator's direct costs and the incremental costs of each line section. The second limb of the floor test was previously an obligation. Due to concerns raised by the NCC,[23] in February 1999 the Government amended the Regime to reduce the second limb to an objective. The Regime now also allows for inclusion of the line Sector Community Service Obligation[24] (CSO) subsidies paid by the NSW Government to RAC, to be included as revenue in assessing whether the floor test is met.

Another significant change to the amended floor test is the removal of the words 'incremental fixed costs' from the definition of the term 'full incremental costs.'

3.4 Ceiling Test

In the Regime, the ceiling test is:

b) for any Access Seeker or group of Access Seekers, access revenue must not exceed the Full Economic Costs of the Sectors which are required by the Access Seekers on a stand alone basis ('**ceiling test**');

However, RAC is currently charging access seekers servicing some Hunter Valley coal mines access charges which are above the ceiling price, ie a monopoly rent. Issues relating to monopoly rent are discussed further in Section 3.5.

The combinatorial nature of the ceiling test

The combinatorial test refers to the requirement that revenue RAC collects from any rail operator or group of access seekers is not to exceed full economic costs on a stand alone basis. Hence, RAC must assess whether it has breached the ceiling by examining multiple combinations of customers against the relevant costs of the line Sectors used. In theory, the number of combinations is large.[25] However, the plausible number of combinations likely to breach the ceiling test is far lower because:

- In 1997/98 the ceiling price including the maximum rate of return was only paid by mines using 11 rail loading loops in the central Hunter Valley.
- RAC has undertaken to charge the same access price to mines which load from the same rail loop.[26]
- All central Hunter Valley coal traffic travels up to 153km along one track corridor in a south easterly direction from near Muswellbrook to the port facilities at Newcastle. This track corridor contains the most profitable combination of mines which are in close proximity. Hence, charging the central Hunter Valley combination the ceiling test

[23] For example, where an operator ceases services on a line used by only one other operator. The continuing operator (without alteration to its usage) would probably require an access charge increase to ensure RAC satisfied the second limb of the floor test.

[24] NSW Treasury pays RAC a fixed line sector CSO ($177.2m in 1997/98) to cover the difference between access payments and the second limb of the floor test for rural and non-electrified regional rail lines. The Hunter Valley coal lines and the CityRail electric network do not receive line sector CSO funding.

[25] For example, in 1997/98 there were 11 coal loading rail loops known as 'Category 1 mines' (explained further in Section 3.3). This created (2^{11}- 1) possible combinations, or 2,047 combinations.

[26] RAC submission to IPART, 27 November 1998, p 28.

constrains most individual mines and other combinations of mines to price levels well below the ceiling price.

Total RAC Access Revenue

Schedule 3(i)(c) of the Regime, contains the following final limitation:

c) total Corporation Access revenues must not exceed the stand alone Full Economic Costs of the entire NSW Rail Network.

In practice this revenue test has not been a constraint for RAC. The test would only activate if RAC was able to earn full economic costs including the full maximum rate of return over the whole of the RAC Network. RAC reports that its rate of return over the whole of the RAC Network is low.[27]

3.5 The carriage of coal

The terms of reference for this Review require IPART to "consider the assets used for the carriage of coal." RAC assets used for transporting coal are the only assets not valued at zero in RAC's financial accounts. This is because some coal customers are the only customers who pay access at or above the ceiling test.[28] Providing access to coal trains is a core market segment for RAC. It accounts for 31 percent of RAC's Network GTKs and 29 percent of access revenue in 1997/98.[29] RAC states that coal is "the key ingredient in its commercial success."[30] However, only 13 percent of RAC's track kilometres are used for hauling coal.

To accommodate growth in tonnage and to improve profitability, train operators have sought to raise capital and labour efficiency. This is primarily done by increasing the coal tonnes per train by running longer and heavier trains. The weight of loaded coal trains (up to 11,000 net tonnes)[31] places track components under greater stress. Consequently, most of RAC's coal assets, especially the tracks for loaded trains heading to port have been upgraded to feature concrete sleepers and a heavier grade of steel. RAC also completes a more frequent maintenance and replacement program for its coal rail assets.

Assets used for the carriage of coal

RAC's Hunter coal network is centred on the Hunter Valley between Muswellbrook and the Port of Newcastle.[32] It extends beyond this to service coal mines near Gulgong, Gloucester, Gunnedah and Fassifern. The Hunter coal network uses 784 route kilometres of track (1,000 track km) over 58 line Sectors. The Hunter coal network uses four rail lines:

1. The Main North Line from north of Gunnedah to Newcastle Port.
2. The Ulan line between the Ulan mine (near Gulgong) and Muswellbrook.
3. The North Coast Line between the Stratford mine (south of Gloucester) and Maitland.
4. The Main North Line between the Newstan mine (near Fassifern) and Newcastle Port.[33]

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27 RAC submission to IPART, November 1998, p ii.
28 RAC Annual Report 1997/98, p 78.
29 RAC submission to IPART, November 1998, p 5.
30 RAC Annual Report 1997/98, p 18.
31 A net tonne measures only the weight of the freight (coal). The gross tonnes of a coal train (including locomotives and wagons) are approximately 1.8 times the net tonnes.
32 The Port of Newcastle is serviced by two coal loading terminals at Kooragang Island and Port Waratah.
33 A Hunter Coal Rail Network map is contained in the RAC submission to IPART, 27 November 1998, p 9.

RAC's Southern and Western coal network has a lower traffic intensity, carrying around 10 percent of the coal hauled over the Hunter network. This coal network is approximately 400km and links Port Kembla to nine coal loading terminals. The majority of the coal is from mines around the Lithgow region. It is hauled using a combination of diesel and to a lesser extent electric locomotive power. It travels down the Main West Line to Sydenham and then proceeds via the Illawarra line to Port Kembla.[34] RAC state that access prices for southern and western coal mines are presently set as close as possible to direct costs and that line CSO payments enable this coal to meet the second limb of the floor test.[35] Because the Southern and Western coal network do not earn a return on assets, RAC's financial accounts value them at zero.

CityRail is the major user of most of the track for the Southern and Western coal network. Under the Regime, passenger services retain right of priority over freight services.[36] IPART believes the range between the floor and ceiling tests provides adequate scope for accommodating the cost of such priorities. RAC has separate cost accounts for coal network costs and other network costs. For example, the third and fourth tracks of the 'quad track' between Newcastle and Maitland, mainly used by CityRail, are not included in the coal network costs or the asset valuation.[37]

Coal train operations

During the first two years of the Regime (1996/97-1997/98) FreightCorp was the only coal train operator. Now, National Rail Corporation (NRC) has won a contract to haul domestic coal commencing in 1999. This signals the start of formal competition.[38]

Coal comprises 84 percent of total FreightCorp tonnages with 69.1m tonnes of coal hauled in 1997/98. Almost 90 percent of FreightCorp's coal haul originates from Hunter Valley mines. In 1997/98 Hunter Valley mines exported 61.6m tonnes of coal via rail for shipping from Newcastle, 6.2m tonnes of coal was exported from Port Kembla (from the Southern Highlands, Illawarra and Lithgow coal mines) and 1.3m tonnes was railed for domestic usage by power stations and in steel production.[39]

To prevent disruption of other rail traffic, coal trains leave the main line to load and usually enter a privately owned branchline featuring a 'balloon loop' which is commonly 3-13km long. It enables the train to load and then turn around to head towards port. Some loops in the central Hunter Valley contain multiple overhead loaders capable of servicing several mines each. The train's wagons circle slowly under overhead loaders and progress to port once fully loaded. Coal trains in NSW vary in length from 0.7 to 1.5km long and carry 3,000-11,000 tonnes of coal each. This variation in haulage capacity per train is due to factors such as track strength/quality, track grade, mine loader capacity and passing loop lengths.

Access prices for coal haulage

Access prices for the carriage of coal are set by RAC.[40] By contrast, all other access prices are negotiated between RAC and the access seekers. Some Hunter Valley mines are paying above the ceiling price. The portion of charges above the ceiling price is called monopoly

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34 An alternative route requires diesel power and uses the Main South Line via Moss Vale to Port Kembla.

35 RAC submission to IPART, November 1998, p 4.

36 See Schedule 4 of the NSW Rail Access Regime of 21 August 1996.

37 Mr Mike Smart, Manager Corporate Strategy, RAC, IPART Hearing Transcript, 15 December 1998, p 131.

38 Dr Fred Affleck, National Rail Corporation, IPART Hearing Transcript, 14 December 1998, p 83.

39 FreightCorp Annual Report 1997/98, p 3.

40 See NCC, *Application for Certification of the NSW Rail Access Regime, Draft Recommendation,* April 1998, p 19.

rent. The Regime requires use of origin-destination specific coal access prices.[41] Consequently, RAC must charge a uniform access price per rail loading loop regardless of the quality of the trains wheels, the weight of the axle load[42] or the viability of the coal mines using the loop. Rewarding train operators who cause comparatively less damage to the track with lower prices is desirable and would improve the cost reflectivity of access pricing. The NSW Government has provided an undertaking to the NCC to review the use of origin-destination coal access pricing in consultation with mines for implementation by July 2000.[43]

IPART understands that FreightCorp uses some price differentiation in servicing coal mines using the same rail loop based. FreightCorp price differentiates based on factors such as volume, the remaining life of the coal mine and the service frequency requirements.

The Regime phases out all remaining monopoly rents by 30 June 2000. In assessing which mines continue to pay monopoly rent, the Regime examines the extent to which 1996/97 rail freight revenue exceeded full above rail and below rail costs.[44]

The central Hunter Valley mines, previously known as 'Category 1' mines under the August 1996 Regime, refers to 11 loading rail loops (15 loading points) between Bloomfield (38km from port) and Dartbrook (153km from port).[45] The central Hunter Valley mines are the only ones to pay monopoly rent and account for over 80 percent of coal railed to Newcastle for export. Mines formerly known as Category 1 pay their train operator (or RAC) the ceiling test amount plus a declining 'adjustment component' (representing monopoly rent). It is set at 25 percent (of 1996/97 levels) for 1999-2000 and will be zero by 1 July 2000. The mines also pay the train operator (FreightCorp or others) a charge for train operating costs. Total monopoly rent collected in 1996/97 was $50.8m.[46] RAC advises that it collected $41m in monopoly rent in 1997/98 which was forwarded in full to NSW Treasury.[47]

Table 3 Government's progressive reduction of monopoly rent for coal rail haulage

Reduction of monopoly rent	1996/97 (Actual)	1997/98 (Actual)	1998/99 (Target)	1999/00 (Target)	2000/01 (Target)
Monopoly rent retained by Government $m	50.8	41.0	25.4	12.7	0.0
Monopoly rent as a % of 1996/97 rent	100	80.7	50.0	25.0	0.0
Accumulated monopoly rent returned to coal mines $m	0	9.8	35.2	73.3	124.1

Source: NSW Treasury, submission to IPART, December 1998.
Notes: All figures are nominal amounts (or dollars of the day).
The figures from 1999/2000 will alter following adoption of this report.

41 See Schedule 3(ii)(a) of the Regime. Origin-destination pricing is used due to fixed distances between each rail loop and Port. Coal rail access prices are set for each rail loop in $ per net tonne for use of the track from each rail loading loop to Port. More often rail access prices are expressed in cents per GTK and also commonly use a two-part tariff.

42 Heavier axle loads and unmaintained wheel profiles generally cause faster track wear and raise costs.

43 NCC Circular, NSW Rail Access Regime Certification Process, 2 November 1998, p 2.

44 Above rail costs are those related to train operation and rolling stock. Below rail costs are those related to the track and related structures including signals, overhead power systems and track fencing.

45 Category 1 mines utilise 11 loading points: Bloomfield, Branxton, Camberwell, Dartbrook, Drayton, Hunter Valley, Liddell, Mt. Owen, Mt. Thorley, Newdell, Pelton, Rix's Creek, Saxonvale and Bengalla.

46 NSW Treasury submission to IPART, 11 December 1998, Table 1.3.

47 RAC submission to IPART, 27 November 1997, p 42.

The August 1996 version of the Regime contained two other classifications for mines not paying monopoly rent: 'Category 2' and 'Category 3'. Category 2 applies to four mines that pay a positive rate of return which is less than the maximum rate. The Category 2 mines are Ulan, Stratford, Newstan and Teralba which transported by rail a total of 7.7m tonnes in 1997/98 or 12.5 percent of the total tonnage of the Hunter Valley coal rail network. Category 3 mines are three loading points in near Gunnedah which paid access at below the floor test. This required RAC to use the line CSO to lift effective access charges to the floor level. These mines are paying reduced access fees due to their longer distances from port (up to 320km from Newcastle) and lower output levels. In 1997/98, Category 3 mines accounted for only 2.3 percent of FreightCorp's coal rail haulage.

The trend for both access and total freight charges for coal rail transport is downwards. FreightCorp reports that total rail charges for coal mines in the central Hunter Valley have been reduced by 25 percent in the two years since 1995/96.[48] This price reduction was achieved through a combination of decreased operating costs and lower access prices. More recently RAC advise that coal rail access charges per tonne (excluding the adjustment component) decreased by 11 percent in real terms between 1997/98 and 1998/99.[49] Access prices for the southern and western coal mines have been more stable as since July 1996 they have been set "as close as possible to the absolute floor level of direct costs."[50]

The impact of this Review on monopoly rent reductions

Schedule 3 (ii) of the Regime defines the process for the phase out of monopoly rent payments before July 2000. The monopoly rent in 1999/2000 will be 25 percent of an adjustment component calculated by the formula described in Schedule 3 of the Regime. The formula includes consideration of the maximum rate of return. If the maximum rate of return is reduced, the adjustment component increases by an equivalent amount.

Overall, coal access prices will continue to fall. This final report contains a recommendation which reduces the rate of return. The monopoly rents summarised in Table 3 are based on the 14 percent nominal post tax rate of return. With the implementation of a lower ceiling rate of return, the size of the adjustment payments (monopoly rent) may be larger[51] than forecast for in 1999/2000 ($12.7m). However, the lower ceiling test prices (due to the lower rate of return) will more than offset the one year rise in the monopoly rent.

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48 FreightCorp Annual Report 1997/98, p 8.

49 RAC submission to IPART, 27 November 1998, Appendices p 27.

50 RAC submission to IPART, 27 November 1998, p 4.

51 This rise is because the monopoly rent will increase by 25 percent of the difference in the two maximum rates of return. The amount of the final rise in the adjustment component is uncertain as it will vary with the final asset valuation.

4 DEFINITION OF ECONOMIC TERMS

Determining floor and ceiling prices for access seekers in NSW involves calculating the costs borne by RAC in providing track. Schedule 3 of the Regime is drafted to automatically adopt IPART's recommended definitions of certain cost terms which describe the component costs to be recovered in the floor and ceiling access prices.

In formulating better definitions, IPART notes there is a tradeoff between simplicity in providing short definitions and some possible extra clarity in providing more prescriptive definitions. Yet there is also potential for highly specific definitions to exclude the recovery of reasonable yet unforeseen costs.

4.1 Allocation of costs

RAC's Network wide costs are predominantly fixed. RAC reports a split of 80 percent fixed and 20 percent variable costs over its Network.[52] RAC also reports that the proportion of variable costs rises with tonnage. For example, the Hunter coal lines have broadly equal (50:50) fixed and variable costs.[53] Consequently, some means must be used to determine how fixed costs are recovered from RAC customers.

The key objective of cost allocation is to ensure that each operator pays a fair and cost reflective share of the expenses related to its operation. For example, heavier loads travelling at higher speeds impose greater maintenance and renewals costs. Cost allocation involves using judgement to select the most appropriate means of attributing common costs[54] between multiple users. Where costs can be exclusively and causally related to particular services or access seekers, no cost allocation is required. Where multiple access seekers use the same line Sector, it is more difficult to allocate costs.

IPART notes that RAC's *Access Pricing Policy* states "Rail Access will not use profits to cross-subsidise between access seekers or sections of the network."[55] Calculation of the size of any cross subsidy will vary with the method of cost allocation.[56] Cross subsidies distort resource use because prices do not reflect costs. This can also lead to inefficient use of resources in downstream industries.

RAC has an Infrastructure Cost Model (ICM) used to allocate costs and enable the calculation of access charges. The ICM contains 15 different cost categories. Of these categories, RAC believes only the allocation of RAC overheads to operators has any degree of subjectivity. Overheads could be allocated by an operator's proportion of either GTKs, train paths or of RAC's estimated total access charges. RAC has chosen to allocate overheads in proportion to GTKs. RAC believes that subjectivity of allocation is generally low as currently relatively few line Sectors have significant usage by more than one train operator. Sectors with multiple train operators generally share track costs in proportion to their GTKs. Most non-track costs, such as signals and telecommunications for example, are

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52 RAC submission to IPART, 27 November 1998, Appendices p 10.

53 Mr Mike Smart, Manager Corporate Strategy, RAC, transcript of Public Hearing, 15 December 1998, p 203.

54 Common costs are those which remain unchanged as access services are expanded or varied and are incurred if any one customer is serviced; eg a PABX telephone system. Yet some common costs may rise when threshold points of service expansion are reached.

55 *Access Pricing Policy*, Rail Access Corporation, September 1996, Section 3.5.

56 The economic definition of a cross-subsidy is when one service is priced below avoidable cost, while simultaneously another service is priced above stand alone costs.

generally allocated by train kilometres. This general approach is formally endorsed by the rail industry as the most reasonable method of cost allocation between multiple users.[57]

IPART's terms of reference do not require an assessment of the reasonableness of RAC's system of cost allocation. Instead, IPART encourages train operators to request information on RAC's cost allocation methodology as part of the negotiation process.

A balance must be struck between the detail of cost information made available to access seekers, its usefulness and the cost of providing this information. An ideal regime would place an obligation on RAC to publish highly segregated cost components for each market segment and to provide customers with a transparent description of cost allocation. The revised Regime requires RAC to provide an information package to prospective operators. This may reduce the problem of information asymmetry.

4.1.1 The basis of costs used in access prices

The draft report for this Review noted that access prices could be based on forward looking efficient costs and not actual (or forward looking actual) cost levels. To calculate likely Sector costs for the year in which access is sought, RAC examines the previous year's cost levels, discounts this by expected efficiency gains and adds a CPI based margin to allow for changes in input costs.[58] All submissions to IPART on this issue sought the use of estimated forward looking efficient costs in calculating access prices.

The NSW Government has imposed a 17 month moratorium on RAC competitively tendering maintenance contracts.[59] In light of this ban, RAC customers are increasingly concerned about the gap between efficient and actual costs.[60] The difference between the two appears significant. RAC's submission expresses confidence in its ability to still meet targeted maintenance cost reductions of 30 percent over the five years commencing July 1996.[61] Given the likely downward trend in maintenance costs following the re-commencement of tendering in July 1999, access charges must be based on forward looking (forecast) rather than historical costs.

There is an issue as to whether the costs used should be a forecast RAC's actual costs, or a forecast of RAC's efficient costs. Efficient costs are defined as an estimate of total costs assuming best practice industry benchmarks are achieved across all activities. If prices were based on forecast actual costs rather than forecast efficient costs, RAC would have reduced incentives to lower costs, as prices reflect a simple pass through of expenditure. Similarly, some costs such as capital may be considered to be sunk costs.[62] Depending on demand levels, recovery of sunk capital costs may not provide appropriate signals for efficient future resource use.

If RAC's efficient costs differ from its forecast costs, the use of efficient costs in the definitions is more likely to promote appropriate resource allocation and encourage RAC to

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57 See NFG2 costing convention (Railways of Australia - National Freight Group 2nd Cost Convention, 1990).

58 RAC submission to IPART, 27 November 1998, p 26.

59 See RSA 1997/98 Annual Report, p 4. A 17 month moratorium was imposed on 10 February 1998 to enable the RSA to be corporatised and for improvements in management systems to be implemented. The Government has stated that it will allow the recommencement of competitive tendering from 1 July 1999.

60 See FreightCorp submission to IPART, November 1998, p 24 and Minerals Council submission to IPART, 4 January 1999, p 4.

61 RAC submission to IPART, 27 November 1998, p 7.

62 The capital value of infrastructure may be regarded as 'sunk' if it cannot be moved to an alternative investment.

improve its cost structure. Alternatively, if RAC is not able to cover its actual operating costs, the financial viability of the business may be reduced leading to under-investment and reduced levels of maintenance.

RAC reports that it is progressing toward a fully efficient cost structure by demonstrating efficiency gains made to date. RAC states that competitive tendering and 'alliance contracting' with Railway Services Australia (RSA)[63] will produce further savings. The use of competitive tendering and the threat of competition do not automatically guarantee that efficient cost levels have been reached. Most submissions on this issue concur with the Minerals Council which state:

> Nevertheless there can be no doubt that not only direct costs but all costs should be based on efficient costs rather than actual costs.[64]

IPART encourages train operators to conduct their own examination of proposed access prices to ensure they based on forward looking efficient costs as part of the negotiation process. Overall, a gradual progression toward a efficient cost levels would appear a reasonable outcome.

Recommendation 1 – The basis of costs
For the purposes of the NSW Rail Access Regime, RAC access prices should be based on forward looking (forecast) efficient costs.

4.1.2 Establishing a process to ensure access prices are based on efficient costs.

The draft report for this Review sought stakeholder views on the most reasonable method to ensure access prices are based on efficient cost levels rather than actual costs. Submissions presented several options including:

- Minerals Council proposal: completion of an estimate of efficient cost levels as part of the independent DORC valuation consultancy.[65] The Council views estimating efficient costs as a necessary part of the valuation process to determine capital/operating cost tradeoffs.
- FreightCorp proposal: a combination system featuring progress toward full contract contestability, a consultancy validating targets, periodic cost assessment by an independent regulator, periodic benchmarking and bottom-up cost studies. On completion of the competitive tendering process FreightCorp would accept the resulting cost levels as efficient.[66]
- RAC & NSW Treasury: efficient costs be determined by the competitive tendering of maintenance programs.

IPART's terms of reference do not require an assessment of efficient cost levels. However, IPART believes that RAC's targeted maintenance cost reductions provide a significant cost improvement and provides one of several options for a path towards efficient costs. IPART suggests that RAC publish sufficient information to illustrate progress towards or compliance with, its own cost efficiency targets. RAC is aiming for a 23 percent real reduction by 1998/99, a 30 percent real reduction in maintenance costs by 2000/01 and 40 percent real reduction by 2004/05 from the total dollar amount spent on maintenance in

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63 RSA is the train and track maintenance entity owned by NSW Government. RSA was formed in July 1996 when most track and train maintenance staff and equipment were transferred from the SRA to RSA.

64 NSW Minerals Council submission to IPART, 27 November 1998, p 31.

65 Minerals Council submission to IPART, 19 March 1999, p 17.

66 FreightCorp submission to IPART, March 1999, pp 5-9.

1996/97 ($564.1m). Routine maintenance and MPM account for around 80 percent of RAC's cash costs. Train control is the other major expenditure item for RAC representing 11.3 percent of cash costs in 1997/98.[67] RAC has also committed to passing on a CPI-1% per annum decrease in train control costs. Total train control costs were $74m in 1997/98.[68]

FreightCorp believes that access prices from 1 July 1999 should be based on the full gains from contestability rather than a staged approach. In light of the Government imposed moratorium on competitive tendering of maintenance contracts, FreightCorp seeks an immediate CSO for the gap between actual costs and efficient costs which RAC estimate are 40 percent below 1996/97 maintenance cost levels.[69] This CSO can then be phased down as efficiency gains are achieved.

The Table below outlines IPART's understanding of RAC's proposed efficiency targets. This system is only a guide and is not binding on RAC. Naturally, each operator's actual price decrease will vary from the average depending on factors such as changes to their service specifications and the point in the MPM cycle. RAC should provide each operator with information on progress towards efficient costs for the Sectors utilised by them.

Table 4 Summary of RAC's proposal to move toward efficient maintenance costs

RAC Maintenance Cost Targets	1996/97 (Actual)	1997/98 (Actual)	1998/99 (Target)	1999/00 (Target)	2000/01 (Target)
Targeted cumulative real reduction in maintenance costs	0%	15%	23%	26.5%	30%
CPI Forecast	2.5%	2.5%	2.5%	2.5%	2.5%
Cumulative Nominal decrease	0.0%	12.5%	17.9%	18.8%	19.6%
Maintenance Costs	564.1	493.8	463.0	458.0	453.5
Average Access Price (c/GTK)	1.15	1.27	na	na	na
Ave maintenance costs (c/GTK)	1.21	1.06	0.99	0.98	0.97

Maintenance costs are the sum of routine, variable MPM and fixed MPM costs. na: not applicable.
Assumes constant GTKs (46.68bn from 1997/98 onwards).

The access prices paid by operators from 1998/99 onwards may also be affected by separate arrangements applying to the phase out of monopoly rent.

The draft report raised the issue of whether a system of efficiency performance indicators would provide train operators with greater comfort that progress towards efficient costs is occurring. Most stakeholders agreed that it would also be desirable for RAC to demonstrate to end customers and to train operators its commitment to reach efficient costs by regularly publishing performance indicators measuring:

- Operating efficiency: demonstrating that the productivity of inputs utilised in providing track and associated overheads meets and is maintained at world's best practice.
- Technical efficiency: demonstrating that the optimal type and combination of inputs is utilised to provide a safe and 'fit for purpose' track at the lowest possible cost. An example is programming the cost efficient combination of ballast cleaning and ballast replacement to provide a quality track formation.

[67] RAC Annual Report 1997/98, p 61 and p 67.
[68] RAC submission to IPART, 12 April 1999, p 2.
[69] FreightCorp submission to IPART, April 1999, p 1.

Consequently, IPART encourages RAC to publish sufficient performance indicators to enable RAC's progress towards efficient cost levels to be monitored.

Recommendation 2 – Provision of information on progress towards efficient costs
IPART recommends that Government consider requiring RAC to demonstrate progress toward reaching maintenance cost targets to each access seeker for the Sectors utilised.

4.1.3 Segmenting track to attribute costs

An objective basis for desegregating the RAC Network into discrete components is required in order to derive prices for train operators under the Regime. Schedule 3 of the Regime uses the term, 'Sectors' to segment the RAC Network. The Regime defines a Sector as a continuous length with end points determined by RAC from time to time for its management purposes, usually delineated by major junctions or traffic origins and including all rail infrastructure facilities associated with the track on that Sector.[70]

The length of Sectors is important in measuring costs related to particular train operators. Sectors which are too small increase the proportion of costs avoided if operators' cease services. Conversely, Sectors which are very large result in very few costs being avoidable for any given traffic. Similarly, too small a line Sector may increase the subjectivity in allocating common costs.[71] The optimal size of each Sector needs to be considered in light of traffic mix, usual routes and density. RAC has segmented the RAC Network into 239 active Sectors, 58 of which are in the Hunter Valley Coal network. Sectors are on average 36km in route length with a shorter average length in the Hunter Valley of 14km.

In setting Sector boundaries RAC uses some discretion. In practice, customers will request that Sectors are defined so no significant traffic joins the track in the middle of a line Sector. RAC uses this approach to ensure most costs are identified closely to specific customers and their traffic flows.

4.2 Access prices where operators have funded enhancements to the RAC track corridor

To reduce the risks associated with capital expenditure, RAC can permit operators to either self-fund track improvements or to enter joint ventures with RAC. This operator funded capital expenditure is repaid via lower (or pre-paid) access prices for the section concerned.

The Speedrail group's proposed high speed passenger train[72] and the NRC crossing loop extension program[73] are examples of where access seekers are partly funding improvements for track which remains in RAC ownership. Similarly, all CityRail related track capital expenditure is directly funded by Government.

The track improvements, whilst of primary benefit to the funder, are also of benefit to all users of the section. Each train operator which funds enhancements to RAC track will seek a return for this investment in the form of reduced access fees, possibly to a level approaching the floor test (direct costs). Yet RAC will be responsible for completing MPM and routine maintenance on operator funded sections.

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70 NSW Rail Access Regime, as published in Gazette No. 22, 19 February 1999, p 929.
71 FreightCorp submission to IPART, November 1998, p 34.
72 See Speedrail submission to IPART, March 1999, p 1 and RAC Annual Report 1997/98, p 31.
73 See NRC submission to IPART, December 1998 and RAC Annual Report 1997/98, p 25.

Operator funded track sections should be excluded from the asset base where they are gifted to RAC by the operator. This ensures RAC does not charge a rate of return or depreciation on these assets. However, where the funding operator negotiates a lower access charge, effectively requiring RAC to purchase the asset, the asset should be included in the asset base.

Recommendation 3 – Access charges where track capital is access seeker funded
For the purposes of the NSW Rail Access Regime, track capital transferred to RAC without payment from July 1999, should be excluded from the asset base.

4.2.1 Maintenance costs and the treatment of major periodic maintenance (MPM)

Track maintenance is completed using two main methods:

1. MPM: refers to activities which renovate the rail infrastructure facilities to retain it in a functional condition. MPM is completed on track Sectors at intervals of more than one year. MPM can be categorised into two types:
   - Variable MPM: is programs mainly driven by usage volume. Under current programs this is based on three activities being re-railing, rail grinding and re-surfacing.[74]
   - Fixed MPM: depends more on time than usage and includes re-signalling, communications upgrades, renovating structures, ballast cleaning and re-sleepering.
2. Routine maintenance: refers to activities which are necessary to ensure a line remains operational. Routine activities are completed more often than once a year and include different track inspections cycles, track patrolling, fettling (replacing broken track components), corridor maintenance, fence maintenance and signal testing.[75]

Total maintenance costs for RAC were $493.8m in 1997/98, of which routine maintenance was 41 percent ($204m), MPM was 53 percent ($261.9m) and 6 percent ($27.9m) related mainly to maintenance overheads.[76] A summary of the significance of each component of maintenance specifically for the Hunter Valley Coal network is provided in the table below.

Table 5 Summary of the Components of the Hunter Valley maintenance program

Maintenance Component	1997/98 $m	1997/98 $ per track km	% of total maintenance
Annual Routine	20.785	25,228	50.9
Annual Levellised Variable MPM	10.866	13,188	26.6
Annual Levellised Fixed MPM	9.151	11,107	22.5
Total (Routine + All Levellised MPM)	40.802	49,523	100.0

Source: RAC submission to IPART, March 1999, pp 15-16.

[74] The process of re-surfacing refers to replacing the top layer of ballast and then tamping and restoration of the alignment.

[75] MPM and routine maintenance are discussed in RAC submission to IPART, 27 November 1998, pp 70-71.

[76] RAC confidential submission to IPART, 24 February 1999.

RAC customers are concerned to ensure that expensing MPM and also charging depreciation does not see them pay twice for the same assets. Following consideration of submissions on the treatment of MPM and the NSW Government Policy on MPM,[77] IPART supports the continued use of a levellised (smoothed) amount for expensing MPM based on the long term average MPM expenditure.

Some customers raised the issue of the need to decrease MPM programs as the coal network approaches the end of its useful economic life following resource depletion. RAC has undertaken to closely monitor remaining mine life and to allow track condition to decline (yet remain within a serviceable range) as the viability of relevant Sectors diminishes.

Calculation of the levellised charge for MPM

The concern regarding double counting can be alleviated by requiring RAC to provide access seekers with detailed annual information about the calculation of the levellised charge. RAC's March 1999 submission provides a breakdown of how the levellised charge was estimated.[78] For each MPM category the levellised calculation establishes cost driver(s) which determine the useful life of the asset component being restored. For example track curvature and tonnage carried are the main cost drivers used to estimate likely re-railing costs. Access seekers should consider these assumptions during negotiations with RAC.

Over time the objective of the levellised MPM charge is to obtain equivalence with actual expenditure on MPM and a provision account is utilised for any difference between actual and the levellised expense.

Expensing MPM requires RAC to estimate a levellised amount of MPM based on likely long term needs and to charge this consistently each year. This task is made slightly easier by the low variation (to date) in MPM expenditure. MPM fell by 6.4 percent between 1996/97 and 1997/98.[79]

In theory, capitalising or expensing MPM results in equivalent costs in net present value terms over the life of the asset, provided assumptions on levellised MPM and pre-paid maintenance are correct. Most submissions concurred that the two methods are equivalent.

Incorrect assumptions in estimating the levellised MPM and the extent of pre-paid maintenance arising from MPM, can result in double counting. New assets are maintenance free for an initial period and expensing MPM necessitates assumptions about the extent of this prepaid maintenance. Some submissions argued that RAC may have an incentive to overstate the levellised charge and to understate pre-paid maintenance to boost revenue. In practice RAC is under pressure and scrutiny to complete its annual MPM program on-time and within budget. Any delays would require RAC to transfer any under expenditure on MPM to a reserve account within RAC's financial statements.[80]

Recovering a levellised MPM charge from customers may have some benefits as RAC systems are already established to calculate the levellised charge. Capitalising MPM would require significant new development of financial systems.

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77 See NSW Treasury Circular, *Accounting for Major Periodic Maintenance*, TC96/7, 27 June 1996.

78 See RAC submission to IPART, March 1999, pp 15-16 (including spreadsheets).

79 RAC Financial Statement 1997/98.

80 See RAC submission to IPART, 19 March 1999, p 13 and RAC Annual Report 1997/98, p 82.

NSW Treasury requires the separate reporting of MPM within financial accounts as an item separated from capital expenditure and routine expenditure.[81] However, NSW Treasury recommends government entities consider the materiality of the MPM, the stability in expenditure levels and whether there is any change to capacity or future economic benefits from MPM in determining whether MPM should be capitalised or expensed. NSW Treasury supports a levellised expensing of MPM as it involves material amounts which are fairly consistent in size between years and do not significantly expand capacity.[82]

RAC state that capitalising all MPM expenditure would add major complexity to its financial accounting without any gains in transparency. RAC report that capitalising all MPM would require 90,000 separate depreciation schedules.[83] RAC provided information to IPART illustrating that some MPM items are as small as $400.

FreightCorp's submission stated a preference for capitalising MPM due to a guarantee of no 'double counting'. Yet FreightCorp also stated they are comfortable using a levellised expense to account for MPM provided the calculation does not contain a return or depreciation component and that the calculation of the levellised expense was transparent and audited.[84] The Minerals Council shared FreightCorp's first preference, yet are also comfortable expensing MPM provided RAC gives a transparent breakdown of the calculation to ensure there is no double counting.[85]

The Australian Accounting Standard for depreciation requires capitalisation of MPM where a probable future economic benefit will eventuate. Where MPM will not create probable future economic benefits, the Standard permits expensing of these items.[86]

On balance, IPART supports continuing to estimate the cost of MPM using a levellised expense. IPART's support for the continued use of a levellised expense for MPM is based on:

- the existence of an established accounting system for expensing MPM
- RAC utilising a transparent and accurate methodology which they have undertaken to provide to customers
- customers supporting use of a levellised expense subject to RAC's provision of adequate and transparent calculation information
- the apparent complexity of switching to a system of capitalising MPM.

Recommendation 4 – Treatment of Major Periodic Maintenance
For the purposes of the NSW Rail Access Regime, RAC should continue to recover the costs of major periodic maintenance through a levellised annual expense. This expense should not include a rate of return or depreciation component. The Government should consider requiring RAC to provide all access seekers with a detailed breakdown of the MPM expense calculation including all assumptions used in the calculation for each Sector utilised.

81 See NSW Treasury Circular, No TC/96/7, *Accounting for Major Periodic Maintenance*, 27 June 1996.
82 NSW Treasury submission to IPART, March 1999, pp12-13.
83 RAC submission to IPART, March 1999, pp 12-13.
84 FreightCorp submission to IPART, March 1999, pp 11-14.
85 Minerals Council, submission to IPART, March 1999, p 3.
86 Australian Accounting Standard 4 as revised, August 1997.

4.3 Definitions contained in the Regime

The Regime gazetted on 19 February 1999 ,contains a series of definitions which apply until they are replaced by definitions recommended in this final report. The definitions contained in the Regime are repeated in the Box 3. IPART has utilised these definitions as an initial reference point.

Box 3 Economic cost term definitions contained in the NSW Rail Access Regime

For the purposes of Schedule 3 of the NSW Rail Access Regime:

1. **Direct cost** means the change in RAC's total costs (excluding returns on asset) caused by the use of Rail Infrastructure Facilities by an access Seeker. These costs include:

(a) additional costs of maintenance and train control due to use of Rail Infrastructure Facilities

(b) provisions for the future renewal of Rail Infrastructure Facilities, to the extent that these renewals are renewals which would not be required in the absence of the access seeker's use of the Rail Infrastructure Facilities, or are advanced in time because of the Access Seeker's use of the Rail Infrastructure Facilities.

2. **Fixed Cost** are costs (excluding returns on asset) which do not vary in the long term with usage of Rail Infrastructure Facilities (except by closure of the Rail Infrastructure Facilities).

3. **Full Incremental Costs** means the total costs of a Sector inclusive of the Incremental Fixed Costs for the Sector and any additional Direct costs attributable to Access Seekers' use of the Sector, excluding returns on assets.

4. **Incremental Fixed Costs** means Fixed Costs which are attributable to a Sector and which could be avoided by closure of that Sector.

5. **Full Economic Costs** is the total cost of providing the Rail Infrastructure Facilities and the train control services for an Access Seeker or group of Access Seekers, including returns on assets.

Source: NSW Government Gazette No. 22, 19 February 1999, p 903.

4.4 The Floor Price

4.4.1 The purpose of the floor price

The floor test has two limbs. The first limb requires that operators meet their direct costs. The second limb is to become an objective whereby it is desirable for operators to meet their full incremental costs (as discussed in Section 3.3).

The Regime does not specify the purpose of applying the floor test. IPART believes that the purpose of the floor test should be to recover the avoidable costs of an operator. The avoidable costs of an operator include the variable costs associated with their usage. IPART has defined the first limb of the floor test to recover cost related to track usage.

Some fixed or common costs may also be avoidable with respect to a particular operator. Where an alteration or addition to the RAC Network is required only to service a particular operator, the fixed cost of this alteration or addition should be included in the floor price. Some fixed costs such as administration, billing and information technology may also be reduced (avoided) when a particular operator is omitted from the system. IPART has defined the second limb of the floor test to include the above fixed costs, notwithstanding that they do not vary with a particular operator's usage.

RAC is under no obligation to charge less viable train operators only the floor test price. In reality, the essential nature of the government owned CityRail service means that the government probably has a higher capacity to pay than any other private or government owned rail operator using the RAC Network. Theoretically, RAC retains the right to negotiate any price between the floor and ceiling price levels.

4.4.2 The most suitable time frame to assess fixed and variable costs

Most of the proposed definitions submitted to this Review contain subjective descriptions of the applicable time frame for assessing which costs are fixed and which are variable, notably 'short run' and 'long run'. Ideally, short run and long run are defined on an industry specific basis corresponding with the production cycles of each industry.

Given that RAC's access charges for all train operators are negotiated and re-set on an annual basis, it seems reasonable to define the short run as occurring within a 12 month period. Costs which do not vary within 12 months' usage by an operator can be considered relatively fixed for access pricing purposes. Given that floor and ceiling test define boundaries for annual negotiation of access prices, IPART views 12 months as the appropriate separation between short and long run costs. One year is also broadly reflective of the RAC's separation of routine and major periodic maintenance expenditure planning and should provide greater clarity to both parties in negotiations.

4.4.3 The definition of direct costs

Direct costs are those variable and fixed costs which can be unequivocally attributed to a single operator. Direct costs include routine maintenance, labour and materials used to provide a specific service. As MPM is to be expensed, direct costs should also include variable (usage related) MPM. For example re-railing is an MPM cost driven by usage levels and Minerals Council support the inclusion of re-railing in avoidable and therefore direct costs.[87]

RAC's propose a revised definition of direct costs namely:

> Direct costs are short and long run costs borne by the infrastructure owner which increase with usage. They include recovery of past renewal expenditures to the extent that the life cycle average quantum of renewal related activity per period is related to usage.[88]

The issue of whether the definition of direct cost should include fixed MPM is the subject of debate. Economic efficiency principles dictate that if all users pay at least their avoidable cost, cross subsidies are prevented and all usage is beneficial. The variable MPM is the component avoided in the absence of usage and hence is a justified inclusion within direct costs. By contrast, fixed MPM expenditure does not alter significantly with track usage and hence should not be recovered as a component of direct costs.

In Section 6 of this report, IPART has recommended that depreciation be based on the forecast remaining life of the Hunter Valley coal mines. Hence, depreciation is not directly linked to track usage and is not included as a component to be recovered within the direct cost floor test.

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87 See Dr John Fallon, acting for the Minerals Council, transcript to IPART Hearing 15 December 1998, p 208.

88 RAC submission to IPART, 19 March 1999, p 5.

Recommendation 5 – Definition of Direct Costs
For the purposes of the NSW Rail Access Regime, Direct Costs are the costs which vary with the usage of a single operator within a 12 month period, plus a levellised charge for variable MPM costs, but excluding depreciation.

4.4.4 The definition of fixed costs

While all fixed costs are included in the ceiling test, only a subset of fixed costs being 'incremental fixed costs' are included in the second limb of the floor test. IPART notes that 'fixed costs' is not a separate term within the Regime as the floor test refers to 'incremental fixed costs' rather than 'fixed costs' in isolation.

RAC's preferred definition of fixed costs "is costs which do not increase with usage, including depreciation."[89] RAC seek a depreciation charge which compensates for "the loss in economic value due to depletion of coal reserves and the trend away from fossil fuels."[90] However, depletion of coal reserves generally requires rail track usage which infers depreciation is not a fixed cost. RAC seek to use fixed costs as a building block for the definition of incremental fixed costs (IFC). RAC would like to include 'indirect' costs such as corporate overhead and train control in IFC, even though these costs are generally not Sector-specific as required by the Regime's description of how to assess IFC.[91] RAC report that indirect costs account for approximately 15 percent of total costs.[92]

For completeness, IPART views 'fixed costs' as all costs which do not vary with usage within a 12 month period, but excluding a levellised charge for variable MPM. For simplicity, IPART has defined 'full incremental costs' without reference to 'fixed costs', making the term 'fixed costs' redundant. Effectively, the term fixed costs will be removed from the Regime when IPART's cost definitions become effective.

4.4.5 The definition of incremental fixed costs (IFC)

The terms of reference require a definition of 'incremental fixed costs' (IFC). The Regime defines IFC as 'fixed costs which are attributable to a Sector and which could be avoided by closure of that line Sector.' The pricing principles of the August 1996 Regime specifically referred to and included IFC. This cost term was subsequently not utilised in the amended Schedule 3 of the Regime although the term is still referred elsewhere in the Regime as a component of the definition of 'full incremental costs'.

RAC supports viewing IFC as a component of the definition of full incremental costs.[93] Similarly, FreightCorp proposed that IFC be deleted from the second limb of the floor test as their inclusion creates confusion rather than clarity.[94] FreightCorp supports the second limb of the floor test relying only on the term 'full incremental costs.'

The Minerals Council see incremental fixed costs as forward looking capital costs for fixed assets. However, the Minerals Council believes incremental fixed costs are difficult to calculate due to optimisation issues and multiple operators using the RAC Network.[95]

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89 RAC submission to IPART, November 1998, p 75.
90 RAC submission to IPART, November 1998, p 51.
91 NSW Rail Access Regime, 19 February 1999, A. 4.
92 RAC submission to IPART, November 1998, p 71.
93 RAC submission to IPART, November 1998, p 75.
94 FreightCorp submission to IPART, November 1998, p 18.
95 NSW Minerals Council submission to IPART, 27 November 1998, p 33.

For completeness, IPART views incremental fixed costs as the costs of a line Sector which do not vary with usage within a year, but could be avoided if train operations ceased and the line was closed. For simplicity, IPART has defined full incremental costs without using the term 'incremental fixed costs', making the term incremental fixed costs redundant. Effectively, the term IFC will be removed from the Regime when IPART's cost definitions become effective. The second limb of the floor test will then rely solely on the term 'full incremental costs'.

4.4.6 The definition of full incremental costs (FIC)

The Regime's definition of full incremental costs (FIC) is "the total costs of a line Sector inclusive of the incremental fixed costs for the Sector and any additional direct costs attributable to rail operators' use of that Sector, excluding returns on the asset."[96]

The calculation of FIC for each Sector estimates all costs saved assuming the Sector was not used. In this way it includes variable costs and any fixed costs which can be avoided if a line Sector was closed, but does not include sunk capital costs.

FIC adds fixed MPM (and any other minor fixed costs that can be avoided by closure) to direct costs, but does not include the recovery of depreciation or a rate of return on assets.

Recommendation 6 – Definition of Full Incremental Costs
For the purposes of the NSW Rail Access Regime, full incremental costs are all costs that could be avoided if a Sector was removed from the RAC Network.

4.5 Ceiling price definitions

4.5.1 The purpose of the ceiling test

The ceiling test within the Regime requires that "Access revenue must not exceed the Full Economic Costs of the Sectors which are required for the Access Seeker on a stand alone basis". To apply this ceiling test requires RAC to understand the type of costs to be included in Full Economic Costs and that these be measured on a stand alone basis.

The terms of reference for this Review appear to be intended to require IPART to define the ceiling test. However, IPART has in fact been asked to separately define the terms 'Full Economic Costs' and 'Stand Alone Economic Costs'. To overcome this anomaly, IPART has developed a definition of Full Economic Costs which includes an explanation of how 'stand alone basis' should be interpreted. IPART has not recommended a separate definition of 'Stand Alone Economic Costs' as this term is not included in the Regime. However, if the term was included in the Regime, IPART is confident these costs are fully included within the term 'Full Economic Costs'.

Interpretation of 'stand alone basis'

Professor William Baumol and his co-authors describe stand alone costs as:

> The cost that would be incurred by an efficient entrant to the industry if it were to produce only some specified set of commodities. …That is, it is the cost to produce just those items, 'standing alone'. The concept also applies to an entrant that decides to produce only a single commodity …[97]

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96 NCC, *Application for Certification of the NSW Rail Access Regime, Draft Recommendation,* April 1998, p 17.

97 *Toward Competition in Local Telephony,* Baumol, W.J. and Sidak, G.J., AEI Studies in Telecommunications, MIT Press, 1994, p 58.

At the simplest level, stand alone costs are the minimum cost of producing a single product by itself (in isolation). In developing an appropriate definition for stand alone costs, consultant to IPART, Professor Stephen King proposed two possible interpretations. King believes stand alone costs can be given two interpretations:

1. **By-pass or Contestability**: when current purchasers construct and operate an alternative service (rail or non-rail) themselves because it is cheaper. Competition may also occur when an efficient new firm finds it profitable to enter the market and provide a rail track at a price below that of the monopolist.[98]
2. **Cost allocation (or maximum reasonable revenue)**: a variant of rate-of-return type regulation which allocates costs between customers. For a monopoly that serves a variety of customers, reasonable revenues are set for each customer or group of customers and for the firm as a whole. These reasonable revenues are commonly set using fully distributed costs[99] and are used to limit the amount of revenue that the firm can charge any customer or group of customers, and as a whole.

A stand alone basis is commonly used to place an upper limit on the 'legitimate' revenue a monopoly can earn. This is clearly its role in the rail access pricing principles. In practice, the bypass or cost allocation instances are unlikely to occur 'naturally', due to barriers to entry and the incumbent monopoly making strategic responses to preclude new entrants. Thus, stand alone costs provide a useful theoretical regulatory ceiling, but this may be breached by unregulated monopolies. [100]

The Regime refers to actual NSW rail costs[101] which together with RAC's practical application of the ceiling tests means that the stand alone cost test is essentially used as a basis for cost allocation. To date, RAC has determined a value of rail infrastructure by Sector to enable the accurate application of asset related costs to individual operators.

Interpreting stand alone costs as a cost allocation method ignores the 'bypass' interpretation which would result in each customer paying asset related costs based on the most efficient mode of coal transport, for example a slurry pipeline. From a practical perspective, bypass appears very unlikely.

RAC supports the cost allocation interpretation by focusing on the actual costs of their existing RAC Network rather than the costs of the most efficient technology (perhaps slurry pipelines or conveyors). IPART notes that none of the submissions to this Review sought by-pass based stand alone cost prices which utilised non-rail transportation. Similarly, the regime itself refers to the "costs of the entire NSW Rail Network." The cost allocation interpretation appears more reasonable for both RAC and its customers as the chance of bypass is remote, and this approach still allows significant optimisation by re-configuration of the RAC Network. Professor King also stated that a critical shortcoming of the bypass interpretation of stand alone basis is that there usually is no bypass option, so no natural limit is imposed on access prices.

In the future it is possible that bypass options may become viable at a cost below the access charges of RAC. In this instance train operators and final customers, could estimate the

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98 Professor Stephen King, *Review of Aspects of the NSW Rail Access Regime*, 15 February 1999, p 2.

99 Fully distributed costs refers a methodology which allocates direct costs to their respective outputs and pro-ratas indirect costs between activities based on in one of several ways including budget for the activity over the total budget or staff dedicated to an activity over total staff.

100 Professor Stephen King, *Review of Aspects of the NSW Rail Access Regime*, 15 February 1999, p 2.

101 See for example Schedule 3 (i) – (iii).

access costs of the bypass option and utilise this estimate to negotiate a reduced access charge with RAC.

4.5.2 The definition of full economic costs on a stand alone basis

RAC's preferred definition of stand alone full economic costs is more prescriptive namely "the Sector-specific costs borne by RAC plus the permitted return on assets of that Sector and an allocation of non-Sector specific costs (including a return on non-Sector-specific assets)."[102] The allocation of non-Sector specific costs (eg train control) should be in proportion to the amount of traffic on that Sector relative to the total traffic on the RAC Network. Although RAC's proposed definition uses accounting categories to define full economic costs, it may promote greater certainty and facilitate a faster negotiation process.

The Regime's definition of full economic costs is the total cost of providing the infrastructure and train control services for an access seeker (or group thereof) including returns on assets.

The Minerals Council's revised and comprehensive proposal for 'full economic costs' using the cost allocation interpretation of stand alone costs is:

> Full economic costs are sector specific costs plus a permitted rate of return and depreciation and an allocation of non-sector specific costs such as train control and overheads including a rate of return and depreciation on non-sector specific assets with all inclusions based on efficient and forward looking costs. A stand alone basis requires calculation based on the optimal configuration of a network designed to serve existing and near term future anticipated demand of all existing access seekers. Capital and operating costs will be estimated based on the cost of constructing the optimal network. Operating costs will be based on the utilisation of that network by only the Access Seeker or Access Seekers for which the ceiling test is being carried out. Allocation of costs between access seekers in any group will be carried out using an activity based costing[103] approach.[104]

RAC argues that the term 'stand alone economic costs' is superfluous as its meaning is encompassed by the term 'full economic costs'. The Minerals Council agrees the term should be deleted. The Minerals Council objects to monopoly pricing using Baumol theory and supports the use of the term 'full economic costs' instead.

FreightCorp seek to include the term stand alone economic costs and propose a definition as "the lower of internal (optimised cost to RAC) and external (new entrant cost to duplicate) calculations", based on optimisation and efficient costs with rate of return set at RAC's WACC (weighted average cost of capital – see Section 7.1).[105]

Overall, IPART sees some merit in the definition proposed by RAC for 'full economic costs', yet has amended this definition to restrict consideration to rail costs, to reinforce the need for these costs to be calculated on an efficient and forward looking basis and to explain how a stand alone basis should be interpreted.

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102 RAC, submission to IPART, 27 November 1998, p 75.

103 Activity based costing (ABC) involves identifying categories of indirect costs and allocating them to products using criteria known as 'drivers' which are based on the relative usage of each product.

104 Minerals Council submission to IPART, March 1999, p 23.

105 FreightCorp submission to IPART, November 1998, p 23.

Recommendation 7 – Definition of Full Economic Costs on a Stand Alone Basis
For the purposes of the NSW Rail Access Regime, Full Economic Costs are Sector specific costs including a permitted rate of return and depreciation and an allocation of non-Sector specific costs such as train control and overheads including a rate of return and depreciation on non-Sector specific assets. All included items are to be assessed on a stand alone basis. A stand alone basis requires calculation based on the optimal configuration of the existing rail infrastructure to serve all operators including an allowance for five years demand growth.

Consideration of CSO's in the ceiling test

The second limb of the floor test permits the inclusion of line Sector CSO subsidy (paid by the NSW Government to RAC to support the viability of rural branch lines) in assessing whether the minimum revenue target of the floor test is met.[106]

The Minerals Council raise the issue of whether the Government's payment of CSO's to support specific low volume line Sectors needs an alteration of the ceiling test to avoid RAC being paid twice.[107] The Minerals Council propose that the ceiling test be reduced by the amount of the line CSO paid in respect of any Access Seeker. IPART believes that payment of CSO's does not alter the ceiling test of full economic costs on a stand alone basis. Hence, no recognition of line CSO's is required in the ceiling test. Payment of line Sector CSO's remain a discretionary decision of Government which is used to support specific rural lines rather than all access seekers.

Schedule 3 (i)(c) of the Regime limits total RAC revenue for the RAC network and Line Sector CSO's are a component of total RAC revenue.

106 NSW Rail Access Regime, Schedule 3(i)(a), 19 February, 1999.
107 Minerals Council submission to IPART, March 1999, p 24.

5 ASSET VALUATION

5.1 Why we need to value assets

In a competitive environment, market forces determine demand and prices. The 'value' of assets is determined accordingly. Since the provision of access to RAC's assets is not contestable, there needs to be an assessment of the value of RAC's assets so that an appropriate return on assets can be calculated. Regulators permit utilities to earn a return on their asset base consistent with prevailing capital markets conditions adjusted for the relative non-diversifiable risks involved in their business.

For financial reporting purposes, RAC has valued 94 percent of its Network (route kilometres) at zero because they do not believe they can recover full economic costs and a rate of return in the foreseeable future (the ceiling test). Currently, only parts of the Hunter Valley coal network are paying the ceiling price for access. Nevertheless, IPART seeks to provide an asset valuation methodology suitable for application to the whole RAC Network.

In selecting an asset methodology for pricing, IPART is aware that there is no single correct methodology. IPART has considered a number of methods of asset valuation including: indexed depreciated historical cost, depreciated replacement cost and depreciated optimised replacement cost (DORC).

The appropriate asset valuation methodology depends on a number of factors including the objectives for which asset valuations are sought. What may be an appropriate methodology for RAC may be unsuitable for other industries. In this Review IPART has performed a very different role to that which it performs as a pricing regulator for declared monopoly services. For these reasons, it is inappropriate for the asset valuation method recommended for RAC to be applied by reference to other utilities regulated by IPART.

5.2 The need for multiple asset valuation methodologies

IPART sought views on whether there are advantages in using more than one asset valuation methodology, for example, valuing new investments differently from existing assets (which may or may not be expected to remain unchanged into the future). IPART notes that none of the submissions to this Review specifically requested the use of multiple asset valuation methodologies (other than for the existing corridor formation).[108]

In effect, the Regime already utilises two asset valuation methodologies:

1. 'nominal amounts' for the existing corridor formation,[109] being assets which do not require future expenditure to maintain the current RAC Network capacity
2. 'current cost depreciated replacement value' for all other RAC assets.[110]

As part of the restructure of SRA in July 1996 the below rail assets were vested in RAC. Title to the corridor formation assets remains with SRA, yet RAC has some control of the corridor. SRA cannot sell or develop any part of the corridor without RAC's approval.

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[108] For example see Minerals Council, submission to IPART, March 1999, pp 25-33.

[109] Under the Regime 'existing corridor formation' refers to RAC land (the corridor) used to operate rail track and includes cuttings, embankments and tunnels except to the extent that these assets require future expenditure to retain current network capacity.

[110] NSW Rail Access Regime, Section A. 1. (a), NSW Government Gazette, No. 22, 19 February 1999, p 903.

The Regime specifies use of nominal values for the corridor and RAC does not own the land around the corridor. Consequently, RAC has valued the corridor formation at zero. RAC has not proposed any change to this zero valuation. The exception to this is small parcels of land RAC has acquired since its formation (July 1996) which (due to their recent purchase) are valued at acquisition cost.

On balance, IPART supports continuing to value the corridor formation as vested to RAC in July 1996 at zero.

In the draft report, IPART proposed valuing land acquired by RAC using the same method as is used for RAC track assets. Upon detailed consideration of this issue IPART supports a different methodology. As RAC's land acquisitions are all recent and accounting records for these acquisitions are complete, RAC should utilise the actual land acquisition cost indexed annually for inflation.

IPART does not support revaluation of RAC owned rail corridor as the rail corridor will only be acquired once and hence is not usually replaced. Additionally, revaluing the corridor could provide RAC with a windfall gain if other development proceeds in the vicinity of the corridor.

Recommendation 8 – Valuation of the corridor formation
For the purposes of the NSW Rail Access Regime, the existing corridor formation vested to RAC in 1996 should be valued at zero. Corridor formation assets and land subsequently purchased by RAC should be valued at actual cost indexed annually for inflation.

5.3 RAC initial proposal for an asset valuation methodology

RAC originally proposed use of a discounted replacement cost asset base of $522m.[111] The discounting was completed as a proxy for depreciation, using a track condition index (TCI).[112] RAC claim the proxy is necessary as it is unable to accurately calculate depreciation due to incomplete or non-existent maintenance and construction records.[113]

RAC's original proposal started with a November 1997 replacement cost valuation prepared by consultants Curry and Brown which valued the Hunter Coal network at $1,029m. RAC then deducted a TCI based discount due to track wear of $507m to give a discounted replacement cost value of $522m. This represents an average discount of 49.3 percent on replacement cost.

IPART is not convinced that TCI is an effective proxy for depreciation due to several factors including:

- High levels of subjectivity and 'lumpiness' in a three level system of discount settings.
- Some unreliability and unexplained variability in TCI readings.[114]
- A failure of the TCI to separately consider expensive off-track items such as signals, bridges, culverts and tunnels which are around one third of the replacement cost value.

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111 RAC submission to IPART, 27 November 1998, p 45.

112 The Track Condition Index is a composite measure of track quality, combining four geometry indicators (top, twist, gauge and line). Note also that the TCI is expressed on an inverse scale whereby low TCI values indicate good track condition and high TCI values indicate poor quality.

113 RAC submission to IPART, 19 March 1999, p 14.

114 For examples see the views held by Dr Dick Day, General Manager, CityRail, transcript to IPART Hearing 14 December 1998, p 53.

- Little or no incentive for RAC to provide an optimised RAC Network.
- Some potential for the asset values to be manipulated by focusing on improving the top of the track, while possibly neglecting, say, track formation. This track focus may also deter the detection of deterioration in the underlying formation. Hence, it is possible for track with an average TCI condition to fail due to formation problems.

IPART notes RAC has been using the replacement cost (discounted by TCI) methodology since July 1998. However, this TCI discounted replacement cost may not be permitted by the Regime as it stipulates use of a "current cost depreciated replacement value" methodology.[115] Between July 1996 and June 1998, RAC used a depreciated replacement cost valuation calculated from the SRA asset register. RAC ceased using this SRA valuation due to major data integrity problems which resulted in inconsistent values by Sector. Yet the total depreciated replacement cost value for the Hunter Valley coal network is very similar under both valuations.

IPART believes a reasonably accurate estimate of depreciation costs is possible because:

- Hunter Valley coal assets have a higher rate of maintenance and shorter useful lives due to the high tonnages. This reduces the number of years of data required.
- The aggregated depreciation information from the SRA valuation used by RAC between July 1996 and June 1998 would provide a useful guide.
- The Minerals Council has supplied IPART (on a commercial-in-confidence basis) with a consultant's study titled, *Hunter Valley Rail Project, Phase 1 Report*. This report contains SRA's replacement cost valuation ($726m) and a depreciated replacement cost valuation ($352m) for the existing Hunter Valley coal network. This valuation was included in a report prepared by SBC Dominguez Barry in January 1993 acting as advisers to the State Rail Authority (titled *Information Memorandum – Stage 1, Northern Region Coal Haulage Business*).[116] Hence, depreciation records were maintained and could be utilised by RAC.
- Capital expenditure on the Hunter coal network has been a separate and transparent line item in the Government's budget papers since 1983/84.[117] Capital expenditure decisions required supporting submissions which could be used to estimate depreciation.
- RAC claims to be capable of differentiating between track deterioration caused by atmospheric conditions and deterioration caused by train operation. This capability implies RAC could estimate depreciation based on an assessment of the physical condition of track components and could then consider the likely remaining useful life in relation to the estimated replacement cost of the track.

Consequently, IPART believes a reasonably accurate estimate of depreciation can be arrived at by examining previous studies and by assessing the current status of individual asset components (eg rail, sleepers, ballast) to assess their average remaining life in relation to total useful lives. This assessment would provide a superior estimate of depreciation.

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115 NSW Rail Access Regime, Section B. 1. (a) NSW Government Gazette, No. 22, 19 February 1999, p 903.

116 Morrison Knudsen Corporation Australia Ltd and CRI Ltd, *Hunter Valley Rail Project, Phase 1 Report, Rail Technical Study,* April 1993, p 2-40.

117 For example, see NSW Treasury Budget Paper No 4 1983/84 , p 109.

5.4 RAC revised proposal for an asset valuation methodology

The draft report for this Review recommended the adoption of a DORC valuation to be prepared by an independent consultant and apply to access prices from 1 July 1999. Consequently, RAC revised their position to support the use of DORC. To minimise the size of price changes from the change in valuation method, RAC have requested that an interim (or quick) DORC valuation prepared by RAC be used to set temporary prices from July 1999. Actual final access prices will be adjusted to reflect the final DORC value set by the independent consultant.

IPART supports the use of RAC's interim DORC value as RAC has undertaken to retrospectively adjust access prices back to 1 July 1999 once the final DORC value is settled. To ensure the fairness of the interim DORC value, IPART recommends that if the final DORC value is lower than the interim DORC, RAC customers should receive a refund. This refund should include interest calculated at the risk free rate utilised in this report (5.37 percent per annum) for the holding period between each date of payment and the date of refund following the final DORC valuation becoming the established asset base. In the event that the final DORC value is higher than the interim DORC, RAC has agreed not to seek any retrospective adjustment from customers.

A detailed breakdown of the interim DORC valuation is contained in RAC's submission (20 April 1999) to IPART. A summary of the replacement cost, TCI discounted replacement cost and the interim DORC values are contained in the table below.

Table 6 Summary of RAC's Interim DORC Valuation for Hunter Valley coal assets

Hunter Valley Coal Network	Replacement cost (RC) [$m]	TCI discounted replacement cost [$m/]	Interim DORC Valuation [$m]	DORC Discount from Replacement cost [%]
Category 1 *	333	181	223.088	33.0
Category 2	452	231	294.060	34.9
Category 3	244	110	147.019	39.7
All Categories	**1,029**	**522**	**664.169**	**35.5**

Source: RAC April 1999. * The Category system is explained in Section 3.3.
Does not include a value for track sections partly owned by RAC.

5.4.1 Other submissions

The Minerals Council supports the use of DORC, stating it is necessary for the benefits of competition to flow through to customers, and to ensure the benefits are not absorbed by network owners.[118] This position was later refined to support DORC when a bypass interpretation of standalone basis was utilised but not when the cost allocation interpretation is used.[119] FreightCorp and SRA also support the use of DORC, stating that this would result in prices which would provide efficient economic incentives to RAC Network users.[120]

[118] NSW Minerals Council submission to IPART, 27 November 1998, p 37.
[119] NSW Minerals Council submission to IPART, 19 March 1999, pp 25-33.
[120] FreightCorp submission to IPART, November 1998, p 26 and SRA submission to IPART, November 1998, p 7.

NSW Treasury supports the use of DORC yet seeks greater definition of its practical implementation in relation to stranded assets and the optimisation process.[121]

All submissions which stated a preferred asset valuation methodology, with the exception of Dr Ernest Easton,[122] supported the use of a DORC methodology.

5.5 The key asset valuation methods

The issues paper for this Review sought stakeholders views on a variety of valuation methods. Submissions from these stakeholders and IPART's analysis suggested the most appropriate asset valuation method for the NSW Rail Access Regime was either:

- indexed depreciated actual cost, and
- DORC (depreciated optimised replacement cost).

The merits of each method, the applicability of each method to the Regime and practical implementation issues are considered in the following section.

5.5.1 Indexed depreciated actual cost

Indexing the depreciated historical cost of assets (ie book value or actual cost) reflects the original cost of purchasing or constructing the assets, plus an indexing of these costs for inflation, less accumulated depreciation. No adjustment is made for technological advancement, however any 'gold plating',[123] surplus assets or stranded assets would be excluded from this valuation.[124] An attraction of this method is lower subjectivity, (except when adjusting for gold plating) while producing a value more relevant to recent costs.

Supporters of historical cost argue that if the Regime is to act as proxy for a competitive market, the asset valuation methodology should be the same as that used for competitive industries. Actual cost is a widely used basis for recording asset values. It can be argued that government owned corporations should also use actual cost. The indexation of historical cost enables the application of a real rate of return to this asset base. This has the advantage of determining a relevant charge expressed in today's dollars.

Opponents counter that historical cost generally bears little resemblance to the value of the cashflows of today and therefore is irrelevant, especially in the case of long-lived assets. It is argued that even if indexed, prices based on historical cost will not give consumers the correct economic price signals in relation to the cost of the service today.

From a practical perspective, RAC claims to be unable to accurately estimate either construction or depreciation costs due to incomplete and non-existent construction cost and maintenance records.[125] Whilst the process of reconstructing maintenance records to form a reasonably accurate actual cost valuation is not physically impossible, IPART agrees that this task may be more time consuming compared to other valuation methods.

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121 NSW Treasury submission to IPART, March 1999, p 10.

122 Dr E. Easton supports using a historical cost method, submission to IPART, 23 November 1998, pp 1-4.

123 Gold plating refers to cases where a utility has overspent on capital investment, for example, constructing assets with greater capacity than required in the foreseeable future or using more expensive materials than required for a fit for purpose network.

124 Capital expenditure by a regulated monopolist is commonly subject to a prudency test.

125 RAC submission to IPART, 27 November 1998, p 44 and pp 47-48.

5.5.2 Depreciated optimised replacement cost (DORC)

DORC is the replacement cost of an 'optimised' system, less accumulated depreciation. 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. Calculating depreciation for this valuation approach is often a contentious issue if the level of optimisation is high. In setting an asset valuation methodology for the NSW Rail Access Regime, IPART has considered using DORC despite its tendency to produce higher asset values than some other valuation methodologies. From a practical perspective, access prices are negotiated to levels less than or equal to the ceiling test price, making it unlikely that RAC will obtain it's maximum rate of return on all assets.

IPART wishes to stress that its terms of reference require it to establish an appropriate asset valuation methodology from which a ceiling test price can be determined. IPART is not required to determine the actual price to be paid by an individual customer. This distinguishes the rail access regime Review from other reviews conducted by IPART. To date most train operators (other than Hunter Valley coal trains), have paid access charges at well below the ceiling price.

5.5.3 The process for completing a DORC asset valuation

If DORC is utilised, IPART believes the next essential step is to engage an independent consultant to complete the valuation of the RAC Hunter Valley coal network. The process of selecting and managing the independent consultant must also be independent and transparent. It is critical to ensure that the consultant completes an independent valuation and this is best achieved at arms length from RAC. However, the independent consultant should liaise extensively with RAC and other rail stakeholders.

In the draft report for this Review, IPART sought stakeholder views on whether independent management of the consultant was necessary and potential bodies capable of completing this task. Stakeholders universally agreed independent management was essential and suggested bodies including the NCC, ACCC and IPART.[126]

Recommendation 9 – Appointment of an independent body to manage the asset valuation consultant

For the purposes of the NSW Rail Access Regime, the Government should appoint an independent body to manage the consultant selection process and then provide subsequent management of the asset valuation consultancy.

RAC's consultant, Curry and Brown, estimates the Hunter Coal Network has a replacement cost value of $1,029m.[127] The independent consultant would evaluate the accuracy of the Curry and Brown replacement cost valuation and make revisions as deemed necessary. Following this, the consultant would examine the scope for optimising the rail network and also assess whether any gold plating is present. Finally, the consultant would adjust the optimised replacement cost value for depreciation. The valuation would provide separate values for each line Sector.

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126 For examples see FreightCorp submission to IPART, March 1999 p 10, SRA submission to IPART, 29 March 1999, p 1 and Minerals Council submission to IPART, March 1999, p 26.

127 RAC submission to IPART, 27 November 1998, p 44.

RAC has stated that the lack of records prevents calculation of actual depreciation.[128] Yet, IPART believes a reasonably accurate estimate of depreciation is possible using sources outlined in Section 5.3 of this report. Estimating depreciation on track where optimisation is assumed is more difficult. The independent asset valuation consultant will assess the most appropriate method for the starting depreciation value by examining a variety of approaches including those outlined in section 6.9.

'Brownfields' and 'greenfields' DORC valuations

The valuation should estimate optimised replacement cost on the basis of both brownfields and greenfields conditions. 'Brownfields' refers to a value which assumes construction takes place around all existing above ground development and community infrastructure. Cost adjustments in a brownfields valuation may include surface restoration and other surface diversions. 'Greenfields' refers to a value which assumes construction occurs across an area free of any development.

The sensitivity of DORC to using a greenfields or brownfields assumption in assessing the level of optimisation possible often discourages the use of a DORC methodology. A greenfields assumption generally produces a lower value. Brownfields values include estimate of costs such as accommodating and restoring existing facilities and infrastructure such as roads, ports and dwellings. Overall, a greenfields estimate is faster to derive and less subjective/contentious. However, it is possibly less relevant to the hypothetical new entrant. A way to resolve this issue would be to require the calculation of both greenfields and brownfields, and then consider which of the two values is more reasonable.

RAC states it has assumed a greenfields approach to optimisation as it sees is required by the stand alone cost ceiling test. RAC believes brownfields implies an assumption that rail traffic must continue uninterrupted which adds expense and time to optimisation cost estimates.[129] However, it is probably unnecessary to impose this practical constraint on an otherwise hypothetical brownfields value.

IPART notes that the brownfields approach is used more widely for DORC valuations. Both methods require significant initial assumptions on what structures are already built and what corridors are available or need to be purchased. NSW Treasury opposes the use of greenfields as they view it as not practical as construction of a new track to serve the whole Hunter Valley export coal market would be impossible at the present time.[130]

Consultant to IPART, Professor Stephen King, notes that "the use of a brownfields valuation can arbitrarily raise the asset value of the network owner by taking into account costs that were not relevant to the original construction." For example, if a track section was constructed before a new suburb developed, the brownfields cost will take into account the costs of repairing surface features such as roads that were not in place when the track was built. King concludes, "in this case, a greenfields valuation appears more reasonable."[131]

IPART believes the independent valuation must complete both greenfields and brownfields estimates as, in reality, different parts of RAC's assets were built under greenfields and brownfields conditions. The final decision regarding the more appropriate assumption should be made following the consultation period. When the independent consultant is

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128 RAC submission to IPART, 27 November 1998, p 44.

129 Mr Mike Smart, Manager Corporate Strategy, RAC, IPART hearing transcript, 15 December 1998, pp 130-131.

130 NSW Treasury submission to IPART, March 1999, pp 10-11.

131 Professor Stephen King, *Review of Aspects of the NSW Rail Access Regime*, 15 February 1999, p 7.

deciding whether to adopt values assessed under greenfields and brownfields assumptions, the consultant should assume that coal will be carried by rail, and choose the method which provides for a reconfiguration of track which best meets the needs of all users, taken as a whole.

Does the combinatorial test ensure pricing is based on an optimised RAC Network?

RAC's submission states that using a DORC methodology is not necessary as the stand alone cost ceiling test forces it to provide an optimised RAC Network. RAC states:

> … an inherent feature of the combinatorial test is its consistency with the principle of optimisation. RAC must comply with the ceiling test for each and every possible combination of services. In so doing, only those assets or line sectors necessary to serve each group of users may be included in the stand-alone cost. Assets not required by the group in question must be excluded. This forces the stand-alone cost element of the ceiling test to reflect a reasonably high degree of asset optimisation.[132]

Consultant to IPART, Professor Stephen King considered RAC's argument that the combinatorial test forces RAC to provide optimised track. King concluded that the combinatorial test does optimise 'assets that are redundant with respect to all existing rail traffic on the RAC network. However, the combinatorial test does not automatically optimise with regard to assets being used by individual operators or groups of operators.'[133]

IPART is concerned that RAC's application of the stand alone test does not adjust access prices for any 'gold plating' of assets. Consequently, IPART is not convinced that the stand alone test as interpreted by RAC results in a fully optimised RAC Network.

The extent of optimisation possible for the Hunter Valley coal rail network

FreightCorp and the Minerals Council have proposed the use of a DORC asset valuation as they believe that the potential gains from a reconfigured RAC Network may be significant.[134] RAC originally contended that the optimisation exercise "will come up with a system which is quite similar to the one we have."[135] Subsequently, RAC in preparing an interim DORC valuation has valued some double track sections (eg 19 kilometres between Drayton to Newdell Junction) as if they were a single track. The replacement cost value of the track optimised (removed) by RAC in the interim DORC is approximately $12.05m.

To reinforce the potential gains from optimisation, the Minerals Council supplied IPART (on a commercial-in-confidence basis) with a report which in part considers potential gains from rationalising the Hunter Valley coal rail network from its current largely double track system to a single track system with passing loops and upgraded signalling.[136] The report found that additional room created in the track corridor by reverting to a single track could be used to moderate adverse track curvature and grades. IPART is not qualified to assess the viability of the optimisation proposed. IPART recommends that if a DORC valuation is undertaken, this report be provided to the relevant consultant.

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132 RAC submission to IPART, 27 November 1998, p 45.

133 Professor Stephen King, *Review of Aspects of the NSW Rail Access Regime*, 15 February 1999, pp 7-8.

134 Mr Greg Cutbush, consultant to the Minerals Council, IPART Hearing Transcript 15 December 1998, p 133 and David Cousins, consultant to FreightCorp, IPART Hearing Transcript 15 December 1998, p 136.

135 Mr Mike Smart, Manager Corporate Strategy RAC, IPART Hearing Transcript 15 December 1998, p 135.

136 Morrison Knudsen Corporation Australia Ltd and CRI Ltd, *Hunter Valley Rail Project, Phase 1 Report, Rail Technical Study,* April 1993, pp 4-15 to 4-55.

Demand for access to RAC's Hunter coal network

A DORC valuation contains an allowance for demand growth (usually 3-5 years) translated into an expected growth in capacity. There has been steady recent growth in the rail haulage of export coal from mines in the Hunter Valley. In the seven years between 1990/91 to 1997/98, the quantity of export coal rail hauled to Newcastle grew by 87 percent, equating to an average of 9.3 percent compound growth per annum.[137] This has placed greater demands on the RAC infrastructure. The future growth rate for coal rail transport is the subject of contentious debate, yet it is an important issue in assessing the appropriate levels of optimisation for coal asset valuation. A consultant completing a DORC valuation of the Hunter Coal assets will have to make transparent assumptions on estimated growth in coal train movements, their origins, the capacity of the existing RAC Network to accommodate this growth, and any capital expenditure required arising from demand growth.

Adjusting for growth in the optimisation process is important due to several factors including:

- The strength of recent coal tonnage growth.
- RAC's customers preferring to have capacity expansions completed prior to them being required.
- The longer planning and construction times associated with rail capital expenditure.[138]

Consequently, IPART supports the use of an allowance of a five years demand growth forecast within the DORC valuation.

5.5.4 Assessing the merit of DORC

DORC values may not be appropriate for calculating maximum allowable revenues for several reasons including:

- with the possible exception of telecommunications assets, DORC is commonly the highest value within the range of feasible asset values which are consistent with economic efficiency principles
- calculating a DORC is very sensitive to a greenfields or brownfields estimate
- calculating depreciation is contentious as subjectivity rises with optimisation
- where DORC values exceed indexed historical cost, potential exists for the recovery from customers of capital never invested
- greater complexity and enhancement of the utility's information asymmetry advantage
- if DORC is higher than depreciated historical cost, switching methods provides the utility with a windfall gain.

DORC also tends to produces values at the upper end of the range of feasible asset valuation methods. In assessing the suitability of using DORC for the NSW Rail Access Regime, IPART believes that:

- the consultant can complete both greenfields and brownfields estimates which stakeholders can then debate during the consultation period

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137 FreightCorp Annual Report 1997/98, p 9. Tonnage grew from 33mt in 1990/91 to 61.6mt in 1997/98.

138 See FreightCorp submission to IPART, 22 March 1999, p 3 and RAC submission to IPART, 19 March 1999, p 9.

- the degree of subjectivity in completing the optimisation is lower due to restricting consideration to rail transport only
- DORC is consistent with the Baumol floor and ceiling price model
- the potential for any windfall gain from changing valuation methods is minimal as the asset value is pertinent to customers paying the ceiling price rather than all customers
- the independent consultant will exclude any assets that are not likely to be replaced
- relatively few end customers are expected to pay an access price including a DORC based rate of return
- RAC's main customers have supported the use of DORC. However, the Minerals Council's support of DORC was conditional on use of the bypass interpretation of stand alone basis rather than the cost allocation interpretation.

If DORC is properly estimated and allocated to customers, it should not be economic to duplicate (or bypass) the system as a whole, or in Sectors. However, if prices are based on average costs, it may still be economic to 'cherry pick' and build bypass networks to serve a smaller more profitable groups. However, the Regime is based on negotiation allowing sufficient scope for RAC to respond to such circumstances. Ultimately, the risk of bypass is extremely remote for RAC, due to the extensive hurdles involved in corridor acquisition and the need to obtain local government development consent.

5.5.5 Rolling forward the asset valuation

The term 'rolling forward' refers to how regulators update an asset valuation over time. IPART proposes that the simplest, most transparent and reasonable roll forward mechanism for the NSW Rail Access Regime is to revise the DORC asset valuation every five years and to allow annual indexation by the consumer price index (CPI) between revaluations. The five yearly revision of DORC is recommended to ensure that RAC has strong incentives for efficient capital expenditure which meets the needs of customers.

IPART has considered the relative merits of the underlying and the headline CPI and trends in Sydney and All Capitals CPI over time. IPART has found that the average rates over time are closely aligned. IPART believes it is most important that the same rate be adopted consistently over time. Additionally, the headline CPI has the benefit of being easily accessible by the public.

IPART recommends that indexation of the capital base utilise the actual Sydney (All Groups) CPI for each financial year using the four quarters year on year averaging system described in the roll forward discussion (see Section 5.6.1). A real rate of return will then be applied to the indexed capital base.

A further issue in relation to rolling forward is how to include subsequent capital expenditure in the regulatory asset base. Usually regulators permit actual capital expenditure to be included in the regulatory capital base in the year in which that expenditure is incurred, provided the expenditure is undertaken at efficient cost levels, and the investment passes an annual prudency test adjudicated by the regulator. Operator funded capital expenditure would be excluded in the DORC asset base. The five yearly revision of the DORC valuation will act as a surrogate for an annual assessment of capital expenditure efficiency.

The asset base will also be reduced by the annual depreciation charge (see Chapter 6).

5.6 Conclusion and decision on asset valuation

This Review requires setting a valuation method for calculating maximum ceiling prices for all customers. However, in practice the ceiling test prices are reached by a small number of customers in the Hunter Valley. Following consideration and assessment of submissions on the appropriate valuation methods for RAC assets, IPART is of the view that the most reasonable asset valuation method for the ceiling tests under the NSW Rail Access Regime is either indexed depreciated actual cost or DORC. IPART is generally of the view that DORC is not the 'most reasonable' valuation methodology for setting a maximum allowable revenue of a utility. However, DORC may have greater merit for use in setting ceiling prices in the context of the Baumol model.

In the absence of an indexed historical cost valuation, IPART considers that DORC is the most appropriate initial capital base for calculating **ceiling test** prices (including a maximum rate of return) for the NSW Rail Access Regime. Most submissions support DORC as the favoured method for applying the Baumol stand alone cost test. However, IPART recommends DORC **in this instance** for several other reasons as detailed throughout Section 5.5.

On the basis of its consideration, **IPART recommends that DORC is the most appropriate initial capital base for calculating the ceiling test for the NSW Rail Access Regime.**

RAC's access prices from 1 July 1999 will be based on the interim DORC, yet these prices will be adjusted retrospectively (with an allowance for interest) following the completion of the independent consultants DORC valuation.

5.6.1 Roll forward the asset base

IPART recommends that the DORC regulatory asset value be revised every five years. IPART prefers to calculate the return on capital on the average of an opening and closing regulatory asset base. In summary, the process for rolling forward the asset base used for RAC's access pricing from year one to year two involves;

1. using the final DORC asset value for year 1 as the starting point
2. indexing of the final asset value for year 1 by the Australian Bureau of Statistics actual Sydney (All Groups) CPI for year 1[139]
3. adding RAC funded capital expenditure expected to be made during year 2 (assumed operational at the middle of each financial year)
4. subtracting a depreciation charge
5. establishing a final DORC asset value for year 2.

[139] Annual Sydney (All Groups) CPI for year 1 is to be measured taking the average of the four quarters to March for Year 1 divided by the average of the four quarters to March for Year 0.

Recommendation 10 – Asset valuation methodology

For the purposes of the NSW Rail Access Regime, the assets owned by the Rail Access Corporation (other than Corridor Formation Assets and land) should be valued using a depreciated optimised replacement cost methodology (DORC) applied retrospectively from 1 July 1999. Prior to the finalisation of the independent consultant's DORC valuation, RAC should utilise their interim DORC value for ceiling test access prices. Should the final DORC value be lower than the interim DORC value, RAC should provide customers with a refund including interest for the relevant holding period.

Recommendation 11 – Process for completing the asset valuation

For the purposes of the NSW Rail Access Regime, the DORC asset value should be determined by an independent consultant. A draft DORC valuation should be published which invites stakeholder comment which must be considered by the consultant prior to establishing a final value.

Recommendation 12 – Asset valuation roll forward

For the purposes of the NSW Rail Access Regime, the DORC value should be revised every five years and should be rolled forward through an annual indexation. The indexation should be calculated using the actual inflation (ABS Sydney All Groups CPI) for the average of the last four quarters to March divided by the average of the previous years four quarters to March. The return on capital should be calculated on the average of the opening and closing regulatory asset base.

6 DEPRECIATION

6.1 What is the objective of depreciation?

This Review has two main objectives in regard to depreciation charges for the Regime:

1. to outline a method for estimating the value of depreciation costs to date as a component of the initial asset valuation
2. to detail a methodology for ongoing depreciation.

Depreciation is an asset related cost which is established to compensate an entity for any decline in the economic value of its asset base over time, as the useful life of the asset becomes shorter. From an accounting point of view, a depreciation charge is important because it matches the decline in an asset's value with the revenue generated by the asset base. However, accounting depreciation may not reflect economic depreciation. It is very difficult to apply the economic concept of depreciation within the limitations imposed by accounting data produced to satisfy accounting standards.

The other asset related cost is return on capital. To assess overall capital costs over the life of an asset, it is necessary to consider return **of** capital (depreciation) together with return **on** capital. The timing profile of the return on assets is closely related to the depreciation profiles assumed. For example, the adoption of longer asset lives produces lower annual depreciation charges, but a higher depreciated asset value in the years immediately after the investment. Consequently, the return on assets will be higher in those years.

Common issues in determining depreciation

The value of the underlying asset base at any point in time will depend on the depreciation (and asset valuation) methodology adopted. Depreciation raises numerous complex debates which this Review does not attempt to resolve. The key debates include:

- The asset base: depreciation can be thought of as a return of capital to investors. Often customers argue that to allow depreciation on a written up (current cost) asset base is akin to returning capital never invested. Conversely, utilities argue that with long-life assets (renewed in perpetuity) depreciation on the historical cost asset base does not provide for maintenance of the operating capacity of the RAC Network.
- The useful life of assets: should depreciation be based on economic life or technical life.
- The pattern of depreciation expense: straight-line depreciation provides simplicity and better price stability, yet other profiles either front end or back end loaded, depending on the assets, may be more cost reflective.
- Whether a renewals based depreciation charge would be a reasonable and fair methodology. None of the submissions to this Review support the use of the renewals annuity approach to depreciation.

6.2 Estimation of depreciation costs to date for the DORC value

RAC has stated that the absence of data and records for maintenance and capital expenditure prevents the accurate estimation of accumulated depreciation to date. Consequently, the DORC valuation will have to use a proxy for accumulated depreciation. The most practical proxy for accumulated depreciation is an estimate of the cost of restoring the existing track to new condition. RAC's November 1998 submission used a TCI

discounting approach as a proxy for depreciation which deducted 49.3 percent from the replacement cost value.

RAC, in preparing the interim DORC valuation has provided a revised estimate of the starting value of depreciation. The interim DORC value commences with replacement cost of $1,029m, subtracts optimised track worth $12.05m and then deducts estimated depreciation of $352.78m to derive the interim DORC value of $664.169m. Hence, the depreciation estimate contained in the interim DORC valuation provides an average 34 percent discount from replacement cost for RAC's Hunter Valley coal network.

The independent consultant conducting the DORC will examine the validity, reasonableness and accuracy of RAC's depreciation estimate of $352.78m. Coal access prices from 1 July 1999 will be based on the interim DORC, yet these prices will be adjusted retrospectively (with an allowance for interest) following the completion of the independent consultants DORC valuation.

6.3 Ongoing depreciation for rail track maintained indefinitely

The public hearings and submissions featured extensive debate on the issue of what (if any) depreciation is warranted when assets are maintained using an MPM program to produce an indefinite useful life. RAC track maintenance is completed using either MPM or routine maintenance (as described in Section 4).

IPART notes that RAC has spent relatively stable amounts on MPM which may enhance the accuracy of estimating a levellised charge.[140] RAC maintenance providers are required to separate their costs into categories of MPM or routine maintenance. Hence, RAC customers have some assurance that the distinction between MPM and routine maintenance is clear and not subject to manipulation. Yet the distinction between MPM and capital expenditure is less clear, especially, for example, where timber sleepers are replaced with concrete. In this instance, RAC may also be expanding the net tonne capacity of the track and should capitalise this MPM cost if it increases future economic benefits.

Both FreightCorp and the Minerals Council seek the establishment of systems which ensure the depreciation methodology does not charge them for both (double count) MPM and decline in the physical condition of asset components.[141] The concern is they will pay to permanently maintain or replace a high quality RAC Network and pay again to return the capital originally invested in the RAC Network.

Where MPM is charged as a levellised expense a utility will not receive depreciation charges to specifically compensate for the physical wear and tear on assets. Yet the utility is entitled to compensation for any loss in economic value of the assets (ie coal mine depletion). Where MPM is capitalised (added to the regulatory asset base), the utility is generally permitted to charge depreciation on the (higher) asset base at a rate matching the decline in economic value of the asset. Both methods of charging for MPM result in an equivalent long term net present value cost to customers.

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140 In 1996/97 MPM was approximately $280m compared to 1997/98 when MPM was $262m.

141 NSW Minerals Council submission to IPART, 27 November 1998, p 41 and FreightCorp submission to IPART, November 1998, p 28.

6.4 RAC's proposal for ongoing depreciation

RAC has proposed that annual depreciation be set at 3.33 percent per annum straight line based on an average economic life of 30 years on a discounted replacement cost asset base.[142] RAC estimates that 30 years is the foreseeable remaining life of the Hunter Coal mines, given remaining proven coal reserves and the trend away from fossil fuels due in part to attempts to reduce greenhouse gas emissions.[143] RAC seeks to continue the practice of expensing MPM rather than capitalising. Hence, RAC does not seek any compensation for the physical decline in track components.

RAC's financial accounts capitalise only new assets where the 'assets increase the net present value of future cash flows.'[144] For example, RAC has capitalised MPM when replacing timber sleepers with concrete in the Hunter Valley coal network. RAC pursues a policy of always expensing all MPM on the CityRail network as they do not foresee probable future economic benefit from this expenditure.

RAC's depreciation proposal is linked to its preferred asset valuation method of discounted (by Track Condition Index) replacement cost ($522m). Hence, using RAC's preferred asset valuation and depreciation methodologies would result in a maximum annual depreciation charge of $17.4m. The actual charge will be lower due to some coal customers paying the floor price. RAC's submission states, "depreciation represents about 8 percent of RAC's ceiling revenue."[145]

IPART notes RAC financial statements recorded a depreciation expense of $13.36m in 1997/98 on a depreciated earnings based commercial asset valuation of $364.3m. This equates to a depreciation rate of approximately 3.6 percent per annum. In RAC's financial accounts depreciation is only being charged on the Hunter Coal network as RAC has valued all other assets at zero. Depreciation is currently a small component of RAC's cost structure, accounting for 1.9 percent of total accrual costs in 1997/98.[146]

6.5 Methods of calculating depreciation

The conventional accounting practice allows depreciation to be calculated on either historical or replacement costs. In the UK, depreciation is permitted on the regulatory asset bases (commonly between historical and replacement costs). Other methods include condition-based depreciation, and renewals annuity under a renewal accounting concept. Renewal accounting was adopted in the UK water industry and is based on the assumption that water assets have infinite lives and that capacity can be maintained in perpetuity.

The depreciation profile is altered by the method of depreciation selected. The most commonly adopted methods are:

- Straight line depreciation - a uniform annual depreciation charge based on asset life. Straight line is the method most commonly used by UK economic regulators.
- Accelerated depreciation - depreciation is 'front loaded' (higher in early years). Methods include double declining balance, sum of digits, and diminishing value.

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142 Converting asset useful lives to a percentage charge uses the formula: (100/useful life) = annual percent.
143 Mr Mike Smart, Manager Corporate Strategy, RAC, transcript of Hearing 15 December 1998, p 154.
144 RAC Annual Report 1997/98, p 72.
145 RAC submission to IPART, 27 November 1998, p 40.
146 RAC Annual Report 1997/98, p 71, p 78 and p 60.

6.6 Tribunal's analysis and assessment

Two main depreciation methods comply with Australian Accounting Standards and are available for calculating an appropriate depreciation charge for RAC's Hunter Valley coal network, namely:

1. useful life of RAC's physical track assets
2. the average remaining economic life of Hunter Valley coal mines.

The Australian Accounting Standards permit the charging of depreciation based on commercial obsolescence (mine life) where assets will become redundant through a fall in production, provided the date of likely obsolescence can be reliably measured.[147] IPART is mindful that selecting an alternative method which does not comply with accounting standards would require RAC to maintain separate regulatory and financial accounts.

6.6.1 The useful life of RAC coal assets

Under the asset life method of depreciation, the rate of depreciation is based on the cost weighted average useful life of each asset component. RAC states that the useful life of infrastructure assets is also approximately 30 years.[148] The table below gives a preliminary breakdown of the useful lives of the main track components and their significance to the replacement cost. The table also contains IPART's estimate of the weighted average useful life of RAC's Hunter Valley assets, which is approximately 39.4 years. This equates to an annual depreciation rate of around 2.54 percent per annum using the 'straight line' method.

Table 7 IPART estimate of the average useful life of RAC's Hunter Valley assets

Component	Estimated average useful life (yrs)	Component/replacement cost asset value (%)	Weighted average useful life (yrs)
Rail	12	26.1	3.1
Concrete sleeper	50	9.1	0.5
Timber sleepers	20	0.7	0.1
Turnouts	12	7.0	1.3
Ballast	24	8.5	2.1
Bridges*	60/120	11.7	10.5
Culverts	120	0.4	0.4
Signals	20	10.0	2.0
Tunnels	120	10.0	12.0
Other**	20	16.5	3.3
Total		100.0	**39.4 years**

Source: Estimated useful lives and replacement cost asset value components supplied by RAC, December 1998.

Notes: * Concrete bridges last approximately 120 years while steel bridges last 60 years; an average of 90 years was used to complete the weighting.

** Other refers mainly to level crossings, communications, earthworks and fences. For the purposes of this estimation 'other' was allocated an arbitrary average life of 20 years.

147 Australian Accounting Standard 4, as revised to August 1997.

148 RAC submission to IPART, 27 November 1998, Appendices p 5.

6.6.2 The remaining life of Hunter Valley coal mines

To maintain a given level of service potential indefinitely RAC plans to complete an ongoing MPM program for asset renewal. A substantial proportion of the Hunter Valley Coal rail network would close at the cessation of coal mining. However, it is likely that most track sections would remain open following the possible cessation of coal mining to serve other freight and passenger traffic. Yet, this traffic is generally priced at the floor test and to date not capable of paying depreciation or rate of return as components of their access price.

Consequently, the depreciation methodology should be tailored to the market segment which is paying a return of capital (or capital repayment). Should other market segments become capable of paying depreciation the methodology should be revised. Thus, mine life is the better basis for setting the rate of depreciation.

As noted in section 6.4, RAC's submission states that 30 years is the best estimate of the foreseeable average remaining life of the Hunter Coal mines. [149]

The Minerals Council estimates that 50 years is a more realistic view of the remaining life of the Hunter Valley coal mines, given current production rates.[150] The Minerals Council cites a NSW Department of Mineral Resources estimate that there are 5.7 billion tonnes of proven reserves in the region serviced by the Hunter rail network. Assuming current production of approximately 80m tonnes per annum is maintained, the remaining life is around 70 years. Production would have to rise to 195m tonnes per annum for reserves to be depleted within 30 years (by 2028).

However, not all reserves will be mined and transported due to factors reducing commercial viability including:

- narrow seam width or the fact that poor quality coal has a lower market price
- located too far from port or existing rail tracks
- mining in certain locations may be precluded due to factors such as environmental issues, native title claims, or pre-existing national parks.

On balance, and with the limited information presented to it, IPART believes it is reasonable to assume that the average remaining Hunter Valley coal mine life is approximately 40 years. This would equate to straight line depreciation of 2.5 percent per annum for existing assets. The estimated remaining Hunter Valley coal mine life should be updated every five years in conjunction with the DORC re-valuation.

6.7 Interaction between depreciation and asset value

IPART has examined overseas methods of charging depreciation in regulated industries. The US allows historical cost depreciation from a depreciated actual cost asset base. In the UK, the approaches adopted are slightly different as outlined below:[151]

- Rail industry: the regulator, ORR, permits depreciation on the regulatory asset value of assets. ORR allows the addition of efficient cost capital expenditure where sought by operators or where it meets the needs of operators and delivers a rise in output above

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149 RAC submission to IPART, 27 November 1998, pp 50-52.

150 NSW Minerals Council submission to IPART, 4 January 1999, p 7.

151 See IPART Discussion Paper, *Rolling Forward the Regulatory Asset Bases of the Electricity and Gas Industries* (DP-31), January 1999, Appendix 2.

that achieved by renewals. ORR will reduce the asset base to the extent that outputs which represent renewal in the modern equivalent form are not delivered.[152]

- Electricity industry: the regulator, OFFER, allows depreciation only on the regulatory asset value of assets. It allows all new capital expenditure to be added to the asset base.
- Water industry: the regulator, OFWAT, allows full current cost depreciation/renewals. It allows the regulatory asset base to be enhanced in real terms only to the extent that investment exceeds the renewal charge in respect of underground assets, or to include the depreciation charge in respect of above ground assets.
- Gas industry: the Monopolies and Mergers Commission states that depreciation will be allowed only on the regulatory value of assets. It allows actual capital expenditure incurred over the previous price control period.

IPART considers that allowing depreciation on the regulatory asset base is consistent with allowing the full amount of new capital investment to be included in the asset base. The annual prudent investment test used by regulators to assess the efficiency of capital expenditure will be effectively completed in the five yearly revision of the DORC.

6.8 Ensuring depreciation matches replacement expenditure

A depreciation expense provides for the recovery of capital invested over the anticipated useful life of the depreciable assets. Since depreciation is a provision, not an actual cash expenditure, funds recovered from depreciation charged in prices are retained in the business and are available as a source of capital for replacing, improving, or expanding the system, repaying debt or redeeming equity.

In considering the appropriateness of depreciation, there is a question of whether depreciation also represents a surrogate for replacement capital expenditure. The UK ORR raises this issue in a consultation paper regarding the approval of access charges.[153] The ORR believes access charges should cover depreciation on a current cost basis, and thus should finance, over time, expected expenditure on the MPM of assets.

Depreciation on future capital investment

In regulating other utilities, IPART has allowed the capital base to include capital expenditure incurred in the middle of a financial year as long as the new asset is being used in operations. Depreciation charges can be levied as soon as an asset is operational and included in the regulatory asset base.

6.9 IPART conclusions and decisions on depreciation

All submissions to this Review support the use of straight line methodology as the simplest, most transparent, and fairest method. Some submissions also note that the dollar difference between straight line and other methods is immaterial. **IPART supports using straight line depreciation as a transparent and well understood method.**

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[152] Office of the Rail Regulator (UK), *Periodic review of Railtrack's access charges: the Regulator's conclusions on the financial framework*, Paper 3, 9 December 1998, Sections 5 and 6.

[153] Office of the Rail Regulator, *Railtrack's Access Charges for Franchised Passenger Services: The Future Level of Charges*, policy statement, 1995, London.

Depreciation will be allowed on the initial DORC capital base established for the Regime. The depreciation schedule will be calculated using straight line depreciation over the economic life of the mines. IPART believes that depreciation should be based upon the remaining useful life of the Hunter Valley coal mines rather than the useful life of RAC assets. The basis for this preference is that the RAC Network is maintained in perpetuity until mine closure is foreseeable, when the mines do finally close, the majority of the Hunter Valley coal rail network would also close.

From the information available to it, IPART believes that 40 years, commencing from July 1999, is the most accurate and reasonable estimate of the remaining life of the Hunter Valley coal mines. This result is also very similar to depreciation rates estimated using weighted asset component lives (see Table 7). Forty years equates to a depreciated charge of 2.5 percent per annum for existing assets. Depreciation on future capital expenditure should be permitted at a slightly faster rate. For example, depreciation made on capital expenditure completed in July 2001 would be based on a remaining life of 38 years (or 2.63 percent per annum).

The estimate of remaining mine life should be revised every five years in conjunction with the revision of the DORC valuation. The independent consultant engaged to undertake the DORC valuation should be given overall responsibility for revising the estimate of the remaining mine life. The independent consultant should utilise independent mining sector advice in setting this estimate. All existing assets would then be depreciated at the new rate based on the revised estimated mine life set for the next five years from 2004.

From July 1999, IPART recommends that depreciation be based on the interim DORC value. If the final DORC value is lower, RAC will provide its customers with a retrospective adjustment including interest.

The independent consultant will have the complex task of establishing a reasonable starting depreciation value for inclusion as a component of the DORC value. The independent consultant should assess the reasonableness of calculating the starting value of depreciation by the several methods including:

- An estimate of actual depreciation by reconstructing estimates of capital expenditure, maintenance expenditure and depreciation charges to date utilising the records described in Section 5.4 of this final report.
- An estimate of the average coal mine life exhausted to date as a proportion of the total average coal mine life.
- A estimate of a proxy for depreciation using an asset condition approach as utilised by RAC for the interim DORC.
- Selection of an arbitrary discount from replacement cost based on the judgement of the independent consultant and in consideration of the discounts produced by other depreciation methods.

The merit of each of these methods can be assessed and critiqued by stakeholders when the independent consultant produces a draft DORC value for consideration by stakeholder of this industry. Overall, the final value established by the independent consultant for starting depreciation is likely to require expert judgement.

Recommendation 13 - Depreciation

For the purposes of the NSW Rail Access Regime ongoing depreciation for existing assets should be calculated based on a depreciated optimised replacement cost (DORC) asset valuation, assuming a forty year remaining coal mine life (from July 1999) and using a straight line method. The estimate of remaining mine life should be revised every five years. Ongoing depreciation for future capital investment should be made based on the unexpired portion of the most recently estimated remaining mine life at the time the asset becomes operational.

7 RATE OF RETURN ON ASSETS

The third term of reference for this Review requires IPART to determine:

> 3. An appropriate maximum rate of return on assets under the Regime for the purposes of applying the ceiling test under Schedule 3, clause (i) (b), particularly taking account of the combinatorial nature of the ceiling test.

IPART is asked to determine the maximum rate of return permitted for line Sector(s), a customer and/or the RAC Network. The average rate of return received by RAC will naturally be less than this maximum. The rate of return set in this Review is one component of a ceiling price.

Since August 1996, the Regime has permitted a maximum rate of return of 14 percent (nominal post tax) on a depreciated replacement cost asset base.[154] The Regime does not disclose the parameters for or basis of this rate of return. RAC has subsequently converted the 14 percent nominal post tax maximum to apply pre tax nominal ceiling of 21.88 percent.

In assessing an appropriate maximum rate of return, it is necessary to specify whether the rate is quoted in nominal or real terms (the nominal rate minus inflation). How the rate is quoted will depend on the method adopted to value the underlying asset base and to roll it forward. IPART notes that a nominal return on a depreciated replacement cost base is highly unusual as the regulated entity may be compensated twice for inflation. Consequently, regulators typically use real rates of return with current cost, yet permit nominal rates when a historical cost asset base is utilised. For example, the ACCC has stated that "as inflation is included in current cost asset values, the real risk free rate and cost of debt should be used to determine the revenue requirements."[155]

Rational investors seek to maximise their return on investments. They also seek similar expected returns from investments of similar risk. If not, they will switch to investments offering higher returns for similar risk. Hence, a utility may be unable to attract capital to meet service demand and maintain viability unless it can offer an expected return comparable to investments of similar risk.

A utility is usually unwilling to invest in new assets unless their long run expected return at least equals the utility's weighted average cost of capital (WACC). Hence, the maximum rate of return is usually set at a level which approximates the WACC. Setting a rate of return below the WACC may see the utility reduce maintenance and capital expenditure below optimum levels, possibly reducing service quality. Train operators should recognise that insufficient investment may provide short term gains from lower access prices yet may adversely affect RAC's long term ability to provide a high quality service and to retain customers. On the other hand, a maximum rate of return set above a utility's WACC would distort pricing signals to consumers and investors, resulting in the misallocation of resources and sub-optimal economic outcomes.

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154 See NSW Rail Access Regime, NSW Government Gazette No. 22, 19 February 1999, p 904.

155 ACCC, *Regulation of Transmission Revenues*, Issues Paper, May 1998, p 20.

7.1 The need to regulate the maximum rate of return

Economic regulation is intended to mimic the outcomes of competition over the longer term so that charges for monopoly services reflect efficient costs and provide a surrogate for competition. Alternatively, regulation may provide a more stable and predictable income stream than competitive markets which can be harsh in their sanctions and generous in their rewards.

IPART has considered the following questions:

- What level of return does the market consider necessary to attract new investment?
- Do the non-diversifiable risks faced by RAC warrant a maximum rate of return above its WACC?
- What are the potential impacts on economic efficiency, customers and service standards?

7.2 Weighted Average Cost of Capital

Methods are available to assist in setting a maximum rate of return that is both fair and reasonable. In practice, the required rate of return is usually based on an entity's WACC. The main components to estimate the WACC are:

1. expected return on equity , R_E (the firm's cost of equity)
2. expected return on debt R_D (the firm's cost of debt)
3. capital structure (the firm's debt (D) to equity (E) mix).

The basic formula for evaluating the WACC is:

$$WACC = R_E \times \frac{E}{(E+D)} + R_D \times \frac{D}{(E+D)}$$

The exact formula used will vary depending on whether pre or post tax returns are being determined and on whether dividend imputation is considered.

7.3 Evaluating the cost of equity

A widely accepted method for estimating the cost of equity is the capital asset pricing model (CAPM). Under CAPM the expected return on equity is equal to the risk-free return plus the company's systematic risk, times the risk premium required by the market. Despite its simplicity in measuring the risk and wide commercial acceptance, significant controversy on the application of the CAPM remains.

The application of CAPM to entities like RAC is more difficult due to a scarcity of truly comparable businesses. RAC does not have a share price to enable the calculation of an empirical equity beta estimate. Hence, judgment is required in estimating RAC's risk levels.

Estimating the size of the equity (market risk) premium is a controversial aspect of calculating the cost of equity. Measurement issues focus on whether the arithmetic average or the geometric average is more appropriate. Some CAPM practitioners believe that the market risk premium is relatively constant through time at 6-7 percent. An alternative view, is that a variety of factors such as lower inflation, changing demographics, changes to taxation and superannuation policies, growth in the importance of dividend imputation, and

developments in world investment markets may have decreased the market risk premium to between 3.5 percent and 4.5 percent.[156]

7.3.1 Capital Asset Pricing Model

The basis of the CAPM is the relationship between risk and return. Over the long term, evidence indicates that there is a linear and positive relationship between risk and return. The essential elements in establishing a required return on equity for a specific stock are:

- the estimation of the risk free rate
- the estimation of the risk premium for the market as a whole
- a companies risk relative to the market's risk as a whole (ie a companies equity beta).

IPART calculates the nominal post tax WACC using the following formula[157]

$$WACC = R_e * \frac{(1 - T)}{1 - T(1 - \gamma)} * \frac{E}{(E + D)} + R_d * (1 - T) * \frac{D}{(E + D)}$$

R_e = required rate of return on equity after company tax
R_d = pre tax average cost of debt
D = market value of debt
E = market value of equity
T = corporate tax rate
γ = franking credit utilisation

The cost of equity component of the WACC was determined using the Capital Asset Pricing Model (CAPM). The general formula for CAPM is:

$$Re = Rf + [\beta e (Rm - Rf)]$$

Where:

Re = return on equity, being the return after corporate tax but before personal tax
Rf = risk free rate of return
Rm-Rf = market risk premium
βe = levered equity beta, a measure of systematic risk of an investment, relative to the systematic risk of the market as a whole.

In many cases, the value of CAPM parameters is a matter of some debate. Consequently, it is preferable to examine the contentious parameters across a range of values, which in turn produces a range for the rate of return. This has the advantage of preventing a reliance on the outcome of one particular set of parameters.

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156 For further discussion see ORG, *Access Arrangements, (Multinet Energy, Westar and Stratus) Final Decision*, October 1998, pp 202-203 and IPART, *Final Decision Access Arrangement for Great Southern Energy Gas Networks Limited*, March 1999, pp 168-170.

157 This formula was developed by Officer (1994), *The Cost of Capital of a company under an imputation tax system*, Journal of Accounting and Finance, 34. This formula is widely accepted as a tool of business valuation.

Other methods used for setting the WACC

Other methods are available to estimate the WACC. These methods include the price:earnings ratio, the dividend growth model and arbitrage pricing theory. Generally, these methods are utilised to confirm that the CAPM produced WACC is reasonable. As RAC is not traded on a stock market and receives significant income from a government subsidy, these methods are not available to confirm CAPM results.

7.3.2 Practical issues associated with CAPM

CAPM is theoretically simple to apply and has widespread support. Whilst these may provide reasons to use it, CAPM has several faults and problems. The controversy surrounding nearly every parameter in the CAPM formula is reflected in recent debate about the Victorian gas decisions. Issues that have attracted attention include:

- CAPM is not reliable for accurately predicting actual equity returns over time. It is argued that if market risk is not identical to systematic risk, beta cannot adequately reflect market risk.
- Some of the economic assumptions underlying CAPM may be questionable, eg risk free returns, mean variance analysis and fully informed investors.
- Measuring the market portfolio is difficult.[158]
- Whether to measure the risk free rate using a historical average rate of return on bonds, a forecast rate or the prevailing market rate. The relationship between the term structure of the bond chosen, the regulatory period and the average asset life are also issues.
- Estimation of the market risk premium on equity and the equity beta.
- Treatment of firm specific and systematic risk.[159]
- A number of different methods of converting between nominal and real WACC and between post and pre tax WACC are used in the market. The method selected can significantly alter the results of CAPM.
- Whether the effective[160] or the statutory (36 percent) tax rate should be used in grossing up the post tax cost of equity to a pre tax figure.
- The optimal gearing level, ie the profit maximising mix of debt and equity.

Most of these uncertainties and problems can be addressed by utilising a range of values for controversial parameters. This in turn produces a range for the WACC, within which a regulator can select the final value based on consideration of all information available to it.

IPART stresses that there is no single 'precise' value for the component parameters of the WACC. However, the parameters provide a useful guide for establishing a reasonable range for the cost of capital within the CAPM approach.

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158 The market portfolio is a theoretical portfolio where all available investments are held in proportion to the total market value of each investment.

159 An underlying assumption of CAPM is that returns follow a normal distribution. It is argued that under a regulatory regime, asymmetric distribution of returns may result (eg investment disallowance by a regulator). If this happens, all the regulatory risk faced by the company is not captured by CAPM.

160 The effective tax rate is usually significantly less than the statutory tax rate due to timing and permanent differences. The effective tax rate simplistically is the tax a company paid divided by profit (percent).

7.4 RAC's proposed WACC

Following several revisions, RAC's current proposal for their maximum rate of return is 8.3 percent pre tax real for central Hunter Valley coal assets and 9.86 percent pre tax real for all assets outside this area. RAC claims that this rate of return is to compensate for the perceived higher risks of factors such as having a high proportion of fixed costs (80 percent) and the high sensitivity of RAC earnings to the performance of coal companies.[161] RAC did not provide revised CAPM parameters which are used to derive this rate of return.

7.5 Public submissions

Most submissions supported using the CAPM to derive the WACC as the most appropriate method for calculation of the maximum rate of return. IPART received detailed analysis of the CAPM/WACC derivation from Minerals Council, FreightCorp, NSW Treasury and RAC. These analyses display significant commonality and some discrete differences which are summarised for comparison in the following table.

To enable a fuller comparison, the table contains other WACC estimates, including:

- IPART Final Decision for Access Arrangement for Great Southern Energy, March 1999.
- ORG Victorian Gas Access Arrangements (Westar, Stratus and Multinet) Final Decision (October 1998).

[161] RAC submission to IPART, 27 November 1998, Appendices, pp 7-11.

Table 8 WACC comparison table

CAPM Parameter	IPART Final Wagga Gas (March 99)	ORG Victorian Gas (Oct 98)	FreightCorp Proposal for RAC (Nov 98)	Minerals Council Proposal for RAC (Nov 98)	RAC Proposal Private Ownership** (Nov 98)	RAC Proposal (March 99)
Risk free rate	5.18% - 5.67%	6.0%	5.00-5.33%	6.0%	5.61%	n.s.
CPI	1.69% - 2.14%	2.5%	2.0-2.5%	2.5%	2%	n.s.
Real risk free rate	3.43% - 3.46%	3.4%	2.94-2.76%	3.41%	3.6%	n.s.
Market risk premium	5% - 6%	6%	6.0-7.0%	6.0%	6.5%	n.s.
Debt margin	1.2%	1.2%	0.6-0.9%	0.8%-1.2%	1.0%	n.s.
Asset beta	0.40-0.50	0.55	0.41-0.48	n.s.	1.0	n.s.
Equity beta	0.96-1.1	1.20	0.54-1.31	0.2-1.0	1.2	n.s.
Debt to value	60%	60%	30-70%	40%-60%	20%	n.s.
Franking credit (gamma)	0.30-0.50	0.50	0.4-0.6	0.5-1.0	0.25	n.s.
Effective tax rate	36%	36%	36%	36%	36%	n.s.
Cost of equity (nom post tax)	9.82%-12.25%	13.2%	8.24-14.51%	7.2-12.0%	13.37%	n.s.
Nominal post tax WACC	5.52%-6.83%	5.62%-7.25%	5.78%-6.05%	4.5%-7.5%	10.19%	n.s.
Real pre tax WACC	**5.9% - 8.4%**	**6.7% -8.0%**	**6.78%-6.90%**	**4.4%-8.9%**	**13.6%**	**8.3%***
Preferred real pre tax WACC	**7.75%**	**7.75%**	**6.84%**	**5.4%**	**13.6%**	**8.3%***

Notes: n.s.: not supplied.
IPART convert from a nominal post tax WACC to a real pre tax WACC using both the standard market practice and the Macquarie conversion methods.
The standard market practice method converts from nominal post tax => nominal pre tax => real pre tax.
Conversion methods used in other submissions are varied and have not been validated by IPART.
* RAC's March 1999 proposal sought a rate of return of 8.3 percent (pre tax real) for assets between Port and Drayton and 9.96 percent real pre tax for single customer assets.
** RAC's Private Ownership proposal utilised a gamma value of 0.25. RAC also provided a public ownership proposal with gamma set at zero and all other parameters unchanged.

7.6 Establishing a feasible range for rate of return

In setting a rate of return IPART has considered a range of values derived under CAPM. In a consultation paper released in March 1998,[162] IPART examined and refined the values of some of the CAPM parameters in the light of submissions and recent regulatory applications of this model. IPART has developed a feasible range for the WACC based on a combination of plausible parameters.

In setting RAC's maximum rate of return IPART is conscious that:

- all former SRA rail track related assets were transferred to RAC for nil consideration
- RAC is debt free and has recently accumulated high cash reserves
- RAC's principle maintenance supplier (the Government owned RSA) assisted Government to meet targeted track maintenance cost reductions by accepting a nil profit margin in 1997/98[163]
- in 1997/98, 92 percent of RAC's access revenue comes from two NSW government owned train operators (SRA accounts 60 percent and FreightCorp is 32 percent)[164]
- the SRA access price was brokered by government (NSW Treasury) and set at a level which was forecast to allow RAC to 'break even' on a cash basis[165]
- 21 percent of total RAC revenue is from a direct government subsidy (the Line CSO).[166]

Whilst these facts partly explain RAC's operating environment, not all of them are relevant to setting a reasonable rate of return using CAPM.

The risk free rate and the real risk free rate

Under CAPM principles, the risk free rate of return should be set on a forward looking basis and reflect returns which investors can currently obtain in the market.

ORG in the final decision for the access arrangements for Victorian gas utilised an average of the last eight weeks of the 10 year Commonwealth Bond rate.[167] This approach was supported by the Minerals Council.[168] FreightCorp propose a risk free rate based on the 10 year Commonwealth Bond using a seven day moving average calculated over the last three months of trading.[169]

IPART has decided to use the 20-day average of the 10 year Commonwealth Bond rate calculated at the time of deciding the rate of return for this final report. On 19 April 1999, the 20 day average was 5.37 percent. On this basis, IPART sets the nominal risk free rate of return as 5.37 percent.

To estimate the real risk free rate, the draft report for this Review subtracted inflation forecast (2 percent) from the estimated risk free rate using the Fisher equation. Upon further

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162 IPART, *Review of the delivered price of gas in Albury and Moama: A consultation paper*, March 1998.
163 See RSA Annual Report 1997/98, pp 6-9.
164 NSW Treasury submission to IPART, November 1998, p 5 and RAC Annual Report 1997/98, p 60.
165 RAC submission to IPART, 27 November 1998, p 3.
166 RAC Annual Report 1997/98, p 60.
167 ORG, *Access Arrangements, (Multinet Energy, Westar and Stratus) Final Decision*, October 1998, p 201.
168 Minerals Council submission to IPART, 27 November 1998, p 46.
169 FreightCorp submission to IPART, 27 November 1998, p 48.

consideration, IPART believes a more stable and accurate estimate of the real risk free rate is provided by the yield on 10 year capital indexed bonds. The capital indexed bonds provide an empirically based forecast for long term inflation. Consequently, IPART has decided to use the 20 day average of the August 2010 Capital Indexed Bond rate calculated at the time of making this decision. On 19 April 1999, the 20 day average yield for August 2010 capital indexed bonds was 3.52 percent. On this basis, IPART sets the real risk free rate of return at 3.52 percent.

Inflation

The draft report considered a range of forecasts and examined indexed bond yields to establish a CPI (consumer price index) assumption for RAC of 2.0 percent. In selecting this value IPART noted that the Minerals Council proposed a CPI value of 2.5 percent.[170] FreightCorp proposed a range of 2.0 percent to 2.5 percent.[171] RAC proposed a value of 2.0 percent.[172] ORG also used a CPI assumption of 2.5 percent in its final decision on the rate of return for Victorian gas arrangements in October 1998.[173]

Following a re-consideration of the best method of deriving a long term CPI forecast, IPART believes a better indication of the longer term inflation rate anticipated by financial markets is provided by the difference in 10 year bond rates and the yield for inflation indexed bonds for the same term (2010). This method has the advantage of being less subjective and providing a forecast based on a longer term time horizon compared to more subjective inflation forecasts. Consequently, the inflation assumption for CAPM is calculated as the difference between 5.37 percent and 3.52 percent adjusted using the Fisher equation.[174] The current difference between 10 year bonds and indexed bonds is around 1.79 percent. On this basis, IPART has revised the inflation assumption to 1.79 percent.

The market risk premium

There is general consensus among Australian market commentators and those making submissions to this Review that the risk premium on equity generally is in the range of 5.0-7.0 percent. The most recent major Australian regulatory decision on the market risk premium came from the ORG / ACCC Victorian gas access decision which set the market risk premium of 6.0 percent.[175]

Recent publications from UK regulators discussing prospects for future settings of the market risk premium have reduced levels to a range of between 2.75 percent and 4.0 percent.[176] This is a decline from levels of 5.0 percent to 6.0 percent used previously by UK regulators, due mainly to a narrowing between the risk free rate and empirical estimates of the average return on equity.

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170 Minerals Council submission to IPART, 27 November 1998, p 47.

171 FreightCorp submission to IPART, November 1998, p 47.

172 RAC submission to IPART, 27 November 1998, Appendices p 19.

173 ORG, *Access Arrangements, (Multinet Energy, Westar and Stratus) Final Decision*, October 1998, p 201.

174 The Fisher equation converts nominal to real rates and vice versa. The basic Fisher equation is: (1+nominal rate) = (1+real rate) x ((1+inflation).

175 ORG, *Access Arrangements, (Multinet Energy, Westar and Stratus) Final Decision*, October 1998, p 203.

176 See Office of the Rail Regulator (UK), *Periodic review of Railtrack's access charges: the Regulator's conclusions on the financial framework*, Paper 3, 9 December 1998, Section 4.

Professor Kevin Davis estimates that the market risk premium may have fallen following the introduction of dividend imputation, reflecting the additional value of franking credits. Davies believes that the ex-ante market risk premium is between 4.5 percent and 7.0 percent with a preference for the lower end of this range. [177]

In submissions to this Review, RAC proposed a market risk premium of 6.5 percent,[178] the Minerals Council proposed 6.0 percent[179] while FreightCorp preferred a range of 6.0 percent to 7.0 percent.[180]

Following consideration of submissions, recent regulatory decisions and overseas trends, IPART views on the market risk premium remain unchanged. A reasonable range for the Australian market risk premium is between 5.0 percent and 6.0 percent.

An appropriate gearing level for RAC

IPART supports the use of an assumed optimal capital structure for calculating the WACC. For RAC, an optimal capital structure sets gearing on a forward looking basis to minimise the WACC, whilst still enabling RAC to retain an investment grade credit rating and finance investments in its core business.

RAC's proposed gearing level (debt / debt+equity) of 20 percent is significantly below the gearing assumption used by other regulators (60 percent), and indeed those put forward by other utilities (60 percent).[181] IPART has previously endorsed a gearing level of 50-60 percent for a variety of private and government owned utilities. This range for gearing levels is broadly acknowledged as the optimum target level for companies seeking to retain an investment grade credit rating[182] whilst seeking to minimise their cost of capital. Following consideration of a broad range of gearing levels, FreightCorp support gearing of 50 percent,[183] whilst the Minerals Council preferred a gearing range is 40-60 percent.[184]

In the United Kingdom, Railtrack (the RAC equivalent) proposed use of their current gearing level (11 percent) to calculate their WACC. The UK ORR believed Railtrack's customers should pay for an efficient forward looking capital structure rather than RailTrack's actual capital structure and endorsed a range of 40 -50 percent as the appropriate gearing assumption for setting Railtrack's rate of return.[185]

As the WACC is based on market conditions, as long as an appropriate levering formula is used to adjust the cost of equity capital based on the gearing of the firm, and on the assumption (which could be challenged) of an equal tax treatment of debt and equity

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177 Kevin Davis, *The Weighted Average Cost of Capital for the Gas Industry*, Report Prepared for ACCC and the Office of the Regulator General, 18 March 1998, pp 13-14.

178 RAC submission to IPART, 27 November 1998, Appendices p 7.

179 Minerals Council submission to IPART, 27 November 1998, p 47.

180 FreightCorp submission to IPART, 27 November 1998, p 47.

181 For examples see gearing assumed in ACCC, *Victorian Gas Transmission Access Arrangements Final Decision,* October 1998, pp 46-56 and gearing proposed by AGL in the *Revised Access Arrangement Information,* February 1999, p 10.

182 IPART considered the Standard & Poor's credit rating system whereby companies rated between AAA down to BBB are referred to as investment grade debt and companies rated BB to D are referred to as speculative grade debt.

183 FreightCorp submission to IPART, November 1998, p 47.

184 NSW Minerals Council submission to IPART, 27 November 1998, p 47.

185 Office of the Rail Regulator (UK), *Periodic review of Railtrack's access charges: the Regulator's conclusions on the financial framework*, Paper 3, 9 December 1998, Section 4.

returns,[186] the actual gearing level chosen should make little difference to the WACC. That is, the cost of capital should be unaffected by changes in the firm's capital structure.[187] Changing the leverage ratio simply redistributes risk between debt and equity holders without altering the overall risk borne by investors.

In the draft report for this Review, IPART utilised a range of 50 percent to 60 percent for gearing. The draft report contained an error placing the higher gearing on the high WACC value and the lower gearing on the low WACC value. As debt is currently less expensive than equity, it is more correct to associate the low gearing with the high WACC value and the high gearing with the low WACC value. This correction has the effect of increasing the size of the WACC range.

NSW Treasury submission stated that applying a gearing assumption of 50-60 percent to RAC was "too high and not in line with the rate for overseas railway corporations."[188] Treasury seeks the use of a range from 20-60 percent with a preference for the midpoint of 40 percent as appropriate gearing for RAC. Treasury supports basing the CAPM gearing assumption on actual industry averages rather than an optimal gearing level which minimises the cost of capital for the benefit of customers yet can retain investment grade rating for the benefit of shareholders.

Following consideration of all the available evidence, IPART supports a gearing level of 50 percent to 60 percent.

Cost of debt

Like gearing, the cost of debt (debt margin) should be calculated using the likely cost under an optimal capital structure. RAC currently has no debt, yet is confident it can borrow at approximately 1 percent above the 10 year Commonwealth Bond rate.[189] However, this debt margin may rise slightly if credit ratings are progressively downgraded from AAA towards say BB (see Table 9) as actual gearing increases toward the optimal level.

Like RAC, the Minerals Council also propose a debt margin of 1 percent above the 10 year bond rate.[190] In the United Kingdom, the ORR uses a debt premium range of 1 percent to 1.5 percent.

The final ORG / ACCC Victorian gas access decision which set the set the debt margin at 1.2 percent .[191] This was an increase of 40 basis points from the draft decision as these borrowing costs had risen due to "growing uncertainties in global financial markets."

Government trading enterprises are required to pay a loan guarantee fee to NSW Treasury, which is set to neutralise any discount on interest rates received due to government ownership.[192] IPART is of the view that the ownership of the regulated business is irrelevant to estimating the cost of capital.

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186 Fully franked dividends and a dividend imputation factor (γ) equal to one.

187 This is known as the Modigliani-Miller Theorem.

188 NSW Treasury submission to IPART, March 1999, p iii. and p 5.

189 RAC submission to IPART, 27 November 1998, Appendices p 11.

190 Minerals Council submission to IPART, 27 November 1998, p 46.

191 See ACCC, *Access Arrangements, (Transmission Pipelines Australia) Final Decision*, October 1998, p 62.

192 In 1990, the NSW Government introduced a credit rating based fee on the guaranteed debt of GTEs.

The second submission from NSW Treasury advised that debt margins have increased in recent months and that an appropriate range is 1 percent to 1.5 percent. However, IPART believes that utilities own submission gives the better guide to the maximum debt margin required and RAC has sought a margin of 1 percent.

Overall, IPART is of the view that the cost of debt for RAC is approximately 1 percent above the risk free rate of return. Hence, the estimated cost of debt for RAC in April 1999 is 6.37 percent.

Beta

CAPM uses portfolio theory of finance which classifies risks into two types of risk:

- Systematic risk: non-diversifiable risk applicable to the market and the economy as a whole such as inflation, levels of economic growth, taxation rate increases and rises in interest rates. Systematic risk is often caused by socio-economic and political events and in CAPM is measured by the equity beta.
- Specific risk: the residual risk unique to the entity or to a small group of companies that forms a subset of the market. Specific risks are not considered in estimating WACC as they can be minimised by holding a diversified portfolio.

RAC faces several different specific risks such as achieving track maintenance cost targets, greater exposure to industry specific fluctuations or say losing market share to conveyors or slurry pipelines are not compensatable through increasing beta under CAPM. The equity beta should reflect only systematic risk. CAPM views specific risks as potentially diversifiable risks. However, specific risk will be considered in setting the final maximum rate of return.

The standard method for measuring a company's systematic risk, or it's equity beta, is to calculate its share price volatility compared to the market index volatility by means of a linear regression based on historical data. Where an entity is not traded on a stock exchange its equity beta has to be estimated by comparison and judgement.

In assessing what is a reasonable range for equity beta for RAC, IPART considered submissions to this Review and other equity beta levels of comparative companies. A summary of some of these considerations is contained below:

- RAC's estimate their equity beta to be 1.2.[193] IPART notes that this exceeds the April 1997 estimate completed for RAC by HongKongBank of Australia which estimated RAC's equity beta at 1.02.[194]
- FreightCorp preferred estimate of RAC's equity beta is 0.78[195] and Minerals Council preferred equity beta setting is 0.6.[196] Thus, the submissions from the key stakeholders indicate an initial range of 0.6 to 1.2.
- Dr Ernest Easton believes the systematic risk RAC Hunter Coal business is lower than that of the National Electricity Grid which was given an equity beta of 0.4. Hence, Dr Easton suggests an equity beta of 0.3 as reasonable as RAC is a low risk business.[197]

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193 RAC Submission to IPART 27 November 1998, Appendices p 16.
194 HongKongBank of Australia (HSBC Corporate Finance), *RAC Capital Structure Study*, 17 April 1997, p 9.
195 FreightCorp submission to IPART, November 1998, p 47.
196 Minerals Council submission to IPART 27 November 1998, p 47.
197 Dr Ernest Easton, submission to IPART, 23 November 1998, pp 4-5.

To assist the debate, the Minerals Council and RAC provided beta values for both mining and specialised coal mining companies as potentially reflective of RAC's systematic risk.[198] These values varied enormously depending on factors such as the financial viability and commodity price exposure of each company. Consequently, IPART did not consider betas for mining companies.

Given the absence of stock exchange listed rail track business in Australia, IPART considered comparable overseas examples. However, beta is a measure of relative risk and the riskiness of the Australian market as a whole is likely to be different from that of overseas market, if only due to the proportionally larger resource sector. The companies considered were:

- Railtrack is the privatised equivalent of RAC in the United Kingdom. Railtrack's prices are regulated by ORR. Railtrack's submission to ORR proposed a range for the equity beta of 0.8 to 1.0. Railtrack suggests that the higher end of this range is appropriate if it takes on increased risk by increasing the proportion of its charges which are variable. ORR reports that the latest estimate of Railtrack's equity beta is 0.75. Railtrack has a actual gearing level of only 11 percent which is ignored by the ORR which calculates Railtrack's WACC based on an assumed optimal gearing range of 40 percent-50 percent. Consequently, ORR propose to use an equity beta range of 0.75 to 0.85.[199]
- Three United States rail companies (Providence and Worcester Railroad Inc, Genesee and Wyoming Inc and RailTex Inc) provided by FreightCorp. IPART is conscious of the difficulties of comparing overseas results and that these companies generally performed a greater range of services than RAC (eg train operation and track maintenance). However, these values provide some guidance on a reasonable range and confirm rail track ownership is generally less risky than the average market risk. The equity beta values ranged from 0.57-0.94 while the asset beta values varied from 0.28-0.48. [200]

IPART considers that the risks faced by RAC are below the market average. IPART considered providing a small amount of 'headroom' in determining the rate of return for RAC, given its vulnerability through having only a small number of major customers. However, the major customers are Government owned which underwrites their viability. Additionally, major customer risk is diversifiable and should not be considered in the CAPM.

In regard to the equity beta, IPART has used a range of 0.7-1.0. This range is the same as that used in the draft report and was selected following consideration of the factors discussed above including the ranges proposed in submissions, observed equity betas from the United States, the equity beta allowed for Railtrack and ranges used in gas regulation.

With gearing assumed to be unchanged at between 50 percent and 60 percent, the equity beta range (0.7-1.0) results in an asset (ungeared) beta range of approximately 0.29-0.55.

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198 RAC submission to IPART, 27 November 1998, Appendices p 9 and Minerals Council submission to IPART, 27 November 1998, p 49.

199 Office of the Rail Regulator, *Periodic review of Railtrack's access charges: the Regulator's conclusions on the financial framework*, Paper 3, 9 December 1998, Section 4.

200 FreightCorp, submission to IPART, November 1998, p 51.

Setting the taxation rate

The CAPM requires an assumption on the tax rate to enable conversion of pre tax rates of return to an equivalent post tax rate and vice versa. Significant debate centres on whether it is more reasonable to use the statutory company tax rate (36 percent) or the effective tax rate.[201] Adoption of an effective tax approach requires assessment of the general tax position of the industry as a whole and/or the specific tax position of individual utilities. Altering access prices for changes in RAC's tax position may cause an undesirable increase in price volatility. IPART believes that it is for utilities to manage their own tax affairs.

IPART notes that the Minerals Council,[202] FreightCorp[203] and RAC[204] all proposed use of the statutory company tax rate (36 percent). Similarly, the ACCC has utilised the statutory company rate for CAPM.[205]

RAC's effective tax rate is currently low as it has depreciation related tax benefits which "are likely to shelter RAC from tax for the foreseeable future."[206]

IPART utilised a tax rate of 36 percent for the draft report and did not receive any submissions suggesting alternative rates. IPART has decided to continue utilising the statutory tax rate of 36 percent.

Estimating the value for franking credits (gamma)

There is no consensus regarding the correct method to account for the value of dividend imputation credits to investors. Most submissions on this issue considered the following themes and arguments:

- Since not all imputation credits are utilised, the value to investors of these credits should lie somewhere between zero and one depending on average usage.
- Given any one investor will either place a zero or full value on dividend credits, an averaging process across all investors is not appropriate. Instead, what is relevant in determining the required rate of return on equity investments is the value the marginal investor places on these credits which could be anywhere between zero and one.
- Gamma should be set at one as the government can fully utilise imputation credits. However, an alternative argument can be made that the government as a shareholder is unable to claim imputation credits as it pays no personal income tax. This analysis would imply a quite low overall gamma.

IPART considers that ownership is irrelevant for gamma in CAPM in this context. In valuing an asset, governments should apply the same discount rate as that which would be used by the private sector. If a gamma can be estimated for private sector investors, this should be used to determine the required rate of return. Assuming the same required rate of

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201 The effective tax rate is tax paid divided by operating profit. The statutory tax rate for companies is 36 percent. Due to timing and permanent differences of tax deductions the actual expense for tax charged against profit is usually less than 36 percent. Differences can arise from the investment allowance, tax losses etc.

202 Minerals Council submission to IPART, 27 November 1998, p 47.

203 FreightCorp submission to IPART November 1998, p 52.

204 RAC submission to IPART, 27 November 1998, Appendices p 13.

205 ACCC, *Victorian Gas Transmission Access Arrangements Final Decision*, 6 October 1998, p 57.

206 RAC Annual Report 1997/98, p 75.

return for the government implies no bias in investment decision making or valuation for commercial activities arising solely from public rather than private ownership.

IPART has briefly examined the issue of whether to estimate gamma on a marginal (one or zero) or an average basis (somewhere between one and zero). IPART considers estimating the marginal usage is a more difficult task, and additionally, prices would have the desirable feature of more stability using an average basis.

IPART notes that the Minerals Council propose a range of between 0.5 and 1.0.[207], FreightCorp proposed a range of 0.4 to 0.6.[208] RAC proposed a gamma value of 0.25 assuming private ownership of RAC.[209] In its Victorian gas access final decision ORG has utilised a gamma rate of 0.5. [210]

Due to some uncertainty on the best estimate of gamma, IPART has decided to utilise a range for gamma of 0.3 to 0.5.

7.7 Conversion to a real pre tax range for the WACC

A number of methods can be used to change a nominal WACC to a real pre tax WACC and vice versa. The choice of conversion method is contentious, varied and the subject of extensive submissions to other reviews. Using a different conversion sequence can alter the rate of return significantly. RAC's submission supports the use of the standard market practice conversion method.[211] This method has been adopted by the ACCC.[212] Using the market practice conversion method has the consequence of slightly inflating the resultant real pre tax WACC compared to other methods.

The draft report for this Review utilised the standard market practice conversion method. Following further consideration of the debate on the main conversion methods, for the final report IPART has chosen to consider the total combined range produced by the Macquarie and the 'market practice' methods of conversion. The market practice method commences with the nominal post tax rate of return, converts this to a nominal pre tax rate and finally adjusts for inflation to provide a real pre tax rate of return. The Macquarie method commences with the nominal post tax rate of return, converts this to a real post tax rate (using the Fisher equation) and finally completes a 'gross up' to provide a real pre tax rate of return.

Summary of parameters IPART's WACC for RAC

A summary of the parameters selected by IPART as reasonable for RAC are contained in the table below.

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207 Minerals Council submission to IPART, 27 November 1998, p 47.

208 FreightCorp submission to IPART, November 1998, p 47.

209 RAC submission to IPART, 27 November 1998, Appendices p 15.

210 ORG, *Access Arrangements, (Multinet Energy, Westar and Stratus) Final Decision*, October 1998, p 207.

211 RAC submission to IPART, 27 November 1998, Appendices p 18.

212 See ACCC, *Assessment of Telstra's Undertaking for PSTN Originating and Terminating Access Cost of Capital*, January 1999.

Table 9 Summary of parameters IPART's WACC for RAC

CAPM Parameter	Low	Mid-point	High
Risk free rate (20 day ave yld of 10 yr bond)	5.37%	5.37%	5.37%
Real risk free rate (20 day ave yld 2010 Indexed Bonds)	3.52%	3.52%	3.52%
Inflation Forecast (using Fisher equation)	1.79%	1.79%	1.79%
Market risk premium	5.0%	5.5%	6.0%
Debt margin	1.0%	1.0%	1.0%
Equity beta	0.70	0.85	1.0
Asset beta	0.29	0.41	0.55
Debt beta	0.10	0.09	0.08
Debt to value (gearing %)	60.0%	55.0%	50.0%
Franking credit (gamma)	0.5	0.4	0.3
Effective tax rate	36%	36%	36%
Cost of equity nominal post tax	8.90%	10.06%	11.39%
Nominal post tax WACC (with imputation)	5.23%	5.94%	6.91%
Nominal pre tax WACC (Standard market practice method)	8.17%	9.28%	10.80%
Real pre tax WACC (Macquarie method)	5.26%	6.37%	7.86%
Real pre tax WACC (Standard market practice method)	6.27%	7.36%	8.84%
Real pre tax WACC Range (Combined Standard market practice & Macquarie)	**5.3%**	**7.1%**	**8.8%**

Notes: 20 day average yields for 10 Year Commonwealth Bonds and August 2010 Capital Indexed Bonds are for the 20 trading days prior to 19 April 1999.
Macquarie conversion method: nominal post tax => real post tax => gross up to real pre tax.
Standard market practice method: nominal post tax => nominal pre tax => real pre tax.

The CAPM analysis suggest that RAC's WACC (real, pre tax) is in a range between 5.3 percent and 8.8 percent. The revised draft report WACC estimate for RAC suggested a range of 5.8 percent to 8.4 percent (real, pre tax). In summation the three changes between the draft and final reports to the WACC parameters are:

1. An increase in the real risk free rate from 3.14 percent to 3.52 percent due to a rise in the risk free method and a change in the method used to estimate this rate.
2. A rise in the risk free rate from 5.21 percent to 5.37 percent. Between 22 February 1999 and 19 April 1999 the 20-day average of the 10 year Commonwealth bond rose 0.16 percent.
3. A decrease in forecast inflation from 2.0 percent to 1.79 percent.

7.8 Assessing the appropriate rate of return for RAC

In setting a maximum rate of return within the range specified by the WACC analysis (5.3-8.8 percent), IPART considers specific risks and other issues impacting on RAC's business.

7.8.1 Does the combinatorial test affect the rate of return required?

The terms of reference for this Review require IPART to consider whether the Regime's combinatorial ceiling test demands a different rate of return than would otherwise be set. The combinatorial test[213] requires that RAC revenue from any rail operator group or combinations of operators not exceed full economic costs on a stand alone basis. Hence, the assessment of whether RAC has breached the ceiling requires the examination of multiple combinations of customers against the relevant costs of the line Sectors used. RAC believes the combinatorial test limits its achievable return which creates a need to be able to charge a maximum rate of return set at a level above its cost of capital.

RAC's earlier submission sought a maximum rate of return multiple (or uplift factor) of 1.2 times its WACC. RAC stated that a multiple over its WACC is necessary because:

- The ceiling test prevents any single investment from earning a return (ex-post) above the regulated maximum and most RAC line Sectors earn a nil or minimal return on asset.
- The combinatorial component of the ceiling test "prevents RAC from averaging under performing assets and high performing assets." If "the maximum is set at RAC's WACC and it is prohibited from earning greater than WACC on any investment, if any investments earn less than WACC, then the WACC can not be earned overall."[214]

RAC's later submission was revised to describe the Central Hunter between Port and Drayton as lower risk and acknowledges that a broad, high quality revenue base exists.[215] Consequently, RAC seek a rate of return of 8.3 percent pre tax real from central Hunter Valley coal assets. RAC then seek 1.2 times this rate (9.96 percent) for the remainder of the RAC Network including the single mine track (currently viewed as the track from Maitland to Stratford mine and Drayton Junction to the Ulan mine) due to greater asset stranding risk.[216]

IPART is concerned that permitting a multiple above the WACC endorses a continuation of monopoly rent which would not be sustainable if rail track ownership was truly contestable.

The concept of requiring a multiple above the WACC has also been proposed by United States telecommunications companies to regulators. The premise of their argument was that DORC valuations had seen these companies suffer large write downs due to rapid technology advancements. The uplift was required to compensate them for having greater technology risk. However, this argument does not appear applicable as RAC has stated that risk of major technological advances creating redundant assets is minor because the alignment of the track and standard of construction is generally efficient. Consequently, RAC believes that there is "very limited scope for optimisation."[217] RAC also admits that the

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213 See the NSW Rail Access Regime Schedule 3 clause (i) (b), February 1999.

214 RAC submission to IPART, 27 November 1998, p 12 and p 57.

215 RAC submission to IPART, 19 March 1999, p 21.

216 RAC submission to IPART, 19 March 1999, p 25.

217 See RAC submission to IPART, 27 November 1998, p 36 and Mr Mike Smart, IPART Hearing transcript 15 December 1998, p 131.

required uplift needed by RAC "is low when compared to telecommunications". RAC go on to state "that the mark-up be levied in a manner which takes account of willingness and ability to pay".[218]

Why a multiple of 1.2?

The size of RAC's proposed uplift factor was estimated by using real option price theory to examine the volatility of coal sales revenue from central Hunter Valley mines and export tonnages of bulk minerals from nine Australian ports. RAC's later submission recognised that this empirical data is probably not representative of the additional volatility of returns.[219] However, in the absence of better data, RAC continue to believe that an uplift of 1.2 over its WACC is the approximate compensation required for single mine track assets.

The impact of charging 'single mine track' assets at RAC's proposed rate of return of 9.96 percent instead of at RAC's proposed maximum rate of return of 8.3 percent (and using the interim DORC asset base) is sizeable. IPART estimates the difference between the two rates of return proposed by RAC is:

- Stratford mine to Maitland - $0.9m extra per annum.
- Ulan mine and Drayton Junction - $3.6m extra per annum

On balance, if an uplift factor is justified to compensate of possible additional risk of holding single mine track assets, it remains unclear whether 1.2 is the correct compensation.

IPART assessment of the need for a multiple above WACC

IPART has given significant consideration to issues relating to the need or otherwise for an uplift factor. The combinatorial test does prevent RAC from averaging returns between separate line Sectors and over time in respect of particular line Sectors. IPART recommends rectifying the second of these constraints by allowing the operation of an unders and overs account. However, IPART has yet to be convinced that a fixed uplift factor is required to compensate RAC for single customer assets. The floor and ceiling tests are designed to ensure efficient pricing of RAC's outputs rather than to set a regulated revenue for RAC. Hence, it is unreasonable to claim that low overall returns justify charging monopoly prices to certain coal mines.

IPART believes that the purpose of the floor and ceiling test is to place a lower and upper limit on the negotiation range. The combinatorial test is not designed to limit RAC's total allowable revenue.[220] A reasonable and efficient ceiling test is one which is set so that no operator (or groups of operators) pays more than the efficient costs of supplying them with rail services. Efficient costs for any particular asset include a reasonable return on assets, which is estimated using the CAPM to calculate RAC's WACC. Approving a fixed uplift factor would allow RAC to charge selected mines what is, in effect, a monopoly price for that access. IPART cannot endorse a ceiling price containing monopoly rent from selected customers in order to boost the average rate of return.

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218 RAC submission to IPART, 27 November 1998, p 17.

219 RAC submission to IPART, 19 March 1999, p 24.

220 However, Schedule 3 (i){c} of the Regime prevents total RAC revenue from exceeding network wide stand alone economic costs. In practice this clause does not constrain prices as the vast majority of non-coal rail access is charged at the floor price.

IPART is concerned that utilising different rates of return for different units of the one entity is inconsistent with the CAPM. A key assumption of CAPM is that the rate of return is estimated to be the rate which a diversified investor would require to justify investment in a particular firm. The single rate of return should then be used to evaluate all the firm's investments.

The Ulan and Stratford Mines

RAC seek a greater rate of return for these 'single mine customer assets' due to the greater risk of asset stranding should a single mine cease production permanently.[221] RAC has also stated that both mines currently generate a rate of return of less than 7.5 percent real pre tax which is significantly below the current ceiling of 14 percent post tax nominal.

The Ulan line between Ulan mine and Muswellbrook is approximately 146km long. This line was funded by the mine owners and opened in 1982. The mine's capital investment in the line was defrayed by a reduced freight rate over seven years which was completed in 1989. Since 1989, a full commercial rate of return has been paid by the mine. In the absence of RAC capital investment prior to establishment of the Ulan mine and construction of the Ulan line, it is difficult to justify compensation for what RAC sees as the ongoing greater risk of asset stranding.[222]

The Stratford mine utilises 101km of 'single customer asset' line between Stratford and Maitland which is also part of the North Coast interstate main line. This RAC asset first opened in 1913, however, coal haulage did not commence until 1995.[223] As the main interstate corridor, coal remain was less than 30 percent of GTKs over this section in 1997/98.[224] FreightCorp, the train operator servicing Stratford, has confirmed that RAC made nil capital investment associated with coal haulage.[225] A rail loading loop was funded by the mine (CIM Resources). Given the line was viable before, and by inference after, coal haulage, the comparatively short duration of coal haulage on this line and the absence of RAC capital investment, IPART is unable to observe any significant risk of asset stranding for Stratford mine.

Commercial solutions to alleviate any additional risk from single customer assets

If RAC continues to believe that the risks of single customer assets are far greater than the remainder of the RAC Network, RAC is free to explore commercial solutions to alleviate any additional risk. Possible commercial solutions could include:

- divesting specific line Sectors which RAC view as having unacceptable risk. The new owner being the customer or another third party which would then take responsibility for track maintenance.
- transferring the whole (or part of the) tonnage risk to the 'high risk' customer, with this customer being compensated with a corresponding discount in their access charge

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221 RAC submission to IPART, 19 March 1999, p 21.

222 FreightCorp submission to IPART, 12 April 1999, p 4.

223 J. Gunn, *Along Parallel Lines, A History of the Railways of NSW 1850-1986*, Melbourne University Press, 1989, p 273.

224 Proportion estimated by IPART using RAC Annual Report 1997/98, p 24 and Stratford's saleable production for 1997/98 (1.8m tonnes) contained in Mineral Resources NSW, Coal Industry Profile, 1999, p 113.

225 FreightCorp submission to IPART, 12 April 1999, p 4.

- with the support of government and perhaps the customer concerned, the Regime could be amended to permit the exclusion of the track Sectors servicing the single customer.

In assessing the business risk faced by RAC, IPART examined the profile of RAC, including area of operation, customer profile, growth prospects, competition, operational issues, and the potential volatility of earnings.

With some minor exceptions, IPART considers that coal rail access in the Hunter Valley is substantially a monopoly. This is because most mines are prohibited from using road transportation to reach port.[226] This results in lower risk.

7.8.2 Managing deviations from the maximum rate of return

The Regime's references to revenues implies that access prices should be set prospectively, which requires a tonnage forecast. Hence, there will be unavoidable deviations around the maximum rate of return. RAC applies the ceiling test prospectively (ex-ante) and in the absence of direction from the Regime, has retained some very small breaches of the maximum rate of return generated by greater than expected demand.[227] The cusp pricing system (discussed below in Section 7.8.4) and annual negotiations for coal access assist to moderate the size of deviations and provide RAC with incentive not to underestimate the forecast tonnage.

In the draft report, IPART considered establishing unders and overs accounts, to average small deviations around the maximum rate of return. At the time of the draft report this option was not pursued for two reasons:

1. RAC did not request an unders and overs system, instead undertaking to bear any shortfall below the maximum and to provide refunds when the ceiling is exceeded.[228]
2. The Regime does not have a regulator to confirm the calculations of the unders and overs accounts. Reconciliations for these accounts may be complex and time consuming.

Following detailed consideration, RAC,[229] NSW Treasury,[230] and Minerals Council[231] have all supported establishing an unders and overs account for minor deviations about the maximum rate of return. Additionally, FreightCorp support the philosophy of an unders and overs account, yet are concerned that it requires independent regulatory oversight.[232] IPART has provided an indicative example of how an unders and overs account would operate in the table below.

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226 Minerals Council Submission to IPART, 27 November 1998, p 15.
227 RAC submission to IPART, 27 November 1998, Appendices pp 25-28.
228 RAC submission to IPART, 23 December 1998, p 4.
229 RAC submission to IPART, March 1999, p 35.
230 NSW Treasury submission to IPART, March 1999, p ii.
231 Minerals Council submission to IPART, March 1999, p 44-45.
232 FreightCorp submission to IPART, March 1999, p 19.

Table 10 Indicative example of unders and overs account for a group of mines

Unders and Overs Account	Year 1	Year 2	Year 3
Opening balance $	$0.00	$1,250,000.00	$605,000
Forecast Tonnes	50,000,000	58,000,000	
Actual Tonnes	55,000,000	55,000,000	
Variation	5,000,000	-3,000,000	
Cusp Tonnage	40,000,000	44,000,000	
Pre Cusp access price	$2.00	$1.89	
Post Cusp access price	$1.00	$0.97	
Average Direct Cost	$0.75	$0.75	
Asset Base	$400,000,000	$408,000,000	
Rate of Return	8%	8%	
Return	$32,000,000	$32,640,000	
Fixed costs	$20,500,000	$20,530,000	
Ceiling Test			
Forecast Revenue:			
Return	$32,000,000	$32,640,000	
Fixed Costs	$20,500,000	$20,530,000	
Direct Costs	$37,500,000	$43,500,000	
Total	$90,000,000	$96,670,000	
or			
Pre-cusp	$80,000,000	$83,160,000	
Post-cusp	$10,000,000	$13,510,000	
Total	$90,000,000	$96,670,000	
Actual Access Revenue:			
Pre-cusp	$80,000,000	$83,160,000	
Post-cusp	$15,000,000	$10,615,000	
Total	$95,000,000	$93,775,000	
Corrected Revenue:			
Return	$32,000,000	$32,640,000	
Fixed Costs	$20,500,000	$20,530,000	
Direct Costs	$41,250,000	$41,250,000	
Total	$93,750,000	$94,420,000	
Balance transfer to U/O a/c	$1,250,000	-$645,000	
Closing Balance U/O a/c		$605,000	
As a % of revenue	1.3%	0.6%	

In managing this system, RAC will face some complexity in tracking the pre and post cusp tonnage of each coal mine, in relation to the respective access prices paid by each mine. RAC will need to consider issues relating to the confidentiality of individual mine tonnages in providing unders and overs account information to customers. IPART sees merit in an independent audit of each unders and overs account, with the audit opinion also provided to customers.

Recommendation 14– Establish an unders and overs account

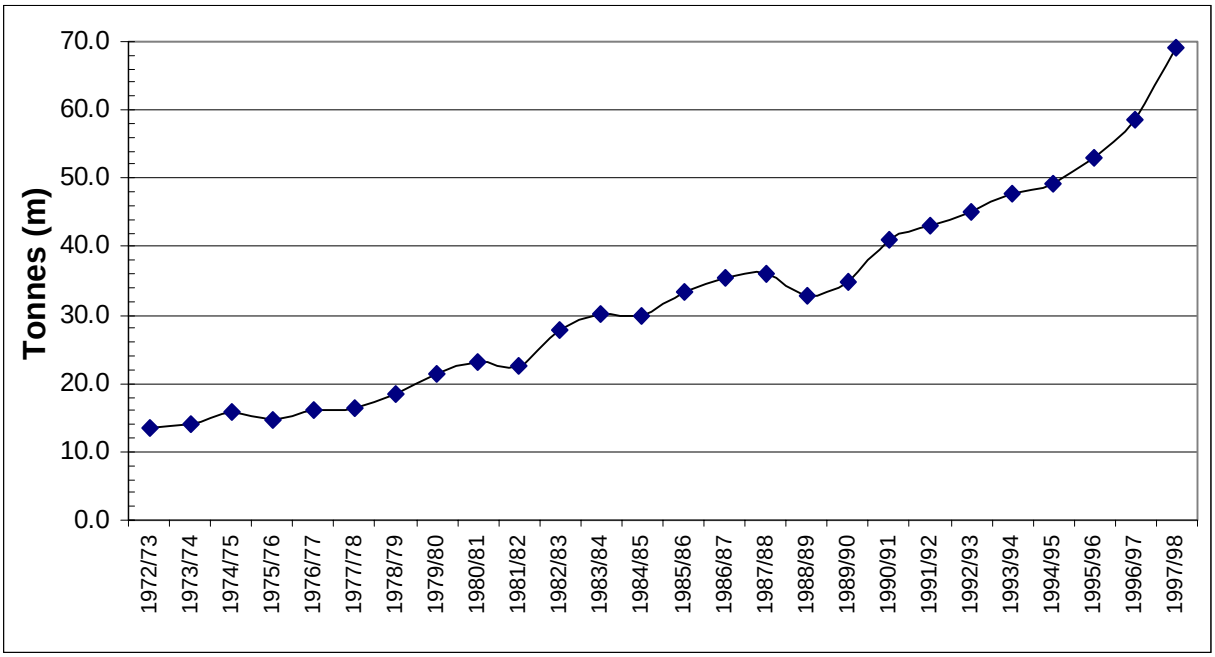
RAC should establish an unders and overs account system to average deviations around the maximum rate of return. IPART recommends that RAC keep such accounts for groups of customers and individual customers who could potentially breach the ceiling test. IPART recommends that RAC provide an annual reconciliation of each account to the applicable access seekers, that RAC attempt to return the account balance to zero each year and that the account balance should not exceed +/-5 percent of forecast access revenue.

7.8.3 Other issues

The volatility of historic coal tonnages

In assessing the potential volatility of RAC coal rail tonnages IPART examined 26 years of data on the total coal rail hauled by FreightCorp and prior to 1996/97, by the SRA. Although the volatility in historical tonnage levels will not necessarily reflect future tonnage volatility levels, it is a very useful guide. This data shows only four years negative growth over the 26 years with growth rates varying between –9.4 percent and 23.5 percent. Average annual growth was 6.7 percent with a standard deviation in the growth rates of 7.6 percent. Hence, historical coal tonnages show only minor volatility. Data for coal transported by rail is presented in the graph below.

Figure 2 Coal tonnages transported by rail in NSW



Source: FreightCorp, February 1999.

The use of a cusp tonnage for coal to reduce risk

A cusp is a target freight tonnage. Following negotiated agreement between FreightCorp and RAC, rail access prices for coal are based on a two step tariff with prices falling to variable cost (plus monopoly rent if applicable) upon reaching a cusp tonnage. The pre cusp price is set at the ceiling level and is designed to recover full economic costs as per the ceiling test. The post cusp price for all tonnage above the cusp target is designed to recover variable costs (and the monopoly rent) of the tonnes above the cusp.[233]

The cusp system is intended to prevent RAC from over-recovering costs due to greater than expected tonnage growth. RAC believe that the cusp system may also encourage greater RAC Network utilisation towards the end of each year. In 1997/98, RAC coal access prices for the central Hunter Valley fell from cusp day (when total Category tonnage hauled reached 37m tonnes) by between 30 percent and 50 percent per tonne. The central Hunter Valley mines went on to produce approximately 50m tonnes in 1997/98. Assuming constant tonnages, this meant that the central Hunter mines enjoyed variable cost (plus monopoly rent) access prices for the final three months of 1997/98.

RAC's submission states that the two tier (cusp) tariff system has:

> … somewhat mitigated its exposure to the systematic risk of the coal companies in the Hunter Valley.[234]

IPART agrees that the cusp pricing system serves to greatly reduce RAC's coal tonnage risk.

In setting a reasonable maximum rate of return for RAC, IPART notes that the two main train operators (SRA and FreightCorp) are, like RAC, owned by the NSW government. These two operators accounted for over 91 percent of RAC access revenue (in 1997/98).[235]

Risks faced by RAC in providing Hunter Valley coal access

RAC argues that its Hunter coal network business is highly sensitive to the operating performance of coal mines in the area.[236] Track ownership is generally regarded as stable and low risk businesses. RAC faces several company specific or diversifiable risks which do not need to be considered under CAPM. Most specific risks are insurable or can be moderated by fixed price contracts. Specific risks include exposure to a few large customers, maintenance overruns, track failures and derailments. Typical systematic risks faced by RAC, as network service provider, are:

- Technology: customers switching to alternative modes such as road transport, conveyor or pipeline.
- Market: market is mature and customers may lose export supply contracts.
- Political and regulatory: imposition of new operating, safety or regulatory requirements.
- Other risks (reliance on electricity motive power, environmental risks, etc).

In regard to risks faced by RAC, IPART has reached the following conclusions:

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233 See RAC submission to IPART, November 1998, p 27.

234 RAC submission to IPART, November 1998, Appendices p 10.

235 NSW Treasury submission to IPART, December 1998, Table 1.2, FreightCorp submission to IPART, 27 November 1998, p 2 and RAC Annual Report 1997/98, p 60.

236 RAC Submission to IPART, 27 November 1998, Appendices p 10.

- Obsolescence: changes to the technology used in track operation and renewal have been slow and incremental. Basic track construction featuring rail, sleepers ballast and formation has been largely unchanged for decades. RAC state that "the current Hunter Coal Network and an optimal version of this are unlikely to be materially different."[237] Hence, there appears to be little risk of obsolescence due to advances in technology.
- Stranded investment: RAC states that "the geography of the Hunter region means there is generally little to choose from in terms of the best route from the mines to Port," which infers a very low risk of assets becoming stranded.[238] Over the longer term, it would be expected that RAC would protect its investment, eg by obtaining commitments from larger customers to use their assets prior to re-investment.
- Market risk: RAC's Hunter coal network is a mature network business with a market serving up to 30 mines. The loss of any major customer may have an impact on revenue. Growth depends on RAC's ability to attract new loads. Since 1973/74 coal tonnages moved by rail in NSW have grown by an average of 6.6 percent per annum. The volatility of this growth rate was also low with a standard deviation for the 26 years of 7.6 percent.
- Regulatory environment: the regulatory risk associated with access prices depends on the regulatory formula. IPART considers that despite the immaturity of the Regime, there is a fair degree of certainty for RAC under the principles and requirements of the Regime. However, the combinatorial nature of the ceiling test provides a truncation to the rate of return that RAC can earn.

7.8.4 The impact on service standards

RAC has a variety of customers with very different service quality requirements. For example, some train operators are time sensitive (eg CityRail and FreightCorp coal) and others are less sensitive (eg a wheat train operator). Other operators require specific quality infrastructure to operate heavier trains, longer trains or at higher speeds. Consequently, RAC negotiates service quality requirements with individual customers and incorporates minimum service standards within formal access agreements (contracts). As such, RAC does not have a system wide service standards but seeks to provide an RAC Network which is safe, reliable and best suits the needs of individual customers.[239]

Overall, service quality standards committed to in existing access agreements with RAC were commercially negotiated and should be met regardless of the recommendations of this Review.

7.8.5 Regulatory return allowed by overseas regulators

Overseas rate of return comparisons provide a useful guide on what has been deemed reasonable profit levels within other jurisdictions. Detailed comparisons are difficult due to factors such as different interest rate markets, attitudes to risk and tax regimes. In the UK, a consensus has been achieved that the cost of capital is in a narrow band of between 6-7.5 percent before tax in real terms. Three key current examples are:

- ORR (the UK Railtrack regulator) currently 7.5 percent (real pre tax) with the regulator foreshadowing a decrease to between 5 percent and 6 percent (real post tax) for the

[237] RAC submission to IPART, 27 November 1998, p 49.
[238] RAC submission to IPART, 27 November 1998, p 49.
[239] RAC submission to IPART, 27 November 1998, p 26 and RAC Corporate Plan 1997, p 9.

period commencing 1 July 1999.[240] This converts to a range of 5.97 percent to 7.16 percent real pre tax.

- OFFER (the electricity regulator) 7 percent real, pre tax.
- OFWAT (the water regulator) 5-6 percent real, post tax (for the 1995-2000 price review).
- OFGAS (the gas regulator) 7 percent pre tax, real (for the 1997-2002 review).

In the United States, gas and electricity utilities have been permitted to earn a nominal post tax return on equity capital of around 11 percent.[241] This equates to a real pre tax rate of return of between 6 percent and 7.8 percent depending on conversion methods, gearing and tax assumptions.

7.8.6 Financial indicator analysis

To determine an appropriate rate of return for regulated utilities, IPART assesses financial performance at several different rates of return. Rating agencies commonly assess an organisation's financial capacity and ability to service debt using financial ratio analysis. The three main ratios examined by creditor and their notional ratings are presented below:

- funds flow interest cover - to assess an organisation's ability to service debt
- net cash flow / capital expenditure - to assess internal financing capacity
- net debt / funds from operation - to assess ability to repay debt.

Table 11 Credit agency rating ratios

Rating	AAA	AA	A	BBB	BB
Funds flow interest cover (times)	4.00	3.25	2.75	1.50	<1.00
Internal financing ratio (%)	100	70	60	40	>35
Net debt/Fund flow from operation (times)	4	6	9	12	20

Source: *Capital Structure Policy for NSW Government Trading Enterprises,* NSW Treasury, August 1994.

Selected key performance indicators (KPIs) for RAC are shown in the table below:

[240] See Office of the Rail Regulator (UK), Periodic review of Railtrack's access charges: the Regulator's conclusions on the financial framework, Paper 3, 9 December 1998, Section 4.

[241] Submissions on ACCC / ORG draft decisions by J Makholm, National Economic Research Associates, June 1998 and July 1998.

Table 12 Key Performance Indicators for RAC

KPIs	1996/97	1997/98	1998/99 f
Financial KPIs			
Funds flow interest cover (times)	>4,000	>13,000	19.0
Internal financing ratio (%)	27.8	23.8	24.3
Net debt/Funds from operation (times)	-0.8	-0.9	-0.9
Gearing (%) (Debt/(debt+net assets))	0.0	0.0	14.1
Gross profit pre interest & depreciation/Revenue(%)	5.4	15.7	11.2
Operating KPIs			
Track utilisation (GTKs (b) / track km)	5.24	5.26	5.26
Cash costs/Total costs (%)	79.4	87.0	91.9
Cash operating costs (c/per/GTK)	1.40	1.35	1.27
Maintenance cost (c/per/GTK)	1.21	1.06	0.99
Ave access revenue (c/per/GTK)	1.15	1.27	1.11
Line CSO/Total revenue (%)	20.7	21.1	20.3
Return to Government $m (Dividend +Tax)	31.6	88.2	61.2
Net cost of RAC to Govt $m (CSO-Return)	145.5	88.8	111.3
Overheads/Cash costs (%)	4.1	3.2	4.4
Total maintenance cost per track km ($)	63,582	55,658	52,187

Sources: RAC Annual Reports 1996/97 and 1997/98 and RAC Statement of Corporate Intent 1998/99.
Note: all figures are nominal ('dollars of the day').
f = forecast from RAC Statement of Corporate Intent 1998/99.

The financial KPIs for RAC are generally extremely strong. The operating KPIs illustrate a trend of cost reductions, most of which were passed through to customers during a period of static track utilisation. However, the relevance of some of the KPIs is distorted and hence they have been given a reduced degree of reliance by IPART. Factors affecting the KPIs are:

- RAC is debt free and has accumulated large cash reserves ($113.3m at June 30 1998).[242]
- RAC has a 'strained' internal financing ratio (worthy of a <BB credit rating) due to:
  - maintaining a payout ratio (to government) of 70 percent of earnings as either dividend or tax equivalent which is further reducing RAC's internal funding capacity.[243]
  - an aggressive investment progam, which will soon drain RAC's cash reserves.[244]
- RAC has been granted ownership of all track assets formerly owned by the SRA and was also given control (vested) of the land within the rail corridor, both for nil consideration.
- 92 percent of RAC access revenue comes from two NSW Government owned train operators.
- The SRA access price was brokered by Government (NSW Treasury) and set at a level which was forecast to allow RAC to 'breakeven' on a cash basis.[245]

[242] RAC Annual Report 1997/98, p 66, p 77 and p 88.
[243] RAC *Statement of Corporate Intent Year Ending 30 June 1999,* p 11.
[244] RAC Annual Report 1997/98, p 8.

- As CityRail pays only a floor price based on direct costs, RAC requires all passenger related capital works to be financed directly by the Government or by CityRail.[246]
- 21 percent of total RAC revenue is from the line CSO.[247]
- To assist Government to meet its rail reform objective schedule, RSA voluntarily reduced RAC's annual maintenance payment by 16.7 percent from $634m in 1996/97 to $528m in 1997/98. In 1997/98, RAC accounted for 82 percent of RSA's customer revenue and 93 percent of RAC's maintenance expenditure was completed by RSA.[248]
- To enable RSA to breakeven following its decline in RAC revenue, Government increased its subsidy to RSA from $12.3m to $32.8m.[249] This scenario implies some of RAC's efficiency gains are artificial and emphasises a lack of commercial tension in RAC and RSA negotiations.

Overall, the KPI analysis illustrates that RAC is in an extremely strong financial position which is unlikely to be materially affected by the outcomes of this Review.

7.9 IPART's decision on an appropriate rate of return

Submissions reflected some differences of opinion about how WACC should be calculated under a CAPM framework. An additional concern is the sensitivity to current interest rates. Neither can be easily factored into CAPM, but should be considered in selecting the final maximum rate of return within the range produced by the WACC analysis.

From the evidence currently available on the cost of equity, use of the CAPM suggests that RAC's nominal (post tax) return on equity should be within the range of 8.9-11.4 percent. The WACC for RAC should be within the range of 5.3-8.8 percent (real, pre tax). The mid-point of this WACC range is 7.1 percent.

IPART believes that the partial truncation of RAC's returns due to the combinatorial test does not warrant allowing a fixed uplift factor above the WACC. IPART proposes to take account of truncation by allowing an unders an overs account system and permitting a maximum rate of return above the mid-point determined by the CAPM framework.

In addition to CAPM, IPART has considered other factors including the risks faced by RAC, financial performance indicators for RAC and evidence on market expectations of the rate of return. Within this range for the real pre tax rate of return (ie 5.3 percent to 8.8 percent), IPART must decide on the most appropriate point as the rate of return for RAC. This decision has been made after examining the risk profile of RAC's coal business, the partial truncation of returns caused by the combinatorial test, implications for access prices and RAC's financial position.

IPART concludes that a real pre tax rate of return of 8.0 percent is an appropriate maximum for RAC for the NSW Rail Access Regime.

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245 RAC submission to IPART, 27 November 1998, p 3.
246 See RAC submission to IPART, 27 November 1998, pp 3-4 and RAC Annual Report 1997/98, p 74.
247 RAC Annual Report 1997/98, p 60.
248 RSA Annual Report 1997/98 p 6, p 9 and p 40 and RAC Annual Report 1997/98 p 74.
249 RSA Annual Report 1997/98 p 40.

Recommendation 15 – The Appropriate rate of return for the NSW Rail Access Regime
The rate of return (in real, pre tax terms) used in the NSW Rail Access Regime should not exceed 8.0 percent and should be applied to the average of the opening and closing DORC asset base.

Appropriate rates of return for other RAC Assets

In this Review, IPART has specified a rate of return based on consideration of information relating to RAC's total business, but focussing in particular on the Hunter Valley coal network as this is the only group of customers currently paying a rate of return. In the event that other RAC market segments are able to pay the ceiling test price for access, the rate of return would need to be reviewed to ensure it adequately reflects the risks of the other market segments.

7.10 The need for a mechanism to revise the rate of return

A mechanism needs to be developed for periodic review of the maximum rate of return RAC can earn. IPART considers that the rate of return needs to be revised every three to five years. Both train operators and RAC face risks from allowing long intervals between resetting the rate of return. Similarly, stakeholders would appreciate a degree of certainty over how and when the rate of return will be revised.

Recommendation 16 –A process for revising the maximum rate of return
The NSW Government should consider creating a process for revising the maximum rate of return at periodic intervals. IPART considers that three yearly revisions would be appropriate.

7.11 The impact of the reduction in the maximum rate of return

Estimating the cost impact of the change to a lower rate of return is difficult and complex due to different mines paying different rates of return and changing tonnages.

NSW Treasury provided information on the cost impact on the NSW Government of a decrease from 14 percent (post-tax nominal) to the 7.5 percent pre tax real rate of return recommended in the draft report for the 1997/98 year.[250] NSW Treasury reported that if the draft report rate of return was adopted using the 1997/98 profit and asset values, the cost to the NSW Government (dividend and retained earnings) post tax is approximately $13.2m per annum. NSW Treasury also reported that incorporating the tax equivalent payment from RAC increases the total cost to Government to $20.6m per annum.

For the final report, IPART has recommended a maximum rate of return of 8 percent real pre tax. Using the NSW Treasury assumptions, the total cost to the NSW Government would fall to approximately $20m per annum. However, the actual cost to Government impact will with the final DORC asset value, changes to coal tonnages and other factors affecting RAC profitability.

The importance to the NSW Government of earning a lower maximum rate of return from coal mines needs to be considered in the context of Government returning a total of $124.1m of monopoly rent to coal mines between July 1997 and June 2000 (see Table 3 of this report).

[250] NSW Treasury submission to IPART, March 1999, p 16.

RECOMMENDATIONS OF THIS REVIEW

Recommendation 1 – The basis of costs
For the purposes of the NSW Rail Access Regime, RAC access prices should be based on forward looking (forecast) efficient costs.

Recommendation 2 – Provision of information on progress towards efficient costs
IPART recommends that Government consider requiring RAC to demonstrate progress toward reaching maintenance cost targets to each access seeker for the Sectors utilised.

Recommendation 3 – Access charges where track capital is access seeker funded
For the purposes of the NSW Rail Access Regime, track capital transferred to RAC without payment from July 1999, should be excluded from the asset base.

Recommendation 4 – Treatment of Major Periodic Maintenance
For the purposes of the NSW Rail Access Regime, RAC should continue to recover the costs of major periodic maintenance through a levellised annual expense. This expense should not include a rate of return or depreciation component. The Government should consider requiring RAC to provide all access seekers with a detailed breakdown of the MPM expense calculation including all assumptions used in the calculation for each Sector utilised.

Recommendation 5 – Definition of Direct Costs
For the purposes of the NSW Rail Access Regime, Direct Costs are the costs which vary with the usage of a single operator within a 12 month period, plus a levellised charge for variable MPM costs, but excluding depreciation.

Recommendation 6 – Definition of Full Incremental Costs
For the purposes of the NSW Rail Access Regime, full incremental costs are all costs that could be avoided if a Sector was removed from the RAC Network.

Recommendation 7 – Definition of Full Economic Costs on a Stand Alone Basis
For the purposes of the NSW Rail Access Regime, Full Economic Costs are Sector specific costs including a permitted rate of return and depreciation and an allocation of non-Sector specific costs such as train control and overheads including a rate of return and depreciation on non-Sector specific assets. All included items are to be assessed on a stand alone basis. A stand alone basis requires calculation based on the optimal configuration of the existing rail infrastructure to serve all operators including an allowance for five years demand growth.

Recommendation 8 – Valuation of the corridor formation
For the purposes of the NSW Rail Access Regime, the existing corridor formation vested to RAC in 1996 should be valued at zero. Corridor formation assets and land subsequently purchased by RAC should be valued at actual cost indexed annually for inflation.

Recommendation 9 – Appointment of an independent body to manage the asset valuation consultant
For the purposes of the NSW Rail Access Regime, the Government should appoint an independent body to manage the consultant selection process and then provide subsequent management of the asset valuation consultancy.

Recommendation 10 – Asset valuation methodology

For the purposes of the NSW Rail Access Regime, the assets owned by the Rail Access Corporation (other than Corridor Formation Assets and land) should be valued using a depreciated optimised replacement cost methodology (DORC) applied retrospectively from 1 July 1999. Prior to the finalisation of the independent consultant's DORC valuation, RAC should utilise their interim DORC value for ceiling test access prices. Should the final DORC value be lower than the interim DORC value, RAC should provide customers with a refund including interest for the relevant holding period.

Recommendation 11 – Process for completing the asset valuation

For the purposes of the NSW Rail Access Regime, the DORC asset value should be determined by an independent consultant. A draft DORC valuation should be published which invites stakeholder comment which must be considered by the consultant prior to establishing a final value.

Recommendation 12 – Asset valuation roll forward

For the purposes of the NSW Rail Access Regime, the DORC value should be revised every five years and should be rolled forward through an annual indexation. The indexation should be calculated using the actual inflation (ABS Sydney All Groups CPI) for the average of the last four quarters to March divided by the average of the previous years four quarters to March. The return on capital should be calculated on the average of the opening and closing regulatory asset base.

Recommendation 13 - Depreciation

For the purposes of the NSW Rail Access Regime ongoing depreciation for existing assets should be calculated based on a depreciated optimised replacement cost (DORC) asset valuation, assuming a forty year remaining coal mine life (from July 1999) and using a straight line method. The estimate of remaining mine life should be revised every five years. Ongoing depreciation for future capital investment should be made based on the unexpired portion of the most recently estimated remaining mine life at the time the asset becomes operational.

Recommendation 14– Establish an unders and overs account

RAC should establish an unders and overs account system to average deviations around the maximum rate of return. IPART recommends that RAC keep such accounts for groups of customers and individual customers who could potentially breach the ceiling test. IPART recommends that RAC provide an annual reconciliation of each account to the applicable access seekers, that RAC attempt to return the account balance to zero each year and that the account balance should not exceed +/-5 percent of forecast access revenue.

Recommendation 15 – The Appropriate rate of return for the NSW Rail Access Regime

The rate of return (in real, pre tax terms) used in the NSW Rail Access Regime should not exceed 8.0 percent and should be applied to the average of the opening and closing DORC asset base.

Recommendation 16 –A process for revising the maximum rate of return

The NSW Government should consider creating a process for revising the maximum rate of return at periodic intervals. IPART considers that three yearly revisions would be appropriate.

GLOSSARY AND ACRONYMS

ABC	Activity based costing involves identifying categories of indirect costs and allocating them to products using criteria known as 'drivers' which are based on the relative usage of each product.
Above rail cost	Costs related to train operation and rolling stock.
Access	The right to use the infrastructure owned or operated by another party.
Access charge	A fee paid in return for access to infrastructure.
ACCC	Australian Competition and Consumer Commission
Access seeker	A rail operator, a prospective rail operator, an access purchaser, a prospective access purchaser and the Australian Rail Track Corporation.
Below rail costs	Costs related to the track and related structures including rail, sleepers, signals, overhead power systems and track fencing.
Branch lines	Low density rail lines which join onto main rail lines
CAPM	Capital Assets Pricing Model
CityRail	The NSW government owned urban passenger train operator, a unit of the SRA.
Common costs	Costs that remain unchanged as the production of different good is varied and they are costs which are incurred if any one customer is serviced.
Corridor formation	Refers to land (corridor) used to operate rail track and includes cuttings, embankments and tunnels except to the extent that these assets require future expenditure to retain current RAC Network capacity.
Countrylink	The NSW Government owned long distance passenger rail (and coach) services. Countrylink is a business unit of the SRA.
CPA	Competition Principles Agreement
CPI	Consumer Price Index: a measure of price change.
Cross subsidy	When one service is priced below avoidable cost, while simultaneously another service is priced above stand alone costs.
CSO	Community Service obligation: a government subsidy for activities undertaken by a Government enterprise which would not be undertaken as a commercial activity or would require higher prices to be commercial.
Cusp price system	A cusp is a target tonnage which separates a two part pricing system. Upon reaching the cusp tonnage prices are reduced to a new level.
Depreciation	A charge to compensate for any decline in economic value of an entity's asset base over time as its useful life becomes shorter.
DORC	Depreciated optimised replacement cost: an asset valuation methodology that reflects both the age of the assets and the required size of the assets.
Efficient costs	An estimate of total costs assuming best practice industry benchmarks are achieved across all activities.
FDC	Fully Distributed Costs: refers a methodology which allocates direct costs to their respective outputs and pro-ratas indirect costs between activities based on in one of several ways including budget for the activity over the total budget or staff dedicated to an activity over total staff.
FreightCorp	The NSW Government owned freight train operator which prior to July 1996 was part of the SRA and traded as Freight Rail.
Gold plating	Refers to cases where a entity has overspent on capital investment, eg excess capacity or using more expensive materials than necessary.
GTK	Gross tonne kilometres; a measure of rail track usage. Total tonnes (including the weight of the train) multiplied by total kilometres travelled.

Glossary and Acronyms continued

Hunter Coal Network	Broad term for the RAC coal assets between Newstan mine south of Newcastle, Ulan mine to the West, Stratford mine on the North coast, and Gunnedah in northern NSW (see RAC Annual Report 1997/98, p 19).
IPART	Independent Pricing and Regulatory Tribunal of New South Wale
KPI	Key performance indicators; statistics developed to assist in assessing the quantity and quality of a firms operating performance.
Marginal cost	The cost of producing one additional unit of output or service.
MPM	Major periodic maintenance; the provision for asset renewal expenditure required to maintain a given level of service potential indefinitely.
Natural monopoly	Occurs when economies make it cheaper for one firm to supply an entire market more cheaply than a number of firms.
NCC	National Competition Council
NCP	National Competition Policy
NRC	National Rail Corporation; a freight train operator (mainly inter-state haulage) owned by the Commonwealth, Victorian and NSW Governments.
NSW	New South Wales.
ORG	Office of the Regulator General Victoria.
ORR	The United Kingdom Office of the Rail Regulator.
Overhead costs	Costs not directly attributable to an activity.
RAC	Rail Access Corporation.
Rollingstock	Locomotives and rail wagons.
Route kilometres	The length of the RAC track between an origin and destination.
Routine maintenance	Refers to activities completed more than once a year and includes different track inspections cycles, track patrolling, fettling (replacing broken track components), corridor maintenance, fence maintenance and signal testing.
RSA	Railway Services Australia: the NSW Government owned maintenance provider servicing trains, track and other infrastructure.
Sector	A continuous length with end points determined by RAC from time to time for its management purposes, usually delineated by major junctions or traffic origins and including all rail infrastructure facilities associated with the track on that sector.
SRA	State Rail Authority of NSW, the NSW Government owned passenger train operator with units trading as CityRail and Countrylink.
Sunk costs	When the capital value of an investment, typically in infrastructure, cannot be moved to an alternative investment .
Systematic risk	Relates to risk factors common to the whole economy eg interest rate movements and variation in cost or revenue streams (also called market risk).
TPA	Trade Practices Act (C'th) 1974.
Track	A broad term used to describe the various components of a railway line.
Train path	A time slot within which a train can travel though specific sectors.
Track kilometres	Total rail length including sections featuring double track or passing loops.
The Regime	The NSW Rail Access Regime established on 19 February 1999.
WACC	Weighted average cost of capital.

APPENDIX A TERMS OF REFERENCE

This Review has been referred to IPART by the Premier, under Section 12A (1) of the *Independent Pricing and Regulatory Tribunal Act 1992* (Reference: 98 / 110).

IPART is required to investigate and report on the following matters. A draft report is to be provided by 28 February 1999 and a final report to be provided by 28 April 1999, in respect of the NSW Rail Access Regime as amended from time to time ('the Regime'):

1) an appropriate definition of economic terms referred to in Schedule 3 of the Regime, the relevant terms being:
   a) direct costs;
   b) fixed costs;
   c) full incremental costs;
   d) incremental fixed costs;
   e) full economic costs; and
   f) stand alone economic costs.

2) appropriate asset valuation methodologies and depreciation methodologies from which to calculate and apply the rate of return on assets for the purposes of applying the ceiling test under Schedule 3, clause (i)(b) of the Regime; and

3) an appropriate maximum rate of return on assets under the Regime for the purposes of applying the ceiling test under Schedule 3, clause (i) (b), particularly taking account of the combinatorial nature of the ceiling test.

In conducting this Review, IPART should consider the assets used for the carriage of coal.

APPENDIX B IMPACT OF RECOMMENDATIONS ON THE REGIME

IPART notes that by virtue of Schedule 3(iv) of the Regime, its recommendations relating to the terms of reference take effect without any further action, on the sixtieth day after this Report is provided to the Premier.

IPART is concerned to avoid confusion and provide some guidance as to how these recommendations might take effect under the Regime. Accordingly, the following text indicates a suggested way in which these recommendations can be incorporated in to the Regime.

1 Definitions in this Amendment

In this amendment:

"**IPART**" means the Independent Pricing and Regulatory Tribunal of New South Wales established under the Independent Pricing and Regulatory Tribunal Act 1992;

"**Regime**" means the NSW Rail Access Regime established under section 19B Transport Administration Act 1988, as amended from time to time;

"**Report**" means the report by the Independent Pricing and Regulatory Tribunal of New South Wales under section 12A Independent Pricing and Regulatory Tribunal Act 1992, pursuant to terms of reference provided by the Premier of New South Wales dated 25 August 1998 and settled by IPART in consultation with the Premier under the Independent Pricing and Regulatory Tribunal Act 1992;

2 Application of IPART's Recommendations

For the purpose of Schedule 3 (iii) of the Regime the recommendations of IPART relating to the Report's terms of reference apply as if the Regime were amended as follows:

2.1 Commencement

These amendments commence on the sixtieth day after the Report is provided to the Premier.

2.2 Addendum to the Regime of February 1999

The 3-page addendum to the Regime made by the Minister by notice published in the New South Wales Government Gazette No.22 on 19 February 1999 (and comprising pages 903 – 905 inclusive of the Gazette) is deleted.

2.3 Amendments made by the Report

2.3.1 Schedule 3(iv) is deleted.

2.3.2 Schedule 3(iii) is deleted and the following substituted:

"(iii) In this Schedule:

"**Direct Costs**" means the efficient and forward looking costs which vary with the usage of a single operator within a 12 month period, plus a levellised charge for variable MPM costs, but excluding depreciation.

"**Full Incremental Costs**" means all costs which could be avoided if a Sector was removed from the system.

"**Full Economic Costs**" are Sector specific costs including a permitted Rate of Return and Depreciation and an allocation of non-Sector specific costs such as train control and overheads including a Rate of Return and Depreciation on non-Sector specific assets. All included items are to be assessed on a stand alone basis. A stand alone basis requires calculation based on the optimal configuration of the existing rail infrastructure to serve all operators including an allowance for five years demand growth.

"**Depreciation**" means depreciation calculated based on a depreciated optimised replacement cost asset valuation, assuming a forty year remaining coal mine life (from July 1999) and using a straight line method. The estimate of remaining mine life should be revised every five years. Ongoing depreciation for future capital investment should be made based on the unexpired portion of the most recently estimated remaining mine life at the time the asset becomes operational.

"**Rate of return**" means a rate of return (in real, pre tax terms) of 8.0 percent applied to the average of the opening and closing value of the Corporation's assets. All assets except Corridor Formation Assets and land will be valued using a depreciated optimised replacement cost methodology from 1 July 1999. The depreciated optimised replacement cost value should be revised every five years and should be rolled forward through an annual indexation using the actual inflation (Sydney All Groups CPI) for the average of the last four quarters to March divided by the average of the previous years four quarters to March. Corridor Formation Assets vested in the Corporation in 1996 should be valued at zero. Corridor Formation Assets and land subsequently purchased by the Corporation should be valued at actual cost indexed annually for inflation.

"**Corridor Formation Assets**" means cuttings, embankments and tunnels (including lighting and ventilation)."