NATIONAL AIR TRAFFIC SERVICES
PUBLIC-PRIVATE PARTNERSHIP

SETTING THE CHARGE CONTROL FOR UK
EN ROUTE SERVICES FOR THE FIRST FIVE YEARS

Advice to DETR

Economic Regulation Group
Civil Aviation Authority

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## CONTENTS

1. EXECUTIVE SUMMARY ........................................................................................................ 1

2. INTRODUCTION AND CONCLUSIONS ............................................................................. 3

3. PROPOSAL FOR THE INITIAL EN ROUTE CHARGES, 2001-2005 ....................................... 7

4. TREATMENT OF CAPITAL EXPENDITURE ........................................................................ 11

5. ERG’S EFFICIENCY ASSUMPTIONS IN RELATION TO NATS’ OPERATING COST PROJECTIONS ........................................................................................................ 19

6. OTHER ASSUMPTIONS USED IN ERG’S MODELLING .................................................. 37

7. FINANCIAL MODELLING AND FINANCIAL INDICATORS .............................................. 46
1. Executive Summary

1.1 This paper presents ERG’s advice to DETR on the initial charges for UK en route services. The advice covers the five calendar years starting with 2001, since it is assumed that the PPP will go ahead in Spring 2001 and the charges are to be set on a calendar year basis. The core objective of the public-private partnership is to enable NATS to bring forward much needed investment in capacity and service quality in order to meet rising demand for air traffic services safely and efficiently. In order to deliver this, the regulatory framework must be transparent and sustainable. This advice is framed against meeting this overarching objective.

1.2 ERG is advising DETR as the prospective economic regulator for NATS under the PPP. As such this advice is likely to be an important foundation for the regulatory framework and it will have a very different status from simple ‘technical’ assistance on specific issues (such as the robustness of NATS’ traffic forecasts). ERG takes its objectives to be those that would apply if ERG was undertaking a periodic review as the appointed economic regulator.

1.3 ERG has been hampered in preparing its advice by more than usual information problems. User response has also been less full than ERG expected. Nevertheless, ERG believes that its proposed approach to regulation accommodates the uncertainties and considers its recommendation to be a robust basis for the initial charge condition.

1.4 The core of NATS’ service is to enable the safe transit of air traffic through UK air space. Safety is the over-riding objective of the PPP and of the regulatory framework which will govern NATS’ activities. The CAA’s Safety Regulation Group has in place a robust and absolute regulatory regime for ensuring that there will not be any compromises on safety. ERG is confident that its assumptions in relation to the scope for making operating cost efficiencies are conservative and that NATS will be able to achieve gains of the magnitude assumed while providing desired levels of service quality.

1.5 ERG’s proposals on the initial price cap are designed to address three areas of key risk. The first is that the initial charges could compromise NATS’ incentives to meet demand to 2006 at appropriate quality levels. The second is the impact it may have on long term incentives to deliver capacity. But in addressing the first two risks ERG has sought also to ensure the robustness of the regime against any re-opening of the cap within the first five years. Following consultation and debate with NATS we consider that the following proposals best address these risks while achieving the overall objective:-

- the percentage price reduction in each year is the same, rather than having a larger price reduction in the first year (as presented in the April paper);

- a narrower range for the expected scope for operating cost efficiency gains of 3%-4% per annum with ERG’s advice based on a 3% reduction (with the effect that ERG’s assumed operating costs are very close to NATS’ own projections in the early years of the PPP);
• the policy of deferral of remuneration of investment projects in the course of construction (and capitalising interest) is maintained;

• regulatory asset base rolled forward from the balance sheet used to determine charges for 2000, which changes slightly, from the April figure of £610m to £611m;

• a steeper depreciation schedule which results in a lower price reduction in the first five years. This is consistent with the appropriate longer run price path;

1.6 This results in a recommended price cap for NATS en route service of RPI-5 applied to the current charge per CSU of £46.23 (the £49.50 2000 charge adjusted for the costs of the Met Office and the CAA Directorate of Airspace Policy, which will not pass through NATS’ cost base). This price cap will not only allow NATS to deliver planned new capacity but will provide strong incentives to do so.

1.7 These proposals are based on conservative assumptions on NATS’ scope to make efficiency savings. Under the proposals, the difference between ERG’s operating expenditure assumptions and NATS’ own business plan operating expenditure projections is negligible in the first two years of the PPP. This gives NATS adequate time to adjust to the PPP and the price cap. By 2004/5, the latest year covered by NATS’ business plan projections, ERG’s assumption is that NATS will have made operating cost efficiencies of £42 million, or 11% of NATS’ projection. This is not overly challenging given the absence of evidence that NATS is currently operating close to an efficient level.

1.8 ERG recognises that this proposal could result in a poor performance of the licensed business against some financial indicators if NATS’ current financial structure were maintained. ERG recommends that the government take this into account in determining the opening financing of the NATS business.

1.9 While the detailed financial modelling concentrates on the application of the RPI-x/rate of return hybrid model, ERG wishes to emphasise the importance of the benchmarking and the incremental cost analysis. ERG recognises that its analysis of benchmarks have some way to go before each, individually, would support a price cap on its own. Nevertheless, each approach points to a similar conclusion and together provide more robust evidence supporting ERG’s proposals. In ERG’s view the reality checks do more than merely provide comfort that the proposals are reasonable. In the longer run ERG envisions that the basis for regulation should move away from NATS’ average accounting costs, and more towards pricing on the basis of incremental economic costs and benchmarking.
2 Introduction and Conclusions

DETR’s request for advice

2.1 In October 1999, the Department for the Environment, Transport and the Regions (DETR) asked\textsuperscript{1} the Civil Aviation Authority’s (CAA) Economic Regulation Group (ERG) for assistance in determining the initial charge control conditions for National Air Traffic Services Ltd (NATS) under the proposed public private partnership (PPP). The assistance requested was in two forms:

- Technical assistance on the initial charge conditions, relating in particular to an alternative assessment of NATS’ business plan assumptions with respect to: traffic levels and patterns, operating costs and productivity, capital expenditure programme, asset base, allocation of costs (capital and operating) between business units, and benchmark performance measures;

- To lead, on behalf of DETR, the consultation with users on the initial charges in accordance with the revised Eurocontrol principles, which requires that prior to setting regulatory conditions there should be ‘appropriate and meaningful consultation between the regulators, the service providers and users’.

2.2 DETR has made clear that it will make the final decision on the initial charges. In addition to this assistance, DETR wishes the CAA to produce a ‘regulator’s statement’ on how the CAA proposes to approach economic regulation of NATS once the PPP is established.

2.3 This paper presents ERG’s advice to DETR on the initial charges for UK en route services. The appropriate charges for Oceanic are discussed in a separate paper. It advises on all aspects of the initial charge control and is not restricted to reviews of particular input assumptions adopted in NATS’ business planning. It also includes a proposal for a delay term for the en route services, as is envisaged in the draft licence. The advice covers five calendar years starting with 2001, since it is assumed that the PPP will go ahead in Spring 2001 and the charges are to be set on a calendar year basis. If it is accepted, this advice would therefore form the basis of NATS’ 2001 Eurocontrol charges, consultation over which is underway by NATS.

Objectives

2.4 ERG recognises that a core objective of the public-private partnership is to enable NATS to bring forward much needed investment in capacity and service quality in order to meet rising demand for air traffic services safely and efficiently. This is a long term project. In order to deliver this, the regulatory framework must be transparent and sustainable. This advice, which follows

\textsuperscript{1} Letter to Doug Andrew (CAA) from David McMillan (DETR) of 21 October 1999.
ERG’s published consultation papers, is framed against this overarching objective.

2.5 DETR is being advised by ERG as the prospective economic regulator for NATS under the public-private partnership (PPP). As such this advice is likely to be an important foundation for the regulatory framework going forward, and it will have a very different status from simple ‘technical’ assistance on specific issues, such as the robustness of NATS’ traffic forecasts. ERG takes its objectives to be those that would apply if it was undertaking a periodic review as the appointed economic regulator. At a high level these objectives are that the initial charge control conditions:

- should be consistent with the CAA’s proposed statutory duties under the Transport Bill, including the CAA’s duty to promote the interests of users with respect to safety;

- should be sustainable for the first five years;

- should be consistent with the likely evolution of the regulatory framework beyond 2006;

- should provide good short term incentives for NATS to meet user demand;

- should be consistent with longer run incentives to create capacity to meet future demand;

Assessment of key risks

2.6 Following from these objectives, ERG’s proposals on the initial price cap are designed to address three areas of key risk. One is that the initial charges could compromise NATS’ incentives to meet demand to 2006 at appropriate quality levels. The second is the impact it may have on long term incentives to deliver capacity. But in addressing the first two risks ERG has sought also to ensure the robustness of the regime against any re-opening of the cap within the first five years.

The need to ensure the robustness of the initial charge condition

2.7 If the charge cap were to be set solely on the basis of NATS’ business plans, and this resulted in profits which were demonstrably excessive, the framework as a whole could be undermined. The risk is enhanced in the case of NATS because of the unusual role of Eurocontrol and the DETR in annual charge setting, compared with the position with respect to airports under the Airports Act and with the normal situation of regulated firms. Broader European policy objectives of the UK Government in this area could not be ignored. Annual rate of return regulation could evolve by default.

2.8 While the fundamental role of a price cap for a monopoly is to encourage best use of capacity and appropriate investment in a cost effective manner, economic regulation also aims to ensure that users share the benefits from cost savings so that prices are cost related. ERG considers that, as the prospective regulator
applying the RPI-x/rate of return hybrid model, it is under an obligation to users to make an assessment of the scope for efficiency gains, and the possibility that actual investment may be substantially below that currently planned, in advising on charges.

Short run incentives to meet demand at appropriate quality

2.9 There is a danger that if the initial charge path were set too low, NATS’ incentives to meet demand, or to deliver service quality, could be compromised. Throughout the process ERG has been very mindful of this risk. To address it ERG has estimated NATS’ short run incremental costs (SRIC) of meeting demand as a ‘reality check’ and have promoted the concept of a delay term in the price formula. ERG is satisfied that its charge proposals meet the SRIC reality check comfortably. ERG accepts that its proposed delay term is unlikely, in itself, to provide adequate incentives for NATS to meet demand at optimal quality in the short run. But it is a small but significant step in the right direction.

Long run incentives to deliver capacity to meet demand

2.10 A key objective for the PPP is to provide the best framework for giving NATS incentives to deliver capacity to meet demand in the long run, where that justifies the costs of the additional capacity. Optimising NATS’ incentives to deliver that capacity will be a key success criterion for the regulatory framework. While the current framework is far from perfect given the limited information at this stage (in addition to the usual information asymmetry faced by regulators), ERG believes that its proposals provide good incentives to implement investments.

Process

2.11 DETR will be familiar with ERG’s two consultation papers published in December 1999 and April 2000. The April 2000 paper set out ERG’s initial position, and this advice takes that paper as its starting point. Since the publication of that paper ERG has undertaken further work in the following areas:

- discussions with NATS on ERG’s preliminary proposals;
- further consideration of NATS’ business planning, operating cost projections and cost allocations with a view to assessing NATS’ case that their plan already incorporates substantial efficiency gains, and that the cost allocations are robust;
- analysis of whether ERG’s proposals are likely to create financing difficulties for NATS, and the relationship between the proposals and NATS’ initial financing position;
- review of other consultation responses;
- incorporation of further alterations to the NATS’ data on which ERG’s financial modelling is based;
• refinement of ERG’s assumptions on the main variables for the financial modelling.

2.12 ERG’s revised draft proposals were put to NATS for comment. NATS provided a written response which restates some of the arguments made in its response to the April paper and contains extensive analysis of financing issues (which were not covered in the April paper). ERG has made two alterations to the revised draft proposals. First, a further revision has been made to the financial modelling following discussions with NATS on the regulatory asset base and treatment of corporate capital expenditure. The net effect of the revision is to reduce the lower end of ERG’s proposed range for X from 5.5% to 5.0%. The second is that measurement of the delay term should exclude delays attributable to bad weather and airfield delays. NATS’ arguments on the other issues have not convinced ERG that it should change its proposals further.

2.13 ERG received 17 responses to its consultation paper, of which only four were from users or user organisations. The user response was very limited. While there were responses from IATA and BATA on behalf of their members, many of the largest users of NATS’ services are members of The Airline Group, a consortium which is preparing a bid to be the government’s strategic partner under the PPP. The extent to which The Airline Group’s views represent their views as users, as opposed to potential shareholders is not clear. Most of the other substantive responses are from potential purchasers. While raising interesting questions, these responses are clearly not ‘user’ responses.

2.14 NATS’ business and investment planning has not progressed according to the timetable envisaged in DETR’s request for advice. Developments are still taking place at the time of writing. For example, the full and detailed revision of NATS’ cost allocations for 1999/00 was not made available until early July. NATS’ revised and finalised operating cost projections to 2004/5 were not received prior to the release of this advice. ERG’s advice does not, in consequence, reflect any thorough ‘efficiency audit’ of NATS’ business (even if that had been possible). Neither is ERG able to conclude with any confidence that NATS’ cost allocations are appropriate or robust.

2.15 Finally, DETR asked for advice on benchmark performance measures. ERG’s advice makes extensive use of benchmarking on costs and charges, and does propose a limited delay term, but ERG is not at this stage in a position to advise on appropriate performance benchmarks beyond the information disclosure requirements in the licence.
3 Proposal for the initial en route charges, 2001-2005

3.1 This section summarises ERG’s revenue yield proposals for the first five years. The financial modelling is discussed in more detail in Section 7 and the delay term is discussed in Section 8.

3.2 The April Consultation Paper set out initial ranges for the appropriate level of the initial price reduction in 2001 (p(0)) and the X factor for the next four years. These would be applied to NATS 2000 charge per CSU of £49.50. The ‘high charge case’ indicated a p(0) adjustment of 5% with an X factor of 4%. If the RPI were zero across the period, the implied charge per service unit in 2005 would be £39.94. The ‘low charge case’ indicated a p(0) adjustment of 12% and an X factor of 8%. If RPI was zero across the period, the implied charge per service unit would be £31.21 in 2005.

3.3 The April preliminary proposals were based on the following:
   - application of the RPI-x/rate of return hybrid model to NATS’ business plan;
   - benchmarking of NATS’ costs against other European ATSPs and another service provider;
   - estimates of NATS’ short run and long run incremental costs.

3.4 Following the responses to the April Consultation Paper and further analysis ERG has refined its assumptions on the inputs to the financial modelling, and has considered further the appropriate price path for reductions within the first five years. ERG has also reviewed the likely impact of its proposals, and of NATS’ opening debt position, on NATS’ performance against a range of financial indicators. These refinements, and the rationale for them, are set out in the rest of this paper. However, it is useful to re-state the key points here:
   - the Eurocontrol funded costs of the Met Office and the CAA Directorate of Airspace Policy will not pass through NATS (as was assumed in the April paper). This results in a one-off reduction in the NATS’ 2000 charge per CSU from £49.50 to £46.23;
   - the percentage price reduction, against the revised starting level of £46.23, in each year is the same, rather than having a larger initial price reduction in 2001.

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2 On a present value basis the new profile is unchanged. The smaller reduction in the first year is balanced by a higher X factor, with the consequence that the price reached at the end of the period is lower than would otherwise be the case.
• a narrower range for the expected scope for operating cost efficiency gains of 3%-4% per annum. Within the new range ERG recommends adopting a price cap based on the 3% assumption;

• as set out in the April document, these efficiency gains are applied to ERG’s projection of NATS operating expenditure, which is calibrated against NATS’ own projection to 2004/5 on a straight line basis. NATS’ business plan projection shows an initial reduction in operating expenditure, with rising expenditure at the end of the period. The effect of this is that ERG’s assumption on operating expenditure are not significantly below NATS’ projections in the early part of the period. Moreover, in present value terms the 3% efficiency assumption is equivalent to a gain of 2.3% applied to NATS’ business plan projection3;

• the policy of deferral of remuneration of investment projects in the course of construction (and capitalising interest) is maintained;

• a steeper depreciation schedule which results in a lower price reduction in the first five years;

• other variables use the mid-point of the ranges set out in the April paper.

3.5 Table 3.1 sets out the revised ‘high charge case’ and ‘low charge case’ proposals and gives an illustration of the impact these would have on the actual charge per service unit to users if the RPI remained at zero. The only difference between the ‘high charge case’ and the ‘low charge case’ is the (narrowed) range for efficiency assumptions of 3%-4% per annum. ERG believes that the 3% assumption better reflects the responses it has received to the April paper, and would recommend a charge control closer to the ‘high charge case’ set out below.

Table 3.1 - Revenue yield per CSU, calendar years 2001-2005

<table>
<thead>
<tr>
<th>£2000/1 prices</th>
<th>2000 (actual)</th>
<th>2001</th>
<th>2002</th>
<th>2003</th>
<th>2004</th>
<th>2005</th>
</tr>
</thead>
<tbody>
<tr>
<td>Met/DAP adjustment</td>
<td>£49.50</td>
<td>£46.23</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td><strong>High charge case</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Level of p(0) and x</td>
<td>-</td>
<td>5.0%</td>
<td>5.0%</td>
<td>5.0%</td>
<td>5.0%</td>
<td>5.0%</td>
</tr>
<tr>
<td>Level of charge if RPI=0</td>
<td>£49.50</td>
<td>£43.92</td>
<td>£41.72</td>
<td>£39.64</td>
<td>£37.65</td>
<td>£35.77</td>
</tr>
<tr>
<td><strong>Low charge case</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Level of p(0) and x</td>
<td>-</td>
<td>6.0%</td>
<td>6.0%</td>
<td>6.0%</td>
<td>6.0%</td>
<td>6.0%</td>
</tr>
<tr>
<td>Charge if RPI=0</td>
<td>£49.50</td>
<td>£43.45</td>
<td>£40.85</td>
<td>£38.40</td>
<td>£36.09</td>
<td>£33.93</td>
</tr>
</tbody>
</table>

3.6 While the detailed financial modelling concentrates on the application of the RPI-x/rate of return hybrid model, ERG wishes to emphasise the importance of the

3 See paragraphs 5.2-5.10 for further explanation of this point.
benchmarking and the incremental cost analysis. ERG recognises that its analysis of each individual benchmark would be weak evidence to support a price cap on its own. Nevertheless, each approach points to a similar conclusion and together they provide more robust evidence in support of ERG’s proposals. The reality checks do more than merely provide comfort that the proposals are reasonable. In the longer run ERG envisages that the basis for regulation should move away from NATS’ average accounting costs, and more towards pricing on the basis of incremental economic costs and benchmarking.

3.7 ERG’s use of regulatory depreciation to profile prices is consistent with a long run price path which is consistent with ERG’s current estimates of long run incremental costs. This has involved a degree of advancement of depreciation compared to the approach adopted in the April paper.

3.8 The next sections of this paper set out NATS’ and other commentators’ responses to the April paper, ERG’s review of those responses, and ERG’s final recommendations in relation to the key questions they raise. In the next section the treatment of capital expenditure is addressed, followed by estimates of operating cost efficiencies. ERG’s final views on the other issues are set out in the subsequent section.
4 Treatment of capital expenditure

4.1 ERG believes that providing the best incentives to implement appropriate investments in increasing capacity and delivering good quality services is one of the key objectives of the regulatory framework, and of the PPP itself. ERG’s proposals are based on this imperative.

4.2 The April paper proposed a price cap based on deferral of remuneration of assets in the course of construction until the second quinquennium, capitalising the capital costs of actual expenditure. In addition, ERG suggested that efficiency gains in relation to the capital expenditure programme should be possible, of 1%-3% across the whole programme, and 15%-35% against projected capital expenditure above £50m in each year. Given the AICC policy proposal the 15%-35% efficiency gains against capital expenditure above £50m had a negligible impact on the initial charge control proposals.

4.3 Consultation responses on the AICC policy were split. User responses confirmed their view that AICC remuneration should be deferred, while NATS, potential strategic partners, and designated airports regulated by the CAA were opposed to it. In broad terms the objections to the AICC policy were on the basis that it would reduce incentives to invest and that it would create difficulties in financing the programme. Following further discussions with ERG, NATS produced an alternative proposal with some similarities to the AICC policy, but which allowed for AICC projects up front with ex post claw backs of capitalised financing costs if actual spend were below projections, subject to an assessment of efficiency savings.

Areas of agreement and disagreement between NATS and ERG

4.4 While NATS and ERG differ on the best policy treatment of investment, there is broad agreement on the following key points:
   • that incentivising investment which will deliver additional capacity and quality to users and consumers is a key objective of the PPP and the regulatory framework;
   • that NATS’ current investment plan is subject to considerable uncertainty, both in terms of its scale, scope, and technical feasibility, and that it will be an important area that the strategic partner will want to address;
   • that a substantial part of the plan will not produce outputs until after 2005.

4.5 There are some areas of disagreement which are summarised below.

4.6 While NATS provides some comments on ERG’s assessment of its investment plan (NATS, paragraph 4.9 – 4.13) there is no fundamental disagreement that the plan is uncertain (NATS paragraph 4.21). NATS’ claim that ERG believes that the plan is ‘reasonable’ (NATS paragraph 4.6) is incorrect. ERG’s view is that a plan of this scale would probably justify its costs if it did produce the additional
capacity it is held to create. But ERG certainly does not agree that NATS has demonstrated that the plan will achieve the output stated, or that it is necessarily the best approach to delivering the outputs.

4.7 NATS argues that its investment history is poor evidence of the likelihood of future slippage. While ERG agrees that external interference in implementing the investment plan has been a factor in past delays, the scale of past under spend, and the length of delay in projects in the past remains an important indicator in the absence of better information for the first five years. Projections such as that set out in the current NATS’ plan should be treated with caution. This adds to the uncertainty surrounding the likely scale of NATS capex in the first five years.

4.8 There is also an element of misunderstanding that ERG is keen to clear up. ERG’s proposals do not involve ‘cutbacks’ to the ‘allowed’ capital expenditure, or a view on the part of ERG that particular project should be dropped or replaced. ERG is not in a position to ‘second guess’ NATS in this respect, and it would be contrary to ERG’s general approach to regulation for it to propose cuts to the investment programme on the basis of ‘second guessing’. ERG’s AICC policy solution addresses the risks and uncertainties faced without making such disallowances.

4.9 There is no agreement on ERG’s assumptions on efficiency gains in relation to capital expenditure, which NATS argues are arbitrary and excessive. Nor is there agreement on the appropriate policy solution to the uncertainties outlined above. These two points are discussed further below.

Scope for efficiency gains in the investment programme

4.10 NATS criticises ERG’s assumptions on the scope for efficiencies in relation to the investment programme. In its preliminary proposals ERG adopted a range of 1%-3% per annum assumed across the whole investment programme, and a range of 15%-35% assumed for expenditures above £50m in any one year. These assumptions were in addition to NATS’ ‘stretch target’ of 7.5% applied across the board to its investment plan. NATS’ view is that these assumptions are arbitrary, without empirical foundation, and excessive.

4.11 As NATS point out, if the AICC proposal is adopted, the 15%-35% has very little impact on charges for the first five years. This assumption would only have a material impact if:

- the AICC approach was not adopted, or its scope were to be reduced. If the AICC approach were not to be adopted the weight put on the analysis would be significantly greater and ERG would need to reconsider the best assumption to make about NATS’ actual capex in the first five years;

- it were used as an assumption for NATS’ actual capex expenditure in testing the financing of NATS’ investment programme.

4.12 ERG’s proposal is to adopt the policy of deferring remuneration of AICC in the first five years along the lines proposed in the April Consultation Paper. The efficiency assumptions do not therefore have a major direct impact on the charge
control proposals. The financing question does require assumptions on NATS’ likely actual capital expenditure over the first five years. While ERG’s capex efficiency assumptions were not originally adopted for this purpose, the analysis of financing questions does adopt the mid-range assumption of 25% savings in relation to NATS’ projected capital expenditure. While this is not a ‘disallowance’ of capital expenditure it does require justification. ERG’s assumption that there remains considerable scope for efficiency gains in delivering NATS investment plan is supported by the following qualitative and quantitative factors.

4.13 While ERG agrees that its assumption does not have a strong empirical basis, NATS’ themselves have adopted a 7.5% ‘stretch target’ across all investment included in the investment plan. This stretch target is unfounded by empirical support.

4.14 Analysis of a comparable ATSP indicates that the costs associated with NATS’ New Scottish Centre are very high. Comparisons are difficult, and NATS’ figures involve a substantial component of new software development. But, as with the overall comparison of operating costs the scale of the difference is wholly consistent with scope for cost savings. A recently completed (and larger) control centre at the comparable ATSP had costs of about £130 million (including buildings, hardware and some software development costs) compared with projected costs of £220 million for the buildings and hardware costs of NSC.

4.15 Substantial efficiency gains are often assumed against regulated companies’ investment projections by other regulators, albeit with wide variations in the scale of these assumptions. For example Ofgem, utilising yardstick comparisons between Public Electricity Suppliers, conclude that the five least efficient PES should be able to make capital expenditure reductions of 18%-41% against the companies’ own projections of capital expenditure. In aggregate, a reduction of 13% in total capital expenditure allowances, across all PES was adopted. Ofwat have recently assumed aggregate reductions of in capital expenditure allowances compared with water companies’ plans of 23% against capital maintenance and 31% against quality enhancement expenditure. Of Ofwat’s reductions, 9% and 14% respectively resulted from pure ‘efficiency’ assumptions.

4.16 Finally, it is important to reiterate the role that these ‘efficiency’ assumptions play in the charge control proposals. Since they have no impact on the charges in the first five years, their primary use is as an input into the analysis of whether NATS’ investment programme is likely to be able to be financed. But the question in relation to financing is not the efficiency gains which can be achieved against NATS’ long term investment plan, but the likely aggregate investment spending that NATS will undertake. That is, it covers not just the scope for efficiency gains, but also any substantive changes to the programme itself which may arise. Together with past evidence on investment spending, it seems more likely that NATS’ out turn investment will be below NATS’ LTIP projections. In

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5 Ofwat, Final Determinations, Future water and sewerage charges 2000-05. ERG calculations from Tables 19 and 21.
this light ERG’s assumptions on efficiencies provide a reasonable basis for testing its price proposals against financing requirements.

ERG’s proposal of deferring remuneration of AICC and NATS’ objections

4.17 ERG proposed deferring remuneration of AICC projects for the following reasons:

- a presumption that prices of outputs should reflect the incremental costs of producing those outputs. AICC projects are intended to meet demand growth in the future, not demand over the next five years;

- while there are exceptions, it is usually the case in competitive markets that outputs are priced when they are delivered, as opposed to when they are in the course of construction;

- there is uncertainty as to the scale, scope and timing of the investment plan that NATS have presented, and that this creates a significant regulatory risk that if ERG was to allow for the full NATS programme, actual spend could be substantially lower. Equally, ERG is not in a position to second guess just how much lower the actual figure is likely to be with enough confidence to base a price cap upon, together with a statement that ERG was prepared to ‘allow’ a specified amount of investment and no more. Such an approach carries obvious dangers in disincentivising NATS to undertake potentially valuable investments;

- the approach provides strong incremental incentives for NATS to undertake large investments in the first five years. This is because ERG’s approach involves capitalising capital costs on NATS’ actual investment and adding this to the RAB at the first review. Normal regulatory practice is merely to roll forward actual spend with no capitalisation of interest. Thus the expected incremental return on investment (once the price cap for the initial period has been fixed) is higher than normal practice;

- the approach does not provide strong incentives to make capital expenditure efficiencies. Effective consultation with users on the investment and business plans during the first five years may ameliorate the potential problem. It may also be possible in due course to establish a framework for providing explicit incentives to make efficiency gains in relation to particular projects. Alternatively, if it becomes possible for the regulatory structure to move away from NATS’ own costs to costs based on long run incremental costs, possibly estimated through international benchmarking, incentives to invest efficiently will become very high powered.

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6 This is required under Condition 10 of the draft licence.
4.18 NATS' has several objections to the AICC proposal which it expressed in its response and in subsequent discussions with ERG.

4.19 The first is that ERG’s claim that the Eurocontrol Principles require that AICC should not be allowed for in charges is not correct. In response to its Consultation Paper Eurocontrol has advised that there is indeed some ambiguity here. ERG therefore accepts that the Eurocontrol regime could allow for funding of AICC and that this is not a bar to allowing AICC to be remunerated in the first five years.

4.20 NATS points out that there are market situations where buyers and sellers have contracts which provide some up front payments or progress payments during construction or production. ERG does not argue that it is never the case that buyers might provide up front payments negotiated as part of contractual arrangements in competitive markets. Indeed ERG has emphasised the desirability of long term contracts which carry the prospect of lighter handed regulation. The point is that there are plenty of examples where this does not occur, and that there is certainly no presumption that simply because an investment project is uncertain and/or has a long lead time, up front payment are necessary for that investment to take place. Recent examples of large and risky investments being made with no up front payments from customers include the recent bids for mobile phone licences, BSkyB’s development of first analogue, and now digital, satellite broadcasting, the UK cable network, and the channel tunnel. ERG therefore maintains its view that the deferral of remuneration of AICC is consistent with competitive markets. If NATS had reached agreement with users on pre-funding for AICC projects ERG would have taken this into account.

4.21 NATS argues that the AICC proposal will result in a sharp jump in prices in 2006. NATS’ analysis of this increase is presented in paragraphs 9.24 to 9.30 of their response. Unfortunately its analysis also assumes that ERG’s operating cost efficiency assumptions are not realised. Clearly if these efficiency assumptions were not realised there would indeed be a jump in prices in 2006. It is ERG’s view that these efficiency gains will be realised and are likely to be outperformed. ERG’s modelling of the longer run price path under its final proposals suggests that there will not be any jump in prices in the next quinquennium, and that unit prices will either flatten out or decline further.\(^7\)

4.22 NATS argues that non-remuneration of AICC in the initial charge control would severely compromise NATS’ incentives to invest (paragraphs 7.12-7.14). The basis for this view appears to be that the CAA as regulator will retain the discretion not to allow recovery of actual expenditure at the first review. There are two responses to this. First, the same argument can be made about all aspects of NATS’ asset base, including the regulatory asset base; it will be up to the regulator to convince NATS that it will not renege on its regulatory commitments, including its commitment to roll the RAB forward capitalising the financial costs of AICC. Second, ERG believes that, compared with up front remuneration of NATS’ investment plan, the incentive qualities of the AICC approach give NATS stronger incentives to invest, not weaker incentives. The

\(^7\) See paragraphs 7.6-7.11.
key observation is that once this price control is set, NATS’ incentives to bring forward AICC will be driven by its expectation of what the regulator will do for the next quinquennium, not the initial charge control. Viewed from this perspective, the commitment to capitalise capital costs makes AICC investments more attractive than if some part of the return had already been ‘allowed’ in the first price cap.

4.23 NATS argues that the AICC policy would, if implemented, increase regulatory risk which would be compensated through an increased cost of capital. Again, an important point is that this risk will be based against NATS’ incremental incentives to invest. The AICC approach, by creating a regulatory commitment to allow for capital costs, increases the incremental expected return NATS would expect to earn compared to up front remuneration of the investment plan. ERG is not convinced that NATS would be exposed to greater regulatory risk under its proposals than are other regulated firms.

4.24 Finally, NATS argues that the AICC proposal creates the danger that the programme could not be financed. Further analysis of financing questions is set out in Section 7. It is agreed that there are issues on financing which need to be addressed. There are a range of possible solutions to the potential difficulty, such as revising NATS’ opening financing structure.

NATS’ alternative proposal

4.25 NATS’ response to the April paper suggested that some form of formal regulatory contract should be the basis for going forward. In discussions with ERG since then, NATS has indicated that they thought this approach was probably not practicable. They have put forward an alternative which is not dissimilar to ERG’s proposal. NATS propose that all investment planned in the LTIP would be allowed for in the initial charge control (with no ex ante capex efficiency assumption), but that the RAB would be rolled forward on the basis of capitalising under spend or overspend. This would be combined with a framework for determining where under spend resulted from efficiency savings, in which case there would not be any clawback.

4.26 This approach would also have high powered incentives for NATS to invest in the initial period, and that the incentive effects should be similar to its own proposals. In theory the difference between the two is largely one of profiling. ERG believes that its own approach is superior in several respects:

- user responses display broad support for ERG’s approach;
- profiling can be considered separately from the specific treatment of capex by the approach taken to regulatory depreciation. Adopting a degree of depreciation acceleration, ERG does not expect the AICC approach to result in any significant jump in prices in 2006; if anything prices are likely to continue to decline (in real terms).

4.27 NATS’ view is that its alternative, by providing up front remuneration, gives a stronger signal that the regulator will reward investment. ERG’s concern is that by creating an explicit obligation on the regulator to ‘claw back’ under spend
(rather than not remunerate spend which has not taken place) is likely to give undesirable signals that ex post reviews of capex spend will be the norm, and is therefore as likely to give poor signals as it is to give positive signals. For these reasons ERG believes that its policy solution is preferable to NATS’ proposal.

Other approaches to investment in AICC

4.28 The incentive problems in relation to investment discussed above are not limited to NATS. They also apply to other regulated firms. Prior to a price cap being set a firm’s incentive is to overstate the capital expenditure it expects to undertake in the future in an attempt to get a looser price cap. Once the price cap is set, the regulated firm’s incentive moves against actually implementing the investment. This is particularly problematic for investments with long lead times since ‘allowing’ for that investment in an up front price cap has as its corollary that the allowed return under future price caps will be correspondingly reduced. This reduction in the incremental return on the investment will dampen incentives to actually implement the programme.

4.29 The usual solution is to establish a ‘regulatory contract’ around the investment plan (and the business plan more generally). This might be an explicit ‘contract’ where the regulator sets out a detailed framework of what has been allowed for in the plan, what is expected of the regulated firm in return, and a series of measures and inducements to try and ensure that this is met. The trend is to attempt to measure and price outputs, to ensure that the company meets the contract but retains scope to make cost efficiencies. Approaches of this sort are often accompanied by detailed appraisal of the business plans and investment plans, with a view to ‘allowing’ and ‘disallowing’ parts of the programme or costs up front, and taking independent advice on the scope for cost efficiencies available in delivering the programme.

4.30 A more light handed approach is to accept the plans following challenge at a high level, and then expect the company to deliver the plan, or something like it, where there is a high level of agreement about what the plan is expected to deliver and how it should be delivered, but without the detailed scrutiny of an explicit contract approach. This model might be termed the ‘implicit regulatory contract’. The CAA’s approach to airport regulation in the past has generally followed a model of this type.

4.31 Neither of these approaches is appropriate in the case of NATS’ initial charge setting. There is certainly common agreement between NATS and ERG that the aim of the investment programme and the business plan more generally should be to deliver sufficient capacity to meet future demand growth for NATS services (where the benefits of so doing outweigh the costs). However, ERG’s review of NATS’ investment plan suggested that the plan was not robust enough to support a contract. Review by the strategic partner and further review by NATS’ management may result in a revision to the plan which differs significantly from that presented. There may be significant differences to the

8 If the regulator tries to counter this risk by allowing investments which are delayed back in to the price cap at future reviews, this merely reinforces the incentive not to invest up front in the hope of getting an even higher return by so doing.
timing, scale and scope of the plan. Nor would ERG wish NATS, under the PPP, to be tied to the existing plan under the contract model.

4.32 In the absence of such a contract, there is a real danger that once the price cap is fixed NATS’ incentives to actually implement their programme, or any other programme, will be seriously dampened for the reasons outlined above.

**Conclusion on Investment**

4.33 ERG’s proposals adopt the policy of deferring remuneration of AICC until the next quinquennium. At a basic level this policy is consistent with a presumption that users should pay for inputs when they deliver outputs. AICC projects are intended to enhance capacity to meet demand in the future; they are not intended to meet demand in the next five years. This presumption is strengthened by ERG’s conclusion that NATS’ investment plan, and particularly the AICC elements of it, is subject to uncertainty as to its eventual scale and scope. Moreover, incentivising investment is one of the key reasons for the PPP. Deferral of remuneration of AICC projects (and capitalising interest) both reduces the risk that the charge control will have allowed for a much larger investment programme than that which emerges, and provides high powered incentives to implement investments for the future.
5 ERG’s efficiency assumptions in relation to NATS’ operating cost projections

5.1 In the April paper ERG’s preliminary conclusion was that NATS should be able to make operating expenditure efficiencies in the range of 2%-5% per annum compared with the operating cost projections in NATS’ business plan. These assumptions were based on:

- efficiency gains achieved by other regulated utilities, and a presumption that NATS should be able to achieve efficiency gains of a similar magnitude;

- the ‘reality checks’ provided by benchmarking against other European ATSPs and case study comparison of one similar ATSP.

Preliminary clarification and revised operating expenditure assumption

5.2 There was some confusion as to how ERG had applied its 2%-5% efficiency assumptions to NATS’ operating cost projections in the April paper, given that ERG had opted for a traffic-cost elasticity in its financial modelling. Clarification is required since this question is material to some of the arguments outlined below. The following outlines the process by which the efficiency assumptions were applied.

5.3 The April paper charge control modelling took as an input ERG’s projection of NATS’ operating expenditures (on a single till basis). There were two elements to this projection:

- a projection of operating expenditure before any efficiency gains are applied; and

- the application of efficiency assumptions to that projection.

5.4 The link between ERG’s projection before efficiency gains and NATS’ projections in its business plan was that ERG estimated a traffic-cost elasticity between traffic growth and operating expenditure which was applied to NATS’ operating expenditure in 2000. This elasticity was chosen such that the implied level of operating expenditure reached in 2004/5 was equal to NATS’ business plan projection for that year. The efficiency gain assumptions were then applied to this projection.

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9 NATS’ projections run only to 2004/5. Since a figure for 2005/6 is required for the charge control modelling, ERG extended the 2004/5 figure by the elasticity of 0.25 and its efficiency assumption. In fact ERG’s projection to 2004/5 (prior to applying ERG’s efficiency assumptions) was slightly higher than NATS’ projection – see Figure 5.1. This higher projection was equivalent to assuming that NATS’ business plan projection to 2004/5 included an annual efficiency gain of slightly below 1%.
5.5 This approach is favourable to NATS. Since traffic growth rates are not expected to vary significantly over the period, ERG’s projection (before efficiency gains are applied) resulted in operating expenditure growth in a straight line. NATS’ business plan projections, in contrast, show a fall in operating expenditure in 2002/3, with rising expenditure thereafter. Since ERG’s projection resulted in the same end point in 2004/5, but cuts off this ‘U’ shape, it implies levels of operating expenditure, prior to the application of efficiency gain assumptions, which are higher than those in NATS’ business plan over the period. This is illustrated in the left hand panel of Figure 5.1.

Figure 5.1 - Comparison of ERG’s and NATS’ projections of operating expenditure to 2004/5 in the April Consultation Paper and for the final assessment

5.6 The result is that even once ERG had applied its efficiency gain assumption, the difference between ERG’s assumption on operating expenditure used in the charge control modelling, and NATS’ own projection, was very minor in the first two years of the charge control period, and did not exceed 10% until 2004/5. This difference was detailed in Table 9.6 of the April paper and is restated in Table 5.1 for ease of reference.

The right hand panel illustrates the case under ERG’s final proposals. Overall operating costs are shown to be different to the April paper because Met Office and DAP costs have been excluded and because there have been further adjustments by NATS’ to the single till operating expenditure projections. The series is also extended back to 1999/00 because ERG now believes that it is appropriate to bases its projections on the audited data now available for that year.
Table 5.1 - Comparison of ERG’s operating expenditure assumptions and NATS’ business plan operating expenditure projections, 2001-2004

<table>
<thead>
<tr>
<th></th>
<th>£1999/00 prices</th>
<th>2001</th>
<th>2002</th>
<th>2003</th>
<th>2004</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>April paper - intermediate charge case</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>ERG’s assumption (3.5% efficiency gain)</td>
<td>366.1</td>
<td>358.7</td>
<td>351.1</td>
<td>343.1</td>
<td></td>
</tr>
<tr>
<td>NATS’ business plan projection</td>
<td>378.4</td>
<td>366.8</td>
<td>377.3</td>
<td>386.2</td>
<td></td>
</tr>
<tr>
<td>Percentage difference</td>
<td>-3.2%</td>
<td>-2.2%</td>
<td>-6.9%</td>
<td>-11.2%</td>
<td></td>
</tr>
</tbody>
</table>

| **Final proposals - 3% efficiency gain assumed** |       |      |      |      |
| ERG’s assumption (3.0% efficiency gain) | 353.6 | 348.2| 342.4| 336.1|
| NATS business plan projection – adjusted for MoD/ Met/ DAP changes | 364.4 | 351.1| 364.7| 378.1|
| Percentage difference | -3.0% | -0.1%| -5.8%| -11.1%|

5.7 Since April there have been a range of changes to NATS’ operating cost projections (on a single till basis). Of particular note is the removal of Eurocontrol funding for the Met Office and the CAA Directorate of Airspace Policy from NATS’ cost and revenue base. Also, in order to anchor its projections more firmly in audited data, ERG’s projection is now based on the audited 1999/2000 figures.

5.8 A similar approach to that adopted in the April paper, but applying a 3% assumption for operating cost efficiency gains to the new operating cost projections, is illustrated in the right hand panel of Figure 5.1 and in Table 5.1. The shape of the comparison is similar to the April paper proposals and again is favourable to NATS. Similarly, over the first four years for which direct comparisons are possible, the new projection of operating expenditure after taking account of efficiency gains results in minimal divergence between ERG’s assumption and NATS’ business plan projections in the first two years of the PPP. This provides considerable comfort in giving NATS time to identify and implement efficiency gains.

5.9 These points are reinforced by the magnitude of the difference between ERG’s projections and NATS’ business plan projections. In the second year of the PPP ERG’s projection of operating expenditure is only £3 million below NATS’ own

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11 Taken from Table 9.6, April paper.
projection. This is a negligible difference. Even by 2004/5, which allows NATS four years to plan and deliver efficiency savings, the difference is £42 million, or 11%. On a cost per flight basis the figures show a similar pattern. In 2001 ERG’s projection is that the cost per flight will be £166/flight compared to a figure of £172/flight for NATS\(^{12}\). The gap narrows in 2002 to £154/flight for ERG and only £158/flight for NATS. The divergence is greater thereafter, but this in part reflects ERG’s higher traffic growth assumptions which, combined with low incremental costs, would generally be expected to result in a lower cost per flight.

5.10 In order to allow a more direct comparison between ERG’s operating expenditure projection and NATS’ business plan projection, ERG has remodelled its operating expenditure projections to reflect the ‘U’ shape pattern of NATS’ business plan projection. This remodelling takes the final proposal operating expenditure projection shown in Table 5.1, and fits it to the shape of NATS’ business plan projection, but maintaining the total amount of operating expenditure assumed in present value terms. The remodelled operating expenditure projection is illustrated in Figure 5.2 and Table 5.2. The efficiency assumption of 3% per annum applied using the elasticity approach is equivalent in present value terms to a 2.3% assumption applied directly to NATS’ projections.

\(^{12}\) These figures are based on the following:

<table>
<thead>
<tr>
<th></th>
<th>2001</th>
<th>2002</th>
<th>2003</th>
<th>2004</th>
</tr>
</thead>
<tbody>
<tr>
<td>NATS</td>
<td>Opex(£m)</td>
<td>363.6</td>
<td>351.1</td>
<td>364.7</td>
</tr>
<tr>
<td></td>
<td>Flights(m)*</td>
<td>2.1</td>
<td>2.2</td>
<td>2.3</td>
</tr>
<tr>
<td></td>
<td>Opex/flight(£)</td>
<td>£173</td>
<td>£158</td>
<td>£157</td>
</tr>
<tr>
<td>ERG</td>
<td>Opex(£m)</td>
<td>353.6</td>
<td>348.2</td>
<td>342.4</td>
</tr>
<tr>
<td></td>
<td>Flights(m)*</td>
<td>2.1</td>
<td>2.3</td>
<td>2.4</td>
</tr>
<tr>
<td></td>
<td>Opex/flight(£)</td>
<td>£166</td>
<td>£154</td>
<td>£144</td>
</tr>
</tbody>
</table>

*Calendar years.
Figure 5.2 - Remodelling of ERG’s opex projection to reflect profile of NATS’ opex business plan projection

Table 5.2 - Remodelled ERG operating expenditure projections to reflect the profile of NATS business plan projection

<table>
<thead>
<tr>
<th>£1999/00 prices</th>
<th>2001</th>
<th>2002</th>
<th>2003</th>
<th>2004</th>
</tr>
</thead>
<tbody>
<tr>
<td>ERG’s opex projection (final proposal – 3% efficiency assumption) re-profiled</td>
<td>356.6</td>
<td>335.5</td>
<td>340.2</td>
<td>344.3</td>
</tr>
<tr>
<td>NATS’ business plan projection – adjusted for MoD/Met/DAP changes</td>
<td>364.4</td>
<td>351.1</td>
<td>364.7</td>
<td>378.1</td>
</tr>
<tr>
<td><strong>Percentage difference</strong></td>
<td>-2.1%</td>
<td>-4.4%</td>
<td>-6.7%</td>
<td>-8.9%</td>
</tr>
</tbody>
</table>
Consultation responses

5.11 The response from The Airline Group to these proposals was that there was likely to be scope for NATS to make efficiency gains, but that these should not be at the cost of reduced service quality. The response did not express a view on what assumption ERG should actually adopt. IATA gave a strong steer that it was looking to ERG to protect user interests in this area, and BATA gave similar advice but urged caution if service quality standards were threatened. Potential strategic partners thought that ERG’s benchmarks did not provide strong support for a strong assumption on efficiency gains. NM Rothschild, representing a potential purchaser, indicated that an assumption at the lower end of the 2%-5% range should be used. ERG has no wish to take an aggressive approach to the scope for NATS to make efficiency gains, and recognises that the incentives provided by the PPP and price cap regulation (in contrast to rate of return regulation) will deliver achievable efficiency gains in due course. ERG interprets the responses as a steer that the efficiency assumption should err on the side of caution, but that the charge control should reflect a low risk assumption on NATS’ scope for efficiency gains. This supports ERG’s own view. ERG’s final recommendation is that gains of 3%-4% per annum, against ERG’s projection of NATS’ costs\(^{13}\), should be achievable. Following the consultation responses ERG believes that DETR should set the charge control on the basis of the lower end of the range.

NATS’ consultation response

5.12 NATS disputed the April assumption of operating efficiency gains of 2%-5% on the following grounds:

- NATS’ projections of operating costs already incorporate significant efficiency gains, and further gains along the lines assumed possible by ERG would not be feasible;

- NATS’ costs cannot be reduced because they are driven by operational requirements in relation to existing assets and cannot be reduced without a direct impact on service delivery;

- comparisons with other utilities are untenable because of the importance of safety to NATS, because other regulated firms have been privatised for some time, and because initial reviews should be treated differently from subsequent reviews;

- ERG’s analysis of international benchmarks is not well enough developed to allow comparisons at this stage;

\(^{13}\) The 3% assumption is equivalent in present value terms to only 2.3% per annum applied directly to NATS’ business plan projections – see paragraphs 5.2-5.10.
• even if additional efficiency gains were feasible, the nature of the safety constraints on NATS and the nature of NATS business more generally implies that they will not be quickly forthcoming;

• the incentives provided by price cap regulation will produce efficiency gains over time in any event.

**Efficiency assumptions made by NATS**

5.13 NATS argues that its operating expenditure projections already incorporate considerable efficiency gains for three reasons:

• its projections already allow for a reduction in unit operating costs of 3.8% per annum\(^{14}\);

• NATS has made significant efficiency gains in the past\(^{15}\);

• NATS’ projections have been subjected to detailed scrutiny by NATS’ senior management.

**Reduction in unit costs in NATS operating cost projections**

5.14 ERG does not accept that the 3.8% reduction in unit costs reflects a significant efficiency gain. The key costs of meeting additional demand over the next five years are the costs of NERC (which have largely been incurred already and are included in the regulatory asset base), the costs of running both the existing centres and NERC during the transition period (which ERG understands are already incorporated in NATS’ cost base), and the incremental costs of the additional resectorisations that the NERC platform is intended to support.

5.15 Only the last of these is likely to form a significant additional expense for NATS in the first five years. Section 6 of the April paper sets out estimates of the short run incremental costs of resectorisations (between £23 and £92 per flight). Projecting NATS costs on the basis of these estimates (and traffic growth projections) indicates growth in operating expenditure which reaches an end-point which is similar to that set out in NATS’ plan. This does not seem to imply that NATS’ operating cost projections incorporate significant efficiency gains, over and above past performance.\(^{16}\)

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\(^{14}\) NATS response, 6.4 and 6.17.

\(^{15}\) NATS, 6.11-6.14.

\(^{16}\) Moreover, ERG’s April projection of NATS’ operating expenditure was consistent with NATS’ projection already allowing for efficiency gains of slightly below 1% per annum - see footnote 9 of this paper.
NATS asserts that the Clacton resectorisation, on which ERG’s estimates are based, is misleading because it involved an unusually high volume gain, and that over time other resectorisations will be subject to diminishing returns. While estimates based solely on the Clacton resectorisation will not be a perfect guide to short run incremental costs, NATS has not presented any alternative estimates or evidence, and ERG believes that the Clacton example remains the best estimator for the future. Moreover, while ERG accepts that resectorisations are likely to be subject to diminishing returns at some point, it has not seen any compelling evidence to indicate when and where this will set in, such as would undermine confidence in the Clacton estimates. In the past NATS has managed to generate higher than expected capacity gains from its existing LATCC infrastructure, primarily through resectorisations.

NATS’ past efficiency gains

NATS argues that in the early to mid-1990s NATS made significant improvements in efficiency, and that ERG’s comparison with efficiency gains made by other regulated firms over the similar period was misleading. NATS’ historical comparison is based on a reworking of their past costs on a single till approach (similar to that adopted by ERG for the charge control modelling). Since this data only appears to be available from 1995/6, NATS compares its reduction in unit costs since 1995/6 with those of water and sewerage, the only industry in ERG’s list of comparators for which the data is presented for an identical period. From 1995/6 to 1998/9 NATS’ reduction in cost per CSU was 4.9%, apparently comparing favourably with the figure for water and sewerage of 3.5%-4.1%.

ERG disagrees with this analysis. First, as is made clear in the rest of ERG’s benchmarking against other regulated firms, NATS’ business is subject to unusually high levels of volume growth combined with low (in the short term) incremental costs of meeting that growth. On unit cost comparisons ERG would therefore generally expect NATS to make more rapid reductions in unit costs than most other regulated firms, not merely achieve similar figures to water (which is characterised by relatively stable demand). Second, ERG’s figures give a more or less identical impression as NATS’ revised data if the period 1995/6-1998/9 is taken for comparison. As ERG’s Figure 6.2 in the April paper shows, this reduction followed a period of rising real costs per flight in the early 1990s, the most likely explanation of which was the expensing of NERC costs during that period. On a real cost per flight basis, NATS’ has higher unit costs now than it did prior to the rising costs in the early 1990s. Third, even if the 1995/6-1998/9 period is taken – and this is clearly the period which presents NATS’

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19 The early 1990s also witnessed other significant development projects as part of the ‘investing in growth programme’ which had an impact on operating costs. The most significant was the creation of the Terminal Control Room at LATCC and the transfer of the Heathrow and Gatwick approach functions but there were also major projects to replace primary radars and the Scottish radars.
performance in the most favourable light - of the comparators listed in ERG’s Table 6.4, only water and sewerage fall below NATS’ own figures. The fact that the years presented for the other comparators is not as close as the years for water and sewerage is a spurious distinction. NATS’ analysis on this point does not lead ERG to conclude that NATS’ historical performance in achieving efficiency gains indicates that it has already reached a position of best practice.

NATS’ internal efficiency audit

5.19 ERG has asked NATS for details of its internal business planning processes and the challenges which have been applied to the bottom up planning. ERG also asked for evidence of where significant changes in cost projections have occurred following any process of challenge. NATS’ response stated that NATS’ planning guidelines set targets for its Divisions real cost per flight reductions of 5% per annum for its ACS, IS, ITS, Programmes and R&D divisions, and a real 5% per annum reduction for other divisions and functions. The Divisional plans were subjected to an internal challenge process. If these targets had been met, it would imply reductions in NATS’ operating costs over five years. However, NATS’ business plan projects rising costs over the five years as a whole and, as NATS has pointed out, allows for cost per flight reductions of only 3.8% per annum. NATS stated orally that this reflected provisions for staff incentive packages and restructuring costs. ERG cannot comment on this particular claim in relation to operating costs, only that in aggregate, NATS’ costs still show rising costs over five years. This evidence does not support a conclusion that NATS is at its optimal operating cost level.

5.20 One indication of the gains which have been assumed is a statement in the NATS response (paragraph 6.41) which states that NATS’ corporate costs will be reduced by 9% over the first five years (and implies that this is an efficiency assumption). Since this is likely to be an area of ‘soft’ costs, the limited nature of this assumption adds to the view that efficiency gains beyond any assumed in NATS’ plan are likely to be feasible.

5.21 It is also important to re-emphasise that the operating expenditure assumptions which underpin the final proposals are equivalent in present value terms to an efficiency gain of only 2% applied directly to NATS’ business plan projection. In effect, ERG’s charge control recommendation is consistent with assuming that NATS’ business plan projections already include notional efficiency gains of around 1% per annum (to give an overall level of 3%).

5.22 On the basis of the above, ERG does not believe that it should amend its analysis of the scope for making operating cost efficiencies on the basis that NATS’ own projections already incorporate potential efficiency gains.

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20 NATS presentation to ERG, 13 July 2000.
21 NATS response, paragraphs 6.4 and 6.17.
22 See paragraphs 5.2-5.10.
NATS’ case that its costs are driven by hard operational requirements

5.23 NATS argues that its cost structure makes efficiency gains more difficult to achieve (without eroding service quality levels). The key points that NATS make are the following:

- the scope for substitution of capital for labour in the short run is limited. For example, further reductions in the requirements for ATSAs will only result in labour cost savings once new technology (eliminating paper strips) is introduced at the new centres;

- it is a labour intensive business, with people costs accounting for 58% of total NATS costs;

- 81% of NATS costs are operationally focused, through controller and engineering operations (59%), investment and development (20%) and training (2%);

- 8% of NATS costs are ‘uncontrollable’ (Met Office costs and costs related to external regulation) and roughly 2% of costs relate payments to the CAA for accommodation. (Since Met Office costs and the cost of the CAA Directorate of Airspace Policy are no longer to pass through NATS’ cost base, this element of costs will disappear);

- on this basis it is not possible to make substantial cuts in the cost base without a direct impact on investment or service delivery.

NATS’ evidence

5.24 ERG agrees with NATS that parts of its operating cost base cannot be reduced without reducing service quality. ERG also agrees that these areas of ‘hard’ costs are likely to be the front end operational safe separation services that NATS continues to provide in the face of rising traffic. ERG recognises the need to increase the number of ATCOs to meet demand in the short run. But these areas of hard costs are likely to be balanced by other areas of ‘softer’ costs. All regulated firms are likely to have had areas of ‘hard’ costs where efficiency gains were difficult to produce. And most regulated firms routinely argue to their regulators that efficiency assumptions used to set prices are too tough and cannot be realised without compromising the service provided. It is equally routine that once the price caps are in place efficiency assumptions are outperformed by the companies without the projected demise of the service provided.

5.25 ERG does not believe that the labour intensity of NATS’ business and the scope for substitution of capital for labour make a strong case for concluding that there is no scope for efficiency gains. Many of the cost reductions in other regulated firms have resulted from labour savings, and these have not all been based on capital substitution. ERG would certainly accept that there is little scope for labour cost savings in relation to front line air traffic controllers. But ATCOs make up only 34% of NATS’ total staff, and the staff costs of ATCOs at the three operational area control centres make up only 18% of the operating
expenditure of the licensed business. Savings elsewhere should be more feasible. ERG would also accept that the rate of substitution of capital for labour in the first five years may be limited in some areas. However, there may be other areas where capital-labour substitution is likely to be possible.

5.26 In its response, NATS argued that 81% of its cost base was operationally focused and that a cost reduction in any of these areas would impact directly on NATS’ ability to deliver current and future delivery. Of the remaining costs a further 10 percentage points were argued to be fixed and so the scope for cost savings only applied to the remaining 9%.

5.27 ERG is not inclined to accept the blanket argument that there is no scope for reducing any costs incurred in offering a service without necessarily directly impacting the quality of that service. There are clearly different degrees of scope for addressing costs depending on the extent to which change and better management can be applied. This may be very limited at one end of the spectrum where ATCOs are working in a real time safety sensitive environment but the scope outside these areas is likely to be greater. In discussions with NATS’ staff ERG has tried to develop a clearer picture of the costs which relate to delivery of the current service distinguishing the costs of ATCOs, costs such as training R&D and support which relate to future service delivery and the other costs which support those other two functions. NATS has subsequently produced a working paper which classifies costs (excluding Met Office services) as 53% current front-line, 24% future costs and 20% support costs. NATS has included regulatory charges, the staff bonus and insurance and loss of licence compensation scheme in the front line costs. If these were excluded the front line costs would fall to 48%.

5.28 ERG believes that this is a very conservative estimate given that the total direct operating costs of the three centres at LATCC, ScACC and MACC accounted for only 33% of operating expenditure (1999/2000 figures). Of the 53%, only about a third will reflect the direct costs of ATCOs. In the rest there is likely to be greater scope for efficiency gains.

5.29 ERG has modelled NATS’ operating costs taking into account a revised efficiency assumption of 3% per annum, which translates in present value terms into efficiency gains against NATS’ plan of 2.3% per annum. This is equivalent to zero savings on the costs of air traffic controllers compared with those forecast by NATS, with savings of around 3.5% per annum on other controllable costs.

A counting ‘efficiency’ gains

5.30 ERG had intended to undertake a process of challenge on NATS’ cost projections. However, due to delays in receiving NATS’ full activity based costing model, it has not been possible to undertake any full examination of NATS’ projections in the time available. Even if time had been available, the inevitable information asymmetries between the regulator and the firm would

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23 see paragraphs 5.2-5.10.
24 ERG (April 2000) paragraphs 1.2, 1.5, 2.11.
imply that those areas of identified efficiencies would only be a small part of those which are actually achievable. However, ERG believes that there are likely to be two areas where soft cost 'savings' can be made:

- NATS’ costs for the licensed business are likely to reflect a bias in cost allocation towards the licensed business and away from the unlicensed business;
- NATS is likely to have scope for reclassifying operating costs as capital expenditure.

5.31 Under the existing Eurocontrol Principles ensuring cost recovery, and especially prior to the setting of a charges cap, NATS has an incentive to allocate costs to the Eurocontrol business rather than to its unregulated businesses. At this stage ERG is not in a position to advise on these allocations, having only recently received the full operating cost breakdowns, while noting that allocations of joint and common costs are arbitrary within broad parameters.

5.32 Some key interfaces between the licensed and unlicensed business are shown below. The figures in round brackets give some indication of the sums of money involved while the square brackets indicate the percentage of costs attributed to the unlicensed business where appropriate in 1999/00. As a rough comparison, the unlicensed business represented 14.5% of the total NATS business in 1999/00:

- the attribution of corporate costs (£7m [10%] to unlicensed);
- the attribution of infrastructure costs (£7m [11%] to unlicensed);
- the attribution of training costs (£3.5m [20%] to unlicensed);
- the scale of the revenue imputed to the London approach service (£6m);
- the attribution of costs between the Manchester Area Control Centre and the Manchester aerodrome service. The attributed costs of the MACC was £18.8m compared to revenue to the Manchester airport service of £6.8m;
- the North Sea Helicopter service which are licensed activities which take place in the Aberdeen and Stansted towers alongside airport operations;
- remuneration of en route services provided from the unlicensed business (e.g. revenue that NATS airport services receive from the Eurocontrol revenues). (£11m)

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25 In the most recent breakdown of NATS costs and revenues by service line, the costs and revenues of the London Approach service are included in the 'en route' service line. No costs are explicitly attributed to London Approach, so the key issue is the level of the revenue assumed for this service from the London BAA airport contracts and whether this adequately represents the cost of this service.
5.33 In the round, there might be the order of £20m to £30m of costs for which there is scope for different attributions between the licensed and unlicensed businesses. For the most part these are common costs. ERG cannot at this stage advise on what the attribution should be, merely that at least part of the current attribution is likely to reflect the bias inherent in the environment that NATS faces.

5.34 The single area where there may be the largest potential for revision is likely to be for London approach costs. ERG understands that the revenue implied from the airport contracts only relates to the direct costs of what it would cost for the ATCOs to provide the former service at the airport control towers. This is not likely to make any substantial contribution to common costs and may not even cover the incremental cost of the service at LATCC.

5.35 The combination of the cost recovery mechanism under the traditional Eurocontrol charging principles and Government control of capital expenditure has traditionally given NATS every incentive to organise its business so that spending is classified as operating cost rather than capital cost. The extent of the distortions caused by these incentives seem to have diminished over time with NATS' internal projects and engineering capability being reduced and more recently by the change in NATS' accounting policies to capitalise some internal costs in accordance with FRS15. Nevertheless substantial contributions to major projects such as NERC continue to be made through operating expenditure and the incentive structure may continue to distort NATS' decisions to favour maintaining rather than replacing assets.

5.36 Under RPI-x/rate of return hybrid regulation these incentives would be reversed. NATS will have an incentive to show spending as capital cost thereby increasing the RAB which is remunerated through the cost of capital and reducing operating cost which has an immediate effect on operating profits. There is still likely to be scope for NATS to organise its spending in such a way that a greater proportion is treated as capital expenditure rather than operating expenditure. This may occur in two ways. First NATS may use the remaining discretion between operating expenditure and capital expenditure to reclassify spending which would have taken place anyway from operating expenditure to capital expenditure. Secondly, the changed incentives might alter the balance of decisions to repair or replace with the effect that the balance would be tilted in favour of capital expenditure rather than operating expenditure.

5.37 A substantial proportion of NATS' operating expenditure is on areas where it would be possible to envisage a shift of this sort from operating expenditure to capital expenditure. The three cost (trading) centres of 'programmes', 'infrastructure' and 'IT services' have combined operating expenditure spending of £111-£122 million per annum over the five years of the financial plan. Of this £40-£60million are for non-staff operating expenditure. If NATS were to respond to its new incentives we would expect some shift in these areas from operating expenditure to capital expenditure. If NATS were to respond to these incentives aggressively, shifts of the order of £20m across the business would not be unlikely.

26 The ‘programmes’ cost trading centre covers the development of centres from operating cost.
27 The ‘infrastructure’ cost trading centre manages the communications, navigation and surveillance assets.
Conclusion

5.38 NATS’ evidence that efficiency gains beyond any assumed in the business plan cannot be realised is not convincing. ERG accepts that the scope for efficiency gains in relation to front line operations may be limited. But this will be balanced by greater scope for gains elsewhere and by the scope for accounting adjustments. It is not inconceivable that the totality of ERG’s 3% efficiency assumption could be ‘achieved’ through accounting reclassifications alone.

Comparisons with other regulated firms

5.39 NATS argues that cost efficiency benchmarking against other regulated firms is unfounded because of the importance of safety and service obligations for NATS, and because the 2%-5% April range is based on judgements by other regulators at the second or third periodic reviews.

5.40 The core of NATS’ service is to enable the safe transit of air traffic through UK air space. Safety is the over-riding objective of the PPP and of the regulatory framework which will govern NATS’ activities. The CAA’s Safety Regulation Group has in place a robust and absolute regulatory regime for ensuring that there will not be any compromises on safety. ERG is confident that its assumptions in relation to the scope for making operating cost efficiencies are conservative and that NATS will be able to achieve gains of the magnitude assumed while providing desired levels of service quality.

5.41 NATS’ argument that it is different from other regulated firms, and that therefore no inferences should be drawn from the performance of other regulated firms, is not convincing. There are of course many differences between NATS and other regulated firms. There are also wide differences between the companies regulated by Ofwat, Ofgem, ORR and Oftel. Despite this, in recent periodic reviews both Ofwat and ORR have made use of the analyses by Europe Economics that inform ERG’s assumptions. ORR, in particular, use the Europe Economics analysis as one of the bases for their assumption that Railtrack should be able to achieve savings in controllable base service costs of 3%-5% per annum. In its provisional conclusions ORR adopted the 5% end of the range. Ofwat’s final determinations assume that the scope for efficiency assumptions in relation to operating expenditure was 1.4%-4.9%, based on work by Europe Economics and on yardstick comparisons, depending on the relative efficiency of the company concerned.

5.42 Following ORR, Ofwat and Ofgem, ERG’s assumptions are based on more than just the comparisons with other regulated firms. They are borne out by the evidence on benchmarking against other ATSP’s which, while not as sophisticated as Ofwat and Ofgem’s yardstick comparisons, indicates that 3%-4% assumptions are conservative.

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28 Office of the Rail Regulator The Periodic Review of Railtrack’s Access Charges - provisional conclusions on revenue requirements, December 1999, paragraph 3.40. ORR’s assumptions were applied to base service costs only because enhancements were still the subject of consultation. Other regulators have typically assumed higher estimates of the scope for efficiency gains against enhancements than for base service costs.

29 Ofwat, Final Determinations, Future water and sewerage charges 2000-05. Table 15.
Thus, while ERG accepts that there are differences between different regulated firms, of which NATS is about to become one, high level top-down analysis of this type is legitimate given information asymmetries and has precedent from the conclusions of other regulators.

**International benchmarking**

5.44 NATS has said in its response that it does not believe the benchmarking studies undertaken by ERG provide a valid comparison for NATS. The main reasons for this conclusion include:

- measurement problems due to exchanges rate variability;
- differences in the nature of service provided, particularly the degree of complexity involved;
- differences in accounting policies, including cost allocation issues; and
- differences in the investment cycle.

5.45 Each of these issues was addressed in the April paper. Although ERG agrees that there are arguments in favour of proceeding with caution in making such comparisons, the arguments do not suggest that the comparisons are invalid. Moreover the comparators themselves should be out-performed by effective commercial management, not merely equalled.

**Regression analysis**

5.46 At least three separate attempts to model ATSP costs have been undertaken. ERG has been working with both NATS and Eurocontrol’s Performance Review Commission in trying to explain the differences in ATSP costs using regression analysis. The ERG and PRC models are very similar in structure while the NATS’ model is structured somewhat differently with a restriction on the two main variables in the regression. A number of the differences between the results can be attributed to the data. The number of years and the number of countries included in the analysis will have an impact on the overall result.

5.47 Despite the differences between the models, all three produce the same finding for the UK – that NATS’ costs are higher than can be explained by the service characteristics included in the models. It is the size of the discrepancy that varies between the models.

5.48 Since April the PRC have published some results of its model30. Its model implies that NATS’ costs in 1998 were 16% higher than would be expected of a typical European ATSP after taking into account the effects of explanatory variables. A number of ATSPs had costs lower than would be expected e.g. Netherlands (-23%), Ireland (-20%), Spain (-16%), Germany (-16%), Sweden (-14%).

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Further work is needed before strong conclusions can be drawn from this type of analysis alone, but nothing in NATS’ criticism of the work would lead ERG to ignore the findings that have been reached.

Comparison with another ATSP

The results of ERG’s comparison of NATS’ en route cost base for services provided under Eurocontrol with the most comparable ATSP in Europe for 1998 indicated a very large difference. Before adjustment NATS’ costs per aircraft kilometre were 78% higher than those for the comparator and after the adjustment made by ERG the costs were 61% higher.\(^{31}\)

The measurement of air traffic control outputs is not well developed. However, a difference on this scale provides corroborating information in conjunction with the other evidence that there is likely to be scope for NATS to make significant cost reductions. This is all the more so as the comparison is with a publicly owned organisation providing a service in a market without competition and may not itself be subject to the full private sector incentives to productive efficiency.

Notwithstanding the difficulties involved in international benchmarking of this type, ERG believes that its analysis provides strong comfort that annual efficiency gains of 3%-4% should not be an overly challenging target for NATS to meet.\(^{32}\) The assumption of 3%, which ERG are proposing as the preferred option, is equivalent to a gain of 16% over five years. This is similar to the PRC revised estimates noted above, and well below the levels indicated by the single ATSP comparison.

Timing of efficiency gains

NATS argues that even if scope is there in longer term, they have problems in short term because of need to make safety cases for changes and because of limited scope for capital-labour substitution.

Reiterating the clarification of ERG’s analysis in paragraphs 5.2-5.10, it is important to note that ERG’s assumptions on operating expenditure involve only very minor operating cost reductions, compared with NATS’ business plan projections, in the first two years of the PPP.

Moreover:

- ERG believes that there are various areas of ‘soft’ cost reductions that NATS can and will make early in the PPP.
- Europe Economics’ analysis of unit cost efficiency gains achieved by other regulated firms does not indicate that gains achieved in the periods immediately following the introduction of commercial incentives were less

\(^{31}\) These adjusted differences are similar if the comparison is made on a per flight basis (64% higher) but somewhat less, though still substantial, on the basis of cost per service unit (40% higher).

\(^{32}\) Especially since the implied difference with NATS’ business plan projection is only 2%-3% on a present value basis – see paragraphs 5.2-5.10.
than in the subsequent period. Intuitively, the scope for eliminating excess costing in the public sector is likely to be substantial from the start;

5.56 ERG’s advice is based on conservative assumptions concerning NATS’ ability to realise efficiency savings in the early years of the PPP.

**Incentive properties of price cap regulation**

5.57 As explained in the Introduction to this paper, ERG considers that it is appropriate to take a view on NATS’ scope to make operating cost efficiencies. ERG agrees that price cap regulation, so long as it is sustainable, has good incentive properties for regulated firms to realise cost efficiencies. Because of this, and following the tone of user responses to the April paper, ERG has adopted a cautious assumption of 3%-4% operating cost efficiencies, and is recommending that the Secretary of State should opt for a price cap based on the lower end of this range.

**Conclusion on scope for operating efficiencies**

5.58 In conclusion, ERG remains of the view that there are substantial efficiency gains to be made, over and above those made by NATS in the past, and those that NATS argue are already incorporated in their plan. ERG has revised its April assumptions of 2%-5% efficiency gains to a narrower range of 3%-4%. While ERG believes that gains of 4% or more will be achieved by NATS, ERG advises the Secretary of State to be cautious, and opt for the lower end of the range. This is in response to the consultation responses from users which indicated that the bias should be in favour of caution, and because the incentive properties of price cap regulation will result in efficiency gains being made in due course in any event.

5.59 For ease of reference, the reasons that ERG believes that its 3%-4% range is reasonable and cautious are summarised below:

- ERG has not been convinced that NATS’ projections have been subjected to an efficiency audit. NATS have stated orally that their understanding of their cost drivers, and consequently their operating expenditure projections, are not well developed and are subject to uncertainty. In such circumstances NATS’ business planning is likely to have resulted in cost projections with considerable scope for efficiency gains;

- NATS’ evidence on its cost structure is unconvincing. While ERG accepts that there will be areas of ‘hard’ costs, these will be balanced with other areas of ‘soft’ costs. Alternative analysis of NATS’ cost structure indicates that front line operations, and front line staff, account for only a minority of NATS operating costs;

- the cost allocations used by NATS between the licensed and unlicensed business may not be robust, and are likely to reflect a historic bias in cost allocations onto the Eurocontrol business. ERG suspects that there will be
considerable scope for NATS to make accounting substitutions from operating expenditure to capital expenditure during the first five years, and that NATS’ incentives will be to take advantage of this. Thus there is likely to be scope for ‘soft’ cost reductions;

- ERG has confidence in its comparisons with other regulated firms, and notes that other regulators have also placed weight on evidence of that type in estimating firms’ scope to make cost efficiencies;

- international comparisons, while imperfect, indicate that there should be scope for significant efficiency gains, merely to reach the cost levels achieved by other public sector providers. Taken together, both of ERG’s international benchmarking studies, and the benchmarking against other regulated firms, point to efficiency gains of magnitudes greater than those which underpin ERG’s proposals. Together these three approaches carry a stronger weight of evidence than the individual analyses on their own;

- the 3%-4% range as applied by ERG is equivalent, in present value terms, to a range of 2%-3% applied directly to NATS’ business plan projections. This is a conservative assumption.
6 Other assumptions used in ERG’s modelling

Traffic forecasts

6.1 NATS disagrees with ERG’s alternative forecasts and attribute the disagreement to differences in interpretation and extrapolation of the past and current trends. In particular, NATS argues that:

- there is no mention of the potential effects of capacity constraints in the April paper;

- it is wrong to simply extrapolate NATS’ forecasts from 2004 to 2006 and then to carry out a comparison;

- ERG has only examined NATS’ forecasts over a part of an economic cycle and compared actual out-turns only with NATS’ base case forecast;

- the use of historical trends is judgmental and the conclusions can vary depending on the time series used;

- ERG’s forecast of traffic growth as a result of further liberalisation ignores both airport and airspace capacity constraints.

6.2 When making comparison between the forecasts, ERG did not simply take a mechanical extrapolation of NATS’ existing forecast trends from 2004 to 2006. In fact, ERG’s forecasts have already taken into consideration the potential effects of capacity constraints at the later years of the forecast period. As NATS mentioned in its Traffic Forecasting Report 1998/99-2004/05, there remains some genuine upside risks to its ATM forecasts as airlines are driven to offer a wider range of routes and a higher frequency of service in order to compete with each other.

6.3 As mentioned in paragraph 5.13 of the April paper, ERG has compared the out-turns with both NATS’ high and base case forecasts and found that, in most cases, the out-turns tend to be even larger than the high case forecasts from the previous years. It is also ERG’s view that, when taking into account the most up-to-date economic and market trends and information currently available, the uncertainties surrounding the future of the economy are more likely to centre around ERG’s base scenario than around the more bearish outlook as forecast by NATS in June 1999 which was based on more pessimistic macroeconomic assumptions. As regards liberalisation, NATS itself notes in its Traffic Forecasting Report 1998/9-2004/5, that

‘Further open skies agreements with such countries as the U.S. will allow airlines to operate routes that were previously denied them. In order to take advantage of these new opportunities, operators will be forced to use smaller airports who offer spare capacity. This type of route proliferation tends to increase the overall number of flights being operated.’ (page 5)
ERG also believes that more recent history should better reflect the rapidly changing aviation market structure and shed more light on the industry’s immediate outlook than older time series statistics. Thus, ERG’s conclusion has not been built in isolation but around an examination of NATS’ forecasting process, the assumptions adopted in that process and the likely sensitivity of the forecasts to those assumptions. In particular, it seems logical to suggest that NATS themselves, given the more optimistic macro-economic outlook which now obtains, would have produced a higher base case.

The latest revised forecasts by Eurocontrol (April 2000) also appear to give further support to this view. Eurocontrol forecast consistent CSU growth rates of 6.4% in both the years 2000 and 2001, which are higher than the 6.2% and 6.0% growth rates forecasted by ERG.

In summary, the points raised by NATS do not alter ERG’s view that the increase in the total CSUs in UK airspace in the future is likely to be somewhat higher than is forecast in NATS’ base case.

**Regulatory asset base**

The April paper proposed that charges should be set by adopting the capital base used to determine NATS’ charges for the year 2000 and to roll this forward uplifting for inflation and taking account of anticipated depreciation. There have been two queries regarding this approach. The first is whether Eurocontrol charging principles allow depreciation on a current cost or replacement cost basis. Second, what the capital base used to set the Eurocontrol charge has been.

**Eurocontrol charging principles**

The Eurocontrol Agency did not interpret the Eurocontrol Charging Principles to allow NATS to depreciate the replacement costs of assets. It did not consider the UK to be a State experiencing high rates of inflation since 1998 which was the basis on which the charging principles allowed the net book value of assets to be uplifted by inflation. BATA and The Airline Group also considered that charges should be based on historic cost principles.

ERG has taken as its starting point the charges and the basis on which those charges were calculated under the existing regime. The charges have been approved both at the national level and by the Provisional Council of Eurocontrol and ERG does not consider it therefore has competence to comment on the basis of these charges. The initial regulatory asset base assumed has therefore been the capital employed on the basis of the depreciated current cost assets. If DETR were to agree with Eurocontrol that it was not appropriate to inflate the asset base between 1998 and the adoption of economic regulation then the initial RAB could be set on the basis of the capital employed based on depreciated historic cost.

Looking forward, the alternative mechanism of independent economic regulation allows the State to dis-apply direct cost recovery where certain conditions are met and the State takes full account of the guidelines set out as Appendix VI of the Charging Principles. These guidelines state inter alia that the regulator should
take account of market returns of businesses facing equivalent risk. ERG has therefore made its recommendation by considering the cash flows required by a business of equivalent risk sufficient to allow it an equivalent return on the RAB assumed above. In making these comparisons ERG has made the calculations on a basis such that the underlying value of assets remain constant in real terms before allowing for investment and depreciation (i.e. consistent with the nominal value of assets being uplifted by inflation). This seems to ERG to be an appropriate approach for addressing appropriate returns and comparing these to those of businesses facing equivalent risk under an RPI-x regime.

6.11 If ERG had conducted its calculations based upon depreciating the historic cost of assets then the ‘terminal value’ of the assets at the end of the five years which would be remunerated over subsequent periods would be lower than under a current cost approach. If ERG had adopted a nominal cost of capital directly equivalent to the real cost of capital it would thus imply that as less of the assets would be remunerated in subsequent periods more would be remunerated in the period in question. Current users would pay more and future users would pay less. If the charges in future reviews were to be based on the depreciated historic cost at future reviews this would itself alter risk. Investors would be subject to inflation risk on the real value of assets which would be remunerated at subsequent reviews. This would increase the cost of capital and thereby imply higher charges to users. ERG does not believe that such an approach would better meet the guidelines.

Capital base

6.12 NATS has stated that the definition of capital employed used in ERG’s proposal differs from that which it had agreed with DETR for determining Eurocontrol charges. The NATS’ definition excluded provisions (except provisions for deferred tax). Adopting the NATS’ definition has the effect of reducing the regulatory asset base compared to the RAB put forward in the consultation paper. ERG accepts the NATS’ definition.

6.13 Since the April paper NATS has prepared its audited financial statements for year end 31 March 2000. ERG has conducted its calculations based upon a single till which includes all the elements of the single till except Oceanic. The capital values presented below therefore indicate the capital employed in this single till used for modelling as well as the capital employed for the En route business (Eurocontrol).

Table 6.1 Regulatory asset base

<table>
<thead>
<tr>
<th></th>
<th>Capital Employed at 31 March 2000</th>
<th>Implied RAB at 31 March 2001</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eurocontrol Business</td>
<td>528</td>
<td></td>
</tr>
<tr>
<td>Single Till</td>
<td>579</td>
<td>630</td>
</tr>
</tbody>
</table>

6.14 ERG’s modelling of the charge control adopts a RAB calculated by reference to NATS’ capital employed at 31 March 2001 of £647 million, but adjusting for the restatement of capitalised costs amounting to £17 million. These were previously treated as revenue in nature and recovered through Eurocontrol charges. The
net figure of £630 million in out turn prices converts to £611 million for 1 April 2001 in 1999/00 prices.

**Cost of capital**

6.15 NATS’ response expresses broad agreement with ERG’s approach, but disputed parts of the analysis. NATS’ objections to the cost of capital estimates are:

- NATS dispute the approach to the tax-wedge;

- if ERG’s assumptions on operating expenditure efficiencies, AICC, capex efficiencies, the delay term, are adopted, they would increase regulatory risk, or push NATS against financial indicator benchmarks, such that the cost of capital should increase in compensation;

- they do not allow for NATS’ technology risk; and

- if the proposals were adopted without any adjustment to NATS’ opening debt position, the resulting financing problems would have implications for the cost of debt.

6.16 In response, it is ERG’s view that:

- the approach to the tax wedge is robust;  

- the effect of the AICC approach is to increase the incremental returns on AICC investments (since the regulator would be committed to capitalising the financing costs on investment undertaken). The main risk is that the

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33 In the April consultation paper, ERG noted that that the effects of capital allowances on a major investment programme will defer the payment of tax on accounting profits, providing significant cash flow benefits. ERG recognised some of these benefits in determining its central estimate of the pre-tax cost of capital at 7.75%. The calculation of ERG’s recommended range of X factors is based on this estimate.

ERG’s regulatory and financial model carries out detailed calculations of the projected tax liability under current taxation rules for each year up to 2014 and provides a basis for considering the crystallisation of deferred tax thereafter. The model calculates total equity returns on a pre-tax and post-tax basis from the equity cash flows (using the net regulatory asset value after deducting debt and tax balances as appropriate as the terminal value of equity).

ERG’s assessment of the cost of capital uses an assumption of 50% gearing (debt / (debt + equity)). Equity returns can be calculated on the same basis. Using an X of 5.0% on this basis provides for a calculated return on equity of 10.6% on a pre-tax basis and about 8.7% on a post-tax basis. 8.7% is towards the top of ERG’s range of estimated post-tax cost of equity. The implied effective tax rate is 18%, well below the full tax rate of 30%.

The main factors that affect post-tax returns are the scale of investment and the profile of prices. The scale of investment beyond NATS’ planning horizon does have an impact, but post-tax returns remain well inside ERG’s cost of equity range for any realistic set of assumptions.

ERG therefore considers that its central assumption of a pre-tax cost of capital of 7.75% remains consistent with its cost of equity estimates.
regulator will ‘disallow’ AICC investments (or other investments and the RAB) \( \alpha \) post. This risk exists whether AICC is allowed for in the initial price cap or if it is not. ERG is not convinced that NATS’ exposure to regulatory risk in general is notably different to that of other regulated firms;

- technology risk is largely eliminated in an RPI-x/ rate of return hybrid framework, so long as the regulator does not disallow ‘failed’ investments while allowing successful investments a ‘normal’ return;

- financing is discussed in Section 7. Adjustments to the opening financial structure would be sufficient to prevent NATS breaching financial indicator targets such that increases in the cost of debt would be warranted;

- compared to recent regulatory developments the general approach to the cost of capital is favourable to NATS. ERG’s conclusion is to adopt the intermediate case of its original range; a pre-tax real cost of capital of 7.75%.

**Depreciation and price profiling**

**Longer run profiling and depreciation**

6.17 In the April paper ERG adopted a 15 year straight line depreciation assumption for its preliminary proposals. NATS subsequently argued that the anticipated onset of depreciation of NERC, which is expected to have a faster rate of depreciation than 15 years, would result in higher depreciation charges in the first five years than were allowed for in the April proposals. However, NATS’ revised projections suggest that NATS have not adopted this depreciation profile. ERG understands that NATS remains undecided about the appropriate depreciation schedule to adopt.

6.18 If all else were equal ERG’s presumption would be to adopt a similar depreciation profile to NATS’ accounting depreciation. Given that there is uncertainty surrounding NATS’ depreciation assumption, there is some basis for acceleration of depreciation above the figures currently included in NATS’ projections, since there is some likelihood that NATS’ will adopt further adjustments.

6.19 The wider regulatory context is that the long run price path should converge to long run incremental costs. Estimating long run incremental costs will be an important issue for the second quinquennium and attempting a precise definition at the present time is fraught with difficulty. The April paper set out a rough analysis of long run incremental costs to 2015 which indicated that a price of around £35 is plausible in relation to technological advances and investments associated with the current NATS’ long term investment plan. Less conservative assumptions would indicate long run incremental costs for this generation of technologies of below £35.

6.20 In moving to LRIC based price setting in the second quinquennium it would be undesirable for this to be accompanied by a price hike at that time. This might
occur if the X factor resulted in ‘under-shooting’ the conservative estimate of £35. This was not a potential problem in the April proposals since the adjustments were applied to a starting base of £49.50. However, the removal of costs and revenues from NATS associated with the CAA Directorate of Airspace Policy and the Met Office have changed the picture somewhat. Adopting a profile similar to that using ERG’s April depreciation assumptions would imply X factors which result in real unit prices by 2006 of below £35.

6.21 As set out in the April paper, regulatory depreciation can be used as a price profiling tool if there is a good reason to depart from the firm’s accounting depreciation assumptions. Since NATS’ assumptions do not appear to be finalised in any event, adopting regulatory depreciation as a price profiling tool does not run counter to a clearly articulated assumption on accounting regulation.

6.22 Applying ERG’s original depreciation assumptions against the revised efficiency assumptions would result in under-shooting of the £35 figure. ERG has therefore adopted a degree of acceleration of its previous depreciation assumption, such that the real unit price reached in 2006 is slightly above £35. The corollary of this adjustment is that application of the RPI-X/hybrid model into the second quinquennium would show a further, but shallower decline. This is consistent with ERG’s view that LRICs for the next generation of technology will probably be below £35, but it avoids the risk that if they are at £35, there will be a need for a price hike.

6.23 ERG is not minded to recommend any further acceleration of revenues to the first quinquennium. To do so increases the risk that accounting profits in the run up to the first review would be very high. Moreover, the application of the RPI-X/rate of return hybrid at that time would then imply sharper price falls in the second quinquennium, very possibly to levels below long run incremental costs. Accordingly a move to benchmarked pricing or LRIC pricing at that time could imply windfall profits in the second quinquennium. ERG considers that further revenue advancement could result in an undesirable longer run price profile.

6.24 The acceleration of depreciation that ERG has adopted has the effect of tempering the potential problems with financing NATS’ business. This is discussed in Section 7. ERG’s view is that residual potential difficulties with financial indicators should be addressed through the financial structures adopted for the PPP.

Profiling of price reductions in the first five years

6.25 ERG’s charge control modelling is based on present value analysis of projected net cash flows. This establishes the required revenues (in present value terms) necessary to align discounted cash flows within the period and the projected terminal value of the RAB with the initial RAB. But these required revenues can be profiled within the first five years in order to meet various objectives.

6.26 There are two, contending approaches. One argument is that, whatever the assumptions adopted in order to calculate the required revenues, the initial price reduction should give NATS time to adjust to the reality of the fixed price cap. Instead of opting for a reduction in prices in the first year which is greater than those in subsequent years, the percentage reduction could be constant in all years.
Naturally, the smaller initial price reduction in 2001 would be balanced, on a present value basis, with larger reductions in the X factor in following years.

6.27 To indicate the effect of this, consider ERG’s ‘intermediate charge control’ April proposals for a p(0) reduction in 2001 of 8.3% and an X factor reduction of 6.3% in the years thereafter. To make the price reduction equal in all years (with the same present value) would mean a p(0) and X factor of 7.0%. Re-profiling in this direction results in a lower price reached in 2005/6.

6.28 There is an opposite argument that the initial p(0) price reduction should be increased, with shallower price reductions thereafter. While equivalent to ERG’s original proposals on a present value basis, this approach would result in a higher price in 2005/6. The argument in favour of this approach is that the problems with financial indicators are likely to arise in 2004/5, and the higher prices then that this profile implies would help dilute those problems.

6.29 ERG considers that there is enough uncertainty surrounding NATS’ business plan and investment plan that precision profiling within five years may end up missing its target in any event. ERG’s conclusion is that a constant p(0) and X should be adopted.

Single till and non-regulated revenue projections

6.30 ERG’s modelling of en route charge is on a ‘single-till’ basis. It takes the costs attributed to the licensed business and makes only one split – between costs allocated to oceanic services and ‘other licensed’ costs. This attribution is based on NATS’ own split, and has not been subjected to significant scrutiny. The ‘other licensed’ costs are included in the single till for en route charges, along with projected revenues from non-regulated income streams – NATS’ provision of services to the Ministry of Defence, and NATS’ projected income from North-Sea Helicopters. This approach has been taken from the perspective of simplicity and the fact that there has been no rigorous review of NATS’ cost allocations between different business lines, particularly within the licensed business. There is no presumption that a similar approach will be adopted at the first review.

6.31 Since ERG’s consultation paper there have been some significant changes which have a material effect on the single till calculation.

- it is now proposed that all the revenues where the responsible organisation is the UK Met Office will in future be delivered to the CAA. Thus the component of the Eurocontrol charge which represents Met Office costs and any internal costs of discharging this function will be assigned directly to CAA. Even NATS’ most recent cost base assumed that Met Office services would be recovered through its Eurocontrol charges and an adjustment has had to be made to reduce the NATS cost base accordingly. The Met Office component represented the following component of cost in real terms;

<table>
<thead>
<tr>
<th>£m 1999/00 prices</th>
<th>2000/1</th>
<th>2001/2</th>
<th>2002/3</th>
<th>2003/4</th>
<th>2004/5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Met costs transfer to</td>
<td>24.6</td>
<td>24.4</td>
<td>24.2</td>
<td>24.0</td>
<td>23.8</td>
</tr>
</tbody>
</table>
similarly it is now proposed that the remuneration of the CAA’s Directorate of Airspace Policy will be assigned directly to CAA rather than pass through the NATS charges;

<table>
<thead>
<tr>
<th>£ m 1999/00 prices</th>
<th>2000/1</th>
<th>2001/2</th>
<th>2002/3</th>
<th>2003/4</th>
<th>2004/5</th>
</tr>
</thead>
<tbody>
<tr>
<td>DAP costs recovered directly</td>
<td>3.6</td>
<td>3.6</td>
<td>3.6</td>
<td>3.6</td>
<td>3.6</td>
</tr>
</tbody>
</table>

the financial arrangements for revenues from and payments to the MoD are now more clear than they were at the time either of the April Consultation paper or at the time when NATS most recent detailed cost breakdowns were prepared.

<table>
<thead>
<tr>
<th>£ m nominal</th>
<th>2000/1</th>
<th>2001/2</th>
<th>2002/3</th>
<th>2003/4</th>
<th>2004/5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lower Revenue from MoD</td>
<td>3.5</td>
<td>4.5</td>
<td>11.2</td>
<td>13.0</td>
<td>15.5</td>
</tr>
<tr>
<td>Higher payments to MoD</td>
<td>4.7</td>
<td>4.7</td>
<td>4.7</td>
<td>4.7</td>
<td>4.7</td>
</tr>
<tr>
<td>Net Effect on NATS</td>
<td>8.2</td>
<td>9.2</td>
<td>15.9</td>
<td>17.7</td>
<td>20.2</td>
</tr>
</tbody>
</table>

6.32 NATS’ most recent breakdown of costs by service lines has integrated the costs of the London approach service. To make the use of these costs consistent with ERG’s single till calculation requires the revenues of the approach service to be separately identified and input as additional non Eurocontrol revenue. The revenue identified by NATS for the approach service is as follows:

<table>
<thead>
<tr>
<th>£ m nominal</th>
<th>2000/1</th>
<th>2001/2</th>
<th>2002/3</th>
<th>2003/4</th>
<th>2004/5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Revenue – London Approach</td>
<td>6.1</td>
<td>6.2</td>
<td>6.4</td>
<td>6.5</td>
<td>6.6</td>
</tr>
</tbody>
</table>

6.33 The above adjustments have been incorporated into the charge control modelling.
7 Financial modelling and financial indicators

Modelling the X factor

Key modelling assumptions

7.1 The key policy assumptions that ERG has adopted in its modelling are set out in Table 7.1
Table 7.1 – Final charge control proposals - key modelling assumptions

<table>
<thead>
<tr>
<th>Nature of assumption</th>
<th>Assumption adopted in revised modelling</th>
<th>Reference to text</th>
<th>Commentary</th>
</tr>
</thead>
<tbody>
<tr>
<td>Regulatory asset base</td>
<td>£611m</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Existing assets</td>
<td>NATS projected CCA depreciation on existing assets</td>
<td></td>
<td>Projections included in NATS’ business plan.</td>
</tr>
<tr>
<td>Regulatory depreciation on new assets</td>
<td>10 Year straight line from year of commissioning except for certain building projects</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Commissioning dates</td>
<td>Commissioning dates advised by NATS</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Capitalised financing costs</td>
<td>Financing costs at the assessed cost of capital on the difference between year of spend and commissioning date</td>
<td></td>
<td>As in the April proposals.</td>
</tr>
<tr>
<td>Profile adjustments</td>
<td>Provision to secure appropriate price profile over 10 years</td>
<td></td>
<td>There is considerable uncertainty over the depreciation profile forecast by NATS for existing assets. ERG has made an additional provision to NATS’ lower projection to ensure that the overall price profile is appropriate, in particular to avoid a rising price profile after 2006. The adjustment is made so as to ensure that the discounted value of forecast revenues across control periods is unaffected.</td>
</tr>
<tr>
<td>Profiling to 2005/6</td>
<td>Similar percentage reduction in real price in each year.</td>
<td></td>
<td>Differs from April proposals which allowed for a higher reduction in the first year (the p(0) reduction). The effect is that price falls more gradually within the five years, but that the price reached in 2006 is lower than it would have been under the previous approach. However, there is an additional one-off reduction falling in the first year which reflects the new policy that Met and DAP costs no longer pass through NATS’ cost base.</td>
</tr>
<tr>
<td>Pre-tax cost of capital</td>
<td>7.75%</td>
<td></td>
<td>Mid-point of range presented in April paper:</td>
</tr>
<tr>
<td>Scaling adjustment to NATS’ capex figures</td>
<td>25% reduction on main projects due for commissioning after 2006</td>
<td></td>
<td>This has no effect on the charge control proposals, but has some implications for the analysis of financial indicators.</td>
</tr>
<tr>
<td>Continuing improvements in capex efficiency</td>
<td>2%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Operating expenditure</td>
<td>Application of efficiency assumptions on certain categories of costs to NATS projections</td>
<td></td>
<td>Audited data for 1999/00 is now used as ERG’s base. Operating costs are projected using the 3%-4% efficiency assumption range against a traffic/cost elasticity of 0.25 or, equivalently in present value terms, a 2%-3% range applied to NATS’ own projections.</td>
</tr>
<tr>
<td>Traffic growth (CSUs)</td>
<td>9.388m in 2001 to 11.538m in 2005.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Treatment of Met and DAP costs

7.2 Eurocontrol funding of the costs of the Met Office and of the CAA Directorate of Airspace Policy will go to the CAA, not through NATS (as was assumed in the April paper). The main effect of this is an initial reduction in the starting charge that the X factor is applied to from £49.50 to £46.23.

Charge control proposals and sensitivities

7.3 Table 7.2 sets out the results of ERG’s charge control modelling. In each year from 2001/2-2005/6 the range implied for the X factor is 5.0%-6.0%, which is applied to the new starting charge/CSU of £46.23.

**Table 7.2 Results from en route charge control modelling**

<table>
<thead>
<tr>
<th>£2000/01 prices (actual)</th>
<th>2000</th>
<th>2001</th>
<th>2002</th>
<th>2003</th>
<th>2004</th>
<th>2005</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Met/ DAP adjustment</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>High charge case</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Level of p(0) and x</td>
<td>-</td>
<td>5.0%</td>
<td>5.0%</td>
<td>5.0%</td>
<td>5.0%</td>
<td>5.0%</td>
</tr>
<tr>
<td>Level of charge if RPI=0</td>
<td>£49.50</td>
<td>£43.92</td>
<td>£41.72</td>
<td>£39.64</td>
<td>£37.65</td>
<td>£35.77</td>
</tr>
<tr>
<td><strong>Low charge case</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Level of p(0) and x</td>
<td>-</td>
<td>6.0%</td>
<td>6.0%</td>
<td>6.0%</td>
<td>6.0%</td>
<td>6.0%</td>
</tr>
<tr>
<td>Level of charge if RPI=0</td>
<td>£49.50</td>
<td>£43.45</td>
<td>£40.85</td>
<td>£38.40</td>
<td>£36.09</td>
<td>£33.93</td>
</tr>
</tbody>
</table>

7.4 The effect of the main changes which have occurred since the April proposals is illustrated in Table 7.3 below. The April proposals had a larger initial reduction in 2001 than in previous years (a p(0) of 8.3% for the intermediate case) and a smaller X factor thereafter (6.3% for the intermediate case). This is equivalent (in present value terms) to a uniform percentage reduction of 7.0% in each year from 2001 to 2005. Table 7.3 shows the effect of the main changes made in coming to the new 5.0% X factor compared with the 7.0% April ‘intermediate proposal’, but before the further adjustment for Met/ DAP costs is made.
Table 7.3 Effect of main changes to April proposals

<table>
<thead>
<tr>
<th>Change since April</th>
<th>Change in X</th>
</tr>
</thead>
<tbody>
<tr>
<td>Underlying depreciation projection</td>
<td>-0.4%</td>
</tr>
<tr>
<td>Changes in NERC accounting</td>
<td>-0.2%</td>
</tr>
<tr>
<td>Revenue profiling adjustment</td>
<td>-0.8%</td>
</tr>
<tr>
<td>Changes to Opex (including MoD)</td>
<td>-0.5%</td>
</tr>
<tr>
<td>Change in efficiency assumption from 3.5% to 3%</td>
<td>-0.3%</td>
</tr>
<tr>
<td>August RPI adjustment</td>
<td>+0.2%</td>
</tr>
<tr>
<td>Total change</td>
<td>-2.0%</td>
</tr>
</tbody>
</table>

7.5 The April paper presented various sensitivities in relation to the main input variables. These are updated below. They are compared to the final proposal for X of 5.0%.

Table 7.4 Sensitivities on input assumptions

<table>
<thead>
<tr>
<th>Nature of uncertainty</th>
<th>Impact on X factor</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cost of capital (7.0%-8.75%)</td>
<td>5.3%-4.6%</td>
</tr>
<tr>
<td>Capex enhancement savings (15%-35%)</td>
<td>No effect</td>
</tr>
<tr>
<td>Additional efficiency improvements (3%-4%pa)</td>
<td>5.0%-5.7%</td>
</tr>
<tr>
<td>Growth in service units (5.8%pa to 4.2%pa)</td>
<td>5.8%-4.3%</td>
</tr>
</tbody>
</table>

Long run price path

7.6 ERG would wish to see a price profile which provides for convergence towards long run incremental costs. Since there is scope for debate around what long run incremental costs are likely to be this is inevitably subject to uncertainty. However ERG’s April estimates indicated that a price per CSU of around £35 gave a conservative estimate for LRIC. ERG’s charge control modelling has a revised depreciation profile which has been set to reflect this estimate. The key assumptions used in this modelling are set out below:
Table 7.5  Key assumptions used in long run price projections

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Cost of capital</td>
<td>7.75%</td>
<td>7.75%</td>
</tr>
<tr>
<td>Treatment of capex</td>
<td>As LTIP, with ERG’s efficiency assumptions and AICC policy (see below)</td>
<td>As LTIP, with ERG’s efficiency assumptions and AICC policy (see below)</td>
</tr>
<tr>
<td>Capex efficiency</td>
<td>2% per annum</td>
<td>1% per annum</td>
</tr>
<tr>
<td>Capex scope savings</td>
<td>0% on projects due for commissioning before 2006</td>
<td>25% on large projects, representing 90% of projects commissioned after 2005</td>
</tr>
<tr>
<td>Commissioning dates</td>
<td>Commissioning dates advised by NATS</td>
<td>Commissioning dates advised by NATS</td>
</tr>
<tr>
<td>Calculation of financing costs on IICC</td>
<td>Financing costs at the assessed cost of capital on the difference between year of spend and commissioning date</td>
<td>Financing costs at the assessed cost of capital on the difference between year of spend and commissioning date</td>
</tr>
<tr>
<td>Price profile adjustments</td>
<td>Further provision made to secure appropriate price profile over 10 years</td>
<td>Reversal of provision starts</td>
</tr>
<tr>
<td>Depreciation</td>
<td>10 Year straight line from year of commissioning except for certain building projects</td>
<td>10 Year straight line from year of commissioning except for certain building projects</td>
</tr>
<tr>
<td>Opening RAB</td>
<td>£611m</td>
<td>Rolled forward after adding capital expenditure, financing costs of IICC and deducting all provisions included in required revenues</td>
</tr>
<tr>
<td>Opex efficiency gains</td>
<td>3% per annum</td>
<td>2% per annum</td>
</tr>
<tr>
<td>Growth in service units</td>
<td>ERG’s base case</td>
<td>4.0% p.a.</td>
</tr>
</tbody>
</table>

7.7 Under these assumptions, unit prices from 2006-2010 would decline at a rate of only 0.5% per annum. However, this is based on relatively conservative assumptions and it is likely that higher price reductions over that period would be expected if the RPI-x/rate of return hybrid model were to continue to be adopted. Given that ERG’s £35 estimate is itself relatively conservative, and that LRIC are likely to be lower, at least for the current generation of technology, these further reductions are likely to be consistent with an appropriate long run price path, but limit the risk of needing a real price hike in 2006.
The longer run price path indicated by ERG’s modelling is shown in Figure 7.1.

**Figure 7.1 - Long run price path, 2000-2014**

**Financing**

ERG recognises that it is important that NATS should be able to finance appropriate investments, and that under normal circumstances periodic reviews of regulated industries place heavy weight on the ability of those firms to finance their investment programmes. However, this review takes place in circumstances that are different from those of a typical utility price review. In particular, the review is taking place before the negotiation of the sale of NATS to a PPP. A number of variables relevant to any financial assessment of the price control are unknown at this stage. There is considerable uncertainty over the scale of the investment programme and that investment need may exceed ERG’s central assumption.

ERG considers that an important reference point for this financing objective is projected financial indicators for the licensed subsidiary of NATS, as if it were a stand alone company, that should sustain at least an investment grade credit rating from the main credit rating agencies.

ERG has therefore calculated projections of a range of key financial indicators for the licensed subsidiary of NATS. ERG used its regulatory financial model to derive these indicators from projections of tax computations and historical cost accounting statements (profit and loss account, cash flow statements and balance sheets), drawing from NATS’ own modelling assumptions in respect of accounting policies.

ERG has also used the financial model to calculate economic indicators, such as discounted cash flows and internal rates of return on a pre-tax and post-tax basis, to ensure consistency with ERG’s economic assumptions.

The main financial indicators ERG has referred to are set out in the table below:
<table>
<thead>
<tr>
<th>Indicator</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>FFO to total debt</td>
<td>Funds from operations (i.e. net income from continuing operations plus depreciation, amortisation, deferred income taxes and other non-cash items)</td>
</tr>
<tr>
<td></td>
<td><strong>Divided by</strong></td>
</tr>
<tr>
<td></td>
<td>Long term debt plus current maturities, commercial paper and other short-term borrowings</td>
</tr>
<tr>
<td>EBITDA interest coverage</td>
<td>Earnings from continuing operations before interest, taxes, depreciation and amortisation</td>
</tr>
<tr>
<td></td>
<td><strong>Divided by</strong></td>
</tr>
<tr>
<td></td>
<td>Gross interest incurred before subtracting capitalised interest and interest income</td>
</tr>
<tr>
<td>FFO interest coverage</td>
<td>Funds from operations (i.e. net income from continuing operations plus depreciation, amortisation, deferred income taxes and other non-cash items) plus gross interest incurred before subtracting capitalised interest and interest income</td>
</tr>
<tr>
<td></td>
<td><strong>Divided by</strong></td>
</tr>
<tr>
<td></td>
<td>Gross interest incurred before subtracting capitalised interest and interest income</td>
</tr>
<tr>
<td>EBIT interest coverage</td>
<td>Earnings from continuing operations before interest and tax</td>
</tr>
<tr>
<td></td>
<td><strong>Divided by</strong></td>
</tr>
<tr>
<td></td>
<td>Gross interest incurred before subtracting capitalised interest and interest income</td>
</tr>
<tr>
<td>Gearing (debt leverage)</td>
<td>Long term debt plus current maturities, commercial paper and other short-term borrowings</td>
</tr>
<tr>
<td></td>
<td><strong>Divided by</strong></td>
</tr>
<tr>
<td></td>
<td>Long term debt plus current maturities, commercial paper and other short-term borrowings plus shareholders’ equity (including preferred stock) plus minority interest</td>
</tr>
<tr>
<td>Net cash flow to capex</td>
<td>Net ‘cash inflow from operating activities’ (i.e. funds from operations minus cash dividends paid)</td>
</tr>
<tr>
<td></td>
<td><strong>Divided by</strong></td>
</tr>
<tr>
<td></td>
<td>Total capital expenditure</td>
</tr>
</tbody>
</table>
7.14 Recent and current regulatory reviews (for Railtrack, water and electricity distribution) have also made reference to these indicators and have indicated threshold values consistent with their objectives. These values, together with ERG’s reference values, have been as follows:

<table>
<thead>
<tr>
<th>Indicator</th>
<th>ORR</th>
<th>OFWAT</th>
<th>OFGEM</th>
<th>ERG reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>FFO to total debt</td>
<td>Min 15%</td>
<td></td>
<td>Min 12%</td>
<td></td>
</tr>
<tr>
<td>EBITDA interest coverage</td>
<td>Min 3x</td>
<td>Min 3x</td>
<td>Min 2.25x</td>
<td>3x</td>
</tr>
<tr>
<td>FFO interest coverage</td>
<td>Min 3x</td>
<td></td>
<td>Min 2x</td>
<td>3x</td>
</tr>
<tr>
<td>EBIT interest coverage</td>
<td>Min 2x</td>
<td>Min 2x to 2.5x</td>
<td>Min 1.5x</td>
<td>2x</td>
</tr>
<tr>
<td>Gearing (debt leverage)</td>
<td>50%</td>
<td>45 -55%</td>
<td>65%</td>
<td>max 55% (regulatory)</td>
</tr>
<tr>
<td>Net cash flow to capex</td>
<td>Min &gt;40%</td>
<td>Min 40%</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

7.15 ERG recognises that the assessment of NATS’ financial position by a credit rating agency would depend on characteristics specific to NATS, in particular perceived risk.

7.16 Like Railtrack and the water and sewerage companies, NATS is facing a substantial investment programme (in relation to its capital base). It is substantially smaller in size than Railtrack. In relation to the 10 (privatised) water and sewerage companies, its capital base is smaller, but it faces a capital programme similar in size to those of the smaller companies and levels of operating costs as great as those of the largest. Comparability with the electricity distribution companies is limited due to their relatively stable and small investment programmes.

7.17 The important question of risk is informed by the regulatory regime. Although there is considerable uncertainty surrounding the scale of investment needed during the control period, ERG proposes an approach that accommodates that uncertainty in investment terms. The regulatory asset base at the next review will be rolled forward on the basis of outcome investment, including the accumulated cost of finance not remunerated in this price determination. This policy provides protection for investors against uncertainty in the capital programme and is fundamentally stronger than the protection provided to investors under RPI-X regimes where the cost of finance on is not capitalised.

7.18 ERG therefore considers that there is no need for greater headroom in the financial indicators in comparison with other regulated companies. ERG uses 2.0 for EBIT interest covers, 3.0 for FFO and EBITDA interest covers and 55% for

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34 Using conventional NPV appraisal techniques. Uncertainty in the investment programme implies a level of 'cash flow' risk for both investors and customers that cannot be accommodated in a fixed price regime without interim re-determinations. ERG considers that its approach strikes an appropriate balance in cash flow terms while affording investors protection in economic terms to sustain the incentive to invest and facilitate access to finance if investment exceeds anticipated levels.
regulatory gearing as reference values. Other financial indicators are also referred to. EBIT interest covers emerge as the most critical.

7.19 ERG calculates that its assessment of the cost of capital, a regulatory gearing level of 50%, modest growth in investment on 10 year assets and inflation at around 2.5% would lead to an equilibrium EBIT cover ratio of between 2.3 and 2.4 (for a generic company, irrespective of accounting methodologies)[35] Gearing of 60% would bring the equilibrium EBIT cover ratio below 2.0. Uneven patterns of investment and other uncertainties imply a natural volatility in gearing and cover ratios, particularly for NATS with the relative size of its investment programme over the next five years and even more so with an assumption of steady dividend payments throughout the investment peak.

7.20 For these reasons, ERG believes that treating its reference values of key indicators as ‘thresholds that should not be breached’ would be inconsistent with relatively high initial levels of gearing that the government expects for NATS. NATS’ capital structure will be the subject of negotiation between the government and bidders and ERG considers that this process should determine a financeable basis.

7.21 The following charts show the pattern of a number of indicators under ERG’s projections showing a 5.0% X factor, assuming that the initial capital structure includes debt at 50% of the combined RAB after repayment of a projected £14 million of income over recovery by the end of the current year.

7.22 The charts show the price profile and the more critical financial indicators, including the equity rate of return (future dividends) implied by ERG’s longer term projections.

7.23 The middle graph highlights the key financial issue – EBIT interest cover dips below the reference level towards the end of the first control period. This is caused by depreciation on relatively short lived assets commissioned in the first half of the control period, including NERC, and by increased interest charges funding the projected high levels of investment in assets due to be commissioned in the second control period. It should be noted that EBIT cover could be lower under alternative depreciation assumptions being considered by NATS and that

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[35] With nominal rates of interest only a little below the real cost of capital, a 50% gearing assumption is bound to imply that EBIT covers cannot be sustained at levels substantially above 2.0.
the minimum level of covers would fall by about 0.2 if NATS were to achieve investment at levels included in their full investment plan. It should also be noted that EBIT interest covers are generally not considered by regulators to be as important as cash flow covers, such as the FFO cover.

Moreover, it is important to note that:

- it is not clear that NATS’ current depreciation policies will remain unchanged under new ownership;

- it is not clear that an initial gearing of 50% is the appropriate basis for considering financial indicators; and

- it is not clear that future shareholders would prefer a price profile that is constrained by stand-alone credit rating considerations.

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NATS’ new owners might reasonably be expected to carry out a major review of its depreciation policies. The current uncertainty within NATS as to what the appropriate depreciation policy for NERC is highlights this. It is possible that a flatter accounting depreciation profile will be adopted than that which ERG have assumed for regulatory depreciation. This would relieve pressure on EBIT interest covers.

An initial gearing of 50%, in regulatory terms, represents a book gearing substantially above 50% against the historical cost balance sheet. It is questionable whether a stand-alone company would have such debt levels at this stage in its investment cycle. Clearly, what would be reasonable depends on the expected pattern of future revenues, so the question becomes circular; but the initial level of debt is a legitimate variable in ERG’s consideration of financial indicators in the special circumstances of this initial price control review.

For the purpose of modelling, ERG assumes an initial level of gearing at 50%. To maintain indicators above ERG’s reference levels with this level of initial gearing would require income levels that fund not only the cost of finance on investment during construction but also recover some of the principal costs. This could contravene Eurocontrol principles. ERG considers that any material concerns over financing should be accommodated in the initial capital structure.

Shareholders have a direct interest in the cost of borrowing. The new owners may, however, have alternative means of securing efficient funding for the investment programme that do not depend on NATS’ stand-alone credit rating:

- depending on the circumstances of the acquiring group, they may choose to provide funds from group resources;

- investment could be funded by alternative means, for example leasing or partnership arrangements with contractors.

For a given pre-tax cost of capital, accelerating revenues to accommodate financial indicators can reduce the effective benefits from accelerated capital allowances and thus reduce the rate of return for equity. The effect is not
necessarily insignificant. Accelerating revenues of £50 million into the control period to eliminate financial indicator constraints, recovered over the following 15 years, reduces the projected post-tax internal rate of return by 0.5% or more.

7.30 ERG intends to maintain strong incentives for efficiency and service. However, significant savings in operating costs could result in apparently very high levels of profitability in the run up to the first periodic review, bearing in mind NATS’ relatively small capital base. Potential bidders are likely to be sensitive to the influence that perceptions of profits by the public may have on the regulatory process. Accelerating revenues to provide for pre-financing would tend to aggravate that perception.

7.31 Finally, although accelerating revenues relieves cash flows and financial indicators in the immediate future, it results in less scope for dividend growth in the longer term and a reduced capacity for finance into the following investment cycle, which we might anticipate in about ten years time. This may be particularly the case if NATS were able to secure significant savings on this investment programme, leading to reduced prices in the second control period (on a reduced asset base) and a continued upward trend in gearing beyond 2010.

Conclusion

7.32 In the special circumstances of this first price review, there are a range of financial considerations which point to a price profile supported by an X factor in the range of 5.0% to 6.0%. ERG has designed a regulatory framework specifically for the uncertainties that exist, particularly in the investment programme. The protection that this provides to investors, the ambiguous interests of shareholders in the price profile and the uncertainty over the specific circumstances of the new owners lead ERG to recommend that no further provision for the pre-financing of investment should be made.
8 Delay term in en route charge control

8.1 In the second consultation paper, ERG put forward a framework for how a delay term might be included in the charge control formula. The key points were:

8.2 The form of the delay term would be:

\[ \text{Charges Cap} = a - (b \times d) \]

Where:

- \( a \) = the other elements in the charge cap
- \( d \) = actual delays per service unit – benchmark (or ‘par’) delays per service unit
- \( b \) = a linear delay term expressed as £ per average delay per service unit.

8.3 This would be symmetrical so that the condition would allow NATS’ charges to be higher when performance exceeded the par value as well as require them to be lower when performance was lower than par.

8.4 ERG’s preliminary view was as follows:

- the measurement of delay should be based upon the ATFM\textsuperscript{36} measure of delay produced by CFMU\textsuperscript{37};

- the measure should be based on the aggregate level of delay in UK airspace without adjustment for weather or controls requested by airports;

- the initial par value should be based on the 1999 average delay (1.53 minutes per flight) with a subsequent decrease in the target delay per service unit of 1% per year (roughly equal to one second per annum);

- the impact of the term should be limited by some scaling down of the delay term relative to the full cost to users in conjunction with an upper bound on the delay term per service unit;

- three options for the level of the delay term were presented for comment as follows:

\textsuperscript{36} Air Traffic Flow Management.
\textsuperscript{37} The Central Flow Management Unit of Eurocontrol
8.5 ERG also consulted as to whether it would be desirable to have a dead-band in the delay term so that it would not apply where the out-turn delay were close to the par value either greater or lower.

**Consultation responses**

8.6 NATS accepted the proposal for a service quality term as a means of incentivising good and penalising poor performance as long as it did not put service delivery at risk. NATS believed that incentivisation should be light in the first quinquennium, because the measurement of quality metrics is in its infancy, the behavioural responses to incentivisation are unproven and the scale of potential penalties should not materially prejudice the resources necessary for service improvement. It therefore put forward alternative proposals which would have a much lower effect on charges. These are considered at paragraph 8.10 below.

8.7 NATS considered that a realistic dead-band would have to be at least ±20% to reflect NATS’ capability to manage delay and that a narrow dead-band would complicate matters unnecessarily.

8.8 There have been user responses from BATA, IATA and the AUC. To a large extent these repeat views expressed after the preliminary consultation paper published in December. They are largely supportive of explicit provision of a delay term in the price condition although BATA expressed concerns that it would not have sufficient scope. BATA also argued that in the absence of a volume term (which it promoted in its earlier submission) that there should be an ‘increased dependence’ on a service quality term and that there should be a more significant improvement in the par level of performance than 1% per year. Both the AUC and BATA made the point that NATS should not get a better return from letting delays grow than from investing for the right level of output. Of the three user responses only BATA directly addressed the issue of a dead-band. It believed that a dead-band would not be appropriate.

8.9 With the exception of the Airline Group which supported a delay term, the responses from prospective private sector partners indicated varying degrees of

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The measures in the table above are based on the Average delay cost per flight in minutes / Average CSU per flight. Thus considering option 1, if the average delay per flight were 1 minute greater than the par value then the delay term would reduce the maximum charge per CSU by £0.27.
scepticism to the robustness of the measurement system to support a delay term. The strength of these views ranged from support only if a fair mechanism, which precisely determined the extent to which NATS is to blame for delays, can be established, to opposition. One potential partner was concerned at the potential trade-off between safety and delay. In respect of a dead-band, one potential partner indicated a preference for a dead-band while two purchasers were against on the grounds of complexity.

NATS’ counter proposal

8.10 The NATS’ response put forward a counter-proposal with the following features:

• a quality term based on NATS’ attributable delays versus a threshold;

• NATS attributable delays calculated from CFMU data and audited. (Attriubitable delays would not include ATFM delays arising from flow management ‘regulations’ requested by airport weather nor airport incidents);

• a threshold delay of 1.5 minutes (based on above measure and average of 1997-1999 performance). This is equivalent to about 2.0 minutes if airport ATFM is not eliminated. (NATS do not consider a small trend in the threshold as proposed by ERG as being consistent with the tolerances involved in managing delays);

• a linear and symmetric reward/penalty regime capped to give a maximum penalty exposure of £1-£2m;

• a realistic range for delay outcomes should be from 0.5 minutes to 3.5 minutes i.e. a band around the threshold figure of -1 minute to + 2 minutes;

• the threshold should be relaxed in the year that NERC opens to a par value of 3.5 minutes to reflect a fallow period for capacity improvements.

8.11 NATS does not derive what the effect of this proposal might be on the unit rate but ERG’s calculation is that a £1-£2million maximum penalty for 2 minutes of delay for 10.5 million CSUs p.a. is roughly equivalent to £0.05-£0.10 per service unit on the same basis as presented in the above table.

Key issues

8.12 Two opposing themes run through a consideration of the delay term:

• the term should aim to provide a sufficient incentive for NATS to provide the right level of service;

• NATS should not be exposed too heavily to the capricious effects of untried measurement systems and behaviour in response to the term.
In their responses to the Consultation Paper users have put more emphasis on the former while NATS and prospective partners in the PPP put greater weight on the latter.

There is also an important safety dimension. It is clearly a requirement for any delay term that it does not place material pressures on safety. The impact of the delay term should therefore not be so great that the implicit cost of ATFM delays forms a material consideration for operational staff when they request ‘regulations’ to protect areas of airspace from overloads. The purpose of the delay term should be to give NATS the right incentives in its various planning functions to provide the appropriate level of capacity not to put any undue pressure on the flow control process at a tactical operational level.

BATA raised the issue of whether in the absence of an explicit volume term, greater emphasis should be placed on the delay term as a means of limiting NATS financial gains or losses from traffic being greater or lower than was anticipated at the time of the charge condition being set. ERG recognises in practice that there is a very strong link between capacity, traffic and delay and that if traffic is higher than anticipated then delays are likely to rise – sometimes very significantly and that a delay term will in practice act as a hedge against traffic risk. This may also mean that where delays arise from unanticipated traffic growth the ‘exposure’ of NATS to reduced revenues from the delay term is likely to be more than compensated by the revenues from the additional traffic implied. While recognising the existence of this hedging effect, ERG has not sought to pursue this as an objective.

The responses to the consultation do not indicate any great support on the part of users, NATS or potential partners. ERG has therefore framed its advice in terms of a simple formula with no dead-band.

Although some potential partners had reservations about its use, NATS agreed that ATFM delays from CFMU operations are the appropriate and independent data source for a delay term. It recognised potential unfairness in delay attribution to ATSPs but it accepted these on a ‘swings and roundabouts’ basis. ERG therefore continues to consider it appropriate to recommend a delay term based on CFMU data.

The most significant measurement difference between ERG’s and NATS proposals relates to the extent of the delay for which NATS would be deemed to be responsible.

ERG’s view at the time of the April Consultation Paper was that the term should include all ATFM delays in UK airspace. NATS proposal argued that flow delays arising from airport congestion, airport weather and airport incidents should be excluded from the measure. One argument put forward to support this point of view is that if airfield delays were to count against NATS it would introduce an
incentive for NATS to stop recommending increases in capacity declarations at the major airports. NATS also favoured excluding en route weather delays.

8.20 ERG’s provisional view on en route weather delays was that, although NATS cannot control weather, it is a factor for which it can plan and make provision. The variation in weather could also be expected to even out over the period of the charge condition. Since the April paper ERG has changed its view following NATS’ submission and also to representations from SRG. Extreme weather conditions, particularly thunderstorms, are difficult to forecast for UK airspace accurately in terms of either time or place but the impact that they can have on the flow of traffic and the capacity of the system can be large. It is important that these situations are anticipated and where appropriate in the interests of safety, appropriate requests are made to restrict the traffic through flow control. ERG accepts that in these circumstances sound operational decisions should not be subject to an implicit financial penalty. ERG is therefore proposing that the measure of ATFM delay used in the delay term should be adjusted to eliminate delays requested because of adverse weather conditions in UK airspace.

8.21 As regards the issue of airport delay, NATS’ argument that including airfield ATFM delays would give it an incentive to oppose increases in capacity declarations at major airports introduces a significant additional consideration. As a consequence ERG is inclined to change its view and to consider that the risks of introducing a perverse incentive in this way outweighs any danger that NATS might use its operational control both airport and en route ATC to manage the reporting of regulations to bias reported ATFM towards airports and away from en route services. ERG is therefore inclined to recommend that the measurement of delay be based on ATFM delays attributed to en route activities. (A corollary of this should be that a very clear set of principles be established for determining whether flow control regulations are attributed to en route or airport activities in such a way that the scope for discretion is minimised.)

8.22 ERG would anticipate using data from CFMU as a disinterested source to the maximum extent possible to measure the overall level of ATFM delay in UK airspace and the amount arising from regulations requested in respect of en route rather than in respect of airports. When dealing with the average delay per flight or per service unit ERG would anticipate using the data used by the Eurocontrol CRCO for billing purposes. There are however issues concerning the discretion of NATS to choose to request as either airport or airspace regulations where the potential congestion problems are complementary. In respect of weather delays the data recording the cause for the regulation will input by NATS. ERG would expect access to appropriate information to monitor whether this discretion and data capture continues to be implemented on a consistent basis. ERG expects to continue in discussion with NATS on resolving these measurement issues.

The par value

8.23 NATS argued that as the par value is to be applied over a number of years it should be based not on 1999 which was a particularly good year but on the average of a number of years. It also argues that a 1 % p.a. improvement in the par value is inappropriate and fundamentally misunderstands the accuracy with which delay can be managed.
ERG’s recommendation of a par value was not intended as an optimal level of delay or to indicate a value which it expected NATS to target its effort to achieve. The par value was only intended to represent a reasonable benchmark on which the delay term in the charges condition could be based. From an incentives point of view the exact level of this benchmark is relatively unimportant although it is plainly important in terms of the relative positions of NATS and users.

NATS had stated that its plans and financial projections were based upon a target level of delay extant in 1998. ERG had proposed 1999 because 1998 had been a particularly bad year for delays largely because of bottlenecks in the Clacton and North Sea sectors which had been ameliorated for 1999. The issue is therefore whether having set aside the standard assumed in NATS projections, the 1999 level of delay represents unreasonably high standard or whether a more reasonable standard would be based on an average over a longer period of time. ERG considers that while 1999 represents a relatively good performance it does not provide an unreasonable basis for user expectations. ERG therefore recommends that the par value be based on the 1999 achieved levels of performance.

When ERG proposed a 1% improvement in the par value it acknowledged that the swings around the par value would be large compared with any small value in the par value itself. The recommendation was made to reflect the user view that users expect the standard of delay to improve over time. As such it represents a signal rather than an indication of a precise time path in delay. ERG continues to consider that this is an important signal to NATS.

Special provision when NATS moves to NERC

NATS has argued for a special provision in the year in which NERC opens and that the par value for that year should be increased to 3.5 minutes. NATS has assumed in its plans that delays would rise during the year that NATS moves to NERC. NATS has argued that this would occur because the move would essentially necessitate a two year fallow period for capacity improvements.

ERG recognises that the move to NERC will present challenges to NATS first in maintaining the capacity of the existing system in the period before the move when staff will need to be trained and validated to operate the new system and after NERC becomes operational there may be delays arising from the bedding down of the new systems. In the April paper ERG argued that the starting point for the benchmark delay target should point to NATS’ own planning target so long as this reflects consultation with users.

In terms of incentives ERG does not judge that the scale of the potential reduction in revenues due to the delay term would be sufficient to play a material consideration in NATS judgement concerning the operational date for NERC. The focus is therefore on whether there are significant equity issues arising because the charges condition has been set on the basis of costs which assume higher delays and whether it is reasonable for users to pay higher charges for any given level of service during the transition. There does not seem to ERG to be an overwhelming equity case for users to pay more. ERG therefore recommends
that no specific allowance be made in the par value for the period when NERC becomes operational.

The proposed par value

8.30 NATS adjusted delay per flight for 1999 as provided to CAA was 1.21 minutes. ERG therefore recommends that the par value be set at 1.21 minutes per flight in the first year of the five year period to be reduced in each of the succeeding years by 1% per annum.

The scale of the term and limits on its impact

8.31 There are a number of interconnecting factors in setting the delay term:

- the scale of the delay term (£/ATFM delay per flight/CSU)
- the range of ATFM delay per flight over which the delay term/CSU varies with the level of delay.
- the maximum effect of the charges on revenue/CSU or on NATS’ aggregate Eurocontrol revenues

8.32 Assumptions about any two of these factors largely determines the third.

8.33 NATS’ suggested approach is to base the term on bullet points two and three in paragraph 8.11. Given the significance of the scale of the maximum effect of the delay term in terms of limiting the risk from the untried measurement systems, ERG agrees that there does appear to be some merit in paying close consideration to the maximum effect of the delay term.

8.34 NATS’ approach to reasoning about the limit (and thus rate) of the penalty exposure was to relate it to the resources needed to rectify the excess delay. NATS argued that average delays of 2.5 and 3.5 minutes versus a 1.5 minute threshold correspond to an annual capacity under-provision of around 1.5% to 2.5% respectively. It estimated that the resources necessary to develop capacity of this size would be of the order of £6m-£10m per annum based on the full costs of capacity. NATS then suggested that on this basis the penalty limit should be in the range £1m-£2m per annum if it is to remain minor in comparison.

8.35 Although ERG believes that there may be a general argument for caution in setting the maximum effect of the delay term, there is not a good argument on its own merits for setting the maximum ‘penalty’ to be small compared to the costs of providing the equivalent capacity. Indeed the extent to which the maximum penalty is below this cost is an indicator of a residual undesirable incentive for NATS to under-provide capacity and just accept the reduced charges. In principle ERG would therefore seek a maximum penalty which was equal to or greater than the cost of providing the equivalent capacity (so long as this did not exceed the implied benefits for users). On the basis of NATS analysis a delay term with a maximum downside effect of £1m-£2m would leave a large residual
incentive for NATS to under-provide capacity and would have little more than a token effect on incentives.

8.36 Any estimate of the additional cost of an increment of capacity sufficient to eliminate a particular level of delay is inevitably subject to margins of error. It requires a view as to whether increases in capacity would be required across the whole system or whether the equivalent level of delay could be eliminated by more targeted projects to concentrate additional resources in the hot-spots which were making disproportionate contribution to the level of delays. This latter type of approach has been adopted in recent years with some resectorisations delivering significant reductions in delay (e.g. the Clacton resectorisation) at an implied level of incremental cost very much lower than the costs applied in NATS submission. Within the five year time horizon, consistent with the charge condition, resectorisation forms the major part of the capacity enhancement programme although this may be subject to diminishing returns. ERG’s analysis of short run incremental costs, based on evidence from the Clacton resectorisation, indicates that NATS could achieve the equivalent increase in capacity at lower cost. The analysis below however adopts as a working hypothesis NATS estimate that a the two minute difference in average delay between its upper limit of 3.5 minutes and its par value of 1.5 minutes would be equivalent to capacity costing £10m per annum.

8.37 The three options set out in the Consultation Paper imply a theoretical maximum exposure to a reduction of charges of approximately £8.5m, £17m and £34 m per annum.

8.38 If the maximum exposure were based on the NATS proposed range over the par value of up to two minutes instead of the three minutes these maxima would be reduced to £5.7m £11.4m and £22.8m. Comparing this to NATS’ estimate of the costs of the underlying costs of capacity would suggest a delay term would have to be set at just under the level of option 2 in order to ensure that there would be no residual incentive for NATS not to provide the underlying capacity.

8.39 A judgement however still has to be applied to test whether a term set at this level would place too great a weight on an untried system. Because of the need for prudence ERG is inclined to recommend a term whose maximum effect is scaled down from this level by proposing:

• the level of the delay term in option 1;

• reducing the upper limit to the par value plus 2 minutes.

8.40 This would imply a maximum exposure of approximately £5.7m compared to NATS’ estimate of the costs of providing the equivalent capacity of £10m. It may therefore imply some residual incentive for NATS to accept reduced

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39 Based on an average of 10.5 million CSUs per annum.
N.B. If the out-turn traffic is higher than this average the implicit reduction in revenue due to this penalty would be higher but NATS revenue overall would be higher as the positive revenue effect of additional traffic is much greater than the negative effect of the delay term.

40 This is the more consistent basis for comparison with NATS’ estimates of the cost of providing the equivalent capacity.
revenues rather than increase capacity but it makes a greater contribution to closing this gap than NATS’ proposal based on a maximum charge of £1m to £2m.

8.41 As set out above it is proposed that the effect of the term would be symmetrical such that NATS would be entitled to a higher maximum limit to charges when delays were below the par value. The NATS’ proposal suggests that this additional benefit should be limited to lie between the par value down to 0.5 minutes of delay. There would be no incentive for NATS to reduce delays lower than 0.5 minutes. NATS argues and ERG agrees that it is not likely to be realistic for NATS to reduce average delay per flight below 0.5 minutes. ERG considers however that the view that very low delays are not likely to be achieved does not seem to require the price condition to place a limit to the benefit to NATS of very low delays other than the natural limit of zero delay.