Prepared by:
NATS (En Route) plc

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NATS (En Route) plc

CMA Statement of Case - 28 November 2019

[RP3 Reference: NERL003]

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1. Foreword

1.1. Foreword by Martin Rolfe, CEO

I consider myself to be privileged to lead the NATS Group, including NATS (En Route) plc (NERL), and that is not a statement I make lightly. Before I took on this role, I worked for Lockheed Martin as a major technology contractor to NERL and saw first-hand its ambition and drive to make its Air Traffic Management (ATM) service amongst the very best in the world. Now that I have the opportunity to see it from the inside, I never cease to be impressed by the professionalism and pride with which my 3,445 colleagues apply themselves to ensure that controlled airspace across the UK and out across the Atlantic to North America runs as safely and efficiently as is humanly possible. Nothing sums this up better for me than when, in the first few months of my tenure, as part of our long-term strategy, my Executive team and I set about updating our vision for the business. It soon became clear that our colleagues are passionate about the critical national service that NERL provides: a service to airline pilots and their passengers overflying the UK; leaving or returning to their home airports; to private pilots lost or straying into controlled airspace; to our military colleagues and to the government, businesses, householders and residents of the UK who place their trust in NERL to maintain and develop the UK's air traffic infrastructure and service in a way that will sustain the UK's place at the forefront of the aviation industry.

The statement of purpose for the business that encapsulated this ethos and the commitment of our staff 24 hours a day, 365 days a year, became "*Advancing Aviation, Keeping the Skies Safe*". Safety has always been at the heart of our operations both before and since the evolution of our business through the Public Private Partnership (PPP). The safety risks in aviation are more of an existential threat than in other sectors, and the travelling public rightly expect that aviation operations are commensurately rigorous in their safety assurance activities. While safety related incidents are rare and technical failures uncommon, they fill the media for days, probably because incident free air travel is something the public rightly expects to take for granted, without needing to appreciate how challenging that is to deliver. Indeed the aspiration of my colleagues is to provide our service day-to-day without incident or drama and largely unseen by the travelling public. Yet there is so much more than the day-to-day service that needs to go on behind the scenes to both keep the skies safe and advance aviation for the UK.

In 2000, the NATS Group was part of the CAA. The CAA, the Department for Transport (DfT) and their lawyers set about designing the framework to entrench and guarantee these requirements while making NATS a sufficiently attractive investment for a successful Public Private Partnership. The result was a multi layered and complex suite of contracts, legislation and protection for lenders, designed to stand the test of time. Part of that complexity arose from the recognition that ATM operations have no ready-made precedent from among other privatised utilities. We operate a single integrated infrastructure rather than a network of pipes and transmission cables, the entirety of which has to operate in complete harmony with our international neighbours, without interruption, day in, day out. On top of the physical technology, significant infrastructure investment is made in invisible structures in the sky and the ultimate deliverable of safe flight relies not on automated switches or signals, but on the skills of a professional body of air traffic controllers, supported by an equally professional body of technologists, engineers, procedure designers, safety analysts and many others. NERL operates the UK ATM network in the centre of a complex interdependent set of external variables – the position of the Jetstream on a daily basis, the changing schedules and destinations of airlines

over days, weeks and seasons, runway closures, drone incursions, thunderstorms, military exercises, closures of neighbouring airspace, terrorist attacks and major sporting events. NERL must deliver its service irrespective of any of these and while doing so, continuously upgrade its technology to keep pace with increasing traffic and emerging threats. It cannot stop operations to upgrade, ever.

Recognising these challenges, three enduring core principles were created to safeguard long term success for that unique PPP structure: Safety, Financeability and the Public Interest. Once the NATS Group had separated from the CAA in 2001, the CAA became the regulator of the NERL licence and therefore was charged with guardianship of these core principles. Over the last 20 years that clear dividing line between regulator and service provider has been embedded through normal turnover of CAA staff and the evolution of theory and practice of economic regulation and safety oversight.

Since separation from the CAA, major change management programmes within NERL have brought advances in leadership, project management, business awareness, efficiency and financial stability. Over £2.2 billion of capital investment has been made into the airspace and ground based infrastructure. Safety measures have improved from an average of four risk bearing category A and B airprox each year to zero. Delays have reduced from an average of over two minutes per flight to around ten seconds per flight. We have saved 1.6m tonnes of aviation CO2 emissions. All while traffic volumes have increased by 25% from 2m to 2.5m flights p.a. Underlying controllable operating costs have reduced by a third, but alongside this focus on efficiency we have always sustained our safety and service ethos and our drive to continuously improve the service through innovation and change. In short, to always do the right thing for the travelling public.

NERL and the CAA have managed to reach an acceptable settlement for each regulatory period of the last 20 years. However, the inherent scepticism with which a regulator typically views the plans of a regulated entity has increased with respect to the CAA's economic regulation of NERL, to the point where there is now an unsustainable gap between the CAA's expectations and NERL's intentions. The tensions arising from this credibility gap have been exacerbated in more recent years due to economic pressures in the aviation industry and were crystallised for NERL and the CAA during the particular circumstances the sector experienced during RP2 (2015-2019). This included a greater increase in the number of flights than predicted, alongside a lack of political leadership on the need for wider airspace changes. That RP2 experience informed the approach of both NERL and the CAA to RP3, but with demonstrably different outcomes.

NERL's performance compares extremely favourably with our European counterparts. When compared with those of a similar size with equivalent traffic (Germany, France, Spain, Italy), overall our investment in technology has been higher, our safety and service performance better and our cost reductions greater. This has placed NERL in the position of being able to deliver on the expectations of politicians, customers and, most importantly, the travelling public. For RP3 we set out to create an ambitious plan that would allow this performance to continue. A plan that would cater for increases in traffic, was based on our customers' stated priorities and underpinned by our broad licence obligations. The plan envisaged completing our technological transformation and progressing with airspace modernisation to ensure that NERL could deliver the required service in and beyond RP3. Our plan delivered these outcomes in a way that balanced the overriding need from our customers for us to assure the safety, resilience and consistency of our service alongside a continued focus on reducing cost where it did not compromise these primary objectives. We strongly believe that the plan managed both the service and cost equation in a reasonable way that supported both the safety and financeability of the service, within those constraints. Naturally our plan met or outperformed on all European

targets, including those of cost efficiency. Importantly, our plan was intended to be a bridge from the technology modernisation started in RP2 to its completion in RP3, a bridge from old to new airspace, and a bridge to new runway capacity in London in RP4.

However, the CAA's expectations were for lower costs still, combined with increases in service and environmental performance while still delivering the key investment milestones in line with our original timescales. It also proposed new regulatory mechanisms and work to be undertaken on airspace modernisation which remain unclear. All laudable objectives, but fundamentally lacking in an appreciation of the inherent interdependencies of the overall plan. We carried out extensive analysis of the CAA's decision, making assumptions where it was unclear, and concluded that not only was the CAA's plan undeliverable, it increased the level of financial risk to unacceptable levels, while the proposed cost of capital was materially reduced despite these increased risks.

Despite considerable efforts to bridge the gap between these approaches a compromise could not be reached and, perhaps more concerning for NERL in the future, is that in spite of prolonged and high level dialogue between us and the CAA, it is still not clear on what basis the CAA has reached its conclusions that create such a materially different position. Both the regulatory precedent and the commercial risk arising from that uncertainty, when considered against the impact of the CAA's final decision for RP3, is such that the NATS board and I are forced to conclude on behalf of our employees, our shareholders and most importantly the travelling public, that NERL has no choice but to reject the CAA's final decision. Our assessment is that it is undeliverable and, whatever the outcome of the CMA's financial redetermination, we would welcome any commentary from the CMA that might assist in avoiding a repeat of this situation for future regulatory periods. This Statement of Case sets out in depth the reasons why we have concluded the CAA's final RP3 decision is undeliverable and contrary to the public interest and why we now look to the CMA to re-examine NERL's plan against the applicable statutory duties. When considering what is in the public interest, we suggest that should be through the wide lens of the PPP principles and NERL's role as the provider of critical national infrastructure for the UK; to reach a redetermination that represents a balanced and financeable solution to furthering our core purpose of Advancing Aviation, Keeping the Skies Safe, in RP3 and beyond.

2. Introduction

2.1. NERL's request for a redetermination

1 On 10 September 2019 NERL formally rejected[1] the CAA's RP3 Decision.[2] In accordance with the procedures under the Transport Act 2000 (**TA 00**) the CAA formally referred this matter to the CMA for redetermination on 19 November 2019. This document is our Statement of Case (**SoC**) and sets out NERL's position on the key issues that will fall to be considered by the CMA.

2 In summary, we do not consider that the proposed modifications to our Licence as set out in the CAA's RP3 Decision are in the public interest. We do not believe that the CAA's RP3 Decision, when looked at in the round, will allow us to provide an appropriately high level of service and operational performance whilst also delivering the ambitious programmes of technological and airspace change. Whilst maintaining the safety of ATM services will always be our number one priority, the challenge of achieving the requisite safety levels within the complex operating environment anticipated during RP3 will be exacerbated by the financial constraints imposed by the CAA's RP3 Decision.

3 In particular, we consider that if the CAA's RP3 Decision were to be implemented without modification, it would:

- allow insufficient financial resources to achieve the major technology and airspace modernisation change programmes at the same time as maintaining appropriate high standards of operational resilience, service and performance;
- impose disproportionate burdens on the business through the imposition of new governance incentives which are neither necessary, justified or likely to deliver better outcomes;
- threaten the delivery of the technological improvements envisaged for the Oceanic service, limiting our ability to deliver safety, technological and operational benefits, to the detriment of customer interests; and
- not allow us to earn a rate of return that adequately reflects the cost of capital for an efficient air navigation service provider over the RP3 period.

4 Importantly, the impact of the individual elements of the CAA's RP3 Decision is to tie the hands of NERL when it comes to making use of the various levers that would otherwise be available to us to manage the delivery of our services and change programme during RP3. The combination of interventions comprised within the CAA's RP3 Decision that includes adopting defined outputs and inputs for RP3 that are so demanding that they effectively remove all of NERL's discretion as to the means by which we can deliver the RP3 business

[1] Letter from Martin Rolfe, NERL to Richard Moriarty, CAA,10/09/2019, ('**Letter to Reject the CAA RP3 Decision**'), (SOC052)
[2] CAA, UK RP3 CAA decision document, CAP1830, 2019, ('**CAA RP3 Decision**'), (SOC012)

plan, is inconsistent with the CAA's statutory duties (see Section 3.4.1)[3] including the obligation to only impose on NERL "*the minimum restrictions which are consistent with the exercise of [the CAA's] functions*" (see para.145).[4]

5 The CAA's RP3 Decision also fails to adequately take account of the interaction between our opex requirements and our ability to deliver the challenging transformation programme envisaged with respect to technology and airspace during RP3. If NERL is required to operate within the financial and governance constraints of the CAA's RP3 Decision we will face a shortfall in resources required to deliver our capital investment programme and a significant increase in business risk associated with the proposed incentive mechanisms. A revised investment programme might lead to reduced resilience in the short term and/or increased costs. This could lead to potential service disruption in the short term and poorer service performance in the medium to longer term, increasing delays and environmental efficiencies. In itself this would clearly be adverse to the public interest and this would be compounded by introducing the prospect of systemic loss leading to financeability concerns for NERL.

6 Our final business plan for RP3 (RBP) was developed by NERL, with the input of our customers and other stakeholders, to achieve a carefully balanced set of safety and service outcomes through an integrated application of resources while continuing to increase efficiency and deliver price reductions to customers. Our plan is focused on the resources required to deliver a safe and efficient operation every day while planning and implementing changes to its systems and operations to ensure that same high quality service can continue to be delivered into the future, particularly in light of increasing air traffic.

7 We consider that our RBP will:

- allow sufficient financial and operational resources to achieve the major technology and airspace modernisation change programmes that are unprecedented in their scale for NERL, and indeed across Europe, and will act as a bridge from RP2 across to performance expectations for RP4;
- allow the delivery of those change programmes at the same time as maintaining high standards of operational resilience, particularly in light of the findings of the CAA's RP2 inquiries and the anticipated challenges during RP3 with respect to growth in traffic levels and managing our workforce;
- apply a significant challenge on the business to deliver operational efficiencies alongside the transformational challenges the business also faces;
- provide an enhanced level of transparency and engagement for customers through improvements to existing governance arrangements that ensure accountability on the part of NERL; and
- allow us to deliver the safety and service enhancements through technological innovation envisaged for our Oceanic service, to the benefit of customers.

8 We have structured our SoC in a way that hopefully allows the CMA to appreciate our RBP as an integrated and interdependent plan (see Section 2.4 below). We also recognise that this is

[3] Section 2 TA00.
[4] Section 2(6) TA00.

a redetermination and the CMA can, therefore, look at any of its components in reaching a view as to what level and form of price control would be in the public interest.

9 In Table 1 below (see Section 2.3) we provide an overview of the areas of difference between NERL and the CAA which contribute to the £212m difference between our RBP and the determined costs in the CAA's RP3 Decision. These are all addressed in the corresponding Sections of this SoC.

10 That said, the areas of dispute between ourselves and the CAA do vary in their magnitude and materiality to the overall settlement. We have sought in this introduction, therefore, to provide an indication of those areas which we consider should be a priority for the CMA's redetermination.

2.2. Areas of focus for the CMA's redetermination

2.2.1. Setting the right opex allowance

11 NERL is an opex intensive business, with our opex accounting for over 70% of our total RP3 revenue allowance (see Section 8 below). Attaining a reasonable opex allowance is vital to ensuring that NERL is able to provide safe and resilient air traffic control (ATC) services, meet its performance targets and deliver a significant capital programme.

12 Our RBP, which proposed £2,156m of opex over five years, was based on a detailed bottom-up assessment of our operational requirements taking into account forecast traffic growth, challenging service quality targets, the increased opex required to support airspace modernisation and the technology capital investment programme, and input price pressures. The opex forecast built in ambitious efficiency savings of over £70m, on top of the efficiencies that NERL has already driven out of the business over several previous regulatory periods. Our RBP struck the right combination of being both efficient and effective as well as delivering the right service at a declining price.

13 Our view is that the CAA's opex allowance, which includes a reduction of £43m[5] relative to NERL's RBP, is insufficient for NERL to deliver its RBP service quality targets when combined with the package of growing traffic volumes and a substantial capital programme. The CAA has also made additional 'indirect' cuts to NERL's opex of £24m through its unachievable interventions with respect to non-regulated income (see Section 9) and a further £6m through its related cuts to ongoing pension costs (see Section 10), totalling £73m[6].

14 We consider that the CAA's proposed opex reductions, which are based on a 'top down' view of information in NERL's RBP, historical trends, information on cost efficiency and stakeholder responses are inadequately justified and the impact of such reductions unanalysed. The CAA's RP3 Decision does not assess in any meaningful way whether NERL has the ability and scope to continue to reduce its cost base by the same levels it achieved in the past into the future. Major reductions in the past have been achieved by reducing the number of operation centres from four to two (Swanwick and Prestwick) which are now at the lowest possible for safe resilient operations.

15 Given the above, and with a high fixed cost base, we know that the opportunities to reduce opex are limited without compromising our service. NERL would be unable to provide the

[5] Total Opex Determined costs of £2111m vs £2156m = £45m reduction, excluding adjustments made for ACOG and OFF of +£22m = £43m reduction
[6] After excluding adjustments made for ACOG and OFF totalling +£22m

headcount built into its business plan with the CAA's RP3 Decision, which would create risks to ongoing safety improvements, resilience and other aspects of operational performance. Consequently, the CAA's proposals in relation to opex are not in the public interest.

2.2.2. Setting the right capex allowance

16 As we set out in detail in Section 11 below, our capital investment programme for RP3 is of critical importance to our operations in RP3 and beyond. NERL's Long-Term Investment Plan (LTIP) for RP3 is proposing to invest c£750m (2017 prices) over 5 years on a combination of airspace re-design, legacy system replacement, and new support tools and system enhancement.[7] It includes the next stage of NERL's Deploying SESAR[8] strategy that began early in RP2 and replaces almost all of our critical infrastructure, some of which is nearly 50 years old and which represents around 40% of the investment programme. As the operators of a single integrated infrastructure that must function 24 hours a day, 365 days a year, without interruption, delivering this level of change poses a considerable number of operational, logistical and financial challenges.

17 The technology and airspace changes planned for RP3 are even more significant than those NERL completed with the consolidation of four control centres to two in 2010. The technology programme will see the renewal or replacement of over 80% of NERL's critical systems in the space of five years. Similarly, the airspace modernisation programme will be the largest change to UK airspace since the start of the modern jet age. The challenge facing NERL to deliver these changes is not comparable, therefore, to other regulated utilities, such as the water sector, which have capex investment programmes based around smaller scale, regular and lower risk activities affecting a smaller proportion of their core infrastructure.

18 The CAA has proposed an 8% reduction to the non-airspace elements of the capital investment plan, representing £48m, on the basis that the CAA believes there are opportunities for further efficiencies. The CAA has not provided substantive justification for those reductions. NERL does not believe savings on this scale can be achieved within the LTIP and we will therefore have to reduce scope, and the associated customer benefit, in order to realise the savings.

19 Whilst we acknowledge that the CAA has ring-fenced specific elements of the critical airspace change component of our investment plan, we consider that this offers false comfort. The level of risk and contingency funding included in the RBP is already very low given the highly complex and integrated nature of the programme. Additionally, NERL's initial investment priority must be on safety, resilience and sustainment to provide the stable base on which to modernise airspace. The overall reductions to our opex and capex are liable, therefore, to impact our ability to deliver airspace change, given the interdependencies with other aspects of our plan.

2.2.3. Achieving the right level of capex governance

20 As set out in Section 11, the CAA has proposed fundamental changes to the existing, and already industry leading, governance and approval arrangements for capital expenditure. This includes three new incentive mechanisms (delivery, efficiency and information) which, allow

[7] NATS, RP2 Capital Investment Plan (2015 -2019) for Condition 10, March 2017, ('**C10 Airspace and Technology Plan 2017**'), (SOC070)
[8] SESAR is the Single European Sky ATM Research programme which has defined future concepts which will need to be deployed across Europe as part of the European ATM Masterplan. Some of these changes are mandated under SES Legislation.

the CAA for the first time to make retrospective changes to our cash flows that relate to investments already made.

21 We consider that the CAA's new incentive mechanisms are not required and undermine, rather than further, the public interest:

- It is not clear how, for example, when assessing efficiency after the event, the CAA will be able to distinguish between: (i) the benefit of hindsight; and (ii) the actual efficiency/performance risk we face on a forward-looking basis.
- The mechanisms hand the CAA significant discretion and latitude without a sound technical basis on which to make judgements. Considered in their totality, the reforms appear to substantially increase regulatory risk and, being penalty only, skew our expected equity returns to the downside.
- The inclusion of a *delivery incentive mechanism* – in practice a penalty regime – effectively drives the LTIP towards a fixed price programme, rather than one based fully on a capex pass-through mechanism. This approach is only appropriate if the estimates used in the LTIP plan are based on a greater than 85% likelihood rather than the most likely (i.e. ~50% likelihood) estimates that NERL has used as the basis of its planning. That approach would also require inclusion of an adequate risk provision which will be larger than currently planned.

22 Overall, the CAA's RP3 Decision are not well suited to the fundamental characteristics of the industry where the combination of: (i) the pre-eminence of safety; (ii) low capex intensity; (iii) high focus on intangible assets; (iv) short asset lives; and (v) capex being volatile and (in part) outside of management control, all point for a need to place weight on avoiding the possibility of efficient capex not proceeding (and in a timely manner).[9] The CAA's proposals go against the principles of this, placing more weight on short-term cost minimisation, without any consideration of the harm that may be caused to customers. Additionally the proposals are not fully defined creating uncertainty for both NERL and customers.

23 We believe that to apply these material changes to the regulatory mechanisms after NERL has completed its RBP on the basis of the existing regulatory framework is contrary to the principles of good regulation and will effectively lead to the application of unsuitable assessments of NERL's delivery performance. We disagree with the CAA's characterisation of the changes to our RP2 investment programme which appear to have driven these proposals and believe they will materially constrain our ability to manage safety and other factors in a complex programme.

24 We consider that a better approach would be to remove the CAA's proposed new governance incentives and to enhance the existing governance arrangements in line with the proposals on which NERL consulted its customers during 2018, gaining their support. [10] Enhancement to these measures would be a more proportionate means of protecting the public interest in accordance with the principles of Best Regulation Practice (see para. 145 below).

[9] 'Economic Insights, Independent Review of Capex Governance, 22/11/2019, (**Independent Review of Capex Governance**'), (SOC068)
[10] Co-Chairs Report, 2018, (SOC016), p. 1 – 8

2.2.4. Facilitating technology based improvements in the Oceanic service

25 As we set out in Section 12, our Oceanic business which covers control of air traffic in the Shanwick Flight Information Region over the North Atlantic, is a standalone operation that is subject to a separate economic regulatory regime from the en route business. Although Oceanic and en route share a small amount of infrastructure and staffing, those shared costs are appropriately and transparently allocated. Condition 9 of our Licence expressly prevents NERL from allowing a cross-subsidy between these two separate businesses.

26 Our RBP for the Oceanic business is based on technology-driven transformation through the introduction of satellite-based ADS-B surveillance data that will: ensure compliance with ICAO safety standards; increase capacity; and deliver considerable benefits to customers in terms of fuel efficiency and service quality. The financial benefits are expected to be between two and four times higher than the additional costs to customers of using the new data.[11]

27 Overall, the CAA's RP3 Decision reduces our total Oceanic Determined Costs by £12m. We do not consider that the efficiency challenges the CAA has applied are supported by evidence. Nor has the CAA properly considered the impact of the cuts on the operation of the Oceanic business.

28 We consider that the scale of the CAA's proposed cuts to opex alone (£6m) means that the Oceanic business will be loss-making and require the Oceanic business to be subsidised by the en route business. This is contrary to the terms of our Licence.

29 NERL proposes that the Oceanic ADS-B data charges be remunerated in full, and due care and attention paid to the scale (as well as the appropriateness) of any other adjustments proposed by the CAA in order to appropriately prioritise the Safety Duty and the balance between the Efficiency Duty and the cost element of the Customer Interest Duty (see para. 145).

30 We also consider that the CMA should take appropriate steps to ensure that its redetermination does not result in a cross-subsidy between the Oceanic and en route businesses. This should include carrying out an assessment of the financeability of each separate business unit, as well as the CAA's RP3 Decision as a whole.

2.2.5. Setting the right cost of capital

31 Under the RAB-based regulatory approach adopted by the CAA, the allowed rate of return is a critical input into the price control determination. As we set out in detail in Section 13, setting the allowed rate of return at the right level allows NERL to recover its costs in full, including the efficient cost of raising finance, and helps to ensure there are appropriate incentives to invest in our assets. This is particularly important at the time of a significant capital investment programme (relative to our existing RAB).

32 Our view as to the appropriate WACC for RP3 (4.21% real, vanilla) differs substantially from the CAA's (2.68% real, vanilla). The CAA's position does not reflect the balance of risk we are exposed to over the next five years and therefore underestimates the efficient cost of finance for RP3. This is the result of several methodological issues that underpin the CAA's WACC determination and markedly different interpretations of the risk facing NERL. In particular:

[11] RP3 Business Plan, (SOC001), p. 67

- in relation to the total market return (TMR), the CAA's proposed figure of 5.4% (RPI deflated) implies an implausibly large and rapid reduction in equity market returns relative to the RP2 determination, and precedent from other regulators (including the CMA); and

- in relation to the asset beta, the CAA's proposals do not adequately reflect the characteristics of NERL's business (particularly its low capital intensity relative to other regulated companies, its exposure to income fluctuations and the resulting sensitivity of equity returns) and imply a material reduction in the systematic risk faced by investors since RP2, which is not supported by objective evidence.

33 The impact of these issues is material for NERL. The difference in revenues resulting from the gap between the WACC proposed in our RBP and the CAA's RP3 Decision amounts to £125m over the RP3 period.[12] The net result of the above issues is that the CAA's final WACC estimate does not adequately reflect the cost of capital for an efficient air navigation service provider over the RP3 period.

34 Given the scale of the impact on our revenues, it is clearly of the utmost importance that we are set a WACC that properly reflects the risks we face – and the opportunity cost of capital for NERL's investors – in RP3. The substantial cuts to the allowed rate of return proposed by the CAA will not be in the public interest if this creates a financeability issue, does not allow NERL to recover its efficiently incurred costs, or deters future investment.

2.3. Overview of the areas of difference between NERL and the CAA

35 The overall impact of the CAA's proposals is summarised in the table below.

Table 1 Overview of areas of difference between NERL and the CAA

CAA Cut	Building Block affected	Value of cut	Disputed by NERL	CAA rationale	Covered in chapter
Operating costs	Opex	(£43m)	YES	Historic opex unit cost efficiency performance	8 - Operating Costs
Costs for Non-Reg income	Opex	(£24m)	YES	Costs associated with Non-reg income have not fallen in-line with revenues	9 - Non-Regulated Income
OFF	Opex	+ £7m	NO	20% increase to OFF for airspace modernisation (neutral to NERL)	8 - Operating Costs
ACOG	Opex	+ £15m	NO	New cross industry entity to support airspace modernisation (neutral to NERL)	5 - ACOG 8 - Operating Costs
Capex	Depreciation	(£11m)	YES	£50m capex cut for efficiency opportunities	11 - Capex Funding & Governance
CPI / RPI wedge	Depreciation	(£13m)	NO	Different inflation assumption (neutral to NERL due inflation 'true-up' mechanism)	13 - Cost of Capital & Financeability
Capex Governance	Depreciation	-	YES	Enhance transparency and incentive to ensure capex is efficiently incurred	11 - Capex Funding & Governance
Ongoing	Pensions	(£6m)	YES	Mechanical impact on pensions of	10 - Pensions

[12] Noting that we subsequently revised our view on certain WACC parameters in response to the CAA's draft proposals, as shown in the previous table. In addition, we recognise that market data can move over time; and that, since our response, we commissioned an independent review of our WACC evidence by Economic Insights.

CAA Cut	Building Block affected	Value of cut	Disputed by NERL	CAA rationale	Covered in chapter
Pension costs				proposed operating cost cuts	
Pension deficit repair costs	Pensions	(£18m)	YES	Disagree with trustee assumptions and risk of stranded pension surplus	10 - Pensions
London Approach & FMARS	Non-Reg Income	+ £18m	NO	Adjustments for the CAA changes to FMARS and London Approach (neutral to NERL overall)	9 - Non-Regulated Income
Capex	Return	(£3m)	YES	Mechanical impact on regulatory return of proposed capex cuts	13 - Cost of Capital & Financeability
WACC	Return	(£122m)	YES	Market wide reductions in cost of equity and cost of debt	13 - Cost of Capital & Financeability
Oceanic	Oceanic Building Blocks	(£12m)	YES	Cuts to Oceanic opex, ADS-B data charges, pensions, WACC, and capex	12 - Oceanic
Delay incentives	-	-	YES	Various, but mainly EU compliance and historic performance	6 - Service Quality Targets
3Di Incentive	-	-	YES	Continuation of 3Di performance improvement	7 - 3Di Targets
Traffic Forecast	Traffic	-	YES	STATFOR is independent	4 - Traffic
TOTAL	Determined Costs	£212m	YES		

Source: NATS

36 The arguments in relation to the issues identified above have already been articulated in NERL's response to the CAA's draft RP3 decision[13] and so the chapters only seek to draw out and focus those issues for the benefit of the CMA. However, there are two exceptions to that general rule.

37 First, NERL did not respond at a granular level to a number of changes made by the CAA between its draft decision and the final RP3 Decision other than to state that NERL's assessment was that the plan was undeliverable. Where there were material changes, in financial terms or in relation to the underlying principles, these will be new commentary.

38 Second, as the CMA is aware, pending the outcome of the CMA's process the price controls and targets as set out in the CAA's RP3 Decision will apply to NERL with effect from the beginning of RP3 – 1 January 2020. This means that during this period NERL will be attempting to deliver the service and resilience that our customers require on a level of revenues that are, in our opinion, insufficient. Although the CAA has profiled the RP3 revenues in a way that ostensibly allows for the majority of NERL's requested operating costs for the first year of RP3, there are two significant caveats to that profiling:

- the total regulatory revenues allowed for in the RP3 Decision are not at the level requested by NERL and achieving those reductions on top of those achieved in previous regulatory periods and those already embedded in our RBP in a largely fixed cost business are extremely challenging; and

[13] NERL's Response to the National Performance Plan CAP1758, 12/04/19, ('**NPP Response**'), (SOC003)

- if we need to achieve the savings profiles envisaged for later years of RP3, early action is required. For example, our assessment of ATCO resource requirements means that we have accelerated our recruitment and training to maximise ATCO validation increases. If we continue to recruit at that rate in 2020 and if we later conclude that, irrespective of the impact on service and resilience, ATCO redundancies are the only option to deliver the required opex reductions, we will incur restructuring costs which will in turn then need to be offset by further reductions.

39 As a result, the NERL Executive team and Board have had to carefully consider the approach to take for business planning in 2020. Given the risks inherent in the regulatory process and the trajectory of equity returns, it was not thought appropriate to continue to incur costs at the rate originally planned for in our RBP. However, if we do not continue as per our RBP to recruit and plan for the outputs we believe are in the public interest then we will be in a position that, even if the CMA determination largely supports NERL's view, NERL will no longer be in a position to deliver. We have, therefore, had to impose what we consider to be short term measures to hold back as many demands as possible on costs on a short term basis, but avoiding measures which we believe will have irreversible effects on the viability of delivering NERL's RBP in RP3. Those deliberations are, however, still live at the time of submission of this SoC and we will update the CMA as required during the redetermination process. In particular, NERL's role and liabilities in the airspace modernisation programme are an area of particular contention and may change significantly in the coming months (see Section 5 below).

2.4. Structure of the Statement of Case

40 The purpose of our SoC is to provide the CMA with the necessary tools and information to carry out this redetermination. We have structured our commentary on the issues in a way that will hopefully assist the CMA in viewing them within the context of the overall plan.

- First, we set out the building blocks that inform our operational requirements during RP3 such as traffic, airspace change, service quality targets and 3Di targets.
- We then look at the building blocks of expenditure, namely opex, our non-regulated income, pensions costs, capex funding and governance and the Oceanic control.
- We then consider our cost of capital and the impact overall of the CAA RP3 Decision on our financeability.

41 Each Chapter sets out the financial impact of the differences between our RBP and the CAA's RP3 Decision. We consider the impact of the CAA's proposals on our business and consider whether they are in the public interest.

42 The SoC should be read alongside the '*Overview of Air Traffic Management Industry and NATS (En Route) plc for the CMA*' submitted by NERL to the CMA on 8 November 2019 (the **Industry Overview**).[14] The Industry Overview set out a broad introduction to NERL and the ATM industry. We do not repeat that detail in the SoC but will draw on those features to highlight their relevance and relative significance to NERL, the CAA's RP3 Decision and the CMA's redetermination.

[14] NERL Information Memorandum, Overview of Air Traffic Management, 2019, ('**Industry Overview**')

43 We recognise that the ATM industry is one which is replete with acronyms, industry jargon and abbreviations. To help the CMA navigate the landscape we have provided a glossary at Appendix 1 that captures all the terms used in this SoC.

44 A more detailed overview of each of the Chapters is provided below.

No	Title	Description
1	Foreword	▪ Introductory comments from our CEO
2	Introduction	▪ An overview of the reasons why NERL has sought a redetermination from the CMA. ▪ Introduces the main themes that run through the SoC ▪ Sets out the structure for the remainder of the SoC
3	Background to RP3 and the context for the CMA's redetermination	▪ Sets out NERL's approach to RP3 in the context of: • the key challenges we face in RP3; • the impact of the RP2 settlement on service performance during RP2 in light of industry developments; ▪ Describes the planning process for RP3 and why we consider our plan best serves the public interest. ▪ Provides an overview of our concerns with the CAA's RP3 Decision and why we consider it would not be in the public interest to implement it as it is. ▪ Sets out our expectations for the CMA's redetermination, including our views on the scope of the CMA's review and the applicable legal and regulatory framework.
4	Traffic	▪ Highlights the importance of traffic forecasts to our operational planning and performance. ▪ Addresses the decision of the CAA to rely on the STATFOR forecasts, rather than the forecasts produced by NERL. ▪ Sets out the limitations associated with the STATFOR forecasts for the UK and explains why the NERL forecasts are more accurate and reliable.
5	Airspace Change Organising Group (ACOG)	▪ Introduces ACOG – the structure through which NERL will support the broader airspace modernisation strategy ▪ Sets out our concerns that the CAA's proposed licence modification goes further than has been agreed with respect to the responsibilities imposed on NERL ▪ Highlights the lack of clarity over the funding for this programme
6	Service Quality Targets	▪ Outlines the CAA's proposed service quality targets ▪ Considers NERLs ability to meet those targets in the context of the RP3 challenges and concludes that penalties are inevitable.

7	3Di Targets	▪ Outlines the CAA's proposed 3Di targets ▪ Sets out our concerns with the targets, the evidence upon which they are based and the potential impact on the business.
8	Opex	▪ Sets out our views on the appropriate level of opex for NERL during RP3, including an ambitious efficiency challenge. ▪ Draws out the significance of opex to a business such as NERL ▪ Sets out our concerns with the CAA's opex allowance and the rationale for the scale of the challenge it has applied.
9	Non-regulated income	▪ Outlines the single till concept that offsets non-regulated income against our regulated operating cost base ▪ Demonstrates that the CAA's cost challenge is unsupported and undeliverable.
10	Pensions	▪ Sets out our concerns with the CAA's pension cost allowances, including in particular the cuts to the deficit recovery payments ▪ Demonstrates that the CAA's assumptions on pension pass-through are not well founded in law
11	Capex Funding/Capex Governance	▪ Provides an overview of our capital investment programme for RP3 and its critical importance to NERL's future operations ▪ Sets out our concerns regarding the basis for the CAA's proposed efficiency challenge ▪ Identifies that the 'ring-fencing' of the airspace modernisation investment may offer a false sense of comfort given the level of allowed funding and the interdependencies with other aspects of our plan ▪ Demonstrates why we consider that the CAA's new governance incentives undermine, rather than further the public interest and that the same aims can be achieved through less interventionist measures
12	Oceanic	▪ Sets out the proposed technological improvements to the Oceanic service that will deliver operational and safety benefits to customers ▪ Demonstrates that the CAA's efficiency challenge to our costs is unsupported ▪ Raises the significant concern that if the CAA's RP3 Decision is implemented the Oceanic business unit will be loss-making and will give rise to a cross-subsidy from our en route business which would be contrary to the terms of our Licence

13	Cost of capital and financeability	▪ Provides NERL's views on an appropriate rate of return for RP3 as measured through the weighted average cost of capital (WACC) ▪ Sets out our concerns that the CAA's views on WACC do not adequately reflect the cost of capital for an efficient ANSP over RP3
14	Annex - Ex-CDS Case Study	▪ This case study provides an example of the planning requirements and logistical challenges associated with delivery of a major change project in the ATM sector.
15	Index of SoC supporting documents	
16	Glossary of terms and commonly used abbreviations	

3. Background to RP3 and the context for the CMA's redetermination

3.1. Overview

45 The purpose of this Chapter is to draw together key themes relating to the background to RP3 with a view to helping the CMA to better understand the context for our RBP and the CAA's RP3 Decision.

46 In particular, this Chapter covers:

- Section 3.2: our approach to planning for RP3, including:
  - the key challenges faced by NERL in RP3 (see Section 3.2.1);
  - the impact of our experience during RP2 (see Section 3.2.2);
  - how this fed into our internal planning processes and customer consultation (see Section 3.2.3); and
  - why we consider the business plan we developed is in the public interest (see Section 3.2.4).
- Section 3.3: an overview of our concerns with the CAA's approach to its RP3 Decision; and
- Section 3.4: our expectations for the CMA's redetermination of our RP3 settlement.

47 In preparing this overview of the background issues, we are conscious that the CMA has already received a summary of the key features of NERL and the ATM industry in our Industry Overview document, including the legal framework within which we operate. These broad issues have also been touched upon in the CAA Notice of Reference and the industry 'teach-in' that took place on 12 November 2019.[15] In this Statement of Case we have avoided repetition of that background and instead sought to highlight the features that are particularly relevant in assessing what form of redetermination is in the public interest.

3.2. Our approach to RP3

3.2.1. Key challenges facing NERL in RP3

48 The challenges that NERL faces in RP3 go to the heart of our operations. As expressed in the Foreword to this Statement of Case, we operate a single integrated infrastructure which has to function without interruption, day in, day out. Our ability to do so is largely reliant on the skills of a professional body of ATCOs, supported by an equally professional body of technologists, engineers, procedure designers, safety analysts and many others. The key issues that relate to our structure and purpose, and which have directly impacted the development of our RBP, fall within three broad categories:

[15] NATS Teach In Slides of 12/11/2019

- the need to ensure operational resilience and the delivery of a service that meets safety and service targets and the expectations of our customers (see Section 3.2.1.1);
- the continuation of the commitment to delivering a technology refresh and new tools that commenced during RP2 (see Section 3.2.1.2); and
- the need to support and contribute to the airspace modernisation strategy (see Section 3.2.1.3).

49 These challenges must also be seen in the context of the drivers that influence our operating costs which are largely fixed or have limited flexibility. This is considered in more detail in Section 3.2.1.4.

50 Operational resilience (particularly through the availability of a sufficient number of suitably qualified ATCOs), technology change and airspace modernisation are all interlinked. Enhancements to technology, and modernisation of airspace design, can help to manage the workload of ATCOs and, by increasing capacity, ultimately have a positive effect on operational resilience.

51 None of these components are, however, individually a panacea for the network capacity limitations created by increasing traffic levels. Together they can be used to contribute to the needed increase in capacity but they draw on common resources. Extracting the highest total benefit within RP3 requires a balanced assessment of the resources required for each component and then overlaying that on a real world operational environment in which customers expect minimal disruption to the service from NERL on which they absolutely depend.

3.2.1.1. Ensuring operational resilience and meeting performance expectations

52 There are various drivers that influence the delivery of our services. The most critical of these is the volume of air traffic that arises in the airspace for which we are responsible. More traffic in constrained areas of airspace creates additional complexity in handling the traffic, and associated safety challenges. Unlike many other regulated businesses where additional volumes tend to reduce the cost per unit, the impact of the additional complexity reduces the maximum amount of traffic that a controller can handle safely, requiring increased resources, which tends to increase the cost per unit.

53 Nor can we turn away this extra business: our Licence requires us to be able handle all traffic that arises, without undue discrimination. As a provider of a network on which airlines and airports rely, the cost to them of an interruption in our service, or large delays, can be much larger than the marginal cost of keeping the network resilient and fit for purpose. This means that we must always have an eye to the future capacity of the network, while ensuring that there our fully redundant systems and processes that remain capable of dealing with both normal operations and any unusual circumstances that might arise – with the safety of the travelling public given priority above all else.

54 In the interests of brevity, we have not considered all of these drivers in detail, but have focused on those that most clearly demonstrate the specific characteristics of NERL's operations, including:

- the fundamental importance of ensuring safety in the skies (see Section 3.2.1.1.1);

- the impact of being a people-centric business, with a focus on the significance of the role played by ATCOs (see Section 3.2.1.1.2);
- the logistical challenges associated with planning for major change within the ATM industry whilst ensuring the appropriate levels of safety, resilience and functionality (see Section 3.2.1.1.3); and
- the financial impacts of any service failure on the part of NERL (see Section 3.2.1.1.4);

3.2.1.1.1. Ensuring safety in the skies

55 Ensuring safety in the skies is a fundamental purpose of ATM. This is enshrined in NERL's Licence[16] and in the corporate purpose of the NATS group: *Advancing aviation, keeping the skies safe*. Maintaining "*a high standard of safety in the provision of air traffic services"* is also the primary duty applicable to the regulation of the sector.[17] One of the constants for NERL's staff, Board and shareholders is the culture and drive to achieve the safest operation as is reasonably possible. This involves actively safeguarding today's traffic and continuous learning from that experience which is applied to keep safety risks *as low as reasonably practical* into the future.[18]

56 NERL has the ability to restrict traffic flows to the point where they can be safely handled by the available levels of technology and controllers at any given moment. In theory, traffic flows could be restricted to one aircraft in any sector at any time, all but guaranteeing safe operations for that single aircraft. However, ATM is not just about ensuring safety, but also about "*managing the flow of air traffic for the purpose of expediting and maintaining an orderly flow of air traffic"*.[19]

57 A service which is both safe, and efficient, will be measured by reference to cost and service performance as demonstrated through delays and environmental benefits, etc. This should not just be considered in terms of what customers experience today, but also through the lens of the development and maintenance of the UK ATM infrastructure to ensure it is fit for purpose to deliver and assure those metrics in the future.

58 Designing and delivering changes to ensure a fit for purpose infrastructure requires resource allocation to the planning and development stages, and also careful management in the rollout of the subsequent changes, if the aims of safety and efficiency are to be preserved throughout. Learning from previous experience and in-depth incident reviews clearly shows that insufficient attention to planning of intrinsically safer systems and processes can lead to future ways of working and applications of technology that increase systemic safety risk in ways that are not immediately obvious.

3.2.1.1.2. NERL is a people-centric business

59 Achieving the dual aims of safety and efficiency of traffic flow is complex and focused on people, especially Air Traffic Controllers (ATCOs).

60 ATCOs play a central role in our operational activities. Indeed, a key driver for an ATM operation is a system that maximises the volume of traffic that licensed ATCOs can handle

[16] Air Traffic Services Licence for NATS (En Route) PLC, June 2018, ('**NERL Licence**'), (SOC005), Part II, Condition 1(3), p. 7
[17] TA00, Sections 1-2.
[18] Accounts, NATS Holdings Limited, Annual Report and Accounts, Year ended 31 March 2019, ('**NATS Holdings Limited, Annual Report and Accounts, March 2019**'), (SOC122) p. 21
[19] NERL Licence, (SOC005), Part II, Condition 1(3), p. 7

before they reach their limiting workload level, above which safe operations could be compromised.

61 The process of identifying suitable candidates to become ATCOs and training them to a suitable level to operate effectively is intensive and time consuming. Typically only 1 out of every 50 applicants will be deemed suitable and it will normally take three years for a new entrant to achieve their first qualification (or 'validation') for the provision of ATC services within a specific geographic sector.[20] NERL supports this training process through the use of its comprehensive in-house training facilities.[21]

62 Once we have ATCOs available for our roster, we use them as intensively as is reasonable, taking into account industry regulations such as the CAA's Scheme for the Regulation of Air Traffic Controller Hours (SRATCOH).[22] In particular, we rely extensively on voluntary overtime to address workload peaks. We also use voluntary overtime to cover short term sickness issues that prevent ATCOs attending for their rostered shifts. However, that flexibility is limited because the available ATCO has to hold the necessary validation for the sectors that need more staff. There is a practical limit of 2 or 3 validations that an ATCO can hold due to the regulatory requirements to exercise those validations in order to keep them current.

63 In addition to the skills embodied in licensed ATCOs, NERL's operation is staffed by Air Traffic Service Assistants (ATSAs) and managers who use their own in-depth experience and training (often from ab initio controller training or on rotation from licensed air traffic control activities) to manage and plan the presentation of traffic to maximise the efficient use of ATCOs across the UK air traffic network. This is a complex activity which is fundamental to our safety assurance and business continuity. As a result, the skill set required from these staff is unique and not readily transferable from other industries.

64 We currently have low resilience in our cadre of ATCOs as a result of traffic growing in RP2 significantly more quickly than expected, along with lower staff numbers as a result of the voluntary redundancy programme put in place before the start of RP2 to meet customer priorities for lower cost (see Section 3.2.2 below) that was followed by more retirements in RP2 than expected (driven in part by pension taxation changes) and increased demands to support the deployment of our technology and airspace modernisation programmes.

65 Our plans for RP3 create extra demands on ATCO capacity to support technology and airspace change programmes. As a result, our plans for RP3 require the recruitment and training of new ATCOs to cope with anticipated traffic growth, to sustain validations in sufficient sectors as NERL hits an age related retirement bulge, particularly given that most retiring ATCOs will have at least two sector validations, and to provide sufficient capacity for the implementation of our investment programme.

66 In circumstances where NERL is already below its ideal ATCO validation requirements for the day-to-day service, even with extensive use of voluntary overtime, ATCO resource has become a limiting factor in the implementation of the changes required to keep the operation running at the day-to-day service level that customers want to see maintained from RP2, while

[20] There is an industry wide aspiration to move the traffic surveillance environment away from the current approach whereby ATCOs are validated to operate within specific geographical sectors to an alternative approach whereby ATCOs are validated on specific tools and tasks irrespective of the geographical location of the aircraft in that system (see Section 2.2.2 of the Industry Overview). This would shorten training times and remove the need for multi sector validations. However, the transition to that new way of working is not within the timelines of RP3 or RP4.
[21] For more detail, see Section 2 of the Industry Overview.
[22] The Scheme for the Regulation of Air Traffic Controllers Hours is CAA, Air Traffic Services Safety Requirements, CAP 670 - Third Issue, Amendment 1/2019, 1 June 2019, Effective 1 August 2019, ('Air Traffic Services Safety Requirements'), (SOC074). See also Section 2.2.4 of the Industry Overview

simultaneously managing complex change programmes in technology and airspace to assure that service can be maintained into RP4 and beyond.

3.2.1.1.3. Logistical issues in planning for major change to NERL's operations

67 Safety assurance is a fundamental underlying driver when planning for the implementation of change. Any change to our operational practices, including plans for the introduction of new technology and the planned airspace modernisation, requires robust reworking of safety cases and the impact on network capacity, introducing new costs. Requisite levels of analysis and assurance are essential to ensure that any changes introduced do not inadvertently increase systemic safety risks that the original approach had carefully mitigated.

68 The ATC services that NERL provides are required both by our Licence, and as a matter of practicality, to operate 24 hours a day, 365 days a year. Airline flight operations will not stop for the aviation equivalent of 'weekend engineering works on the line' or for the network to be closed at night. Therefore any changes to systems or working practices have to be planned carefully and tested extensively to ensure they can be effected safely with the minimum of disruption to the operation. Changing technology safely in such an operating environment could be described as equivalent to replacing the engine in a car while it continues to drive along the road.

69 Problems with technology change programmes in other industries[23] illustrate the challenge and impact of failing to manage transitions effectively. One of the key elements in such an undertaking is forward planning:

- planning for the systems to be safe and resilient in an ATM environment;
- planning for the methodology that will retain live operation and redundant back-up systems during transition to the new systems; and
- planning for the training of both ATCOs and engineers on the new systems so that we can move to the new ways of working safely while maintaining an appropriate proportion of ATCOs' capacity to handle traffic workload.

70 While all changes require rigorous planning, the scale of technical change underway in RP2 and RP3 is unprecedented with multiple interdependencies between all elements of the change programme. This adds further to the rigour in ensuring that the support to the operation is not compromised, risking either safety or unacceptable levels of delay for the travelling public.

71 In addition, the adoption of new technology needs to balance the benefits that the most advanced technology might bring to the operation (e.g. the use of artificial intelligence to alleviate some aspects of ATCO workload) against the requirement for robust safety cases. Those safety cases take into account a wide range of factors, from the provenance and performance history of any new technology system through to the human factors, including the implications of an ATCO or engineer transitioning to and operating that new system.

72 ATCOs play an essential role in designing and implementing technological and airspace change as an adjunct to managing traffic day-to-day. . Although NERL can, and does, use contractors to supplement its engineering capability for these challenges, there is no viable

[23] Slaughter and May, TSB Review - An Independent Review Following TSB's Migration on to a New Platform in April 2018, October 2019, ('**TSB Review**'), (SOC026)

external source of trained and experienced ATCOs. ATCOs are needed to provide design input to new technology systems and optimising new designs of airspace and its associated traffic flows. When these changes come together to create a new way of working, ATCOs must be released from their day-to-day operations to train and prepare for safe transition to the new operating procedures. This transition period requires a constraint on capacity in order for safety standards to be maintained while ATCOs become fully conversant with the changes. These transitions need to be organised in a way that has minimum impact on operational performance. For example, training, system development and implementation input from ATCOs will be scheduled to take place outside of the peak traffic experienced during the summer period.

73 The programme schedules to deliver change and associated benefits are therefore generally set significantly far in advance using robust cost estimates and with risks costed in at a portfolio / programme level. These risks are refined and mitigated as the programme moves into subsequent phases of maturity, taking advantage of the ability to manage risks across the portfolio. Attempts to fix costs and delivery timescales at too early a stage tends to bake risks into the plans, thereby limiting flexibility to manage across the portfolio and to be responsive to changes in circumstances as they arise.

3.2.1.1.4. Financial Impact of Service Failure

74 A key feature of an en route Air Navigation Service Provider (ANSP) is its place at the centre of its country's aviation traffic network. Ever more crowded skies and the expansion of the rapid turnaround, multi sector flight operations of low-cost airlines, such as easyJet and Ryanair, have put an even greater premium on avoiding network delays.[24] The EC Performance Review Unit (PRU) has estimated that the costs to airlines from delays in 2018 were approximately €1.9 billion.[25]

75 In the past, airline customers have lobbied for lowest price services, in part to offset short term industry downturns.[26] During RP2, traffic levels have increased, airline competition has intensified, and customers have suffered as a result of network delays from industrial action and technical issues across Europe. Consequently, airline attention has focused on the importance of resilience and delay management in their strategic requirements for ANSPs in Europe. This includes ensuring that ANSPs have the resources to ensure that neither technology failures nor staff shortages become a regular feature of day-to-day operations. [27]

76 One reason for this is that, in addition to the lost revenue from delays that might lead to flight cancellations, European Regulation EU261/2004[28] has established a regime of cost reimbursement and additional compensation to passengers for flight cancellations and delays which can lead to liabilities that dwarf the marginal additional costs per flight required to fund ANSP investment in resilience.

[24] The creation and work of the Industry Resilience Group has contributed to avoiding delays.
[25] Eurocontrol, Performance Review Report - reviews the performance of air traffic management in Europe during the calendar year, May 2019, ('**Performance Review Report, 2018**') (SOC035), p. 19
[26] RP2 Airline Community – Special interests Paper, December 2013, ('**Special Interests Paper**'), (SOC134), p. 1 - 3
[27] In airline responses to RP3, airlines, such as Ryanair, asked for more stretching delay targets on to help reduce delay to airlines and passengers. In contrast for RP2, airlines asked for more stretching delay targets on NERL because they believed they would be too easy for NERL to outperform against.
[28] Regulation (EC) No 261/2004 of the European Parliament and of the Council of 11 February 2004 establishing common rules on compensation and assistance to passengers in the event of denied boarding and of cancellation or long delay of flights, and repealing Regulation (EEC) No 295/91, Official Journal of the European Union, L 46 Volume 47, 17 February 2004 , ('**Regulation (EC) No 261/2004**'), (SOC006), p. 1 - 9

77 Add to these avoided costs the actual savings generated from reduced fuel burn due to more direct routings and reduced inflight holding, and the industry benefits achievable from relatively marginal additional costs for ANSP services are clearly evident.

78 That is not to say that there are unlimited benefits to be gained. The benefits to airlines of improvements in delay performance within the UK network are important but their value has to be assessed against the backdrop of other delays in the system. These include uncontrollable factors such as weather and delays caused by neighbouring ANSPs, which affect flights once they leave or before they re-enter UK airspace, as well as airport runway capacity constraints. This means that the benefits that can be realised diminish with each marginal improvement in service. In addition, the cost for NERL to achieve those marginal improvements increases, such that the benefits no longer support the cost of NERL achieving them. We rely on consultation with our customers to establish the right balance (see Section 3.2.3.4 below).

3.2.1.2. The continuing commitment to delivering technological improvements

79 Technology is essential to the provision of air traffic services: controllers rely on communications and surveillance equipment to see and communicate with aircraft and this is brought together with flight plan information to allow them to undertake their control function. The accuracy and availability of information provided by this technology is critical to ensuring the safety and resilience of the overall service.

80 The purpose of NERL's investment programme is to enhance, develop and sustain operational capabilities to ensure the ability to provide on-going service performance, resilience to unplanned events (including system failure) and to improve performance and value to customers in line with agreed performance targets. At its highest level it comprises a technology programme and an airspace modernisation programme. It seeks to continue the programme commenced in RP2, with the achievements during RP3 providing a bridge to fully realising the benefits during RP4.

81 For many years it has been possible for NERL to continue to offer service improvements by sustaining its existing systems and enhancing them through incremental changes and the addition of decision support tools compatible with their early architectures[29]. Hardware refreshes, though difficult due to the need to assure old applications on new server technology, have also extended the life of many systems, some for much longer than their originally intended life span. However, some of these systems are beyond their normal end of life and are becoming more difficult and costly to sustain. Additionally it is no longer possible to enhance these systems to meet future needs, including improvements to address the increasing cyber threat as well as new tools to improve ATC performance.

82 The technology programme focuses on updating NERL's core ATM infrastructure, replacing legacy systems and deploying a modern and capable new system to support new operational concepts and modern airspace designs. This aspect of the programme, called Deploying SESAR (DSESAR)[30], will enable and deliver core SESAR capabilities into operational service in line with the Pilot Common Project (PCP) and related European regulations.

[29] Trax International Report, NERL's performance relative to other large European ANSPs - Position Paper for the Competition and Markets Authority 27/11/2019, ('Trax Report, November 2019'), (SOC125)
[30] See Industry Overview section 2.6.3 and Trax Report (SOC125), Section 3.

83 The technology programme will also continue to sustain existing legacy systems to ensure that they remain resilient and fit for purpose up to and through the transition programme.

84 The SESAR programme has been validating future operational concepts capable of delivering the performance expectations demanded by the ATM Master Plan. The new concepts, such as the use of 4D Trajectories, Collaborative Decision Making (CDM) and System Wide Information Management (SWIM) are dependent on the new technology being validated as part of the programme. Some of these concepts are now complete and have been included in the PCP. Our current systems, however, have architectures that are monolithic and data structures designed to support only simple flight plans and trajectories. They also suffer from issues that are increasingly difficult to deal with: systems, such as our core flight plan processing system, NAS, use early software languages that depend upon a rapidly declining number of software specialists. In general, they are therefore no longer capable of being enhanced to meet the goals of SESAR or the needs of the industry, hence the driving need to replace them.

85 The timing of this need to replace NERL's legacy assets with SESAR compliant systems is an opportunity to take advantage of the IT industry's proven technologies. Our existing model follows a traditional approach to ATM systems. Many of our systems are standalone, operate separately from one another and require significant point-to-point integration, which is inefficient. While this approach was a constraint in our legacy systems architecture, introducing a more modern architecture will enable a more flexible and efficient approach.

86 Our new model is based on the industry-recognised Information Technology Infrastructure Library (ITIL)[31] service framework. Our different ATM applications are integrated together on a common platform, and managed together as part of Service Oriented Architecture. This brings the benefits of greater automation, a focus on prevention, proactive incident management, improved capacity and change management, all in support of greater efficiency and improved system availability.

87 A separate stream of technology innovation which falls outside the SESAR programme is the introduction of space based ADS¬B aircraft position data for deployment over the ocean, where there is no ground-based surveillance coverage. This programme entered trial operations in March 2019 and is on track to commence full operations in RP3. This is addressed in more detail in Section 12.

88 The new technology planned and being implemented by NERL is of fundamental importance to the critical programme of airspace modernisation. Without the technology the impact of any airspace redesign will be sub-optimal, if not rendered impossible, which would constrain traffic growth into the future. The legacy technology in use has a planned end date and any delay to the new technology will result in a longer period running the legacy technology at increased cost and risk to the resilience of our operations.

3.2.1.3. NERL's role in delivering airspace modernisation

89 UK controlled airspace is in need of modernisation. We have reached the point where localised optimisation of airspace has been all but exhausted, and now fundamental redesign of the UK airspace network is required to meet the growing traffic demands and address other drivers such as improved aircraft navigation technology and reduced tolerance for noise and

[31] ITIL provides a set of detailed practices for IT service management that focuses on aligning IT services with the needs of the business.

carbon emissions (see Section 2.4.2 of the Industry Overview). Modifications to airspace design that can smooth traffic flows, reduce bottlenecks and enhance pilots' ability to fly their aircraft on pre-set routes that require less ATCO intervention will contribute to managing the pressures placed on operational resilience.

90 Airspace modernisation is, therefore, a common goal among NERL, government and all aviation industry stakeholders.[32] It is also recognised by the CAA as demonstrated by the central role it has played in its RP3 Decision[33] and the CAA's Notice of Reference to the CMA.[34]

91 Proposals for airspace modernisation formed a part of NERL's plans for RP2 but, for the reasons outlined in Section 3.2.2 below, the majority of it has been delayed until RP3.

92 To achieve the level of change required will require comprehensive technical input and consultation with a wide range of airspace stakeholders with competing interests and priorities. The overall planning process is at a scale beyond anything that NERL has ever undertaken and represents an additional programme of works above and beyond the elements for which NERL is responsible under its Licence.

93 NERL, DfT and the CAA have agreed that NERL is well placed to provide industry co-ordination and leadership on behalf of government in this enterprise and have provided stand-alone funding for that management function. Details of how this programme is due to be progressed during RP3 are set out in Section 5 below.

94 A priority for NERL must, however, be to ensure that NERL's technology and infrastructure is in place to ensure that the optimal benefits from the redesigned airspace can be realised.

3.2.1.4. NERL has minimal operating cost flexibility

95 Opex accounts for a substantial proportion of NERL's cost base (approximately 70% of total determined costs over RP3).[35] This is considerably higher than regulated networks, such as energy and water, which are typically more capital intensive. Of this opex approximately 80%[36] is 'fixed' in that it is not impacted by movements in traffic volumes.

96 As explained in Section 3.2.1.1.2 above, NERL is a people-centric business and even with the technology improvements currently planned this is unlikely to change at any point in the near future. Our core assets are our ATCOs and they comprise almost 50% of our total staff costs. We have explained that we must have access to a sufficient number of validated ATCOs to fulfil our service obligations (see Section 3.2.1.1.2) and to facilitate the delivery of technological and airspace change (see Section 3.2.1.1.3). Even if traffic levels were to fall, a reduction in operational staff numbers would be unfeasible as it would create capacity and operational impacts for customers that are disproportionate to any short term savings from avoided salary costs.

[32] CAA, Airspace Modernisation Strategy, CAP 1711, December 2018, ('**Airspace Modernisation Strategy, CAP 1711**'), (SOC107)
[33] Reference to the Competition and Markets Authority of the NERL RP3 price controls, CAP 1857, document 002, 2019, ('**CAA RP3 Notice of reference**'), (SOC026), para. 9, p. 6
[34] CAA Notice of Reference, para. 9.
[35] £2156m Opex from £3155m total determined costs in NERL's RP3 RBP
This is based on operating costs (excl. pensions) and non-regulatory income of £1„665m, pension costs of £392m and total determined costs of £2,956m as per CAA (2019), 'Summary of CAA RP3 conclusions', Letter to Martin Rolfe, 5 August, (SOC163) p. 8.
[36] NATS, Operating Cost Support Pack, 2019, ('**Operating Costs Support Pack**'), (SOC106), p. 15 and p. 16

97 NERL's fixed asset base of items such as radars, operational centres and radio communications is not variable dependent on traffic volumes or cost constraints.

98 Moreover, new cost challenges continue to present themselves such as increased cyber security requirements and potential changes to the scope of our accountabilities through government policy decisions and related changes in legislation. Further details on our opex proposals, and the challenges we face in RP3, are set out in Section 8 below.

3.2.2. The impact of our experience during RP2

3.2.2.1. Background to RP2

99 The development of our RP2 plan coincided with the economic downturn experienced in the last years of RP1, leading the aviation industry to believe that it was about to come under severe cost and competitive pressure. As a result, during the RP2 planning process airlines called for NERL to present business plans that involved sizeable price reductions.[37] This pressure also led the CAA to ask NERL to plan to meet or surpass the rate of cost reduction that was likely to be adopted by the EU under SES regulations.[38] Alongside this, NERL was aware that airspace, at least in the London area, was long overdue for redesign (see Section 3.2.1.3 above) and this became a major plank in the investment programme for RP2, alongside a plan to start to introduce SESAR technology with a measured pace in accordance with the SES aspirations.[39]

100 NERL's RP2 business plan set out an investment programme to improve service delivery to customers whilst seeing real reductions in user charges. It was developed through an extensive customer consultation and engagement process over 2013 and provided the UK input to the UK/Ireland Performance Plan for RP2.

3.2.2.2. The CAA's RP2 Decision

101 The CAA proposals for RP2 initially required DUC reductions of 5.3% per year, which exceeded the EU target of 3.3% across RP2.[40] Whilst NERL's RP2 plan had itself built in cost challenges that led to a 18% real reduction in our charges, the resilience implications of the scale of the CAA's proposed cuts were significant and we engaged with the CAA on our concerns.

3.2.2.3. Implementing the RP2 Decision

102 The CAA's final decision for RP2, which was accepted by NERL, provided a 21% real reduction in our prices. In order to meet this substantial cost challenge, NERL was forced to reduce employee numbers. While some reduction in corporate overhead was implemented, the only means to make the level of cuts required was to resource plan based on the predicted reductions in traffic and to put in place at the end of RP1 a voluntary redundancy programme for ATCOs for the first time in NERL's history. The cost of this exercise was borne by the shareholders because the redundancy costs were incurred in the last years of RP1, without those costs having being planned for as part of the RP1 regulatory settlement.

[37] Ryanair, Response to CAA Consultation on process for developing economic framework for RP2, September 2012, ('**Ryanair Response**'), (SOC116) on the process for developing economic framework for RP2.
[38] CAA Letter to NERL setting out CAA requirements for NERL Revised Business Plan, 09/09/2013, ('**CAA Letter to NERL setting out CAA requirements for NERL Revised Business Plan**'), (SOC137), p. 3. It is worth noting that the targets proposed by the CAA in this context were in excess of the rate of cost reduction that was eventually accepted as the SES target.
[39] NERL 2013, RP2 Revised Business Plan (2015-2019) (SOC147), pp. 2-4
[40] CAA, Draft FAB UK-Ireland RP2 Performance Plan Consultation Document, February 2014, ('**Draft FAB UK-Ireland RP2 Performance Plan - Consultation Document**') (SOC142)

103 In planning to deliver these cost savings we took all reasonable measures available to us to avoid an impact on customer service but, given the scale of reductions required, some impact was unavoidable and inevitable. The resource reductions were carefully planned, based on historical retirement rates as well as traffic forecasts which, at the time, suggested a reduction in the rate of traffic growth. NERL made it clear to customers, however, that these cuts would mean that there would be lower resilience levels to staff sickness, that peak traffic periods would have more associated delays and that 'bad days' would be worse than previously experienced as a result of these factors.[41] Some concerns about this approach were expressed - notably, the NERL unions stated that they believed the manpower reductions were unwise and would leave the company exposed.[42] However, we had confidence based on discussions with customers and the regulator that we had support for the compromises being made and that they were overall in the public interest.

3.2.2.4. Actual experience during RP2

104 Events during the RP2 period demonstrably increased the risks associated with the enforced reduction in staff numbers. After the RP2 plan was produced, there were important changes in both the business environment and technological landscape against which the plan had been framed. This included higher than expected traffic growth, reduced fuel prices, the EU adoption of the PCP Implementing Rule and progress in the development of SESAR capable systems such as iTEC. Traffic growth experienced during RP2 has been c14%, while the STATFOR forecast for RP2 on which the plan was based was 9.9%. [43]

105 In addition, there was adverse public response to initial airspace change proposals, which, when coupled with uncertainty about new runway developments in the South East, led stakeholders to be wary about supporting changes to lower airspace during RP2 (see Section 3.2.2.4.1 below).

106 These developments required NERL to adapt its thinking with regard to the most efficient use of investment funds and timescale for benefit delivery. The increased traffic volume meant that continuing to exploit our legacy systems throughout RP2 and beyond was no longer a cost-effective or efficient option and so it was appropriate to accelerate investment in the new technologies that underpin capacity and efficiency enhancements anticipated in later RPs (see Section 3.2.2.4.2 below).

3.2.2.4.1. Changes to airspace modernisation strategy

107 NERL's original airspace plan envisaged implementing widespread lower level airspace changes while still using existing technologies.[44] In parallel the DfT and the CAA were reviewing their policy on airspace change, including the type and level of consultation required.[45] [46]

108 Given the challenges associated with gaining approval for airspace change within the prevalent environment that became apparent during the early years of RP2 (see Section 3.2.2.4 above), delivering our airspace plan in line with its original scope and timescales was

[41] RP2 Customer Consultation Opex Minutes, 16/06/2013, ('**RP2 Customer Consultation Opex Workshop Minutes**'), (SOC139), p. 6
[42] Prospect and PCS Submission, CAA/IAA Draft, UK-Ireland RP2 Performance Plan Consultation Document, 14/04/2014, ('**Prospect and PCS Submission on RP2 Performance Plan Consultation Document**'), (SOC140), p. 4 and p. 13, 14 April 2014
[43] NATS, Draft Service Investment Plan (SIP) 2020, October 2019, ('**Draft SIP 2020**'), (SOC089)
[44] NERL RP2 plan, (SOC147), pp. 2-4.
[45] UK Airspace Policy: A framework for balanced decisions: on the design and use of airspace: Moving Britain Ahead, Department for Transport, February 2017, ('**UK Airspace Policy**'), (SOC099)
[46] CAA, Consultation on proposals for a revised airspace change process, CAP 1389, March 2016, ('**Consultation on proposals for a revised airspace change process, CAP 1389**'), (SOC101)

not considered feasible. Consequently, it was reluctantly agreed by all parties that airspace modernisation should be delayed and the CAA facilitated a modification to NERL's Licence to remove the obligation to deliver that programme in RP2 (see Section 3.2.2.4.2 below). The sequence of events that led to the refocus of our approach is considered in more detail in Section 11.3.2 below.

3.2.2.4.2. Consequential RP2 Capex Changes

109 The need for changes to the investment programme was discussed and agreed through the Airports Commission Senior Delivery Group in September 2015. Consultation with customers through our Service and Investment Plans (**SIP**) for 2015 and 2016 also recognised the need to revise the airspace programme and expressed a collective ambition to accelerate the deployment of new technologies, delivering earlier benefits and reducing investment in legacy systems. This programme to accelerate the elements of SESAR technology that NERL had chosen to deploy became known in the business as Deploying SESAR (see Section 3.2.1.2 above).

110 The changes were also discussed and agreed with the CAA, who were responsible for changing NERL's Licence to remove the specific conditions relating to Transition Altitude and LAMP airspace changes in RP2.[47] The principles of the Licence changes were agreed through a workshop with the CAA in October 2015. It followed a meeting between NERL and the CAA's governance body of NERL at that time (the NERL Management Licence Coordination Committee) in September 2015 on the changes we were making to our investment plan and the reasons for them.

111 SIP 2016 set out the basis for the revised plan based on a far wider scope than had originally been envisaged – a fundamental redesign and replacement of our core technology infrastructure and tools.[48] It needed to be supported by a more detailed bottom up plan on how to deploy SESAR capabilities, including an understanding of the operational and technical requirements costs, plans and risks, which NERL completed in 2016.[49] As a result, NERL identified a need to increase the capex envelope in RP2.[50] The key drivers for the projected cost increase over RP2 were set out in SIP 2017 and represented an increase from £620m to £750-780m in outturn prices.[51] The revised range included an element of contingency recognising that, as with any programme of this scale and complexity, assumptions will continue to evolve and mature.[52]

112 In practice, the capex increase in RP2 related to expenditure that would otherwise need to be incurred during RP3.[53] In making the proposal, NERL carefully considered whether this represented the best way forward for customers by assessing the value and feasibility of this approach and two alternatives against five assessment criteria were presented to customers, with NERL expressing a preference for one.[54] After extensive consultation undertaken during Autumn 2016 and Spring 2017 customers accepted that NERL's preferred approach did

[47] Proposal to modify NATS (En Route) plc licence in respect of reporting of certain plans under Condition 10a: Notice under section 11(2) of the Transport Act 2000, November 2015, CAP 1352, ('**CAA, Proposal to modify NATS (En Route) plc licence CAP1352**') (SOC141), p. 6-7
[48] NATS, Service and Investment Plan (SIP) 2015, Form, Scope and Level of Detail Subject to CAA Approval, 31/12/2015, ('**SIP 2016**'), (SOC053)
[49] Service Improvement Plan (SIP) 2017 Final, Form, Scope and Level of Detail Subject to CAA Approval, December 2016, ('**SIP 2017 Final**'), (SOC076)
[50] SIP 2017 Final, (SOC076)
[51] SIP 2017 Final, (SOC076)
[52] SIP 2017 Final, (SOC076)
[53] SIP 2017 Final, (SOC076)
[54] SIP 2017 Final, (SOC076)

represent the best way forward and the revised plan was approved by the CAA as part of the Licence Condition 10 plan published in March 2017 together with its June 2017 addendum.[55]

113 Since then NERL has made real progress in delivering its DSESAR programme as well as delivering important airspace changes, particularly those wholly within NERL's control and these have been reported to customers and the CAA through regular SIP consultations.[56]

114 Notably this change in focus for the RP2 investment programme required input from ATCOs (as per Section 3.2.1.1.3 above) which increased the demand on those reduced resources at the same time as the operational demand increased due to the unexpected levels of traffic growth. The same was true for the training programmes required to roll that new technology out.

3.2.2.4.3. Investigation into potential Licence breach - Oberon

115 As traffic levels started to increase at a higher rate than forecast (see Section 3.2.2.4 above), that increase was not experienced uniformly across the network. While average increases were significant, local increases, such as at Stansted Airport due to Ryanair's expansion, were beyond all expectations with growth of 31% over RP2.[57]

116 When this increase in traffic was combined with the delay to airspace changes that would have improved the flows in the area, a number of delay 'hotspots' began to arise. The most high profile of these affected the London approach function into Stansted Airport. A scenario of constrained traffic flows due to the constrained airspace was made noticeably worse on occasions by staff sickness when no appropriately validated ATCOs were available at short notice to substitute for the sick ATCO. Eventually, the CAA commenced an investigation at the request of Stansted Airport, followed by Ryanair, into the delays experienced at Stansted (referred to as Project Oberon).[58] The substance of the complaint was multi layered but an important aspect was whether NERL had failed to meet reasonable demand for its services in accordance with Licence Condition 2.2(a).

117 NERL's defence to allegations of Licence breach was that consultation with customers on RP2, along with CAA's decision to reduce costs further than proposed by NERL, had led to a business plan for the Reference Period that was premised on lower resilience for a lower cost.[59] Whilst NERL had recognised the increasing traffic levels and the need for more ATCOs, the process of recruiting and training was a medium-term project given the unavoidable durations involved (see Section 3.2.1.1.2 above). In the interim, following a year-long dispute with all staff including ATCOs over pay, a number of short term measures such as preferential overtime rates and encouraging increased validations on the Stansted airspace were all being progressed. The CAA investigation concluded that there had been no breach of NERL's Licence but stated that it had been a finely balanced judgement and in particular that the CAA did not acknowledge the qualifications to the RP2 plan on which NERL had relied.[60] The CAA expected NERL to comply with certain absolute obligations in the Licence with respect to

[55] NATS, RP2 Capital Investment Plan (2015 -2019) for Condition 10, March 2017, ('**C10 Airspace and Technology Plan 2017**'), (SOC070'); RP2 Capital Investment Plan Condition 10 (C10) Addendum, June 2017, ('C10 Addendum June 2017'), (SOC142)
[56] SIP 2018 (SOC145) SIP 2019 (SOC144) and Draft SIP 2020, (SOC089)
[57] Draft SIP 2020, (SOC089)
[58] Investigation under section 34 of the Transport Act 2000: Project Oberon, Final Report non-confidential, CAP1578, July 2017, ('**Project Oberon report**') (SOC010)
[59] Hutchinson, NERL performance at Stansted, 19 September 2016, (SOC146), pp. 1-2.
[60] Investigation under Section 34 of the Transport Act 2000: Project Oberon, Final Report Non-Confidential, CAP1578, July 2017, ('**Project Oberon Report**'), (SOC010)

delay and network capacity but did not go so far as to define the minimum level of those obligations.

3.2.2.5. Conclusions on the history of RP2

118 Our experience in RP2 demonstrated the potential impact of changing circumstances on our operational resilience and investment planning – both in actual terms, as evidenced by the capacity constraints experienced with our staffing levels, and in terms of perception as evidenced by the customer complaints about service delivery. Having managed to maintain good service quality and safety performance in accordance with its RP2 targets despite the unexpected challenges described above, NERL had no reason to believe that it was at risk of Licence breach from complaints related to a failure to meet reasonable demand. The realisation that this was not the case, following the views expressed by the CAA in its conclusions on the Project Oberon investigation, raised considerable concerns within NERL. They were taken into careful consideration in the planning for RP3, particularly in relation to any measures impacting on service quality and operational capacity.

3.2.3. Our approach to developing the RP3 business plan

3.2.3.1. Fundamental aims for RP3

119 The starting point for NERL's internal planning for RP3 was consistent with previous regulatory cycles. We consulted extensively with customers to establish their priorities, allowing us to develop our plans based on ensuring the necessary levels of safety, delivering maximum value for customers and, wherever practicable, achieving real cost reductions. This had to be premised on 3 fundamental aims:

- first, the continuation of the commitment to delivering the technology refresh and new tools that had been started in RP2;
- second, planning for airspace change as government policy appeared to be developing to support that deliverable; and
- third, to match the overall safety and service targets that we had managed to deliver in RP2 and which our customers supported.

120 In light of the experience during RP2, however, it was important to ensure that all of these deliverables could be achieved without compromising the resilience of the day-to-day service on a more granular level – both immediately and in response to future challenges to network capacity and operational resilience.

121 There is no dividing line between resources required for day-to-day resilience and those required to plan and deliver investment programmes.[61] In this context, the availability of a sufficient number of ATCOs with an adequate level of individual validations is a key resource.

3.2.3.2. Our approach to developing our RP3 plan

122 Development of the RP3 plan was an iterative process of determining the safety, service and technology deliverables that NERL believed were appropriate to both satisfy customer requirements and to satisfy what we understood to be the CAA's view of an acceptable minimum level of service. Our process took into account the key challenges outlined in Section 3.2.1 above and the lessons learnt from our experience during RP2 (see Section 3.2.2

[61] For further discussion, see section 2.6.4 of the Industry Overview.

above). It was also based on extensive consultation with our customers (see Section 3.2.3.4 below).

123 Our overall approach can be summarised as follows:

- Start with a baseline of the approaches and policies adopted by the CAA historically, unless the CAA (or the latest SES legislation) had already signalled a likely change to them.
- Assess the requirements to ensure safe delivery of the level of service required by customers in consultation, taking into account increasing traffic levels and dissatisfaction with the resilience levels provided during RP2.
- Assess the additional requirements for a challenging but achievable plan for completion of the delivery of the SESAR technology programme including new tools, replacement of end of life legacy systems and the platforms required to support airspace changes and the capacity efficiencies they bring.
- Assess the additional requirements to design, assure and implement airspace change.
- Run multiple scenarios to achieve the above deliverables and select the scenario that provides the best balance of risk management, cost to customers and delivery of benefits within RP3.
- Challenge the efficiency of the costs of that plan on an ongoing basis and, in addition, layer on top as yet unallocated central cost savings that are likely to be achievable based on experience and management judgement.

124 We therefore looked at the feasibility and resource demands of different combinations of technology deployment, taking into account the consequential demands on the operation for the release of operational ATCOs to support that programme and its ultimate deployment in the winter season. This approach was in contrast to RP2 where NERL aimed to meet the upper end of the SES cost efficiency target range, as instructed by the CAA, and set internal resource on the assumption that some high traffic zones and periods would be subject to periods of disruption in circumstances where rostered ATCOs were taken sick at the last minute and ATCOs with the right validations were not available to substitute. Nonetheless, we were trying to strike the right balance of cost and resilience that customers would support for RP3.

125 In September and November 2017, we wrote to the CAA to establish a number of material regulatory assumptions on which we would build this plan.[62] The aim was to save unnecessary reworking of financial and other assumptions later on. The CAA decided to provide only high level guidance and expected NERL to set out and justify our own assumptions in creation of our plan. For example in CAP1593[63] the CAA stated that:

> *It is important that NERL rises to the challenge of producing a well evidenced business plan that wins both our confidence and that of other stakeholders. In this context an*

[62] Phelps, Assumptions underlying NERL's RP3 Initial Business Plan, 12 September 2017 (SOC166) and Phelps, NERL response to CAA consultation on "Guidance for NERL in preparing our business plan for Reference Period 3" (CAP 1593), 10 November 2017 (SOC162)
[63] CAA, Guidance for NERL in preparing its Business Plan for Reference Period 3: Consultation document, CAP1593, 2017, ('**RP3 Business Plan Guidance, 2017**') (SOC017)

unnecessarily interventionist approach by the CAA at an early stage may distract NERL's attention and focus from establishing a persuasive and well evidenced vision for the services it provides to its customers, passengers and other stakeholders.

3.2.3.3. Other relevant factors for RP3

126 At the same time, a number of relevant new issues were under discussion between the CAA, DfT and NERL. These included:

- increased mandating of electronic visibility of aircraft;
- the potential for addressing by the end of RP3 the impact of the new industry of unmanned aerial vehicles, from Amazon cargo carriers to airborne electric taxis; and
- the perennial ambition of the redesign of London airspace.

127 This latter subject appeared to have renewed political momentum, including a decision on the third runway at Heathrow.[64] However, it was not clear how or to what extent these issues would be built into the NERL Licence for RP3. In the event, based on proposals from the CAA,[65] NERL evolved an approach whereby we would submit our 'core' plan covering the usual content for continuation of the air traffic service into RP3, and would also offer a 'wider' plan for these new elements for further discussion, with associated cost estimates where possible and realistic to provide them.

128 NERL's business plan focused almost exclusively on the core plan since cost estimates for the wider plan were difficult to assess without more clarity on the outputs required. Eventually, however, the concept of airspace change was incorporated by the CAA into its RP3 proposals, but on a broader scale. The CAA changed those proposals from being a plan for London and South East UK airspace only, to being a master plan for the whole of UK airspace.[66] Although discussions between DfT, the CAA and NERL had led to a concept that would help use NERL's network expertise to co-ordinate a masterplan for submission to the CAA for approval, the stretch to the whole of UK airspace remains a major change with associated concerns that have still not been resolved or costed (see Section 5 below).

3.2.3.4. Consultation with customers

129 NERL has an extensive customer consultation and engagement process managed by our Customer Affairs department and documented in our Code Of Practice.[67] NERL arranges meetings with airlines and airports on a regular basis including our service and investment plan, operational and flight efficiency partnership agreements, Oceanic operations meetings and an extensive bilateral engagement process. This customer consultation and engagement framework has been highlighted as an exemplar by IATA and airline customers.[68] The RP3 planning was therefore not carried out by NERL in isolation from the input of our customers and stakeholders.

[64] UK Parliament, Government decides on new runway at Heathrow, 25/10/2016, ('**Government decides on new runway at Heathrow**'), (SOC127)
[65] CAA, Guidance for NERL in Preparing its Business Plan for Reference Period 3, CAP 1625, 2018, ('**Guidance for NERL in Preparing its Business Plan for RP3, 2018**'), (SOC030)
[66] CAA, UK RP3 CAA Decision Document, CAP1830, August 2019, ('**CAA RP3 Decision**') (SOC012), para 1.12
[67] NERL Licence - Condition 16, Code of Practice, Updated December 2014, ('**Code of Practice 2014**'), (SOC056)
[68] Trax International Report, SIP Review of Format and Structure, July 2019, ('**Trax Report, July 2019**'), (SOC022)

130 In summer 2017 NERL invited all of our airline and airport contacts to take part in initial consultation on RP3 priorities to inform creation of the initial NERL RP3 Business Plan (IBP). Bilateral discussions were held with 15 of NERL's biggest airline customers and 6 Airports. Customers were asked: what their priorities are for NERL in RP3; what their businesses were expecting in the RP3 timescale that NERL should take into account; if they planned to take part in customer consultation; and if they supported having a customer co-chair. The summary outcome of this consultation is reflected in Chapter 2 of the IBP and RBP.[69]

131 In February 2018 NERL issued invitations to join the RP3 Customer Consultation process to 101 airlines, IATA and business aviation customer organisations and 44 airports. Following this invitation, 55 customer representatives from 29 organisations signed up to the process.[70] Together they represented the majority of movements through UK airspace and a cross section of airline and airport interests and trade associations. They were invited to elect a customer co-chair, which they did.

132 In February 2018 Customers were consulted on the working arrangements, code of conduct and Terms of Reference[71] of the Customer Consultation Working Group (CCWG). Customer and NERL co-chairs were agreed and feedback was taken into account regarding the consultation process and content.

133 At the first CCWG meeting NERL proposed a programme of meetings and workshops, and outline agendas for each of the meetings were agreed. These were amended with the agreement of the CCWG as the process progressed including the addition of extra meetings/workshops between NERL specialists and members of the airspace user community to explore specialist subjects. Three extra workshops were also arranged to further explore headcount and to discuss the costs and benefits of ADS-B in the Oceanic environment. An additional meeting and WebEx were also held to enable UK airports to be briefed on NERL's initial RP3 Business Plan and provide their thoughts, observations and requests into the process. In total NERL held 15 CCWG consultation meetings and WebEx between February and September 2018.

134 The co-chairs' view was that the process had been well run.[72] Working arrangements were appropriate with minor modifications made by agreement through the CCWG when required. All parties were co-operative and considerate of other diary priorities, appropriate attendance and additional requests. NERL worked with the co-chairs to ensure the meetings were well-planned and effective and provided well-structured and clear information ahead of all the meetings. The NATS CCWG website was used effectively to provide all the necessary papers and slides in a timely manner and create a library of information accessible by all CCWG members.

135 Overall the Customer, the CAA and co-chairs feedback was that the process had been well run and was much more thorough and inclusive than that carried out by other ANSPs.[73] The co-chairs recommended that given the huge amount of time and effort put in by NERL and

[69] IBP Chapter 2 (SOC168) and RBP Chapter 2 (SOC21)
[70] RP3 Business Plan (SOC021), Appendix C
[71] RP3 Customer Consultation Working Group (CCWG), Terms of Reference Final V1.2, 23/05/2018, ('**RP3 CCWG Terms of Reference**'), (SOC034); RP3 Customer Consultation Working Group (CCWG), FINAL Co-Chair Code of Conduct v1.0, 15/02/2018, ('**RP3 CCWG Co-Chair Code of Conduct**'), (SOC055); and NERL Licence - Condition 16, Code of Practice, Updated December 2014, ('**Code of Practice 2014**'), (SOC056)
[72] Co-chairs, RP3 Customer Consultation Working Group Report of the Co-Chairs, October 2018, ('**Co-Chairs Report**'), (SOC016), p. 5.and p. 7
[73] Co-chairs, RP3 Customer Consultation Working Group Report of the Co-Chairs, October 2018, ('**Co-Chairs Report**'), (SOC016), p. 6

our airline customers, it was important that the positions stated in the co-chairs report should be fully taken into account by the CAA.[74]

3.2.4. We consider that our RP3 business plan best serves the public interest

136 The purpose of this section is to explain to the CMA why we consider our RBP represents the right settlement for NERL for RP3. These comments should be seen in light of our views on the nature of the public interest test applicable to this redetermination as set out in Section 3.4.2 below.

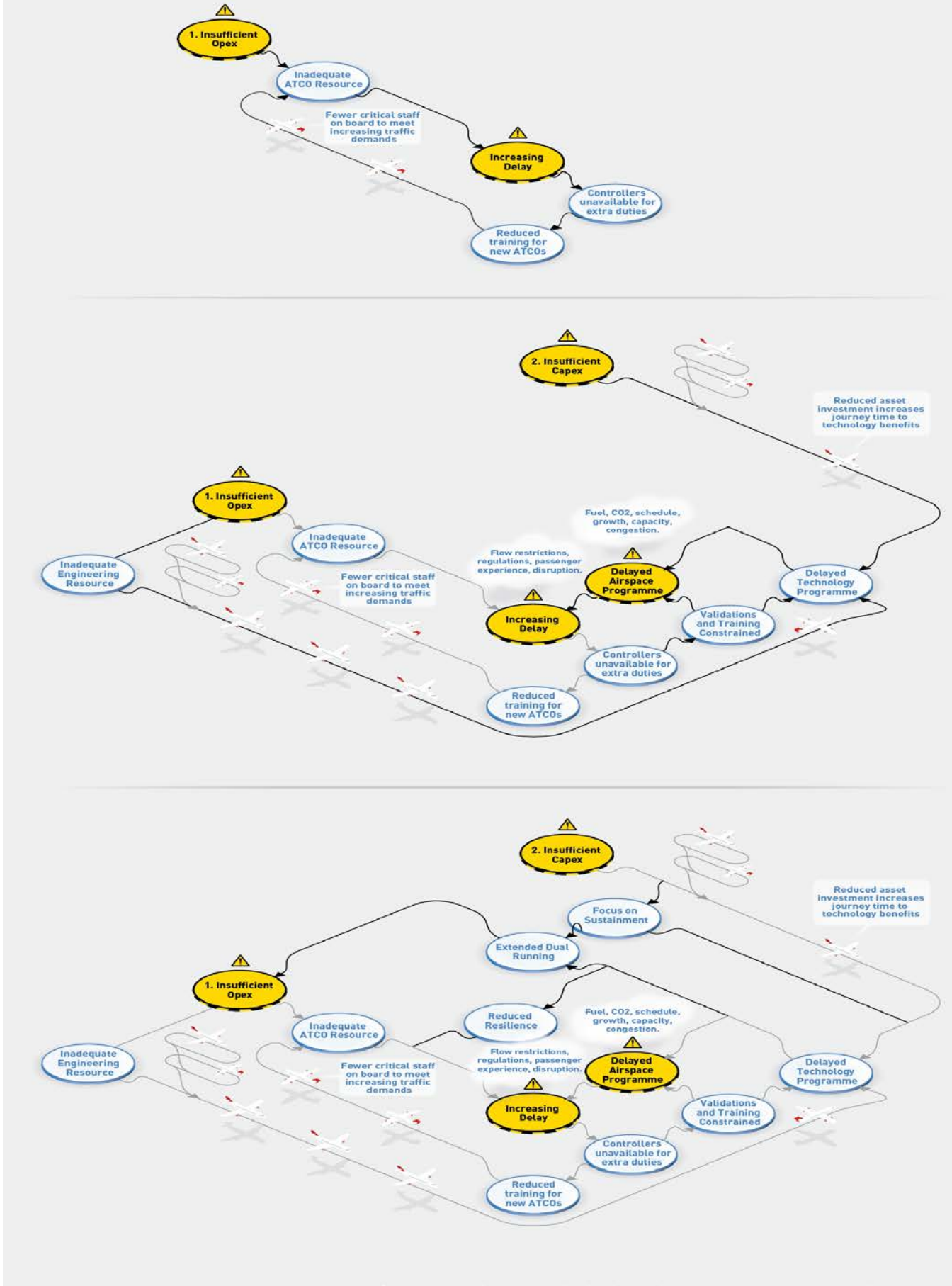
3.2.4.1. Our plan achieves the right balance in the interests of our customers

137 As we have explained in the preceding sections, the challenges faced during RP3 and beyond include the need for underlying improvements to operational resilience to manage the impact of increasing traffic and retiring/long term sick ATCOs alongside sequential technology and then airspace change. This requires a carefully calculated and balanced plan that depends on having sufficient resources to support each stage of these requirements and to programme them in the most efficient way to achieve the critical path, without excessive service impact on customers in the day-to-day service.

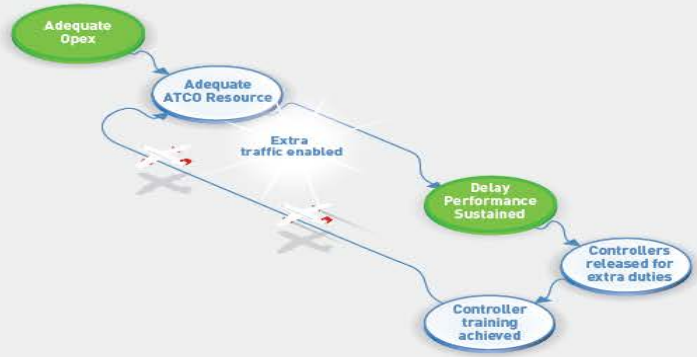
138 There is no solution in which the resources can be divided among the programmes which go on to operate, and can therefore be funded, independently of the others. Every variation in the resource demands and timetabling of one workstream creates challenges or opportunities in another workstream. In addition, external factors such as actual traffic levels experienced will affect the resource requirements for which an element of flexibility must be retained. Importantly, if there is insufficient resource in one area this can create a downward spiral in and across all these deliverables. Get the balance right, and incorporate a sufficient degree of flexibility to manage unforeseen changes, and a sweet spot is achieved that delivers the requirements. The following diagrams illustrate the workflows and dependencies.

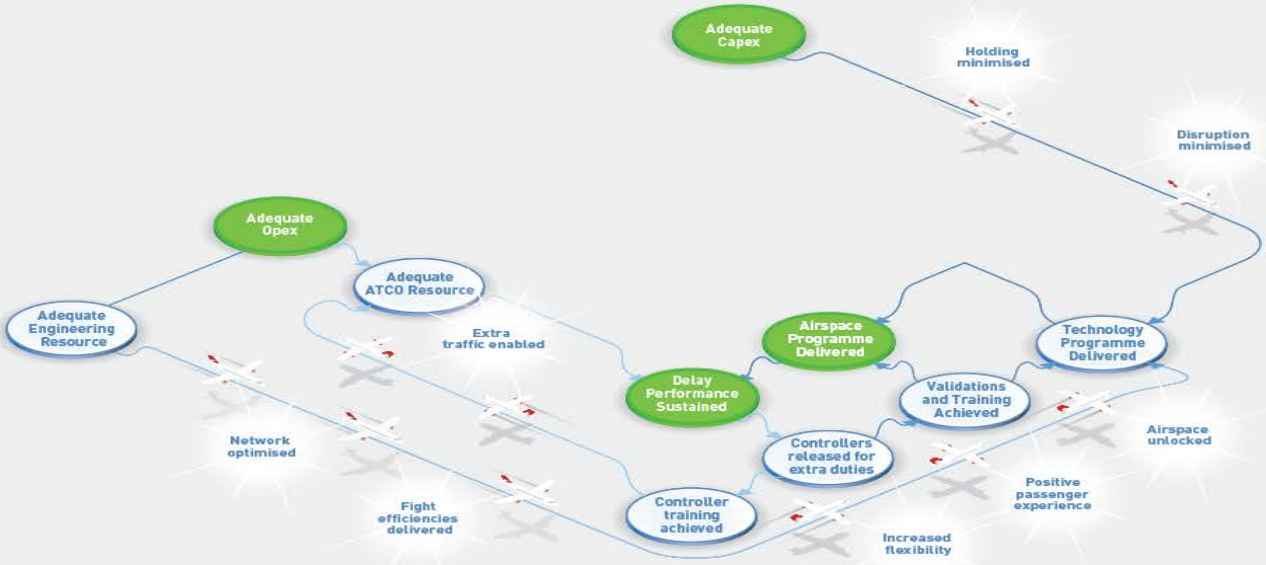
[74] Co-chairs, RP3 Customer Consultation Working Group Report of the Co-Chairs, October 2018, ('**Co-Chairs Report**'), (SOC016), p. 6

Getting the balance right
Performance Risk Cycle



Getting the balance right
Performance Improvement Cycle





139 NERL's RBP is, therefore, carefully balanced, challenging but deliverable, designed to meet customer expectations and, with the exception of some concerns with respect to pricing of Oceanic services (see Section 12 below), has broad customer agreement.

140 We believe it represents the best answer to the multiple conflicting requirements of the business for the following reasons:

- It provides sufficient controller resources to replace retiring and long term sick multi-sector valid ATCOs, maintaining and bolstering resilience in the face of increased traffic levels compared to RP2, and in light of customer expectations regarding service resilience.
- It completes the bulk of the technology change programme started in RP2, reducing the period of exposure to system failure and reducing wasted costs of running legacy systems in parallel with SESAR technology awaiting deployment.
- It sets the right conditions for an airspace change programme within RP3, provided that NERL, the CAA and the DfT can agree on the basis of NERL's accountability for that programme.
- It retains for NERL sufficient control over inputs so that NERL can adjust any element of the plan for changed circumstances and customer priorities.
- It provides for sufficient opex and capex allowances to allow NERL to deliver our licence obligations and performance commitments, and have a real prospect of achieving our regulatory return if we do so.
- The baseline rate of return reflects the risk borne by equity investors and provides a fair return on investment in our asset base.

3.3. Our concerns with the CAA's RP3 Decision

3.3.1. The CAA's RP3 Decision does not achieve the right balance in the public interest

141 NERL recognises that the role of the CAA as economic regulator is to challenge and provide assurance of the NERL plan and we welcome that role. The CAA's approach, however, has led to an RP3 Decision which, in the opinion of NERL, is undeliverable.

142 As set out above (see Section 2.1), this view reflects the following concerns with the CAA's decision.

- The CAA's decision provides insufficient opex for NERL to deliver our RBP service quality targets when combined with the package of growing traffic volumes and a substantial transformative capital programme.
- The cuts to our capex allowance mean that the LTIP cannot be delivered in full and the associated customer benefits will not be realised.
- The CAA's proposed capex governance proposals increase the risk that investment will not be remunerated and reduce levels of flexibility, Any measures which generate uncertainty around whether capital investment will be remunerated risk diluting incentives to invest in the asset base, to the detriment of users.

- The CAA's estimate of the cost of capital does not reflect NERL's risk profile and therefore underestimates the efficient cost of finance for RP3 and is inconsistent with the requirements of the Financeability Duty. This could also negatively impact long-term investment incentives as the allowed rate of return underpins investors' expectations of the returns they will earn from investing in NERL, and influences executive decisions as to whether to pursue capital projects.

- Taken together, these decisions restrict NERL's ability to draw on the levers that would otherwise be available to us to manage the delivery of our services and change programme during RP3.

143 The CAA has given insufficient consideration to the key interlinkages between the price control parameters and has therefore not taken a holistic view of the settlement. If each element of the NERL RBP is taken in isolation there needs to be a rigorous review not just of the efficiency and value of that element, but also of its relative value as part of that balanced plan. For example, savings or increased service targets in the day-to-day operation might on their own provide something of value for customers but the wider public interest might be better served by limiting those changes to the day-to-day service in recognition of the additional scope that would provide to better prepare for tomorrow's service. When assessing our plan in the round not only should the CAA be looking at the overall balance between all the elements, but that in the event of any conflict it should give priority to safety considerations in accordance with its primary Safety Duty (see Section 3.4 below).[75] Instead it would appear that the CAA has improperly given undue weight to the cost element of the Customer Interest Duty, and the implementation of the CAA's Airspace Modernisation Strategy, above other considerations (see Section 3.4.2 below).

144 A further feature of the CAA's RP3 Decision, as highlighted above, above is that deliverables and targets have been either introduced or tightened up to the extent that we no longer have the 'levers' available to us to manage the outcomes in RP3 in the face of normal business challenges, let alone any of the more serious risks associated with Brexit. On the premise that safety will never knowingly be compromised (see Section 3.2.1.1.1 above), the CAA's requirements that restrict operating costs would normally lead us to reduce service performance. But reducing service performance will breach service targets to the level of incurring penalties with extra risk of CAA investigations. Similarly, specifying investment programme milestones with associated penalties removes management's discretion to re-schedule elements of the programme, whether to allow for more efficient management of the programme or to compensate for new demands on the daily operational activities. Ultimately the imposition of this restrictive regime leads to increased financial risk and increased risk of licence breach, or at the very least the distraction and cost of dealing with CAA investigations based on customer complaints.

145 Finally, the CAA (and therefore the CMA on a referral) must also exercise its functions so as to impose on NERL "***the minimum restrictions which are consistent with the exercise of those functions***" (s. 2(6) TA00) (**Best Practice Regulation**).[76] The CAA has also previously acknowledged that "*the regulatory framework and the conduct of the regulator should not impose undue risks or uncertainties on the providers of capital*" and goes on to state that whilst

[75] S2(1) TA00.
[76] This duty is consistent with the general principles of best regulatory practice which provide that regulatory activities should be transparent, accountable, proportionate, consistent and targeted only at cases in which action is needed.

shareholders should be exposed to the risk of underperformance *"regulatory risk should be minimised"*.[77] NERL is concerned that in adopting defined outputs and inputs for RP3 that are so demanding that they effectively remove all of NERL's discretion as to the means by which it can deliver the RP3 business plan, the CAA has not complied with this statutory duty.

3.3.2. Concerns about the CAA's evidence base

146 We consider that just as our business plan proposals need to be based on robust evidence, so too should the CAA be required to demonstrate that its regulatory judgements have been made on the basis of evidence that is sound, accurate and that has been rationally assessed. NERL is concerned that the CAA has not followed such an approach. Some examples include:

- the CAA has not taken into account the expressed views of customers regarding their priorities as between cost savings and service quality, network capacity and resilience as well as more detailed feedback in areas such as revising the 3Di metric;
- the CAA has overridden the views of its expert GAD in relation to the reasonableness of DB pension deficit repair charges (see Section 10 below);
- the CAA has not taken into account, or has applied insufficient weight to, independent evidence from Euroconsult on the reasonableness of Aireon LLC charges for ADS-B data in oceanic regions (see Section 12 below);
- the CAA has relied on reports from Steer/Helios that NERL believes are based on a misunderstanding of the key drivers of cost in NERL's operating expenditure (see Section 8 below); and
- to the extent that the CAA acknowledges the misunderstandings intrinsic to the conclusions in the Steer/Helios reports that raise doubts about the credibility of the conclusions, the CAA has applied too much weight to those conclusions when reaching its decision (see Section 8 below).

3.4. Our expectations for the CMA's redetermination

147 This section sets out, at a high level, our expectations for the CMA's redetermination in light of our understanding of the legal framework that applies to its review including, in particular, the interpretation of the public interest test.

3.4.1. Legal framework for the CMA's redetermination

148 Section 2.8 of the Industry Overview, together with the CAA's Notice of Reference to the CMA,[78] set out a clear exposition of the statutory framework and relevant conditions of NERL's licence and so it is not necessary to repeat them in full here. Instead we have focused on the test that it is to be applied by the CMA in carrying out this redetermination.

149 Under Section 12(1) TA00 the CMA is required to investigate and report on:

[77] CAA decision regarding the re-opening of NERL's en-route price control and amending NERL's Licence (March 2003), in a section titled "statement of regulatory policy" (SOC008) at 6.50
[78] CAA Notice of Reference, Chapter 1.

(a) "*whether **any matters which are specified in the reference** and which **relate to the provision of air traffic services** by or on behalf of a licence holder **operate against the public interest or may be expected to do so***"; and

(b) "*if so, **whether the effects adverse to the public interest** which the matters have or may be expected to have **could be remedied or prevented by modifying the conditions of the licence***".(emphasis added)

150 In the CAA's Notice of Reference the CAA states that unless its proposed licence modifications are made, the provision of air traffic services by NERL will operate against the public interest.[79]

3.4.2. NERL's perspective on the 'public interest' test

151 The term "public interest" is not expressly defined in the TA00. We would therefore anticipate that the term is ultimately to be interpreted by the CMA on the facts.

152 The obvious starting point for the assessment as to whether any matter is in the public interest is the direction that the CMA "*must have regard*" to the statutory duties (the Duties) applicable to the CAA's regulation of NERL (s12(8) TA00). The duties are summarised as follows:

a) To maintain a high standard of safety in the provision of air traffic services (the Safety Duty). The Safety Duty takes priority over the remaining Duties.

b) To further the interests of operators and owners of aircraft, owners and managers of aerodromes, persons travelling in aircraft and persons with rights in property carried in them. These interests are limited to the range, availability, continuity, cost and quality of air traffic services (the Customer Interest Duty).

c) To promote efficiency and economy on the part of NERL (the Efficiency Duty).

d) To secure that NERL will not find it unduly difficult to finance activities authorised by our Licence (the Financeability Duty).

e) To take account of any international obligations of the United Kingdom notified to the CAA by the Secretary of State (the International Obligations Duty).

f) To take account of any guidance on environmental objectives given to the CAA by the Secretary of State (the Environmental Duty).

153 In addition, to the extent that these duties conflict, they must be applied reasonably having regard to the Duties as a whole (s. 2(5) TA00). The CMA has previously interpreted similar requirements to mean that it must look at each of the general duties in accordance with their statutory wording, taking the whole of the Duties into account, and not to apply individual duties in isolation.[80]

[79] CAA Notice of Reference, para. 1.5, p. 14
[80] Bristol Water CMA Decision, (SOC111), para. 3.4, p. 38 (Accessed on 25/11/19 https://assets.publishing.service.gov.uk/media/56279924ed915d194b000001/Bristol_Water_plc_final_determination.pdf)

154 NERL considers that it is clear that the Safety Duty is a primary duty that takes precedence over any of the other secondary duties. This is consistent with the CMA's approach to the consideration of primary and secondary duties in other regulatory contexts.[81]

155 In looking at the secondary duties, it is also well established that duties of this kind are intended to complement, not conflict with, each other and should be given equal weight.[82] The same principle should apply to the interpretation of each individual duty. For instance, when considering the Customer Interest Duty, equal weight should be given to all the potential factors that contribute to the satisfaction of that duty including the cost, range, availability, continuity or the quality of services.

156 We note that in the CAA's Notice of Reference the CAA seeks to rely on comparisons with the CMA's appeal jurisdiction under the Communications Act 2003 and the Electricity Act 1989 to argue that the CMA should adopt, in respect of the present reference under s. 12 TA00, "*an appropriate degree of restraint in relation to challenging the approach and judgements [the CAA has] taken in reaching [its] final decisions on these matters*".[83]

157 We consider that these comparisons to the CMA's appeal jurisdiction in the telecoms and energy sectors are misleading and suggest an inappropriate degree of restraint on the CMA's discretion within the context of a redetermination. In contrast to its appeal jurisdiction in respect of those sectors, the CMA's jurisdiction in this scenario is not to determine an appeal of a decision of the CAA but to "*investigate*" certain questions prescribed under s. 12(1) TA00 and specified by the CAA in its reference, and to "*report*" its conclusions on these questions in accordance with s. 13 TA00. As such, the CMA is not concerned with "*challenging the approach and judgements*" of the CAA.

158 Instead, the CMA is required to conduct its own investigation into the matters specified in the reference and to make a fresh determination as to the questions put to it in the reference. The questions for determination by the CMA are not those previously determined by the CAA, nor does the CMA's determination automatically stand in the place of the CAA's: it is for the CAA to exercise its regulatory functions in respect of licence modifications "*having regard*" to the CMA's report (s. 14 TA00) when making its own determination as to the "*modifications… [the CAA] thinks are needed to remedy or prevent the adverse effects specified in the report*".[84]

159 Accordingly, the CMA's jurisdiction is distinct, free-standing and exercised afresh. The CMA must:

- take account of the information provided to it by the CAA (s. 12(7) TA00); and
- have regard to the matters that arise in respect of the duties imposed on the Secretary of State and the CAA by ss. 1 and 2 TA00 (s. 12(8) TA00).

160 However, in taking account of such matters, the approach to be adopted and weight to be attributed is a matter for the CMA, which "*should build on, but not be unduly constrained by, the analysis already carried out*" by the CAA.[85] This is consistent with the CMA's powers to request further information from the CAA relating to matters within the scope of the investigation (s. 12(6)(a) TA00) and to require the production of documents (s. 12B TA00 and s. 109 of the

[81] Bristol Water CMA Decision (SOC111), para. 3.4, p. 38
[82] Bristol Water CMA Decision (SOC111), para. 3.4, p. 38
[83] CAA Notice of Reference, paras. 1.17-1.18, p. 16
[84] That determination by the CAA is then amenable to review by the CMA under s. 15 TA00.
[85] Bristol Water CMA Decision, (SOC111), para. 3.18, p. 42

Enterprise Act 2002), both of which demonstrate that the CMA is not constrained in its investigation by the information and analysis provided by the CAA.

4. Traffic

4.1. Overview

162 This Chapter sets out the important role that forecasts of air traffic movements play in the setting of our business plans and the CAA's RP3 Decision. We highlight the differences between the forecasts used by NERL and the CAA, and explain why we consider the CMA must ensure that it utilises the most accurate and reliable forecast for air traffic in the UK in its redetermination.

163 In summary, this Chapter demonstrates that:

- The traffic forecast is a fundamental input to our business plan. Decisions on staffing levels, capacity, investment and service performance levels are all based on the traffic forecast. It also clearly informs the assumptions made by the CAA in its RP3 Decision.
- Ensuring we use the most accurate and reliable forecast for the airspace we cover is critically important to any regulatory period.
- In developing our business plan, NERL has relied upon our own forecasts of traffic. The CAA has chosen to rely on the forecasts produced by the Statistics and Forecast Service of the European Air Traffic Control agency within Eurocontrol (STATFOR).
- Whilst we acknowledge the merits of the STATFOR forecasts (readily available, independently produced, and widely used traffic forecast that enables consistency and comparison with other ANSPs in Europe), there are known limitations and flaws in the STATFOR methodology that have a material impact on the forecast produced for the UK. These concerns have been acknowledged by STATFOR[86] and the CAA[87].
- In light of these concerns about the STATFOR forecasts, we consider that the NERL forecasts are more accurate and reliable for the UK. We ask that the CMA takes this into consideration when deciding on which traffic forecasts to base its redetermination.

164 The table below summarises the difference on this issue between NERL and the CAA.

Table 2 Comparison of NERL and CAA position – traffic forecasts

TRAFFIC	NERL RBP	CAA NPP	Delta	Rationale
Source	NATS May-19*	STATFOR Feb-19	-	CAA - STATFOR independent & consistent with Europe. NERL – STATFOR technical inaccuracies make it less reliable.
TSUs '000	65,151	65,743	592	

[86] Eurocontrol, Seven-Year Forecast, Flight Movements and Service Units 2019-2025, February 2019, ('**Seven Year Forecast, 2019**') (SOC033), p. 31, p.46
[87] UK RP3 CAA Decision Document Appendices, CAP 1830a, 2019, ('**CAA RP3 Decision Appendices**'), (SOC041), C3, p. 12

* NERL's RBP was based on the NATS August 2018 Forecast. An updated NATS May 19 Forecast was provided to the CAA, and NERL proposed using this for the NPP.

4.2. Introduction

4.2.1. The role of traffic forecasts

165 Traffic forms an essential building block of the price control. Operationally, the flight volume forecast informs our planning on a daily, monthly and yearly basis. We use it for tactical staff rostering and medium-term manpower planning as well as creating and prioritising our LTIP.

166 Financially, traffic determines how expensive the unit price is for our customers, who pay an amount for each flight based on the distance flown and the weight of their aircraft. This billing / pricing unit is known as a service unit (or Total Service Unit - **TSU**).

167 The European Performance and Charging Regulations dictate what happens to our revenues if actual traffic (specifically, TSU volumes) differs from forecast traffic. We bear all of the risk/reward for variances of less than 2% between actual and forecast traffic. Customers bear all of the risk for variances above 10%. There is a sliding scale in between (30% risk/reward to us, 70% for customers).

4.2.2. Trends in traffic volumes

168 During RP2, actual traffic was materially higher than the forecast assumed by the CAA (growth of 14.2% over the five years rather than 9.9% assumed).[88] Importantly, particular areas of UK airspace experienced very rapid growth, driven by growth at airports. For example, Stansted airport experienced 31% growth during RP2. As explained in Section 3.2.2.4 above, this unexpected growth led to some staffing resilience issues and contributed to two investigations by the CAA into the level of delay experienced by customers, despite our overall service quality performance being slightly better than the target levels set by the CAA for RP2.[89]

169 The level of Oceanic traffic growth has been especially strong (22% over five years).[90] This has strengthened our view that the introduction of satellite-based Oceanic surveillance during RP3 is critically important to enable enough capacity to meet expected future demand in a safe manner (see Section 12 below).

4.3. Background

4.3.1. NERL's traffic forecast

170 Given the importance of an accurate traffic forecast to NERL for our operational planning and to set prices, we produce our own forecast and have done so for many years; since before European wide regulation was introduced and STATFOR commenced producing forecasts.

171 We use the DfT aviation forecasting model to create our traffic forecast.[91] This is a comprehensive model developed and maintained by the DfT, which creates a forecast for passengers, aircraft movements and CO_2 emissions at UK airports. It was used by the Airports Commission and has been extensively peer reviewed.

[88] NATS, Traffic Support Pack, ('**Traffic Support Pack**'), (SOC011), p.22
[89] C2 delay performance in RP2 has averaged 0.14mins per flight vs the RP2 target of 0.18mins
[90] Traffic Support Pack, (SOC011), p.18
[91] Revised Business Plan – Appendices (confidential), 2020-2024, 26/10/18, ('**RP3 RBP appendices**') (SOC021), p7

172 The NERL model takes into account a number of both European wide, and UK specific, drivers. The most fundamental UK specific factor relates to the North Atlantic Jetstream locale (which drives the position of the North Atlantic tracks), and the technique used to take this factor into account within the traffic forecast.

173 The position of the Jetstream can vary greatly from year to year, and this affects the distance flown by transatlantic flights within NERL's en route airspace. In a year when the position is predominantly northerly, this leads to around 4% more TSUs than a year when the position is predominantly southerly.[92] While transatlantic traffic makes up only around 15% of total flights, it makes up around 45% of TSUs. Based on advice from the UK Met Office, [93] the NERL forecast uses a 5 year average Jetstream locale to account for this variability and is more reliable and accurate as a result.

174 Other UK specific drivers that our traffic forecasts take into account include:

- local airport capacity and expansion plans;
- UK events such as the 2012 Olympic games, airport noise restrictions on flights at UK airports, UK impact of airline failures such as Monarch, etc;
- London airport passenger behaviour - with 5 airports in close proximity to each other, passengers tend to freely move from one airport to another when maximum capacity is reached, whereas elsewhere in Europe passengers may not have the option of other alternative airports close by but can move to other transport such as rail instead; and
- local economic conditions that have a particularly material impact on the UK, such as Brexit, which is likely to affect the UK much more significantly than the EU as a whole.

4.3.2. STATFOR's traffic forecast

175 STATFOR provide statistics and forecasts on air traffic in Europe. The STATFOR forecasting model uses a similar methodology to NERL but is limited in the extent to which it can accurately reflect local variations and factors.

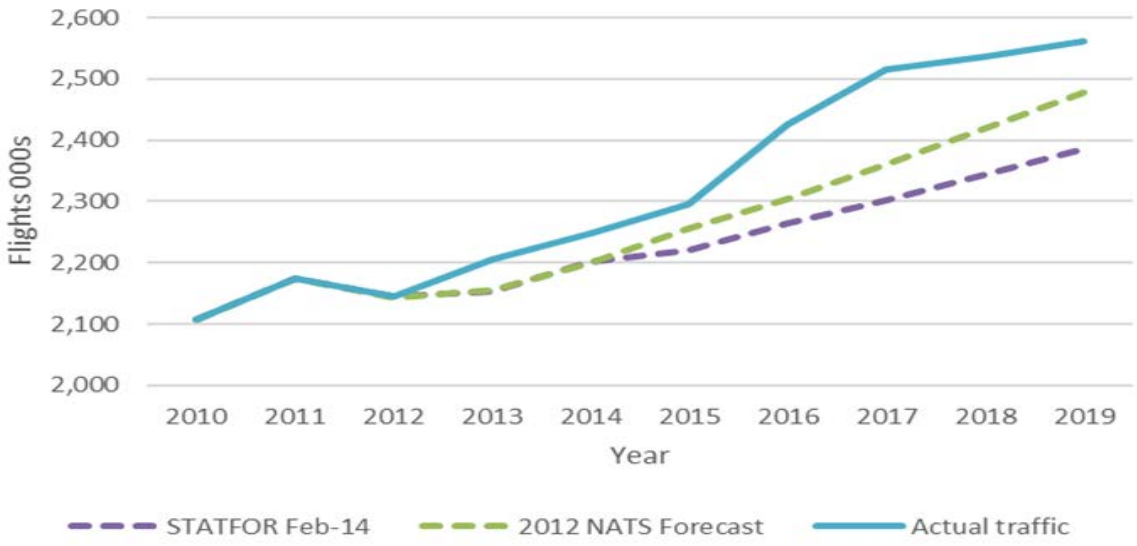
176 STATFOR agree with the need to make an adjustment for the North Atlantic jet stream factor but do not incorporate this sufficiently into their forecast.[94] This is partly due to STATFOR modelling constraints. As such, STATFOR implicitly assume that the position of the Jetstream will be close to the base year during RP3, overstating distances flown. In total, this has over-estimated TSU volumes by around 1% in RP3 because the Jetstream position for the base year (2018) was particularly northerly[95] which causes aircraft to fly longer distances than the 5 year average forecast would show.

4.3.3. Traffic forecasts used for RP2

177 In RP2, the STATFOR forecast was used to set prices. Both the NERL and the STATFOR forecast under-estimated en route traffic levels, but the NATS forecast was more accurate, as it underestimated traffic by a smaller amount.

[92] Traffic Support Pack, (SOC011), p.9
[93] Met Office, Latitudinal changes of the North Atlantic Jetstream: update on past literature review, April 2018, ('**Met Office Jetstream advice**') (SOC040)
[94] Eurocontrol, Seven-Year Forecast, Flight Movements and Service Units 2019-2025, February 2019, ('**Seven Year Forecast, 2019**') (SOC033), p. 31, p.46
[95] Traffic Support Pack, (SOC011), p. 8, p. 9, p. 29

Figure 1 1Comparison of RP2 forecasts



Source: Figure 11 from appendix A in our response to the CAA's draft proposals,[96] updated to include 2019 data

178 In RP2 NERL did not formally object to the use of the STATFOR traffic forecast (despite the same methodological concerns over accuracy) as the effect of the Jetstream issue was much less pronounced. This was because in 2013 (the base year for the RP2 STATFOR forecast), the Jetstream was much closer to the long term average position. In addition, we acknowledged the importance of close alignment with the EU for the first reference period under the SES scheme.

4.4. Basis of NERL's plan

179 We based our RBP on the NERL May-19 base case traffic forecast. This was the latest available NERL Forecast at the time the RBP was published.

4.5. The CAA's RP3 decision

180 The CAA based its RP3 Decision on the STATFOR February 2019 forecast (the most recent available at the time of the CAA's decision). The CAA's rationale for doing so is influenced by the fact that STATFOR is independent.[97]

181 The CAA has also made other assertions with respect to the STATFOR and NERL traffic forecasts:

- The CAA would expect the NERL forecast to be higher than STATFOR's because the NERL model re-allocates passenger demand between London airports, but STATFOR does not.[98]
- The STATFOR base year flight forecast is more accurate (1.7% flight growth rather than 0.9% assumed by NERL). [99]

[96] Response to NPP, (SOC002), p. 103
[97] CAA RP3 Decision, (SOC012) para. 1.21.
[98] CAA RP3 Decision Appendices, (SOC041) C4 p. 12 - 13
[99] CAA RP3 Decision Appendices, (SOC041) C5 p. 13

- The CAA explain that STATFOR shares the same view as NERL regarding distances and the Jetstream impact.[100]

- Both the NERL and STATFOR forecasts understate weight growth assumptions on the basis that "Heathrow and Gatwick airports are likely to be constrained during RP3 leading to larger aircraft sizes to maximise runway utilisation".[101]

182 The CAA does, however, acknowledge that NERL's traffic forecasting approach is "*theoretically preferable*" for the UK. [102]

4.6. Why we believe the CAA's decision is not in the public interest

183 We believe that the CAA should base its price control decisions on the most accurate, credible and reliable traffic forecast. In opting to use the STATFOR forecasts, rather than those produced by NERL, we consider that the CAA is putting too much emphasis on STATFOR's independence at the expense of accuracy and reliability.

184 We also consider that the CAA's other explanations as to why the STATFOR forecasts are suitable are flawed:

- NERL's forecast for the number of flights in RP3 is 1% higher than STATFOR. The passenger reallocation technique used by NERL is one factor explaining why this is the case (although our evidence is that this is a relatively small factor).[103] The reason why STATFOR's TSU forecast is higher than NERL's is mainly due to the assumption used by STATFOR for the number of TSUs per flight, driven by STATFOR's approach to modelling the Jetstream locale, which overstates the assumed average distances in en route airspace flown by transatlantic flights.

- Analysing the forecast for 2019 to date, actual flight volumes have been midway between the STATFOR forecast and the NERL forecast.[104] For TSU volumes, the growth of the overflight market segment is the key driver, as well as the position of the Jetstream (and thus the North Atlantic tracks), which remained in a Northerly position. This does not make it any more likely that the Jetstream will continue to be Northerly during RP3. We will incorporate actual data from 2019 for both flights and TSUs into the next NERL traffic forecast.

- What the CAA does not explain is that although STATFOR shares the same view, it does not actually model the Jetstream impact in an appropriate way. Put simply, it is not sufficient for the CAA to note that STATFOR agree with the need to model the Jetstream impact, if STATFOR do not actually do so sufficiently in their forecast.

- The CAA has provided no evidence to support the assertion that weights of aircraft at London airports will increase. Over the last 10 years, NERL's evidence shows that the average weight for each market segment has remained fairly constant and is also a very small factor in terms of the impact on the total forecast.[105] If we were to assume a similar level of weight growth in our forecast (increasing TSUs per flight), the outturn

[100] CAA RP3 Decision Appendices, (SOC041) C8 p. 14
[101] CAA RP3 Decision Appendices, (SOC041) C3 p. 12
[102] CAA RP3 Decision Appendices, (SOC041) C3 p. 12
[103] Traffic Support Pack, (SOC011), p. 26 and p. 27
[104] Traffic Support Pack, (SOC011), (SOC011), p. 40
[105] Traffic Support Pack, (SOC011), p.25, p. 26, and p. 36 – p.39

growth in TSUs will be offset by the reduction in the number of flights (i.e. larger heavier aircraft would have greater capacity (seats) meaning that fewer flights would be needed to meet passenger demand). As such, we do not believe the weight assumption is material to our forecast.

4.7. Conclusion

185 In reaching its redetermination, we consider that the CMA must base its assumptions on the most accurate and reliable traffic forecast available for the UK at the date of that redetermination. Both NERL and STATFOR will produce new traffic forecasts which will be available in February 2020.

186 Due to the limitations in the STATFOR forecast, which both STATFOR and the CAA acknowledge, we request that the CMA uses the NERL forecast in its redetermination as it represents the most accurate, credible and reliable source, in particular because of the importance of assumptions about the Jetstream locale to 45 per cent of NERL's TSUs.

5. Airspace Change Organising Group

5.1. Overview

187 This Chapter builds on the earlier discussion of the UK's Airspace Modernisation Strategy (AMS). It outlines the proposals for how NERL should structure our input into the AMS through the creation of a self-governing, independent function within NERL known as the Airspace Change Organising Group (ACOG) and how the role and competence of ACOG should be appropriately reflected in a licence modification.

188 In particular, it demonstrates that:

- Following discussions between key stakeholders, NERL has been commissioned to take on a key role in the management of the UK's AMS.
- It was agreed that the best method of delivery for NERL was through the establishment of ACOG as an independent business division within NERL.
- NERL's position, in offering to establish ACOG, is that it should not bear responsibility for any failings of airspace change sponsors other than NERL – namely airports.
- The licence modification proposed by the CAA goes far beyond that premise and effectively places NERL in the position of being a provider of last resort with accountability for elements of AMS that fall well outside the scope of what was planned for in the RBP or should reasonably be attributed to NERL .
- This approach is not in the public interest as it places inappropriate requirements and liabilities on NERL. This is exacerbated by the current lack of clarity over both the scope of AMS and the associated funding.
- Whilst NERL has provided an alternative version of the licence modification wording to the CAA for consideration, there is a realistic prospect that it will not be agreed and that it will also fall to the CMA for redetermination.

5.2. Introduction

189 As explained in Sections 3.2.2.4 above and 11.3.2 below, external factors led to the decision that NERL's plans for airspace modernisation during RP2 should be delayed. The resulting discussions between the key stakeholders as to how the AMS should be revisited led to the proposals for ACOG. The role of ACOG is to develop, maintain and manage the masterplan for airspace change across the UK in accordance with government and CAA policy.

190 The issues in this section have deliberately been presented at a high level as it is still hoped that the details of the licence modification can be agreed bilaterally by the CAA and NERL. If that cannot be achieved, however, the CMA's determination will be required.

5.3. Background

5.3.1. Discussions between stakeholders about NERL's role

191 During the last 2 years of RP2, a dialogue has taken place between NERL, the CAA and DfT, as part of DfT's airspace policy development, about the delivery of airspace modernisation in the UK. It has been agreed that NERL – as the UK airspace expert – should have a leading role in providing the solution for the management of a masterplan for airspace modernisation across the UK, starting with the South East region.[106]

192 The role of NERL is intended to be twofold:

- the provision of the required planning expertise to an independent organisation, ACOG, that will co-ordinate the views of NERL, airlines, airports and other stakeholders, as to the best airspace masterplan to facilitate DfT's aviation strategy; and
- carrying out NERL's own airspace change proposals as our contribution to that masterplan, alongside airports, all as co-ordinated by ACOG.

193 NERL offered this solution to DfT and the CAA on the premise that ACOG responsibilities would be separate from NERL and that ACOG could not be held responsible for any failings of airspace change sponsors other than NERL – namely airports.

5.4. Basis of NERL's plan

194 In early 2019 NERL started work on the high level structure of a masterplan for the South East and the establishment of ACOG's management, governance and membership of its Steering Committee. The CAA and NERL acknowledged that although ACOG would achieve full independence of NERL if it was established as a separate legal entity, the practical realities (staffing, office space, payroll, expert planning skills) meant that NERL would be involved in many aspects and the funding and administration of ACOG would be more efficient and effective if ACOG was created as a business division of NERL. It would have independent governance, albeit that as a matter of law, the directors of NERL would be ultimately accountable for its activities.

195 This planning activity took place under the auspices of a commissioning letter[107] from the CAA and DfT dated 02 November 2018 with funding provided through the CAA's Future Airspace Strategy Facilitation Fund. This fund was a mechanism created in RP2 for funding "out of scope" initiatives of benefit to the aviation industry. However, the details of how ACOG and NERL's responsibilities and funding were to be established for RP3 was left to be developed as part of the RP3 Decision.

196 At the request of the CAA, our business plan for RP3 was split into the core plan and a wider plan (see para. 127). Airspace change is part of the wider plan. In the IBP, our first iteration of the business plan, engagement between the CAA, NERL and DfT was in its early stages. This meant that there was insufficient clarity for NERL to make explicit budget and work scope proposals, although it was clear that conversations centred around major airspace changes in the London area and South East.

[106] See https://www.caa.co.uk/Commercial-industry/Airspace/Airspace-change/Airspace-change-proposals-in-the-FASI-S-and-FASI-N-programmes/
[107] CAA Letter to David Curtis, FASI-S, re UK Airspace Modernisation Commission to NERL to Lead a Coordinated Implementation Plan for Airspace Changes in Southern England, 02/11/2018, ('**CAA Letter to David Curtis, FASI-S, 02/11/2018**'), (SOC131)

5.5. The CAA's RP3 Decision

197 In response to the IBP the CAA appeared to regard the work associated with ACOG as too uncertain and so included no budget for it in the initial RP3 proposals. At the same time, however, as part of the CAA's plan for its own contribution to the NPP, it concluded that in the light of similar uncertainties in scope it would allocate itself a support fund of £10m.[108]

198 By the time of the CAA's RP3 Decision, the CAA had concluded that not only would NERL carry out London and South East airspace planning, but that it would do the same for the rest of the UK as well.[109] A budget was requested by the CAA from NERL for the ACOG function, based on its role being reserved to masterplan co-ordination and creation, rather than carrying out individual airspace changes. The budget for en route airspace changes was to be included in NERL's operating costs for RP3 and the cost of other airspace changes required by the masterplan would be borne by airports accountable for that airspace.

199 As described in para 19 of the CAA's RP3 Decision, the CAA 'ring fenced' £15m for ACOG activities, distinct from NERL's operating cost budget for our own airspace change proposals. The CAA also provided a draft licence condition[110] that set out the CAA's intentions for the accountabilities of NERL and ACOG respectively.

5.6. Why we believe the CAA's decision is not in the public interest

200 The CAA has drafted a licence condition under which the CAA can hold NERL responsible, as a provider of last resort, for airspace changes that airports have decided not to pursue for their own reasons. Similarly, ACOG is required to deliver a masterplan even if it cannot do so due to the failings of third party airspace sponsors.

201 As such the CAA's draft licence condition contains a number of inconsistencies with the arrangements under which NERL has agreed to assist the CAA and DfT with discharging their accountabilities for airspace strategy in the UK:

- NERL is not responsible for ACOG's masterplan; only contributions to its implementation by way of consultation on changes and advice on issues relating to en route airspace. If NERL is directly involved with the creation of the fully developed masterplan this is in direct conflict with the CAA and DfT's stated aim to have an independent body endorse the final balance between potentially competing priorities of airspace stakeholders.

- ACOG cannot take responsibility for delivery of the masterplan to a schedule and to a pre-agreed budget if it is affected by factors outside its control – namely airspace stakeholders refusing to pursue airspace changes for their own reasons.

- ACOG has provided an initial budget estimate of £15m[111] based on its assumed core accountabilities. If the scope of those accountabilities is to be increased, the budget would need to be increased proportionately.

- The CAA would like to direct NERL to carry out airspace changes and contributions to the masterplan in substitution for airspace stakeholders who refuse to carry out their

[108] CAA RP3 Decision, (SOC012), para 6.24
[109] CAA Letter to Martin Rolfe re NERL's RP3 business plan, 25/09/2018 , ('**CAA Letter to Martin Rolfe re NERL's RP3 business plan, 25/09/2018**'), (SOC130)
[110] CAA, Explanatory Note - Draft Airspace Modernisation Licence Condition, 17/06/2019, ('**Draft Airspace Modernisation Licence Condition**'), (SOC057), p. 5
[111] ACOG Initial Mobilisation Plan, 10/12/2018, ('**AGOC Mobilisation Plan**'), (SOC149)

own airspace change activity. This takes no account of the difficulties that will be encountered in standing in the shoes of a third party when dealing with their local communities, nor does the CAA provide for funding for NERL to perform this role.

- Airspace change expertise is scarce and NERL has made our own commitments for RP3 – it is not reasonable for the CAA to impose additional requirements on NERL that might override and/or delay NERL's own change programmes, on which (at present) the CAA seeks to impose penalties through its new capex governance regime (see Section 11). Even without penalties, NERL is subject to incentives and to licence conditions that might be adversely affected by a requirement to be the 'provider of last resort' to ensure that the CAA and DfT's airspace accountabilities are discharged.

- Some of the concepts to which NERL objects in the draft licence condition have also been put forward in the draft Transport Bill referred to in Section 2.8.2 of the Industry Overview. That Bill has not yet passed its second reading in parliament due to the dissolution of Parliament and NERL is actively working for changes to its text with the DfT ready for its future reintroduction to Parliament. It appears that the CAA's licence condition is attempting to pre-empt the passing of the Bill in its unamended form.

5.7. Conclusion

202 The CAA's licence proposals for ACOG and NERL accountabilities for airspace change management tasks are unreasonable, create open ended cost burdens, and risk interfering with NERL's own long term investment programmes for RP3. This is contrary to the CAA's own guidance that highlights the need to minimise regulatory uncertainty (see para. 145 above). The changes also appear to seek to shift the burden of the CAA and DfT's own accountabilities for the future design of UK airspace onto NERL. Revised licence language has been proposed to the CAA to address these issues and that is currently under discussion with the CAA. If agreement is not reached then these issues may have to be developed further to provide the CMA with sufficient information to make an informed determination on this Licence condition.

6. Service quality targets

6.1. Overview

203 This Chapter describes the basis of NERL's and the CAA's targets for service quality, including their respective rationales.

204 NERL is subject to four service quality targets on which it faces financial incentives, each associated with various measures of delay. NERL is concerned that the targets and incentive arrangements set out in the RP3 Decision are not consistent with the public interest. In particular:

- The overly stretching nature of the CAA's service quality targets, when combined with transitions for airspace and technology changes, higher traffic, and insufficient opex allowance means that NERL will not meet our targets in four out of the five years of RP3, resulting in a financial penalty of over £5 million in total.[112]
- The purpose of incentive based regulation is to drive good behaviour by regulated companies. That purpose is undermined if the only likely outcome is a penalty or when it disincentivises behaviour that is in the public interest such as delivering transitional change.
- The mitigation included in the service quality targets by the CAA to account for the impact of transitions is insufficient in scope and effect to address NERL's concerns.
- In setting these targets, the CAA has misapplied European Commission guidance.

205 Details of the service quality targets and the respective positions of the CAA and NERL are summarised in Table 3 below.

[112] NATS, RP3 Incentive Penalties, 2019, ('**RP3 Incentive Schemes**'), (SOC042)

Table 3 Comparison of NERL and CAA position - Service Quality Targets

SERVICE QUALITY TARGET	NERL RBP	CAA NPP	Delta	Rationale
C1 Delay per flight	0.23 mins + transition allowances or 0.39 mins	0.26 – 0.32 mins no transition delay	0.07 – 0.13	CAA: EU compliance NERL: support transitions & encourage airspace modernisation / technology transformation
C2 Delay per flight	0.18 mins + transition allowances or 0.33 mins	0.20 – 0.25 mins no transition delay	0.08 – 0.13	CAA: EU compliance NERL: support transitions & encourage airspace modernisation / technology transformation
C3 Impact score	20 + transition allowances or 150 exemption days	2020 – 20 2021 – 25 2022 – 25 2023 – 23.5 2024 – 25 Impact of score *plus* 100 exemption days	Impact profile 50 exemption days	CAA: Consistency with revised C2 proposals NERL: support transitions & encourage airspace modernisation / technology transformation
C4 Score	2000 + transition allowances or 150 exemption days	1800+100 exemption days	200 50 exemption days	CAA: based on historic performance NERL: support transitions & encourage airspace modernisation / technology transformation

Juliet Kennedy, Operations Director, NERL

"Safely transitioning to new technology and airspace inevitably creates short term delay. It is in the interests of airlines and passengers as well as the UK economy that NERL is encouraged to invest in, and deploy, technology and airspace change to ensure it can meet the forecast growth and environmental demands. At a minimum, we should not be set up to fail against our service quality targets"

6.2. Introduction

6.2.1. NERL's performance on delays

206 In 2018, European Air Traffic Flow Management delays are estimated to have cost airlines over €1.9bn.[113] NERL has a strong performance in terms of minimising delay to airlines and passengers compared to other European ANSPs. In 2018, the UK managed 24% of European air traffic, in airspace which constitutes 11% of the total European airspace in terms of volume, but delays attributable to NERL constituted less than 4% of European ATFM delays.[114] At the same time, NERL's traffic is much more complex than other European ANSPs. For example, only 16% of NERL's traffic is simple overflights. In contrast, 53% of the

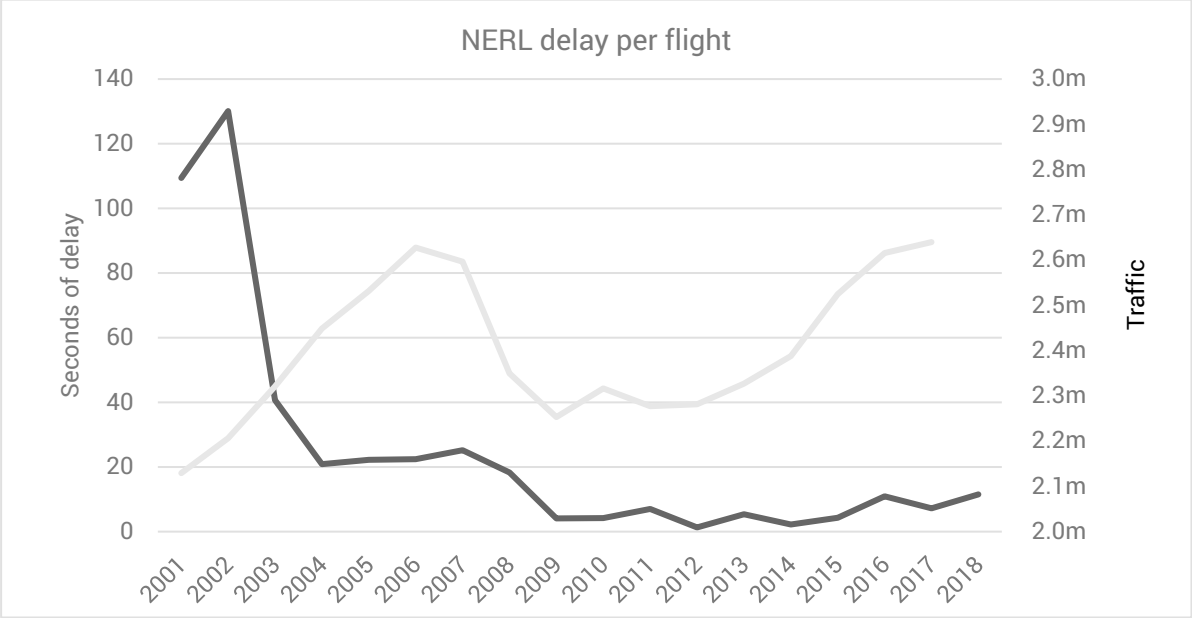
[113] Eurocontrol, Performance Review Report - reviews the performance of air traffic management in Europe during the calendar year, May 2019, ('**Performance Review Report, 2018**') (SOC035), p. 19

[114] Eurocontrol, Performance Review Report - reviews the performance of air traffic management in Europe during the calendar year, May 2019, ('**Performance Review Report, 2018**') (SOC035), p. 19 and PRR/STATFOR traffic data where ECAC flights are stated at 11m UK flights in 2018 were c.2.6m

traffic managed by DSNA are overflights, 40% of DFS's traffic are overflights, and 30% of ENAIRE's and ENAV's traffic.[115]

207 Since PPP, NERL has dramatically improved and then provided consistently good service quality to our customers. However, this delivery has been more challenging following unexpected traffic growth in RP2, reaching previous peak levels.[116]

Figure 2 NERL - Average seconds of delay per flight, 2001-2008

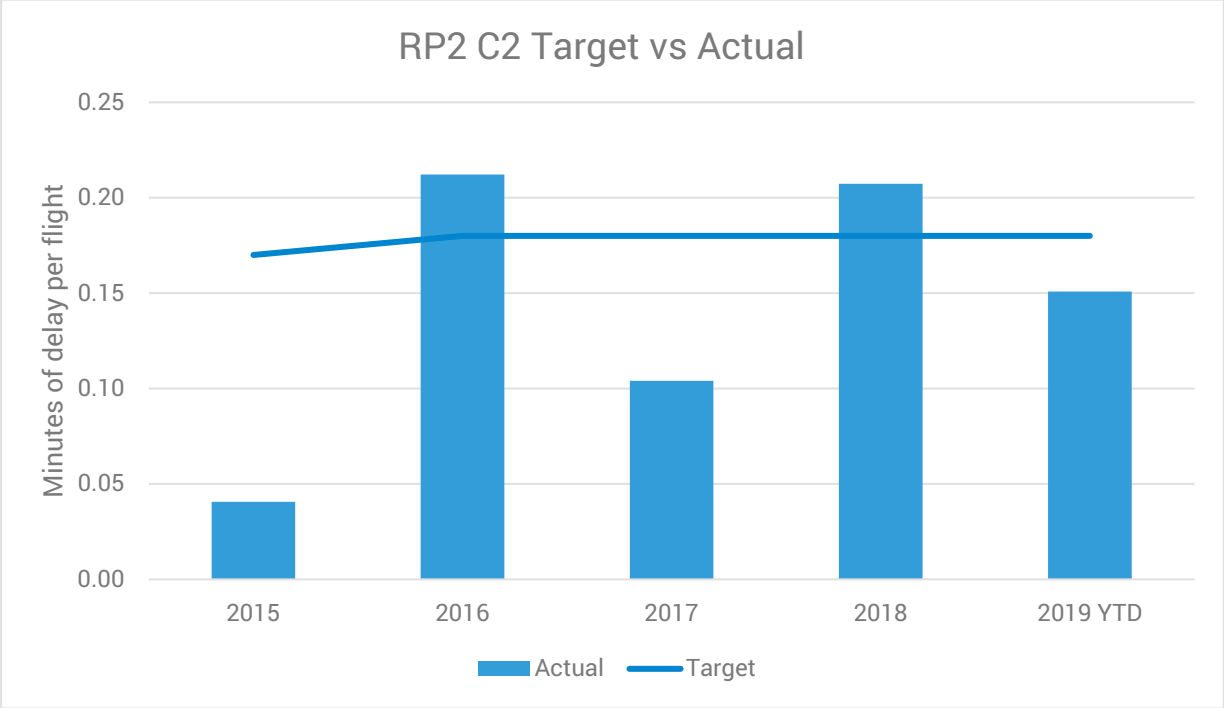


Source: NATS Internal

208 NERL only incurred a financial penalty for service quality in RP2 after traffic levels rose to reach previous peaks. In particular, NERL incurred penalties in the two years in which we undertook significant transitions (in 2016 and 2018). The first was largely due to the impact of introducing iTEC into Prestwick Upper airspace and LAMP1A into TC airspace, whereas the second was due to the implementation of technology changes associated with the ExCDS transition (see Section 14 for a case study detailing the ExCDS transition).

[115] Trax International Report, NERL's performance relative to other large European ANSPs - Position Paper for the Competition and Markets Authority 27/11/2019, ('**Trax Report, November 2019**'), (SOC125), p. 7
[116] NERL Information Memorandum, Overview of Air Traffic Management, 2019, ('**Industry Overview**'), Figure 11, p. 27

Figure 3 RP2 C2 Target vs Actual



Source: NATS Internal

6.3. Background

6.3.1. Interaction between delivering transitional change and delays

209 Maintaining service quality at current levels into the future requires airspace modernisation, including the supporting technology transformation (see Section 3.2.1 above). This is especially true given the expected levels of traffic growth. The logistical challenges in implementing these changes, as described in Section 3.2.1.1.3 above, will mean that there will be "transitions" or periods where delays increase in order to ensure that safety is not compromised. Airspace change is particularly complex as it relies upon all pilots using the airspace and the ATCOs who are validated for that airspace, being familiar with the changes and appropriately briefed. In order to achieve this, we set planned periods during which ATCOs are set lower levels of traffic in their changed environment to ensure they have a manageable workload. It is a necessary safety precaution as they embed and consolidate their training in a live environment using new technology and tools.

6.3.2. Scope of NERL's service quality targets

210 NERL has four service quality targets, on which it is has financial incentives that are based on a combination of the EU target (C1) and ones specific to the UK (C2-C4):

- C1 – En Route ATFM delay per flight from all causes
- C2 – En Route ATFM delay per flight from NERL attributable causes
- C3 – weighted metrics of NERL attributable delays that captures the impact of the timing and length of delay
- C4 – variability of daily average NERL attributable delays, expressed as a daily excess delay score

211 NERL has had a financial incentive on our service quality since PPP (C1), with each of these targets having a different link to financial targets:

- C1 is a trigger for incurring penalty or bonus with immediate and direct financial consequence to NERL. It includes sources of delay beyond our control such as weather and industrial action by other ANSPs. It is defined by the EU SES legislation and cannot be amended by the CAA.
- C2 has a direct financial impact on NERL and is based on causes of delay that are within NERL's control. It has a relationship to the C3 metric, which also has a financial impact.
- C4 relates to excessive delay in a single day which, in practice, might arise from some kind of technical or system failure.

212 Whilst NERL will aim to avoid delays of all kinds, within the constraint of our other operational drivers, based on the distinctions set out above NERL's management and analytics teams are relatively focused on estimating and managing C2 and C3 delay.

6.4. Basis of NERL's plan

213 Given the cost of delays to the industry, airlines and airports regard service quality and resilience as one of their highest priorities for NERL.[117] However, delivering future capacity requires technology transformation and airspace modernisation in RP3 (see Section 3.2.1 above).

214 NERL's proposals in our RBP were calculated to ensure that NERL is incentivised to deliver these transitions for future service quality as well as to optimise our day-to-day operations to manage delays (see Sections 3.2.3 and 3.2.4 above).

215 NERL proposed service quality targets for RP3 that were broadly consistent with those in RP2 when combined with using transition allowances for delay caused by planned transitions.[118] These transition allowances were based on NERL's experience of what we had learned with airlines during the ExCDS transition in 2018 (see our case study in section 14). This approach would have allowed NERL periods for which transition delay would not count against our targets, as long as it was for pre-defined changes and agreed in advance with airlines.[119] This would have enabled an effective indicator of the service quality outside of those critical transition periods.

6.5. The CAA's RP3 Decision

216 The CAA rejected the idea of transition allowances in its draft proposals because of concerns about consistency with the EU framework in terms of the SES Performance regulation as well as monitoring difficulties.[120] Therefore, it proposed sticking to the RP2 approach of service quality targets for C1-C4, combined with a fixed number of exemption days for C3 and C4 only.[121]

[117] Review Period 3 Business Plan (2020-2024), 26/10/2018, ('**RP3 Business Plan**'), (SOC001), p. 19-
[118] RP3 Business Plan, (SOC001), p. 11
[119] Revised Business Plan - Appendices (not redacted), 2020-2024, 26/10/18, ('**RP3 Business Plan Appendices**') (SOC021), p. 34
[120] Draft UK Reference Period 3 Performance Plan proposals, For consultation, CAP1758, ('**NPP**'), (SOC002) p. 45.
[121] NPP (SOC002) p.46

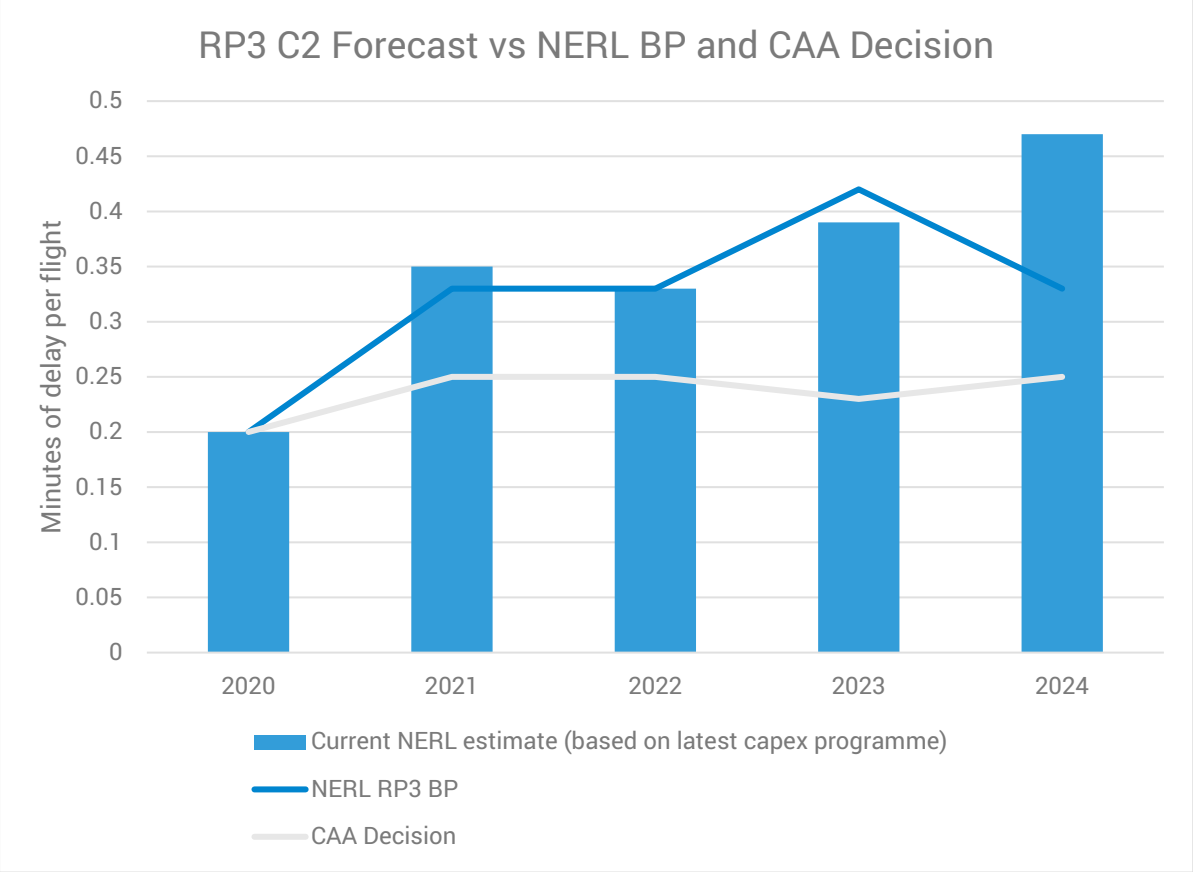
217 In its RP3 Decision, the CAA recalibrated its C1-C3 targets to be consistent with the reference values from the June 2019 Network Operation Plan (NOP) over the RP3 period.[122] The CAA also weakened the incentives on these targets to help mitigate against having set them at levels which it acknowledged could discourage NERL against delivering its capex programme where the activities might incur delay: "*To avoid the possibility of creating windfall gains or losses for NERL through more flexible targets, we have reduced the strength of a possible C2 bonus to near zero, as well reducing the strength of penalties so as not to discourage NERL from delivering its programme, even where it might incur delay.*" [123]

218 When these differences in approach are accounted for, the CAA's service quality targets are still significantly more stretching than those estimated by NERL. The cuts to operational costs that the CAA have decided upon will make it even more challenging for NERL to meet the service quality targets than NERL estimated as part of our business planning for RP3.

6.6. Why we believe the CAA's decision is not in the public interest

219 The CAA's proposed targets for C1-C3 are tighter than those NERL set out in our response to the CAA's draft proposals as estimated by our current modelling, which adjusts our original targets for expected efficient transition delays in the absence of transition allowances.[124]

Figure 4 RP3 C2 Forecast vs NERL BP and the CAA RP3 Decision



Source: NATS Internal

[122] RP3 Decision (SOC012), p. 50 - 53.
[123] RP3 Decision (SOC012), p. 51
[124] NERL's response to the National Performance Plan CAP1758, 12/04/19, ('Response to NPP'), (SOC003), p. 118 – 119. The big increase in delay in 2024 is due to significant airspace changes related to LAMP FOS (B+C) as well as SNIP and PNIP, see RP3 Incentive Schemes (SOC042)

220 RP3 will be the most transition intensive reference period to date, with much of the DSESAR programme being deployed into operation. The service quality targets, applied in that context, will mean that we will incur financial penalties for service quality in almost every year of RP3. The CAA's RP3 Decision risks, therefore, creating a perverse incentive to defer much needed technology and airspace change in order to minimise the risk of delays that contribute towards assessment of the service quality targets.

221 Adopting service quality targets that are almost guaranteed to result in penalties will also cause reputational harm and potentially increase the likelihood of complaints relating to NERL's compliance with our Licence obligation to meet reasonable demand.[125] Despite NERL's good service performance in RP2, we were still subject to investigations by the CAA on these grounds in four out of the five years of RP2 (see Section 3.2.2.4.3 above).[126]

222 The reference values in the NOP on which the CAA have based the service quality targets are exactly that – a reference or guide. The SES performance and charging regulations use the language of "consistency" instead of "adherence" or "compliance".[127] The CAA has always led NERL to believe that it would not rigidly adopt EU targets if there was a good reason for not doing so. This principle was captured in the CAA's guidance to NERL as part of its RP3 preparations.[128] Further, the UK has deviated from SES targets set by the European Commission in the past. This was the case in RP1 or 2012-2014, where the European Commission accepted the UK's relatively weaker performance on cost efficiency because it was stronger on capacity and environment compared to other European countries.[129]

223 NERL believes, therefore, that the CAA has not sufficiently explored its ability to deviate from the NOP, especially for reasons that are generally supported by the airline community and European Commission: namely the implementation of DSESAR and airspace modernisation in which NERL is undertaking more large transitions in Europe than any other ANSP. NERL is also leading a number of those changes for the ITEC group of ANSPs who are implementing the same technology platform and learning from each other's experience. Therefore, it is critical for the UK and European aviation industry that NERL's efforts are appropriately supported by economic regulation. Not doing so is contrary to the public interest.

224 Apparently in response to NERL's concerns that the combination of exemption days granted and the targets set by the CAA will result in repetitive penalties, the CAA has reduced the scale of both the penalties and bonus for these performance targets. This approach is also inconsistent with the public interest because rather than remedy the underlying cause of the penalty risks, the CAA is instead minimising the financial consequences of any errors in the formulation of the target levels. At the same time, this approach is removing any effective incentive to achieve the targets which would be in the public interest.

[125] NERL Licence, 2018, (SOC005), Condition 2, 1 (b), p. 15
[126] Project Oberon report (SOC010)
Investigation under Section 34 of the Transport Act 2000: Project Palamon, October 2018, ('**Palamon indicative timetable**'), (SOC029); Letter from CAA to NERL, Palamon revised indicative timetable, 21/11/2019, ('**CAA Letter – Palamon revised indicative timetable**'), (SOC036) and Palamon revised indicative timetable, 21/11/2019, ('**Palamon revised indicative timetable**'), (SOC037)
[127] Commission Implementing Regulation (EU) 2019/317 of 11 February 2019 laying down a performance and charging scheme in the single European sky and repealing Implementing Regulations (EU) No 390/2013 and (EU) No 391/2013,
L 56/1 Official Journal of the European Union, 25/02/2019, ('**SES Regulations**'), (SOC004)
[128] CAA, Guidance for NERL in preparing its business plan for Reference Period 3, Cap 1625, 2018 ('**Guidance for NERL in preparing its business plan for RP3, 2018**') (SOC030), p13
RP3 Business Plan Guidance, 2017 (SOC017), p13
[129] Letter from Siim Kallas, The Commission's finding regarding the performance plan and associated targets adopted by the United Kingdom for the reference period 2012-2014, in application of Article (14)2 of Commission Regulation (EU) No 691/2010, 2012, ('**Sim Kallas Letter**'),(SOC032) p. 2

225 In summary, the CAA's decision fails to take account of relevant considerations and evidence and is both arbitrary and assertive in nature while failing to take into account the CAA's obligation to balance its Duties in a reasonable manner in order to appropriately conclude what is in the public interest.

6.7. Conclusion

226 Service quality targets are an important part of the regulatory framework and should drive accountability and service performance in the interests of customers. To do so, however, the targets must be designed in such a way so as to incentivise the appropriate behaviour, taking into account the overall circumstances within which NERL will be operating during RP3. This includes understanding the interactions between the different aspects of NERL's RP3 requirements, such as the impact of a significant program of airspace and technological change during periods of transition. In setting appropriate service quality targets as part of its redetermination that have the right incentive qualities and operate in the public interest, we encourage the CMA to take into account the RP3 operational challenges faced by NERL.

7. 3Di targets

7.1. Overview

227 This chapter describes the 3Di environmental targets that NERL calculated for our RP3 business plan. It compares them to those set out in the CAA's RP3 Decisions and explores their respective rationales.

228 It considers in particular:

- If there is a choice for the regulator, it is not in the public interest for NERL to be incentivised on things that are outside our control, nor is it consistent with that general approach which has been used for NERL's incentivisation on service quality.
- The target set out in the CAA's RP3 Decision is based on a policy of constant improvement, but there is no evidence available to suggest that such an improvement could be achievable.
- Instead, the CAA's RP3 Decision on 3Di targets will mean that NERL is in financial penalty for two out of the five years in RP3.[130]
- The CAA's approach risks not maximising the opportunities to make fuel savings and reduce CO_2 emissions in RP3.

229 Details of the 3Di targets and the respective positions of the CAA and NERL are summarised in the table below.

Table 4 Comparison of NERL and CAA position - 3Di targets

ENVIRONMENT	NERL RBP	CAA NPP	Delta	Rationale
3Di score	New metric for controllable factors only: 16.2-17.9 points p.a. or Old metric including uncontrollable factors: 28.5 points	26.7-27.8 points	1.8-0.7 points	NERL: Re-calibrated for all uncontrollable factors and target value held flat in line with performance at the end of RP2 CAA: Not re-calibrated for uncontrollable factors, based on Q1-Q2 values for 2019 and then 1.1% reduction in 3Di score each year during RP3

[130] RP3 Incentive Penalties, (SOC042)

7.2. Introduction

230 3Di is a metric developed by NERL to measure flight efficiency in both vertical and horizontal planes. It measures the flight trajectories of all aircraft in UK domestic airspace against a theoretical optimum trajectory that would incur minimum fuel burn.

231 NERL has had financial incentives for our performance against 3Di targets since 2012.[131] It is also our understanding that NERL is the only ANSP to be financially incentivised on the environmental performance of its network.

7.3. Background

232 As shown in Table 5 below, the 3Di targets set by the CAA have become progressively more challenging. NERL has been able to incrementally improve our 3Di performance through operational procedures, improved staff awareness and smaller scale airspace changes. In the seven years since 3Di targets have been in place, NERL hit our target for the first 2 years and missed the targets for the last 5 years, although it remained within the "deadband" of no financial penalty or gain. However, it is a challenge to make a step-change in this metric without meaningful changes to the structure of UK airspace through airspace modernisation.

Table 5 - the CAA's draft proposal for 3Di targets and deadbands

	RP2 (recalculated for model changes)					RP3				
	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
NERL performance	29.5	29.7	29.0	28.6[27]	N/A	N/A	N/A	N/A	N/A	N/A
Par value[28]	29.1	28.6	28.3	27.5	27.1	26.8	26.5	26.2	25.9	25.6
Lower bound of deadband	N/A	N/A	N/A	N/A	N/A	25.5	25.2	24.9	24.6	24.3
Upper bound of deadband	N/A	N/A	N/A	N/A	N/A	28.1	27.8	27.5	27.2	26.9

Source: CAA

233 A fundamental part of achieving the 3Di targets is the relevance of the metric to the ATCOs that deliver the improved efficiency on a day-to-day basis. Improving the credibility of the metric with our operational employees is vital in increasing the chances of delivering the benefits of improved trajectories. If 3Di directly reflects the actions by the ATCO and support staff community it will be a motivating metric for them. This requires the exclusion from the measure of material effects outside NERL's control. NERL has refined the metric over time to do this.

7.4. Basis of NERL's plan

234 We used an evidence based approach to defining the 3Di score profile for RP3. We modelled the efficiency improvements of individual projects delivering across the period between 2020 and 2025.[132] We also took account of new analysis that showed how the impact of traffic

[131] CAA, CAA Decision, NATS (En Route) plc CP3 Price Control Review, 2011-2014, December 2010, ('**CAA Decision Document for RP1**'), (SOC058)
[132] NERL, Review Period 3 Business Plan (2020-2024), 10 October 2018, ('**RP3 Business Plan**'), (SOC001), p. 27

growth can reduce the efficiency of airspace without mitigating action.[133] This resulted in a credible but challenging target profile that we felt was deliverable in our RBP from looking at the projected increases in traffic across RP3 and our input improvements. [134]

235 We also suggested changes to the scope of the 3Di metric where we felt it could be unduly affected by others' actions. This would align with the CAA's approach to the C2 delay target (see section 6.3.2 above) in which factors outside NERL's control have been excluded from the metric. In particular, the airspace modernisation programme supported by Government will lead to unprecedented levels of traffic increases expected by airports across RP3 and RP4. It will lead to routes below 7,000ft being redrawn, with noise amelioration given priority ahead of fuel savings.[135] Given that the airspace designs in these areas will not be known until mid-way through RP3, and knowing that almost half of the 3Di score is attributed to flights within these regions, we suggested removal of these unknown effects.

236 In the customer consultation working group process, our environmental proposals were strongly supported by the airlines.[136]

7.5. The CAA's RP3 decision

237 In terms of the metric, the CAA decided to remove training, positioning, surveillance, calibration and other non-revenue flights from the 3Di score, which reduces the 3Di score by 0.6 points, 2% when taken against the average target through RP3. The CAA has not agreed to other exclusions that we requested to manage factors beyond NERL's control, such as thunderstorms and runway closures. The CAA also did not support adjustments to base data to neutralise the impact of changes to the volume of airspace or accuracy of data used for 3Di. The CAA has not provided a clear rationale for rejecting some of our proposals to remove elements beyond our control and not others[137].

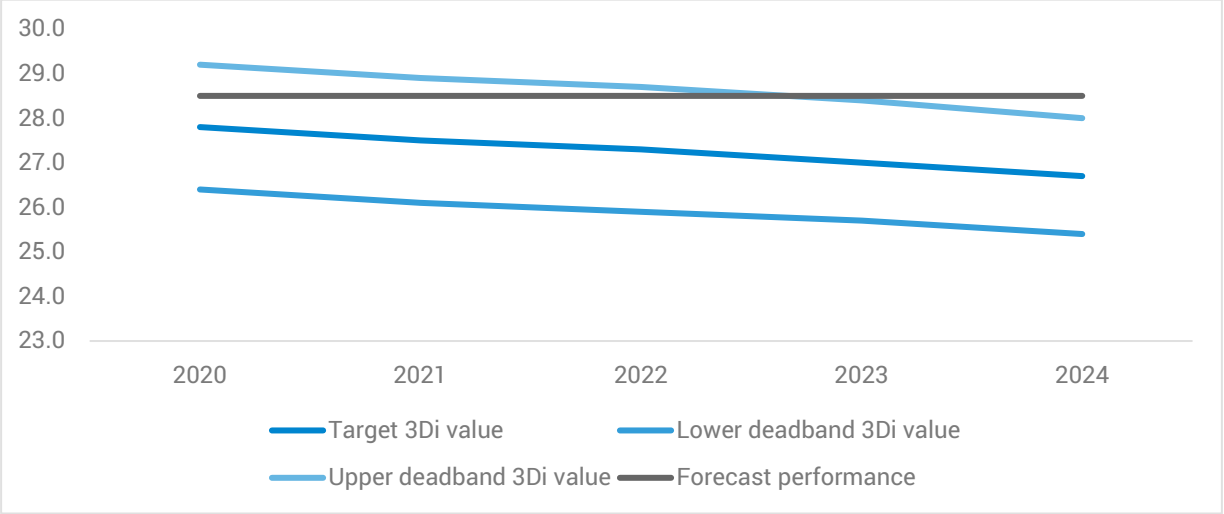
238 In terms of the target, the CAA decision is based on a continuation of past performance of 3Di into the future without taking into account projected increases in traffic that add complexity to flight paths and make all targets more difficult to achieve. It also does not take account of expected airspace changes during RP3, where changes to airspace that prioritise noise are expected to offset those related to modernising the infrastructure in terms of fuel savings. Therefore, the CAA's decision prioritises efficiency over noise impact and is therefore contrary to government environmental policy[138].

7.6. Why we believe the CAA's decision is not in the public interest

If the CAA's RP3 Decision for our 3Di target is enforced on NERL, then the most likely scenario is that NERL will have a £300k penalty during the control period.

[133] NERL, Customer Consultation: RP3 Initial Business Plan Key Assumptions and Performance Metrics, 27 June 2018, (SOC164), slides 69-70.
[134] CAA RP3 3Di requests - Provides additional information on the Environmental KPI/3Di, ('**CAA RP3 3Di requests**'), (SOC038)
[135] Department for Transport (Dft) Moving Britain Ahead - Guidance to the CAA on its environmental objectives when carrying out its air navigation functions, and to the CAA and wider industry on airspace and noise management.
October 2017, ('**Air Navigation Guidance 2107**'), (SOC013)
[136] RP3 Customer Consultation Working Group Report of the Co-Chairs, 2019, ('**Co-Chairs Report, 2018**')(SOC016) p. 22 - 24
[137] CAA, UK RP3 Decision Document, CAP1830, August 2019, ('**CAA RP3 Decision**'), (SOC012), p. 36.
[138] Air Navigation Guidance 2017, (SOC013), para 3.3, p. 17

Figure 5 Forecast 3Di performance set against target and deadband values



Source: NATS, RP3 Incentive Penalties, 2019, ('RP3 Incentive Schemes'), (SOC042)

239 The exclusions that the CAA has rejected were proposed by NERL because they focused on specific issues that ATCOs regard as irrational and unfair features of the 3Di target measures and damage the credibility of the efforts ATCOs make to improve the 3Di outputs. If the CAA's decision on the scope of the metric is adopted, this will further damage its credibility with the NERL ATCO community. This would put at risk the delivery of any additional airspace efficiency on a day-to-day or tactical basis.

240 There is a lack of evidence within the CAA's proposals for both 3Di's scope and the target profile because it is not based on any analysis of outcomes or benefits. It also fails to take account of relevant considerations. For instance, the CAA's RP3 Decision did not address NERL concerns about the importance of making sure that the operation and our staff were only being held accountable for factors within their control.

241 In summary, the CAA's decision is likely to result in penalties for NERL as well as poorer outcomes for airlines and the environment more generally and is therefore not in the public interest.

7.7. Conclusion

242 We actively support the concept of taking steps to reduce the impact on the environment of aviation activity and that has led us to develop and promote targets for 3Di. However, to be effective, those measures need to be within our control and we encourage the CMA to consider what targets would be consistent with good regulatory practice and the Environmental Duty and to take into account an analytical or evidential basis for reaching a decision on them.

8. Opex

8.1. Overview

243 This Chapter sets out our views on an appropriate level of opex for NERL during RP3. NERL's opex forecast for RP3 is based on a detailed understanding of our operational requirements and builds in an ambitious efficiency challenge: NERL's RBP proposed £2,156m of opex over five years. The plan was based on a detailed bottom-up assessment of opex needs taking into account forecast traffic growth, challenging service quality targets, the increased opex required to support airspace modernisation and the DSESAR capital investment programme, and input price pressures. The opex forecast built in ambitious efficiency savings, on top of the efficiencies that NERL has already driven out of the business over several regulatory periods. Our RBP struck the right combination of being both efficient and effective as well as delivering the right service at the right price.

244 Our view is that the CAA's opex allowance has insufficient funding to even deliver NERL's RBP service quality targets when combined with the package of growing traffic volumes and a substantial capital programme. With a mostly fixed cost base, the opportunities to reduce opex are limited. NERL would be unable, with the CAA's RP3 Decision, to provide the headcount built into our RBP, which would create risks to ongoing safety improvements, resilience and other aspects of operational performance. Consequently, the CAA's proposals would not be in the public interest.

245 The CAA has based its decision on a 'top down' analysis of information in NERL's RBP, historical trends and information on cost efficiency as well as stakeholder responses.[139] But their decision does not assess in any meaningful way whether NERL has the ability and scope to continue to reduce our cost base by the same levels we achieved in the past into the future. We know that we cannot without compromising our service.

246 In particular, we demonstrate:

- **NERL is an opex-intensive business:** Opex accounts for over 70% of NERL's total RP3 determined costs. This is a much higher proportion than for other regulated networks (e.g. energy and water), which are considerably more capital intensive. Attaining a reasonable opex allowance is vital to ensuring that NERL is able to provide safe and resilient air traffic control services, meet our performance targets and deliver our capital programme.

- **The scale of the CAA's opex challenge:** The CAA's RP3 Decision allowed for a total of £2,111m opex over the duration of RP3, a reduction of £45m relative to NERL's business plan. The scale of the challenge is, however, even greater as this £45m is comprised of two cuts of £43m and £24m, offset by some other factors. This is combined with over £70m of unsecured savings NERL has already factored into our Business Plan, the

[139] CAA, UK RP3 CAA decision document, CAP1830, 2019, ('**CAA RP3 Decision**'), (SOC012), pp. 57-61.

significant cost reductions achieved in recent reference periods, as well as more challenging service quality targets and forecast higher traffic growth.

- The CAA has also made 'indirect' cuts to NERLs opex – £24m through its interventions with respect to non-regulated income (see Section 9) and £6m through its related cuts to ongoing pension costs (see Section 10).

- **The CAA's proposed opex reductions are inadequately justified:** In coming to its RP3 Decision, the CAA relied on the findings of top-down analysis conducted by its consultants (Steer/Helios), historical evidence on unit cost reductions, and its own judgement. The £43m difference between the CAA and NERL forecasts for opex cuts arises in the last two years of RP3. NERL does not believe the cost reductions in the last two years of RP3 are well justified:

  - Steer/Helios' analysis did not adequately capture the main drivers of NERL's costs, the complexity of NERL's operation, or the range of new requirements for RP3 which necessitate additional resources. It therefore underestimates the headcount requirements for RP3.

  - The operational challenges NERL is facing in RP3 and the nature of historic cost-saving measures already undertaken – including closing two centres - mean that the scope for efficiency savings is smaller than in previous control periods. [140]

  - The proposed efficiencies go beyond the EU wide cost efficiency target of 1.9%, even though the UK is already among the best performers on cost efficiency. [141]

247 Details of the respective positions of the CAA and NERL with respect to opex are summarised in the table below.

Table 6 Comparison of NERL and CAA position - opex

Operating cost	NERL RBP	CAA NPP	Delta	Rationale
OFF	£35m	£42m	+ £7m	CAA & NERL – 20% increase for Airspace modernisation (neutral overall – costs & revenue).
ACOG	0	£15m	+ £15m	CAA & NERL – New cross industry entity to support Airspace modernisation (neutral overall – costs & revenue).
Opex cuts	£2,121m	£2,054m	- £43m	CAA - Historic opex unit cost efficiency performance for 2007 to 2017 (2.3%) applied from 2019 baseline for final 2 years of RP3. NERL – 2.3% is arbitrary, pays no attention to cost drivers or implications on other elements of the RP3 plan & is undeliverable.
Non-reg income			*- £24m*	*See Non-regulatory income chapter 9 **
TOTAL	£2,156m	£2,111m	- £45m	
Memo: Pensions			*- £6m*	*See Pensions chapter 10*

** NB: These cuts to the operating cost building block directly flow from the CAA decision on non-regulated income (chapter 9)*

[140] Economic Insights, Review of cost efficiency, 22/11/2019, ('**Review of Cost Efficiency**'), (SOC039), Chapter 2, p. 13 - 23
[141] Review of cost efficiency, (SOC039), Chapter 2, p. 13 - 23

Alistair Borthwick, CFO, NERL

"Customers and the EU Commission have been clear that the priority for RP3 is service quality, resilience, and capacity. In proposing such significant cuts to operating costs, the CAA have disregarded this since NERL has exhausted many of the areas for cost efficiency in reducing its cost base by 2017 by 43.2% in real terms since PPP. As such, while further efficiencies are possible, and indeed we have included in our plan £70m of savings that have yet to be realised, or in some cases even identified, savings of the scale proposed by CAA are not deliverable without compromising service."

8.2. Introduction

248 NERL's operating costs allowance provides for the day-to-day operating costs of the business and maintenance of our facilities, systems, and infrastructure. This means NERL's operating expenditure touches every dimension in our plan, including:

- our scope for continuous improvements in safety;
- our ability to meet service quality targets for capacity (delay) and environment;
- our ability to deliver and implement our capital and airspace modernisation programmes;
- our capability to respond to unforeseen events, customer requests, or CAA policies;
- our provision of effective assurance processes; and
- our ability to meet pension costs that are driven by staff numbers and pay awards.

249 NERL has a comparatively high operating leverage compared to many other regulated monopolies or utilities with much of our 'investment' formed by our operational manpower levels as opposed to capital infrastructure (as it would be for water or electricity companies).

250 Setting the right operating cost allowance is, therefore, perhaps the most important regulatory building block in order to avoid any unintended adverse consequences for other aspects of the business. It is particularly of concern for an organisation where safety is pre-eminent and our ability to pursue continuous improvement in this area could be curtailed. There is also a more fundamental question about whether the CAA's RP3 Decision strikes the right balance to support and maintain the culture, funding and appropriate levels of efficiency challenges for an ANSP that forms part of the critical national infrastructure and for whom safety is its primary deliverable.

8.3. Background

8.3.1. NERL has a high proportion of fixed opex costs

251 Approximately 70% of our total determined cost base is operating costs. Of this around 80% is fixed in relation to movements in traffic volumes (see Section 3.2.1.4 above).[142]

252 ATCOs make up almost 50% of our total staff costs. As explained in Section 2.2 of the Industry Overview and Section 3.2.1.1.2 above, it takes up to 3 years to train and validate a new ATCO, and a further 2 years for that ATCO to obtain multiple validations when they are most productive and can be deployed to different airspace sectors more flexibly.[143] These long lead times mean that the impact of decisions we take now may not be felt until later in RP3, or even RP4. Conversely, we will need to act early in RP3 to respond to any challenges later in the reference period. Therefore, in RP3, we face the dual challenge of increasing our resilience at existing traffic levels, while at the same time building capacity to meet the forecast traffic growth.

253 We are heavily unionised with Trade Union membership of almost 100% for ATCOs at some of our operational units.[144] As the only en route ATC provider in the UK, the labour market for qualified ATCOs is highly illiquid. We are reliant on these staff members both to deliver the operational service and to deliver our stretching capital investment and airspace modernisation programmes because ATCOs are required to help test, validate and train for new systems and airspace. While we have productive relationships with our trade union bodies, these factors and our reliance on our operational staff – especially on voluntary overtime at periods of high demand - gives them substantial bargaining power in negotiations on pay and conditions and working practices. This is especially true given the potential impact on our customers were delays to arise from strikes or "work to rule". To date we have maintained an effective working relationship with our trades unions and achieved benefits for our customers such as closure of the DB pension scheme to new entrants in 2009. However, a deterioration in employee relations would present additional challenges when having an engaged workforce is critical across a variety of fronts, including the technology transformation which we are currently only half way through.

8.3.2. Historic cost-reduction measures

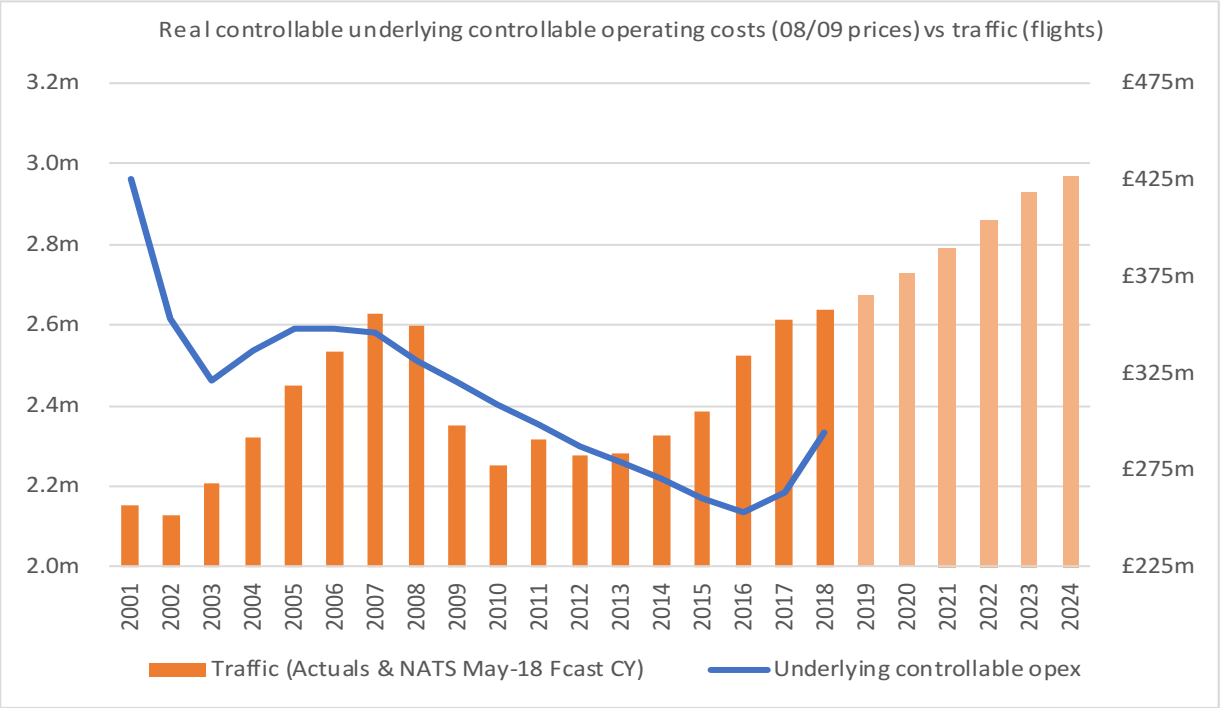
254 We have made substantial reductions (over 40% in real terms by 2017) in our underlying controllable operating costs since PPP. This includes the closure of two out of four ATC centres and two major restructuring programmes, both funded by shareholders.

255 The graph below depicts the evolution of these reductions over time and shows that cost savings are becoming more and more difficult to identify and deliver as we reach the efficiency frontier. In particular, at the end of RP1 and early RP2 where we were heavily focused on cost reductions to deliver the RP2 cost savings that customers were prioritising, we have found that many of our cost efficiency opportunities have now been exhausted.

256 In short, RP3 represents a period in which NERL will face higher cost pressures, but with fewer opportunities to make cost savings.

[142] NATS, Operating Cost Support Pack, 2019, ('**Operating Costs Support Pack**'), (SOC106), p. 15 and p. 16
[143] Industry Overview, p. 13-14
[144] Industry Overview, p. 41

Figure 6 Real controllable underlying opex 2002-2019



Source: NERL analysis[145] *NB: Flights shown including Shanwick FIR only flights (only source available back to 2001)*

8.4. Basis of NERL's plan

8.4.1. Our approach to developing our business plan

257 NERL builds our business plan up from detailed departmental plans, budgets and operational knowledge. Our teams contain sector experts with many years of industry knowledge and experience in their respective roles and activities. We also seek input from key external stakeholders such as the CAA, UK airports, the SESAR JU etc.

258 The plans are then reviewed and challenged by various internal stakeholders, including local and divisional management, the finance team, a central planning function and, ultimately, the Executive and Board.

259 Having developed an initial version of our business plan, we then consult with our airline customers on our proposals and make appropriate adjustments in light of the feedback received.

8.4.2. Key considerations for our RP3 opex proposals

260 In developing our operating costs proposals for RP3 we were particularly mindful of three main areas:

- traffic, service quality, and operational performance;
- delivery of our capital programme of new technology and airspace modernisation; and
- additional requirements and scope, new for RP3.

[145] NATS, Traffic vs Operating Costs 2001-2018, ('**Traffic vs Operating Costs 2001 – 2018**'), (SOC100)

8.4.2.1. Traffic, service quality and operational performance

261 In order to meet an adequate level of service quality and operational performance during RP3, our planning focused on the measures required to provide sufficient capacity to catch up with RP2 traffic growth which had far exceeded the levels assumed in the RP2 plan (see Section 3.2.2 above) and keep pace with the levels of traffic growth expected in RP3 (see Section 4 above). Growth in traffic also increases the complexity of controlling the traffic, which in itself lowers the maximum traffic levels a single ATCO can handle safely, such that traffic increases have a non-linear effect on the requirement for additional ATCOs (see Section 3.2.1.4 above). As highlighted by Trax, airspace capacity constraints and traffic complexity are two of the main reasons why additional flights do not generate economies of scale for large ANSPs. For example, the five large ANSPs take a 55% share of the total costs of European air navigation services while their total share of the traffic is only 49%.[146]

262 This challenge related not just to growth overall but also having enough flexibility to respond to short term changes in traffic flows. Issues such as traffic hotspots, peaks, changes in mix of traffic, can occur with as little as 3 months' notice, while training existing controllers on different sectors can take 6-18 months – noting that it is inefficient to have controllers with more than 3 sector validations due to the restrictions this places on their deployment in the operations in order to allow enough time for them to maintain the currency on each of their multiple validations. This is important as the presentation of traffic, in terms of how it arrives at which sectors and at what time, is a key driver of service quality performance.

263 As explained in Section 3.2.2.3 above, in meeting the efficiency challenge required by the CAA's RP3 Decision for RP2 we had reduced our ATCO headcount. This stretch on our operational resilience was reflected in the customer complaints made during RP2 that NERL did not have sufficient resources to meet reasonable demand. These complaints led to two investigations by the CAA that have run for four out of the five years of RP2 (see Section 3.2.2.4.3 above).[147] Whilst the ATCO reduction was found to have been a reasonable approach in light of the circumstances (including traffic level expectations) at the time,[148] the fact that the complaints were made in the first place shows that customers have high expectations with respect to service resilience. We have planned, therefore, for higher resilience in RP3 than RP2.[149]

264 We also want to reduce our reliance on overtime for operational flexibility, which is efficient in terms of cost but does not increase our operational resilience.

265 Our resource planning also takes into account the bulge in ATCO's reaching likely retirement age expected in RP3 and RP4, taking into account the lead time of up to five years for training and replacing an ATCO (see Section 3.2.1.1.2 above).

8.4.2.2. Delivery of our capital programme of new technology and airspace modernisation

266 Our capacity planning has also taken into account the resources required to support the delivery of the capex and airspace modernisation programmes outlined in Section 11 below.

[146] Trax International Report, NERL's performance relative to other large European ANSPs - Position Paper for the Competition and Markets Authority 27/11/2019, ('**Trax Report, November 2019**'), (SOC125). P. 7
[147] Project Oberon Report, (SOC010), and Palamon Indicative Timetable, (SOC029), plus the revised timetable of November 2019 Palamon Revised Indicative Timetable , (SOC037)
[148] Project Oberon Report, (SOC010), p. 6.
[149] RP3 Business Plan (SOC001)

267 As we have explained in Sections 3.2.1.1.3 and 11, the requirements on ATCOs are greater during a period of introducing new systems and airspace change, such as in RP3, which will require ATCO availability for testing, validation and training effort for making the transitions.

268 The early benefits of the deployment of our DSESAR strategy are also included in our plan but these are small in RP3 while the technology and airspace change is implemented, with most of the benefits coming in RP4. Those benefits are, in any case, much smaller for NERL, where we already have significant automation and controller tool support, than they are for other European ANSPs.

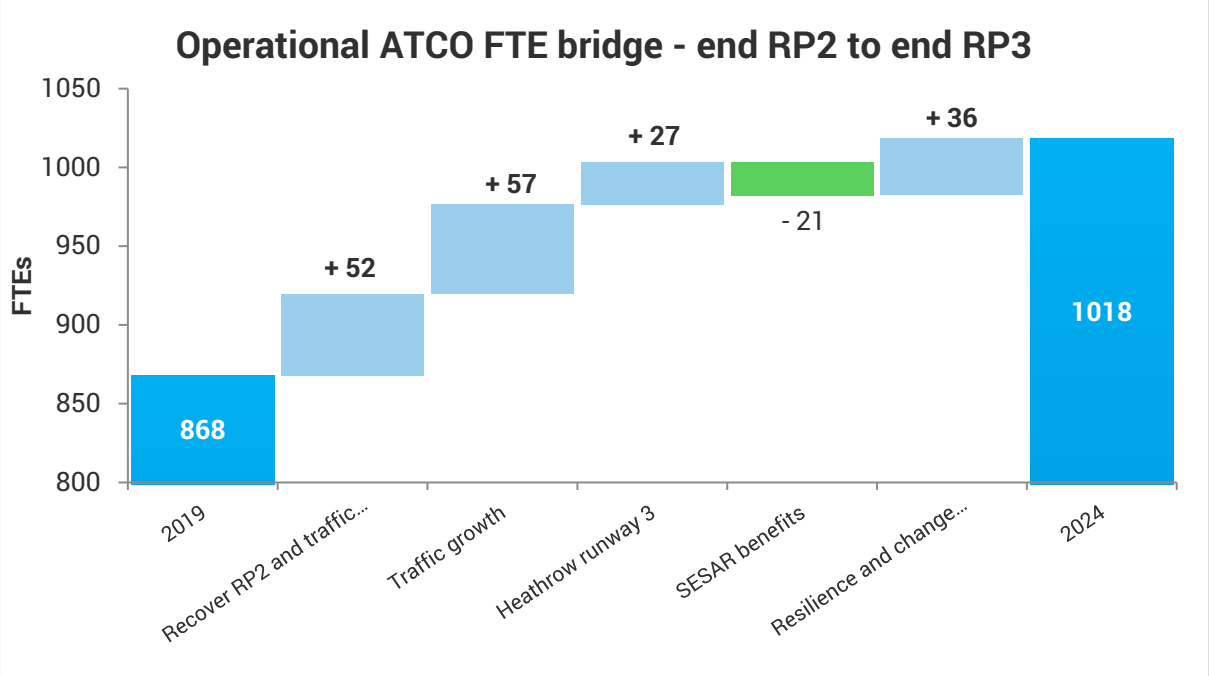
8.4.2.3. Additional requirements and scope, new for RP3

269 NERL is also facing new and emerging costs pressures. For example, there is material additional scope in RP3 for cyber security compliance, protections and mitigations – as a high profile critical national infrastructure target we have seen huge increases in the number of attempts and attacks on our systems and have to undertake extensive liaison with government and other industry partners to help address these threats, as well as ensuring we have the most up to date protection mechanisms in place.

270 Another example is the growth in the use of unmanned aerial vehicles (UAVs or drones) which is a rapidly growing threat to commercial aviation as evidenced by the disruption caused at a number of UK airports during 2019 by relatively minor drone activity. This is likely to generate additional activity to ensure safety for commercial air traffic and to engage with the drone community.

271 A summary of the main drivers for ATCO numbers is shown in the graph below – airspace modernisation is included in resilience and change:

Figure 7 Operational ATCO FTE bridge – end RP2 to end RP3



Source: Operational Service: Resourcing and Resilience, (SOC054), p. 7

8.4.2.4. Our efficiency challenge

272 We provided evidence to the CAA and its consultants, Steer/Helios, to demonstrate our cost projections are efficient. Through a combination of workshops and written material we covered a variety of topics from headcount by grade type, legacy system requirements, training lead times, operational rostering, employee pay, future pay assumptions, our employee relations climate and highly unionised structure, non-staff cost projections, and many others.[150,151,152]

273 We also commissioned NERA to help provide benchmarking reports for staff remuneration levels, which found our pay levels to be similar to benchmarks for comparable roles.[153,154] We referred to European ACE benchmarking for ANSPs.[155,156]

274 We also drew attention to a recent European study by the PRB that found that there was limited opportunity for NERL to reduce costs, compared to other ANSPs.[157]

275 We have factored £70m of savings into our 5 year plan, none of which are yet secured.[158] These are reliant to a large extent on the delivery of new operational systems that will be common across all of NERL's operational units. The majority of the £70m comes from efficiencies in engineering and technical services staff (ATCEs) due to replacing our legacy systems with new systems that are easier to support. Additionally there are some early savings relating to the operational benefits of the deployments of this new system capability that reduce ATSA numbers, the bulk of which will be available in RP4. Finally, we are also targeting some savings from 3rd party suppliers.

276 All these savings are planned at risk and we will not be able to achieve them if the capex programme is delayed. As a side note, we are already seeing some additional cost pressures from delayed staff retirements and higher dual running costs associated with supporting legacy systems.

8.5. The CAA's RP3 Decision

277 In its RP3 Decision the CAA has made reductions, in total, of £45m to the opex building block. This is comprised of:

- £43m direct reduction to opex; and
- £24m reduction to the costs of supporting non-regulated income (see Section 9 below); offset by

[150] Planned and Historical Operating Costs for NERL ATS (RP2, RP3), 16/04/2018 , ('**Planned and Historical Operating Costs for RP2 and RP3**'), (SOC064)
[151] NATS, Customer Consultation Working Group RP3 Manpower Planning Workshop, 23/08/19, ('**CCWG RP3 Manpower Planning Workshop**'), (SOC065)
[152] NATS, Response to SDG Questions on Operational Manpower and Planning, 15/06/2018, ('**Response to Questions on Operational Manpower and Planning**') (SOC066)
[153] NERA, Staff Operating Expenditure for Air Traffic Control Report, 21/03/2018, ('**Staff Operating Expenditure for Air Traffic Control**'), (SOC061)
[154] NERA, Appendix E, Staff Headcount in RP3: A Response to Steer's Analysis, 09/04/2019, ('**Staff Headcount in RP3**'), (SOC062)
[155]'Eurocontrol ACE 2017 Working Group, Air Traffic Management Cost-Effectiveness (ACE) Benchmarking Report for 2017, 2018 -2022 Outlook, May 2019 ('**ACE Benchmarking Report, 2017**'), (SOC059)
[156] ACE 2017 Working Group, Air Traffic Management Cost-Effectiveness (ACE) Benchmarking Report for 2016, 2017 -2021 Outlook, May 2019, ('**ACE Benchmarking Report, 2016**'), (SOC060)
[157] PRB 2018, EU target ranges for RP3: Annex 2. Air Navigation Service Providers: Advice on benchmarking of ANSPs and EU-wide cost Targets (SOC169)
[158] Operating Cost Support Pack, (SOC106) , p. 9

- an allowance of £7m for the Opex Flexibility Fund (**OFF**); and
- an allowance of £15m for ACOG.

8.5.1. £43m reduction to opex

278 In relation to the £43m cut to opex, the CAA provides the following rationale:

- **It reflects historic efficiency**: the CAA has reflected the level of operating unit cost efficiency achieved by NERL historically between 2007 and 2017 of 2.3% p.a.;[159]
- **It reflects historic out-performance**: the CAA took into account NERL's out-performance of c4.9% on operating cost in previous reference periods; [160]
- **The CAA's % efficiency challenge is similar to NERL's**: the CAA reflected that its 2.3% efficiency challenge is very close to the 2.2% proposed by NERL in our RBP; [161]
- **The CAA's efficiency challenge falls within the range presented by Steer:** The CAA notes that its efficiency challenge falls within the range of potential efficiency identified by Steer of £57m - £133m in its report on NERL's operating cost efficiency.[162] [163] [164]
- **The CAA's challenge is consistent with comparator data**: The CAA notes that its approach is consistent with a PRB study suggesting that there is the potential for 8% cost efficiency savings in European ANSPs. [165] In addition, in its referral letter to the CMA, the CAA asserts that NERL's plan does not meet the EC's SES cost efficiency targets[166]; and
- **The CAA's RP3 Decision allows NERL's full opex in years 1-3**: The CAA notes that it allows the full NERL RBP operating costs levels in the first three years of RP3 to help support temporary, one-off, costs increases in this period.[167]

8.5.2. £24m reduction to non-regulated income opex

279 This is addressed in detail in Section 9 below.

8.5.3. Allowance for the Opex Flexibility Fund (OFF)

280 The OFF was proposed by NERL in the RBP as a mechanism to cover a range of uncertain operating costs that may need to be incurred by NERL to deliver the outcomes set out in the RBP, with the proposal that any unspent funds would be returned to customers. NERL proposed that the level of the OFF should be £35m over the RP3 period.

281 The CAA's RP3 Decision increases this fund by £7m to £42m, but makes it clear that the fund should only be used to "*support uncertain costs arising from the implementation of the Airspace*

[159] CAA, UK RP3 CAA decision document, CAP1830, 2019, ('**CAA RP3 Decision**'), (SOC012), pp. 57-61.
[160] CAA, UK RP3 CAA decision document, CAP1830, 2019, ('**CAA RP3 Decision**'), (SOC012), pp. 57-61.
[161] CAA, UK RP3 CAA decision document, CAP1830, 2019, ('**CAA RP3 Decision**'), (SOC012), pp. 57-61.
[162] Steer, NERL's Forward-Looking Capital Programme and Expenditure Efficiency, February 2019, ('**Steer Report**'), (SOC063), pVII.
[163] CAA's draft RP3 Decision proposed cuts of £71m that applied in each of the years of RP3 (i.e. within the Steer range). In the final RP3 Decision the CAA removed the planned reductions from years 1-3 of RP3;[163]
[164] CAA, UK RP3 CAA decision document, CAP1830, 2019, ('**CAA RP3 Decision**'), (SOC012), pp. 57-61.
[165] CAA, UK RP3 CAA decision document, CAP1830, 2019, ('**CAA RP3 Decision**'), (SOC012), pp. 57-61.
[166] RP3 reference CAA document 002 CAP 1857 20191119 – "Reference to the Competition and Markets Authority of the NERL RP3 price controls', page 26, section 2.6 – 2.9
[167] CAA RP3 Decision, (SOC012), 5.25, p. 60

Modernisation strategy". The CAA's draft RP3 decision document also makes it clear that this fund cannot be used to deal with shortfalls in cost as a result of the CAA making cuts to the operating cost allowances proposed by NERL in the RBP: "*we have made an allowance for operating costs that we consider appropriate for NERL to meet its obligations and provide its services, and it is for NERL to manage its business within the revenue we have allowed*".[168]

282 In narrowing the scope of the OFF significantly compared to NERL's proposal, the level of resilience that the OFF now provides to NERL against unforeseen costs is substantially reduced. As such, while on face value this is an increase of £7m in funding, in reality it is a large reduction of up to £35m in the operating costs available to NERL.

8.5.4. Allowance for ACOG

283 ACOG is a new business unit set up within NERL to operate on a standalone basis and help support airspace modernisation. The background to ACOG and the role it is expected to play is described in more detail in Section 5 above. Neither the creation of ACOG, nor the costs associated with it, formed part of our RBP. As such the allowance of £15m in the CAA's RP3 Decision should not be seen as additional funding for our RBP.

8.6. Why we believe the CAA's decision is not in the public interest

284 We consider that the CAA has overstated the scope NERL has to make efficiency savings by attaching too much weight to historic trends. NERL's business plan already incorporates significant efficiency savings and the scope for it to make additional efficiency savings is limited. In addition, we are concerned that there is no transparent or explicit link between the CAA's RP3 Decision and any underlying evidence.

285 Our views on this issue are supported by our consultants, Economic Insight and NERA, whose reports should be read alongside this submission.[169]

286 In the following sections we address the different elements of the CAA's rationale for its proposed reductions as set out in paragraph 278 above.

8.6.1. Historic efficiency savings are not a robust rationale for RP3 reductions

287 The scale of reductions required by the CAA is based on the assumption that the level of cost saving realised by NERL between 2007 and 2017 can continue at the same rate between 2019 (last year of RP2) and 2024. In reaching this conclusion the CAA ignores the fact that most of the operational saving was delivered through the closure of two ATC centres, the rationalisation of a number of other sites, and two major staff restructuring programmes, costing around £80m in redundancy and relocation costs.[170]

288 These restructurings were focused on the central and back office areas and represent a one-off rationalisation which cannot be repeated without negative consequences for the level of service that NERL provides to customers. For example, we estimated as part of our RP3 planning process that having 50 fewer ATCOs in 2023 would almost double the amount of NERL attributable delay, with a considerable increase in the variability of service quality.[171]

[168] CAA RP3 Decision, (SOC012), 9.30, p. 121
[169] Review of Cost Efficiency, (SOC039) and NERA, Appendix E, Staff Headcount in RP3: A Response to Steer's Analysis, 09/04/2019, (SOC062)
[170] NERL's financial accounts for years 2009, 2010, and 2014 – NATS Enroute plc financial statements, (SOC123, SOC124, SOC121)
[171] RP3 RBP Appendices, (SOC021), p. 86

289 Additionally, the choice of this efficiency measure (real reduction in opex per chargeable service unit between 2007 and 2017) is arbitrary. There is no rationale for the start or end year and different choices for those produces widely varying results. For example, if the range was 2007 – 2016 then the result would be 'just' 1.4%.[172]

290 Finally, there is also no rationale for looking at operating costs per TSU, which is a billing unit made up of distance and weight, as opposed to something that is marginally more closely related to the cost of delivery such as flights. Historic operating cost unit efficiency as a factor of flights is around 1.8% and would reduce the CAA's proposed cuts in RP3 by c£10m.[173] With such a large proportion of our cost based fixed in relation to traffic (see Section 8.3.1 above), any unit cost efficiency measure will exaggerate efficiency during periods of traffic growth and underestimate efficiency during periods of traffic decline.

291 Economic Insight considers that the evidence "*does not provide a robust basis for the additional efficiency savings identified by the CAA.*"[174]

8.6.2. Historic outperformance is not a robust rationale for RP3 reductions

292 It is true that NERL has, on average, out-performed our opex allowances over prior reference periods (around 7% in CP2 and CP3). Out-performance in those periods was made possible, in part, by factors such as a downturn in traffic levels.

293 In contrast, however, we have over-spent relative to our opex allowance by around 3% in RP2 to date. Various factors have led to this under-performance, including the reducing scope for efficiency gains, the pressures of increasing traffic levels, and the additional costs required to support our capex programme.

294 Additionally, the 4.9% statistic that the CAA also states is mis-leading when presented in association with the 2.3% efficiency target as they are measuring two different efficiency metrics and these cannot be compared or added together in any way.

8.6.3. The CAA's % efficiency challenge is not similar to NERL's

295 The 2.2% p.a. quoted by NERL in our RBP is the efficiency from 2020 to 2024 (i.e. during RP3) and is not equivalent to the 2.3% quoted by the CAA for 2019 to 2024. This is because of the difference in the cost base between 2019 and 2020. The CAA's decision, measured on the same basis and timeframe as NERL's RBP would represent a 3.6% p.a. reduction.[175] That clearly undermines any suggestion by the CAA that the efficiency challenges it has proposed in its RP3 Decision are similar to the NERL RBP.

8.6.4. There are serious concerns with the Steer/Helios report

296 As noted above the CAA has placed weight upon the findings of its consultant, Steer/Helios. However, as we have previously expressed to the CAA, including in our formal response to the CAA's draft proposals, we have serious concerns about the Steer/Helios report on operating costs.[176] In particular, we consider that the Steer/Helios report was fundamentally flawed in its approach, failing to adequately consider the complexity of NERL's operation, the range of

[172] Operating Cost Support Pack, (SOC106), p. 3 - 6
[173] Operating Cost Support Pack, (SOC106), p. 7
[174] Review of Cost Efficiency, (SOC039), Section 3.2.2.1, p. 29
[175] Operating Cost Support Pack, (SOC106) p. 27
[176] NERL's Response to the National Performance Plan CAP1758, 12/04/19, ('Response to CAP1758'), (SOC002), p. 35

new requirements for RP3, or the level of service quality that customers want, which have led to the need for additional resources.

297 One issue that we have highlighted to the CAA is that Steer/Helios' model has limited ability to explain the relationship between cost and its drivers.[177] In particular, it was only able to explain 10-20% of changes in the opex, which is a low degree of confidence for making cuts to opex for a safety-focused business. Steer/Helios also duplicated its application of an efficiency adjustment for historical European ANSPs, which will include productivity benefits of various investment programmes. Steer/Helios made an adjustment for our own DSESAR investment programme, which is in effect the same as counting the impact of technological progress twice.[178]

298 Economic Insight also found that the Steer report suffered from "*significant methodological issues*".[179]

8.6.5. The CAA's challenge is not consistent with comparator data

299 The PRB study is an academic study looking at the theoretical potential opportunity for efficiencies across both operating and capital costs for ANSPs across Europe.[180] In that report the UK was found to have the lowest opportunity for savings of the 'big 5' comparator group and lower than nearly all other European ANSPs. [181]

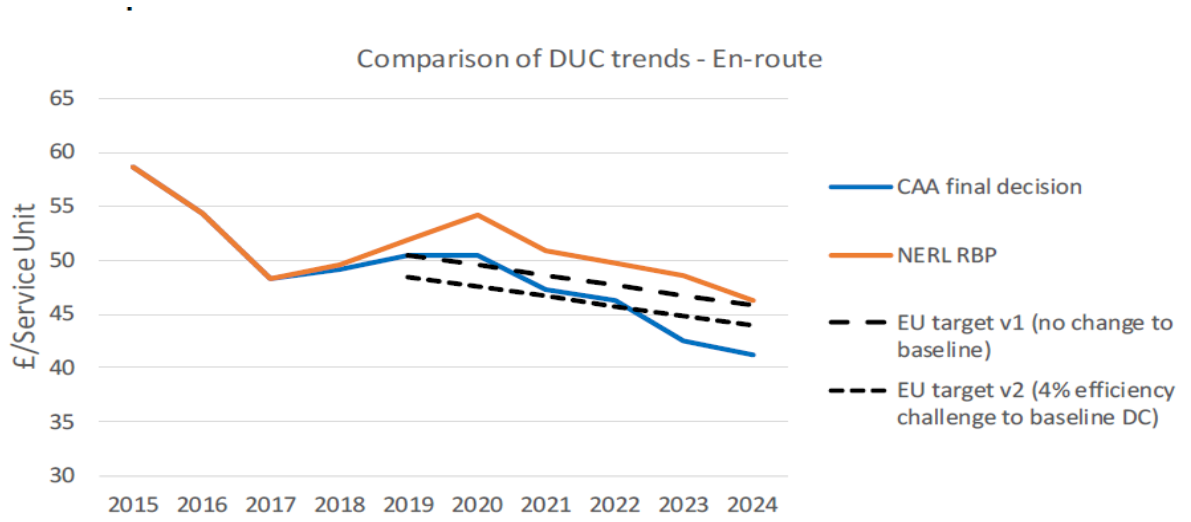
300 NERL is the best performing of the 'big 5' ANSPs in our comparator group in the 2016 ACE benchmarking report, which was current at the time of writing the RBP.[182] NERL comes top for 3 of the 6 en route efficiency measures, 2nd for 2 of the 6 and 3rd for 1 of the 6.[183] NERL also outperforms the European-wide average for all metrics bar one.[184]

301 The UK is already exceeding the EC's proposed SES cost efficiency targets of 1.9% reduction in DUC between 2019 and 2024:[185]

- The NERL RBP – which was based on the NATS August-18 traffic forecast – shows a 2.3% DUC reduction between 2019 and 2024.
- Even if the NERL RBP was to be assessed using the STATFOR February-19 traffic forecast, which is the forecast used by the European Commission as the basis for their cost efficiency target, then NERL's RBP shows a 2.1% DUC reduction between 2019 and 2024. This is shown in Figure 8 and Figure 9 below. [186]

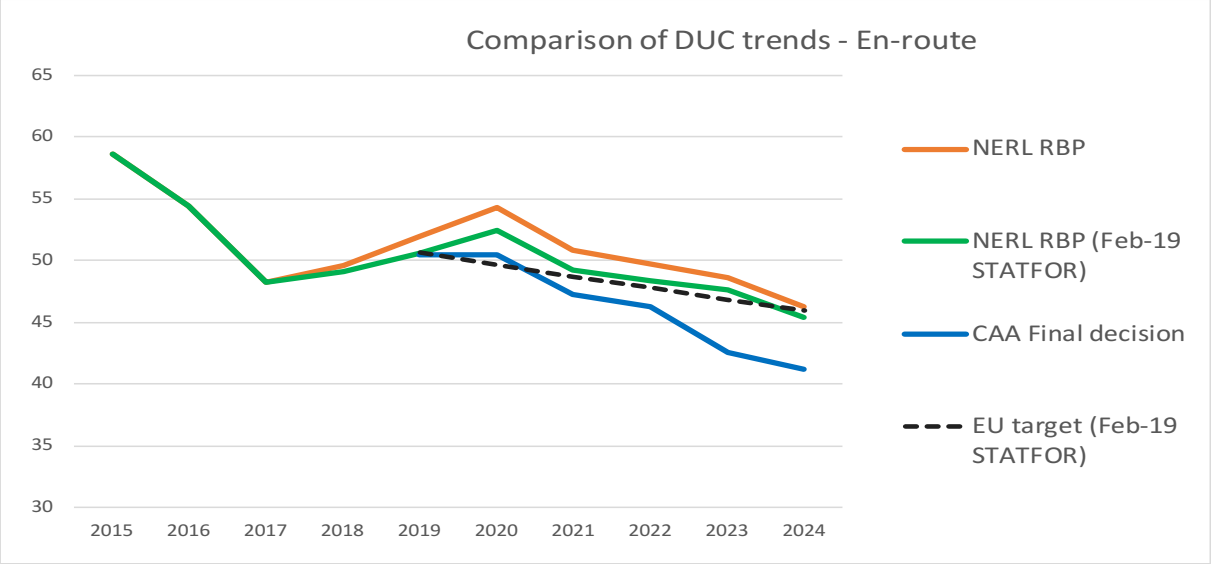
[177] NERA, Appendix E, Staff Headcount in RP3: A Response to Steer's Analysis, 09/04/2019, (SOC062), p6.
[178] NERA, Appendix E, Staff Headcount in RP3: A Response to Steer's Analysis, 09/04/2019, (SOC062), p6.
[179] Review of Cost Efficiency, (SOC039), Section 3.2.3,5 p. 40
[180] PRB 2018, EU target ranges for RP3: Annex 2. Air Navigation Service Providers: Advice on benchmarking of ANSPs and EU-wide cost targets (SOC169)
[181] PRB 2018, EU target ranges for RP3: Annex 2. Air Navigation Service Providers: Advice on benchmarking of ANSPs and EU-wide cost targets (SOC169)
[182] 'Eurocontrol ACE 2017 Working Group, Air Traffic Management Cost-Effectiveness (ACE) Benchmarking Report for 2017, 2018 -2022 Outlook, May 2019 ('**ACE Benchmarking Report, 2017**'), (SOC059)
[183] Eurocontrol 2018, ATM Cost-Effectiveness 2016 Benchmarking Report with 2017-2021 outlook, (SOC060) p16 and 21.
[184] NERL performs similarly in the most recent 2017 ACE benchmarking study i.e NERL is the best performing of the 'big 5' ANSPs in its comparator group for economic cost-effectiveness and financial cost-effectiveness – see Eurocontrol 2019, ATM Cost-Effectiveness 2017 Benchmarking Report with 2018-2022 outlook, (SOC059) p. 16 and p. 23.
[185] CAA, 2019, UK RP3 CAA decision document CAP1830, (SOC 012), p.17, table 5
[186] Operating Cost Support Pack, (SOC106), p. 29 – 32

Figure 8 Figure 5 from the CAA's Notice of Referral



Source: CAA

Figure 9 Equivalent Chart to Figure 8 showing RBP on a consistent traffic basis to the EU target



Source: NERL [187]

- Not only does NERL's plan exceed the DUC % target, but it shows a reduction in determined costs - the DUC target is comprised of a targeted level of performance for Determined Costs (DC) and an assumption for traffic growth. The SES DC target is for a 0.4% increase in DC with an assumed 2.3% growth in traffic (giving 1.9% overall). NERL, in our RBP is proposing a 0.3% decrease in DC but with slightly lower traffic growth of c2.0% (giving 2.3% overall) [188]

- Finally, the CAA refers to a revised EC cost efficiency target for Determined Unit Cost (DUC) with a modified start point in 2019 reduced by 4%. NERL is unclear about the basis for this modification based on existing information available from the European

[187] Operating Cost Support Pack, (SOC106), p. 29 – 32
[188] Operating Cost Support Pack, (SOC106), p. 29 – 32

Commission and Performance Review Body about European cost efficiency targets and their calculation.[189].

302 The SES cost efficiency targets are set by Member State at a national level by reference to the UK's DUC. The UK's DUC is comprised from three cost components: NERL, the CAA/DfT, and the UK Met Office. The contribution being made by each of these parties is shown in the table below:

Table 7 Contributions to the SES cost efficiency targets

UK Component	2019 – 2024 DUC efficiency (NERL RBP)	2019 – 2024 DUC efficiency (CAA NPP)	2019 – 2024 DUC efficiency (EU Target)
NERL	2.3%	4.0%	
NSA (CAA) & DfT	1.0%	1.0%	1.9%
Met Office	(1.9%)	(1.9%)	1.9%
Total UK	**2.0%**	**3.5%**	**1.9%**

Source NERL [190]

303 NERL would be the only entity meeting the EU target, exceeding the EC target in total for the UK and for NERL individually[191].

304 Additionally, traffic is projected to grow more strongly in Europe as a whole than in the UK specifically, which means that there is less scope for DUC efficiency driven by absorbing increases in traffic. Instead costs will need to increase to deal with additional volumes and associated complexity within constrained airspace capacity.

8.6.6. The CAA's RP3 Decision is inconsistent in its treatment of years 1-3 and 4-5

305 As explained above, the CAA's RP3 Decision allows our opex proposals in full for years 1-3, but imposes reductions in years 4-5. The main cost drivers – such as traffic, service quality targets, resilience requirements, airspace modernisation and technology changes – which exist in the first three years of RP3 and which drive 'temporary' cost increases – which the CAA has accepted – continue or, in the case of traffic, increase, in the last two years of RP3.[192] The CAA's rationale for imposing reductions in the last two years, when it has accepted the rationale for not doing so in the first three years is, therefore, unclear.

8.6.7. The potential consequences of giving effect to the CAA's cost reductions will be contrary to the public interest

306 The CAA has not attempted to assess the risks arising to customers of the outcomes of their decisions on opex and therefore cannot evaluate whether their proposed cuts are in the public interest. If NERL was forced to try and implement the savings proposed by the CAA we consider that the likely consequences would be adverse to the public interest:

- A reduction in the number of new ATCOs entering the operation during RP3 would lead to:

[189] Operating Cost Support Pack, (SOC106), p. 29 – 32
[190] Operating Cost Support Pack, (SOC106), p. 28
[191] CAA, 2019, UK RP3 CAA decision document CAP1830, p.17, table 5
[192] Operating Cost Support Pack, (SOC106), p. 10 - 17

- lower service quality, in the form of greater delays, in RP3 as the volume of traffic increases (see Section 4 above);
- further reduction in our operational resilience impacting our ability to deal with unusual events including weather (see Section 6 above);
- an inability to support the additional staffing requirements for the third runway at Heathrow; and
- an inability to release ATCOs to support validation, training and transition activities for the technology and airspace modernisation programmes, which would lead to later delivery and significant service performance degradation in RP4 and beyond (see Section 11 below). This would also lead to extra costs to cover a longer period of dual running and we would need to operate at a higher risk of technical failure.

- Our ability to engage in other activities that customers value, such as communications support in engaging local communities and other stakeholders in airspace modernisation, would be limited.
- Our ability to perform our wider role as the UK's centre of knowledge and excellence for ATC matters would be compromised. Examples would include expenditure on: sharing knowledge internationally on the NERL concept of a Safety Management System; participation in international and European fora to obtain and share knowledge on new developments such as airspace sharing with drones, cyber threats; consultations on proposed international mandates; and, post Brexit, influencing and consulting on changes to the SES and SESAR related legislation which is likely to affect NERL's finances and operations but in respect of which the UK will not have a vote. NERL considers that these activities are vital for the UK public interest, by contributing to improving safety, effectiveness and efficiency throughout the interconnected global network of air traffic control and related services. In the absence of sufficient operating costs, NERL would have to consider the extent to which it was willing and able to fund these activities from shareholder returns.

307 Finally, NERL is very clear that our priority is to deliver a safe service. This is achieved through multiple means, but the key requirement is a strongly embedded safety culture that is underpinned by proportionate operational expenditure. We achieve the former through open reporting by all our operational staff and a 'Just' culture in which staff can openly raise safety concerns, or declare safety related errors, without fear of personal repercussions, in order to promote continuous improvement in safety. This also helps ensure that safety is always given priority over commercial decisions.

308 If these opex cuts were to be imposed and the steps listed above were forced on us in order to live within the revenues the CAA has proposed, safety would of course remain our number one priority. However, achieving essential ongoing safety improvement to maintain safety levels with increasing traffic volumes and complexity through technology, airspace and or process changes will be increasingly challenging within a constrained financial context. Therefore, although we will continue to do the most we can, within the resources available, to maintain our safety standards it must be acknowledged that there may be a risk to our resultant safety performance as measured by the number of safety events. This may subsequently impact on the safety culture, further deteriorating overall safety performance.

309 The CAA has not attempted in any way to assess the risks arising to customers of these outcomes from their decisions around opex.

8.7. Conclusion

310 We request that the CMA assesses what is an appropriate opex allowance and cost efficiency challenge for NERL in the public interest, taking into account:

- our core purpose;
- previous rationalisation exercises;
- benchmarking to similar comparators;
- the efficiencies already built into our plan;
- a bottom up approach to costing; and
- assessing the risks to outcomes that customers care about, taking into account the relative scales of our charges and the potential adverse consequences to customers – the total impact of the CAA's proposed cuts is c12p[193] per passenger per flight, weighed against the potential for significant service disruption if sufficient cost allowances are not made available.

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[193] On average £40m p.a. of cuts to Determined costs in RP3, spread over an average of 2.735m flights p.a. with an average of 120 passengers per flight

9. Non-regulated income

9.1. Overview

311 The purpose of this Chapter is to set out details of NERL's and the CAA's assumptions about the levels of non-regulated income anticipated to be earned during the RP3 period. In particular we demonstrate that:

312 Any non-regulated income we earn offsets regulatory airline customer prices through the single till mechanism. The costs of delivering the services that generate this income are included in NERL's operating cost base. Importantly, the vast majority of this income is generated by sharing the use of our existing regulated infrastructure and staff expertise from elsewhere in NERL. As a result, the non-regulated activity is mainly marginal in nature.

313 We agree that the CAA should test the credibility of both our non-regulated business pipeline as well as the efficiency of the costs that support it. We also agree with the assumptions made by the CAA for FMARS, London Approach and North Sea Helis.[194] However, the CAA has made a reduction of £24m to our operating costs on the basis that we have not provided evidence to demonstrate that cost reductions associated with reduced non-regulatory revenues have been fully taken into account in our business plan.

314 The CAA has made its decision because non-regulated revenues are expected to be around £19m per annum lower in RP3 than in the peak RP2 year (2017) but the costs that we have removed from as the basis of our RBP are reducing by a smaller amount (£8m pa). The relatively small reduction in costs, relative to the reduction in revenues, reflects the fact that many of the costs supporting these activities are fixed and will still be incurred. For example, we received co-funding for R&D from the EU in RP2, but do not expect this funding to continue in RP3. We still need to undertake R&D activity even if we do not receive the funding.

315 The CAA appears to reach the conclusion that our costs have not sufficiently reduced in line with lower revenues. However, it is not feasible for us to reduce our costs any further because the costs relating to these revenue streams are either fixed or form an essential part of our core ATC service. Therefore, we suggest this opex cut of £24m should be removed in its entirety.

316 Details of the respective positions of the CAA and NERL with respect to non-regulated income are summarised in the table below.

[194] NPP, (SOC002), 5.29, p. 57

Table 8 Comparison of NERL and CAA position – non-regulated income

Non-Reg Income	NERL RBP	CAA NPP	Delta	Rationale
FMARS	£215m	£202m	- £13m	CAA & NERL – Impact of the CAA adjustments on FMARS contract now fixed with MoD .
London Approach	£66m	£61m	- £5m	CAA & NERL – Impact of the CAA adjustments on London Approach charges, neutral to NERL via single till.
Income from NSL & other revenue	£183m	£183m	-	CAA proposed £24m cuts to the costs of servicing this income (below)
TOTAL	**£464m**	**£446m**	**- £18m**	
*Opex costs (for Non regulated income)**			*- £24m*	*CAA - Costs associated with Non-regulated income have not reduced in line with lower income levels. NERL – Costs associated with Non-regulated income are marginal in nature (largely fixed).*

** NB: The CAA have made these cuts to the operating cost building block but are shown here as they relate to non-regulated income as the driver*

9.2. Introduction

317 The 'single-till' income building block comprises five main income streams: London Approach, North Sea Helicopters, MoD (the FMARS contract), Intercompany Income from NSL, and 'other revenue'. For all intents and purposes, London Approach and North Sea Helicopters are regulated revenues (with price caps set by the CAA for cost recovery of what are licenced services for London Approach, and a cost recovery charge that is neutral in the single till for North Sea Helis). However, while their costs are included in the determined cost base, their revenue goes into the single till to offset airline customer prices for en route ATC.[195]

318 For the MoD, we support the CAA's proposed changes to our RBP because they reflect the contract now in place for RP3 with the MoD customer. However, the CAA has also proposed cuts that relate to the remaining two revenue streams relating to intercompany income from NSL and 'other revenue' with which we do not agree.

319 As nearly all of our non-regulated business revenue is based on sharing use of our en route ATC infrastructure and resources (staff), our costs do not reduce proportionately to those revenues and thus we do not see how these savings can be achieved.

[195] CEPA Cost Allocation and Non-Regulated Income Report, (SOC014), p70 and CAA RP3 Decision, (SOC012), paras 5.44 and 5.45, p 64

Martin Rolfe, CEO, NERL

"Undertaking commercial business is not our core activity. Where there is a sensible opportunity to do this by sharing our infrastructure or resources, then we will do so. However, we do not have, and do not seek out, commercial business that would detract from our Licence responsibilities. As such, the costs associated with the revenue streams we do have are largely fixed as they are a share of our en route cost base and cannot be reduced in line with a reduction in single till revenue."

9.3. Background

9.3.1. NERL focus on regulated activities

320 As explained in the Industry Overview section 4.1.1, NATS was split at PPP into two distinct legal entities. The more high risk and commercial activity was ring fenced into NATS (Services) Ltd (NSL). NERL took on the lower risk core ATC activity. NERL was not set up to generate other commercial revenue streams - this was why NSL was created. However, any non-regulated income that NERL does generate helps to reduce airline customer prices via a single till mechanism (in RP2 this reduced airline prices by c15%).[196]

321 There are various regulatory mechanisms and licence conditions that are in place to ensure that NERL is not distracted by any non-regulated activity at the expense of our core purpose, which is to provide the licensed UK en route and Oceanic ATC service. For example:

- Licence Condition 5 (12 a (vi)) prevents NERL's non-regulated income from exceeding 4.5% of aggregate turnover of the en route businesses.
- Licence Condition 5 (12b) applies a cap on non-regulated investments of one per cent of the share of capital in issue, share premium and consolidated reserves of the Licensee as shown by its most recent audited historic cost financial statements then available.

322 The CAA has also strengthened these measures over time since the PPP, for example through the creation of cap preventing NSL's income exceeding 45% of NATS', where NSL is an important source of NERL's non-regulated income for the reasons described above.[197]

9.3.2. Categories of non-regulated single till income

323 There are 5 key categories of 'Non-regulated' single till income:

- London Approach: Radar approach services for the six airports inside the London TMA in order to maximise the capacity and efficiency of the busy Terminal Manoeuvring Area (which is amongst the most complex airspace in the world) as well as the interfaces with the London airports and the wider en route network.

[196] NERL, Regulatory Accounts, 2018, (Regulatory Accounts 2018), (SOC071)
[197] Decision on Licence Modifications in Respect of Governance and Ring-Fencing, (SOC015), p. 24

- North Sea Helicopters: ATC services for Helicopter activities servicing the North Sea oil and gas platforms.
- MoD: the FMARS contract for the joint and integrated use of civilian infrastructure to provide Military ATC services across the UK. This is by far the biggest source of single till revenues.
- Income from NSL: Either sharing the cost of central support functions such as Finance, HR or corporate communications, or providing NSL with resources/services to support projects or specific contracts that NSL has with customers.
- Other revenue: Selling vacant space at NERL sites to third parties, selling radar data to third parties, or grant / co-funding income for UK or European research & development projects (most noticeably the EU SESAR Joint Undertaking – EU SESAR JU).

9.4. Basis of NERL's plan

324 NERL's single till revenues are expected to be around £19m lower on average each year during RP3 than their peak in RP2 for the reasons explained in the Table 9 below. The costs supporting these activities have reduced by £12m per annum, but £4m of this resource has been reallocated to other activities that form a key part of our RP3 business plan (e.g. training college resource, and analytical capabilities). The costs we have removed from our plan total £8m pa.

Table 9 Single till income

2017 prices, annual increases / (reductions)	Movement in Revenue (2017vRP3)	Movement in Direct Cost (2017vRP3)	Movement in Contribution (2017vRP3)	Reason for change in contribution	What happens to 2017 costs?	Reason for change in costs
Other revenue (Asset based)	(£2m)	-	(£2m)	One off fees in 2017, site sharing demand falling	No change	Asset costs are fixed and form part of core business
Other revenue (SESAR DM)	(£7.5m)	(£7.5m)	-	End of arrangement with SESAR	(£7.5m reduction)	Costs are entirely variable and have been removed
Other revenue (EU R&D)	(£4m)	-	(£4m)	Brexit – end of funding (*NERL will pass back any monies received)*	No change	R&D still needs to be undertaken despite lower funding
Other revenue (Other)	(£0.5m)	(£0.5m)	-	No material change	(£0.5m reduction)	Costs are mainly variable
MSAs	-	-	-	No material change	No change	No change to income or costs
ICA (Asset based)	(£1.5m)	(£1m)	(£0.5m)	Loss of airport contract, reduced training capacity	No change	College capacity needed to train NERL ATCOs
ICA (Resourced based)	(£3.5m)	(£3m)	(£0.5m)	End of key contract with NSL, resource will support RP3 priorities	No change	Staff retained to support RP3 priorities. Small % of a large number of staff
Total	**(£19m)**	**(£12m)**	**(£7m)**		**(£8m reduction)**	

Source: NERL's business planning

325 For the income from NSL (MSA and ICA income in Table 9 above), the reduction is due to two key reasons:

- Firstly, we need to train around 350 new controllers during RP3, and as such we will not be able to provide resources to support 3rd party training via NSL. Revenues will fall as a result, but costs will be retained to carry out this essential work in-house.
- Second, the cessation of key NSL airport and engineering contracts have led to reduced demands for NERL's resources during RP3. Most of this resource is specialist skilled staff (e.g. analytics) who we need to retain to support key elements of our airspace modernisation programme (e.g. LAMP) and our technical change programme.

326 For the 'Other revenues', the reduction is mainly a factor of the SESAR Deployment Manager (DM) and EU SESAR JU R&D funding coming to an end in late RP2 as the EU are ending the R&D phase for all states now that the ATC concepts that were being researched have been proven ready for deployment. In relation to SESAR DM activities, there has been an equal and offsetting reduction in our costs. For SESAR JU R&D funding, there has not been a reduction in our costs because we still need to carry out the R&D work. In addition, revised EU charging regulations for RP3 mean that if we are able to secure any R&D funding in RP3, this must be treated outside of the single till mechanism and must instead be passed back to customers as a pricing adjustment each year. Any R&D income we do receive will be treated in this way, and will not be retained by us, but will be used to reduce customer prices.

327 Because of the nature of the NERL non-regulated business, the opportunity for generating more income is limited and relies upon customers with a need for the services that can be provided by NERL infrastructure, services or IPR.[198] 5 major opportunities that have existed historically have all been exhausted:

- MoD Project FMARS (now signed and included in the RBP at the full contract value)
- MoD Project Guardian (lost to a competitor in 2017)
- EU Centralised services provision (contract withdrawn from tender by the customer)
- EU SESAR JU part funding (programme has now come to completion)
- Overseas ATC training contracts (no available capacity at the NATS College due to increased internal demand for trainees from the NERL business).

9.5. The CAA's RP3 Decision

328 The CAA's approach to this area has had a confusing journey. The CAA's original proposals assumed a £49m targeted increase in the level of the non-regulated income building block for RP3.[199] The CAA's justification appeared to be based upon the observation in its consultants' report that there may be scope for more ambition to generate other non-regulatory revenues and deliver cost savings.[200] This is unachievable for two main reasons:

[198] Other Revenue Analysis for CEPA, ('**Other Revenue Analysis**'), (SOC0667)
[199] NPP, (SOC002), para. 5.33, p. 58
[200] CAA RP3 Decision, (SOC012), p.62

- it includes no additional costs to enable the delivery of these extra revenues and so is effectively a £49m *margin* target contribution to the single till; and

- given all our existing marginal revenue streams are saturated, to achieve this through revenue growth alone would imply creating a non-regulated commercial business unit (in the few months remaining before RP3 begins) that is capable of generating in the order of c£500m of revenues over RP3 (£100m p.a. over 5 years of RP3, assuming a margin of 10% = c£50m margin). By way of comparison this is around half the size of NSL in its entirety, which is completely unachievable.

329 However, the CAA's RP3 Decision moved away from assuming increased revenue, and instead focused on increased reduction in costs.

330 The scale of the adjustment in the RP3 Decision was reduced to £24m (around £5m p.a.) which was applied as a reduction to the operating cost building block. The justification given by the CAA was that cost reductions associated with reductions in non-regulatory revenue had not been fully taken into account in our RBP.[201]

9.6. Why we believe the CAA's decision is not in the public interest

331 We are content with the CAA's non-regulated income proposals for MoD, London Approach and North Sea Helicopters. However, we do not agree with the CAA's proposals for non-regulated income related to income from NSL and other revenue.

332 The CAA's proposal is based on its lack of confidence that we have removed costs where non-regulated income is decreasing. The CAA has not provided any evidence other than their opinion for this proposal. We have provided a detailed list of the costs associated with non-regulated income and the reasons why individual components do and do not reduce in line with income. This has been ignored.

333 Were we to attempt to implement the CAA's proposed cuts, it would be to the detriment of the core regulated ATC services. Even if we could try to implement them, it would require a fairly complex restructuring programme of our workforce, funding for which is not included in the RP3 plan.

9.7. Conclusion

334 The CAA's targets for reduced opex related to non-regulated income are inadequately justified and unfeasible to deliver with respect to the non-regulated activities in isolation. The CAA's expectations set out in its RP3 Decision can only be delivered through further reductions in the opex of the core licensed ATC business. Such cuts would be in addition to the opex reductions that the CAA has already proposed with respect to the regulated business which, as we have set out in detail in Section 8 above) we have already assessed as unjustified. The CAA has not appropriately balanced its Efficiency Duty with its Customer Interest Duty in considering the public interest.

[201] CAA RP3 Decision, (SOC012), p.18; para 5.28, p. 61; and para 5.47, p.63

10. Pensions

10.1. Overview

335 This Chapter deals with the pension cost allowances that have been allocated in the CAA's RP3 Decision. In particular it sets out NERL's concerns with respect to the CAA's cuts to the Defined Benefit (DB) deficit recovery payments.

336 NERL's concerns with the ongoing DB and Defined Contribution (DC) pension scheme costs arise directly from assumptions made in relation to staffing levels (see Section 8 relating to opex).

337 NERL's business plan projections reflect the contribution schedule set by the Trustees following the 2017 valuation. They are based on long term assumptions – agreed as being appropriate by expert actuarial advisors separately advising NERL and the Trustees – taking account of financial market conditions.[202]

338 Contrary to the approach agreed for deficit contributions by two of the leading consultancy firms in the industry, the CAA has made its own assumption that there will be a reduction in deficit payments during the course of RP3.[203] The CAA is in effect projecting an improved position in financial market conditions on grounds which are not explained. It argues that this assumption is adopted to protect customers because NERL has not provided sufficient information as to how a scheme surplus, were it to arise, would be used for the benefit of customers.

339 This position fails to recognise two things: the role of the Trustees in managing the scheme in the interests of the members; and NERL's track record of influencing Trustees to ensure that customer interests are also considered, most recently through the design of the 2017 valuation recovery plan, which reduced the deficit payments required to be made to the scheme during RP3 by around £40m. This in itself reduced the risk of a trapped surplus emerging.

340 Nor is the CAA's solution to its concerns soundly based. It places reliance on the pension pass-through mechanism in EC legislation to mitigate the risk of its forecasting error.[204] NERL believes that the CAA has misunderstood the legal effect of the pass-through mechanism which at best introduces doubt that it will operate as the CAA intends, and may prevent NERL obtaining a cost pass-through.

341 Since the CAA and its expert advisor GAD has endorsed the reasonableness of NERL's pension costs,[205] which might not subsequently be fully recovered by NERL under the current CAA proposals, the deficit repair payments should be re-instated to the RBP level. The CAA

[189] NATS Section of CAA Pension Scheme Schedule of Contributions (4 June 2018), ('**NATS Section of CAA Pension Scheme Schedule of Contributions**'), (SOC075)
[203] CAA RP3 Decision, (SOC012), para 5.59 - 5.64, p. 68 - 69
[204] CAA RP3 Decision, (SOC012), para 5.65, p. 69
[205] GAD, Analysis of Pension Costs for NATS (en route) plc, 24/09/2018, ('**GAD Report**'), (SOC051)

should use the mechanism of a Regulatory Policy Statement to address its concerns with customer value in a future where the scheme might unexpectedly be in significant surplus.

342 Details of the respective positions of the CAA and NERL with respect to pension costs are summarised in the table below.

Table 10 Comparison of NERL and CAA position - pensions

PENSIONS	NERL RBP	CAA NPP	Delta	Rationale
Deficit repair payments	£71m	£53m	- £18m	CAA – Have determined their own view of future market conditions based on a concern that customers will not share in the benefit of a future funding surplus NERL – Funding position & deficit is determined by the pension trustees who then agree a deficit recovery plan with the company taking account of financial conditions. Pension pass-through only provides for unforeseen market driven changes in costs.
Ongoing pension costs	£345m	£339m	- £6m	CAA – Estimate of the impact on pensions of opex (staff) cuts (see section 8) NERL – Opex cuts are not deliverable and thus this pension reduction will not be realised.
TOTAL	**£416m**	**£392m**	**- £24m**	

10.2. Introduction

343 NERL participates in both a DB and DC scheme operated by the NATS group. NERL believes that the final RP3 Decision cost allowances are too low for both schemes and highlights a potential risk in the legal mechanism that the CAA uses to underpin its decision on the DB deficit repair allowance. The chapter also addresses the Regulatory Policy Statement (RPS) which is proposed by the CAA in relation to the DB scheme costs and how it might be better used to address the CAA's concerns that have led to the reduction in the DB deficit repair allowances.

10.3. Background

10.3.1. DB and DC scheme on-going service costs

344 An overview of the DB and DC schemes is provided in the Industry Overview (section 2.10.2). The reductions proposed by the CAA on NERL's ongoing service pension costs are based on assumptions for reductions in payroll that will flow from the CAA's proposed reductions in operating costs.[206] Those reductions in payroll translate (through NERL's opex model) directly into a blended DB and DC rate of pension cost savings.

345 NERL's rationale for why these opex reductions are undeliverable is set out in Section 8 above. If NERL cannot reduce our opex in-line with the CAA's projections then it will not be able to recover the associated pension costs either and they will have to be funded by shareholder returns instead.

[206] CAA RP3 Decision, (SOC012), para 5.67, p. 69

10.3.2. DB scheme deficit repair costs

346 The defined benefit scheme is NERL's largest pension scheme and it presents a significant risk to NERL. NERL's economic share – at 76% - of the liabilities of the NATS Group scheme is large relative to NERL's net assets and our regulatory asset base. Consequently, the impact of external factors on the funding requirements of the scheme has a considerable impact on NERL's cost base and our financial position. The last formal valuation at 31 December 2017 reported a deficit of £270 million, with scheme liabilities at £4,811 million[207] - NERL's share being c£205 million and c£3,650 million, respectively. At 31 December 2018 the deficit was £432 million,[208] with liabilities of £4,854 million[209] - NERL's share being c£330 million and £3,690 million, respectively. In contrast, NERL's Regulatory Asset Base at 31 December 2018 was only £1,016.1 million.[210]

347 As detailed in the Industry Overview (section 2.10.2), the DB scheme has several guarantees built into it that are enshrined in the DB scheme's rules and by a Government commitment at the time of the PPP. The DB scheme was also closed to new members on 1 April 2009[211] to help control the escalating cost typical of these types of pensions arrangements across all industries. At this point the DC scheme was created. Therefore, the options available to NERL to reduce the cost of the scheme further are materially limited.

348 In general, the CAA will allow the efficient costs of the DB and DC schemes to be charged to customers if NERL has managed those costs appropriately. Any additional pension costs associated with higher than planned pensionable pay increases must be borne by NERL. Pensions are an emotive subject for NERL's workforce, which is highly unionised and there are regular challenges in pay negotiations as a result of NERL's imperative not to exceed planned pensionable pay increases for DB scheme members. The CAA's RP2 decision attempted to introduce an asymmetric pass-through arrangement, an approach which the unions stated would antagonise staff.[212] That decision was eventually reversed by DfT on the basis it was unlawful. The NATS trades unions remain interested in the status of the DB scheme and they have access to the DB scheme actuary - through a regular NERL review body - to monitor developments in the pension deficit and ongoing service costs. This reflects the interest of the workforce in the costs and liabilities of the DB scheme, which itself reflects the wider public concern of the ability of pension schemes to fund their liabilities without recourse to the Pension Protection Fund.

349 The DB pension scheme is much larger than NERL itself, with an economic share of liabilities that are three and a half times[213] the RAB - depending on financial market conditions. This scale of liabilities means that the DB pension Trustees must (under applicable law and regulation) assure themselves regularly that NERL's financial covenant is strong enough to justify a long repayment period for the deficit – a 9 year period was agreed for the 2017 valuation relative to an industry average of c7.3 years.[214] If the Trustees have concerns about

[207] AoN Hewitt, Pension Valuation Report, 31/12/2017, ('**Actuarial Valuation Report at 31 December 2017**'), (SOC043), p. 11
[208] AoN Hewitt, Actuarial report at 31 December 2018, 28/03/2019, ('**Actuarial Valuation Report at 31 December 2018**') (SOC045), p.7
[209] Actuarial Valuation Report at 31 December 2018, (SOC045)
[210] Actuarial Valuation Report at 31 December 2018 (SOC045)
[211] NATS, Memorandum of Understanding in Relation Changes to the Pension Arrangements of NATS Employees, 27/02/2009, ('**Pensions MoU**'), (SOC047)
[212] Letter from NTUS (NATS Trade Unions) to Stephen Hand, Submission following the publication of the CAA RP2 UK-Ireland Performance Plan, 30/05/2014, ('**Letter from NTUS to Stephen Hand, DfT**'), (SOC073)
[213] NERL's economic share of the NATS Group's scheme is c76% or £3656m. Liabilities of the NATS scheme at 31 December 2017 were £4,811 million Actuarial Valuation Report at 31 December 2017, (SOC043); and NERL's RAB at 31 December 2017 was £1,022.7 million from NERL Regulatory Accounts 2017, 05/07/2018, ('**Regulatory Accounts 2017**'), (SOC048'), p. 9;
CAAPs pensions Update, Winter 2014/15, p.2 ('**Pensions Update, Winter 2014/15**')
Regulatory Accounts 2017', (SOC048), p. 19
[214] The Pensions Regulator, Scheme Funding Analysis 2019, ('**Scheme Funding Analysis 2019'**), (SOC049), p.2

the covenant they are required to take a more cautious approach to the assumptions adopted for the valuation and are more likely to seek a shorter duration of the repayment period, subject to affordability by NERL. A longer repayment period provides an opportunity for assets in the DB pension portfolio to grow at a higher rate than assumed by the Trustees in their funding assumptions and reduce the deficit alongside NERL cash payments into the scheme. An accelerated, shorter deficit repayment period reduces that potential contribution from growth assets and therefore results in higher (and earlier) cash payments from NERL. The Trustees wanted to reduce the recovery plan period by three years at the 2017 valuation but NERL successfully negotiated to keep the recovery plan end date at 31 December 2026 to enable more of the deficit to be repaired through investment returns rather than deficit contributions, reducing the contributions being requested by the Trustees by around £40 million over RP3.

350 Once the scheme is fully funded, the Trustees have expressed a strong desire to start to reduce the amount of assets that are invested for growth, moving them into investments that provide natural hedging against the scheme's future retirement liabilities, effectively locking down the exposure of the scheme to volatility in either the assets or the liabilities. An accelerated deficit repayment schedule as referred to above would result in de-risking occurring sooner with higher costs for NERL and, on the basis of allowances for those costs in the regulatory settlement, higher costs to customers.

351 The CAA's policy since the PPP has been an important contributor to the strength of the covenant with Trustees. The policy has put in place strong pension cost protections for NERL and, in large part due to joint lobbying by the CAA and NERL, these were later adopted by the European Commission.[215] This mechanism provides that pension costs variations can be passed through to customers after the end of one reference period, by adjustment to the regulatory asset base for the following reference period. In order to qualify for this pass-through arrangement the change in costs incurred (whether to be added or subtracted) must be the result of unforeseeable financial market conditions and must have been mitigated as effectively as possible by NERL.

352 A second factor in the strength of NERL's covenant is the Trustee's assessment of the CAA's commitment to continue to provide full pass-through of NERL's efficient DB pension costs as part of the regulatory settlement. While the SES Regulations provide for pass-through of variations in unforeseeable costs as described above, there is no SES requirement for the CAA to provide for full cost allowances for known pension costs as part of the initial allowances for the settlement. The ongoing costs of the scheme are assessed at least every 3 years and are comprised of 2 components:

- the deficit repair payments schedule agreed with the Trustees at each triennial valuation; and
- the underlying costs of active members accruing future benefits on an ongoing basis.

353 In common with other DB pension schemes in the UK, the cost of providing a DB pension has risen substantially and for reasons outside the company's control - principally lower investment returns and increased life expectancy. Underlying pension contributions to the DB

[215] Commission Implementing Regulation (EU) No 391/2013, ('**Commission Implementing Regulation (EU) No 391/2013**'), (SOC004), Article 14, L 128/39 - L 128/40

scheme have exceeded 50% of DB pensionable payroll since 2017 and are projected to rise to 60%.

354 After leaving the EU, the UK will no longer be able to participate with a vote in the process of drafting and approving SES legislation. This could mean that NERL would be economically regulated by a body in which the UK does not vote. Unlike NERL's DB scheme which is a fully funded scheme, other ANSP pensions are generally funded by European state governments through social security, on a pay as you go basis. For the most part these costs can be planned for with a high degree of certainty. These factors significantly limit the exposure of other ANSPs to changes in the cost and risk of pensions and their variability. NERL is concerned that the UK will not be able to participate if there are consultations in future between EC Member States on changes to this pension pass-through mechanism, where pension liabilities are not such a priority for other ANSPs in Europe.

355 The Trustee, NERL and the CAA have been in a dialogue with the CAA on the potential for the CAA to produce a Regulatory Policy Statement (RPS). Such an RPS would be intended to clarify the basis on which the CAA will continue its support for pension pass-through, both in terms of initial costs settlement and the variations that might arise during a regulatory period. The Trustee's aim is to obtain comfort on NERL's covenant in relation to pension costs.

10.4. Basis of NERL's Plan

356 Within the constraints to changes in the DB pension scheme set out earlier, and given the high importance for staff of the DB scheme as part of their remuneration, NERL believes it has already taken all reasonable actions that are available to control and mitigate pension cost and risk as set out in the Industry Overview section 2.10.2.5. These actions were agreed without industrial action or other service disruption - which was of real benefit to customers - and reflects the company's approach to working together with its trades unions. The actions have already demonstrably reduced not only costs faced by customers but also the adverse impact of financial market conditions, thereby avoiding materially higher pension costs in RP3 and beyond.

357 NERL's RBP projections in respect of DB pension costs were robust. The Trustee's latest valuation[216] at 31 December 2017, was brought forward by one year (from the usual triennial date of 31 December 2018) to under-pin the RBP with the most up to date values for both the deficit repair schedule and the underlying costs. NERL's projected contributions for RP3 represent NERL's share of the NATS group scheme, using a cost allocation model which is reviewed by the CAA's appointed consultants at each regulatory review. These projections reflect the outcome of the Trustees' most recent valuation as at 31 December 2017 (the 2017 valuation), and advice from Mercer, NERL's actuarial advisor.

358 The 2017 valuation of the NATS Group scheme reported a deficit of £270m (a funding ratio of 94%) with the scheme's liabilities at £4.8billion.[217] This was a reduction in the deficit from £459m (a funding ratio of 91%) reported following the 2015 valuation. Although the 2017 deficit was lower (driven by strong investment returns and demographic factors), the reduction in real interest rates since the 2015 valuation increased the cost of future benefit

[216] Actuarial Valuation Report at 31 December 2018, (SOC045)
[217] Actuarial Valuation Report as at 31 December 2107, (SOC043)

accrual to 41.8% of pensionable pay from 31.8% at the 2015 valuation[218] (in respect of CPI-linked accrual).

359 Extensive consultation took place between the scheme, the scheme actuary and NATS during the 2017 valuation process, during the course of which all valuation assumptions, which are set by the Trustees, were reviewed. NERL considers that the assumptions are in line with relevant benchmarks and are reasonable. This was supported by the Government Actuaries Department's (GAD) review,[219] commissioned by the CAA, which concluded that NERL's business plan projections appeared reasonable.

10.5. The CAA's RP3 Decision

360 The CAA's RP3 Decision reduces our RBP projected pension contributions in RP3 by excluding DB scheme deficit repair payments in 2023 of £18m.[220] It also reduces the ongoing service pension costs for the DB and DC schemes by £6m, by applying reductions in payroll that will flow from the CAA's proposed reductions in opex.[221]

361 The CAA appears to accept that there is no longer a reasonable possibility of a surplus arising at the Trustees' next formal valuation of the DB scheme (31 December 2020). As at 31 October 2019, the scheme actuary estimated the deficit to be c£450 million. Nonetheless the CAA considers that there is a lack of information or comfort around how the risk of a trapped surplus would be managed in the interests of customers.[222] The CAA's solution is then to reduce the available DB pension costs to settle NERL's known efficient and reasonable pension cost projections on the premise that any shortfall that arises from the planned and actual pension costs materialising as expected due to changes in financial market conditions, can be recouped after RP3 on an NPV neutral basis as a result of pass-through arrangements under the SES regulations. Similarly, that if the pension cost contributions reduce during the regulatory period, NERL will simply be alleviated from making the contributions and therefore will not have needed the cost allowance, thereby saving customers money.

362 The CAA also concluded that it supported the principle of an RPS and would engage with NERL, the Trustee and wider stakeholders on the drafting.[223] The CAA plans to have an RPS in place ahead of the next triennial valuation in December 2020.

10.6. Why we believe the CAA's decision is not in the public interest

363 The CAA's decision to reduce the determined costs related to the DB pension deficit repair payments below the level projected - on the basis of expert assessment - for the regulatory period does not appear to have a rational basis. The judgement underlying that decision conflicts with the assessment of both its own advisors and the evidence of real market movements as reflected in the updated scheme valuation. This approach adversely affects the Trustees' confidence in the CAA's support for ongoing pension costs, which affects the Trustees' approach to NERL's financial covenant as described above in section 10.3.2. This

[218] AoN Hewitt, Actuarial Report at 31 December 2015, 02/12/2016 , ('Actuarial Valuation Report at 31 December 2015') (SOC080)
[219] GAD Report, (SOC051)
[220] CAA RP3 Decision, (SOC012), paras 5.59 - 5.64, p. 68 - 69
[221] CAA RP3 Decision, (SOC012), paras 5.67, p. 69
[222] CAA RP3 Decision, (SOC012), paras 5.62 - 5.63, p. 69
[223] CAA RP3 Decision, (SOC012), paras 5.77 - 5.78, p. 71 - 72

risks the Trustees taking a more prudent view on the repayment period following their next formal valuation, increasing costs to customers.

364 In addition, the CAA's decision relies on an assumption that variations in the DB pension deficit repair costs that have been allowed as part of the determined costs can be passed through to the next regulatory period's pension cost base. The relevant article in the SES Regulation[224] is set out below (emphasis added):

> Article 28
>
> **Cost risk sharing mechanism**
>
> *(c) unforeseen and significant changes in pension costs established in accordance with Article 22(4) resulting from unforeseeable changes in national pensions law, pensions accounting law or unforeseeable changes in financial market conditions, on the condition that such changes in pension costs are outside the control of the air navigation service provider and, in the case of cost increases, that the air navigation service provider has taken reasonable measures to manage cost increases during the reference period;*

365 NERL has entered into a contractual commitment with the Trustees to make pension payments in RP3 at the NERL RBP rate, based on expert actuarial views. Any adjustment to that rate will only take place following the next triennial valuation at 31 December 2020 with revised contributions, if required, expected to take effect from 1 January 2022. If financial market conditions remain as foreseen at the start of the reference period through to the start of RP4 - and assuming there are no other factors such as longevity that affect the size of the deficit - then NERL's commitment to make pension payments to the Trustees will remain at the same level as projected in our RBP, resulting in an £18m shortfall in available costs.

366 The question then is whether that shortfall can be reclaimed through the pass-through mechanism. The CAA's basis for reducing deficit repair payments is not clear. If the CAA is making its own assumption about financial market conditions and is using that assumption to override even its expert GAD's advice, then this would appear to be irrational. Alternatively, if the CAA accepts the actuarial valuations that give rise to the scheme deficit then this would imply that the determined pension costs related to the deficit repair profile are based on the costs forecast by the expert valuation, even if they have not been allowed in full by the CAA for other reasons. The determined pension costs would then, by definition, be "foreseeable" costs. If there is no change to the valuation as a result of market factors then there can be no additional costs arising from unforeseeable changes in financial market conditions. It is therefore unclear how NERL would justify pension pass-through of the £18m shortfall in RP4.

367 A similar uncertainty arises if, at the 2020 triennial valuation, financial market conditions have deteriorated resulting in higher pension payments. If, for example, the overall RP3 cost were to be £22m higher than the original RP3 projections, NERL would have funded the original £18m shortfall, together with an additional £22m of pension costs. Of that £40m total, only £22m would relate to changes due to unforeseeable market conditions that can be passed

[224] SES Regulations, (SOC004), L56/23 – L56/25

through with certainty, but NERL would bear the cost of the original £18m shortfall in any event.

368 However, even if the £18m shortfall were to be recoverable through the pass-through mechanism in all circumstances, the CAA's concern could not be effectively addressed by financial mechanisms targeted at NERL. Such an approach fails to take account of the general duties of the Trustees under trust law and guidance from The Pensions Regulator, to act in the best interests of members, in relation to any surplus should it arise. As set out in RBP, if a surplus on the scheme arises in future then there would be consultation between the Trustees and NERL to decide how the surplus would be managed, and we would appropriately consider customer interests. [225] This could involve further de-risking of the scheme (which would reduce the volatility and risk of scheme funding referred to in section 10.3.2 and/or future contributions reduced to below the underlying rate. The latter is evidenced by the past history of contributions relative to the funding position of the scheme.

369 If the CAA wants to influence the views of the Trustees or the nature of that consultation between the Trustees and NERL it has an opportunity to do so through the mechanism of the CAA's proposed RPS. For example, the policy statement could make clear any expectations of the CAA that there should be a balance in the application of any surplus between, on the one hand de-risking the volatility of the scheme thereby reducing customer exposure to future costs of a new shortfall, and on the other hand the reduction of the ongoing contributions to reduce actual costs to customers in the future.

370 The RPS could also be helpful if it set out the CAA's policy with regard to the continuation of pension pass-through protection mechanisms in the event of a loss or deterioration of the current level of protection following Brexit.

10.7. Conclusion

371 The cuts to the underlying costs related to a blend of DB and DC underlying future service costs should be scaled back to match the conclusions of the CMA on appropriate opex allowances (see section 12). The CAA should reinstate the full costs for the known DB scheme deficit repair schedule in RP3. In line with its obligation to apply Best Practice Regulation, the CAA should be encouraged to address any residual concerns on the application of a future DB funding surplus directly with the Trustees, through the medium of the RPS which will serve to reinforce Trustees' confidence in NERL's covenant, whereas unsubstantiated reductions in undisputed projected pension costs would tend to undermine Trustees' confidence resulting in higher costs to customers.

[225] RP3 RBP appendices, (SOC021), Appendix H p. 56

11. Capex Funding / Capex Governance

11.1. Overview

372 This chapter sets out in more detail the nature of our capex programme, the constraints under which it was developed and the implications of trying to operate within these constraints. It outlines the proposals made by the CAA and our concerns with them, demonstrating why the CAA's RP3 Decision does not represent the right outcome for NERL, our customers or the public interest.

373 In particular, we demonstrate:

- Delivering the right investment programme during RP3 is of critical importance to NERL, our customers and the travelling public. The CAA's proposals for capex funding and governance risk leading to underinvestment in our critical national infrastructure. At the same time they will undermine our ability to meet our customer's priorities and to satisfy the CAA's own objectives.

- Our investment plans cover a range of activities that are important to our ongoing ability to deliver current and future service expectations: NERL's LTIP for RP3 is proposing to invest c£750m (2017 prices) over 5 years on a combination of airspace re-design, legacy system replacement, and new support tools and system enhancement.[226] It includes the next stage of NERL's Deploying SESAR[227] strategy that began early in RP2 and replaces critical infrastructure, some of which is nearly 50 years old and which represents around 40% of the investment programme.

- **The CAA's ring-fencing of our airspace investment provides a false sense of comfort:** We acknowledge that the CAA has ring-fenced specific elements of the critical airspace change component of our investment plan. However the level of risk and contingency funding included in the RBP is already very low for a programme of this nature that is highly complex and integrated, with estimates that are for activity up to seven years in the future. Additionally, it is worth noting that NERL's initial investment priority must be on safety, resilience and sustainment and we must also focus on technology changes which enable airspace change, all before the airspace changes themselves can be delivered. Hence the reductions to other aspects of our capex and opex are liable to impact our ability to deliver airspace change, even though we have been given purportedly 'ring fenced' budget for this aspect of the LTIP.

- **The CAA's capex efficiency reductions are not achievable**: The CAA has proposed an 8% reduction to the non-airspace elements of the capex plan, representing £48m, on the basis that the CAA believes there are opportunities for further efficiencies. NERL does not believe savings on this scale can be achieved within the LTIP and will therefore have to reduce scope, and associated customer benefit, to realise the savings.

[226] NATS, RP2 Capital Investment Plan (2015 -2019) for Condition 10, March 2017, ('**C10 Airspace and Technology Plan 2017**'), (SOC070)
[227] SESAR is the Single European Sky ATM Research programme which has defined future concepts which will need to be deployed across Europe as part of the European ATM Masterplan. Some of these changes are mandated under SES Legislation.

- **The CAA's new incentive mechanisms are not required and undermine, rather than further, the public interest:** The CAA has proposed fundamental changes to the existing, and already industry leading, governance and approval arrangements for capex. This includes three new incentive mechanisms (delivery, efficiency and information) which, allow the CAA for the first time to make retrospective changes to our cash flows that relate to investments already made. We consider that governance arrangements already in place are more than sufficient to protect the public interest and that, contrary to furthering that aim, the introduction of these new incentive mechanisms will actually undermine it:

    - It is not clear how, for example, when assessing efficiency after the event, the CAA will be able to distinguish between: (i) the benefit of hindsight; and (ii) the actual efficiency/performance risk we face on a forward-looking basis.

    - The mechanisms hand the CAA significant discretion and latitude. Considered in their totality, the reforms appear to substantially increase regulatory risk and, being penalty only, skew our expected equity returns to the downside.

    - The inclusion of a *delivery incentive mechanism* – in practice a penalty regime – effectively drives the LTIP towards a fixed price programme, rather than one based fully on a capex pass-through mechanism. This approach is only appropriate if the estimates used in the LTIP plan are based on a greater than 85% likelihood rather than the most likely (i.e. ~50% likelihood) estimates that NERL has used as the basis of our planning. That approach would also require inclusion of an adequate risk provision which will be larger than currently planned.

374 Overall, the CAA's proposals are not well suited to the fundamental characteristics of the industry where the combination of: (i) the pre-eminence of safety; (ii) low capex intensity; (iii) high focus on intangible assets; (iv) short asset lives; and (v) capex being volatile and (in part) outside of management control, all point for a need to place weight on avoiding the possibility of efficient capex not proceeding (and in a timely manner).[228] The CAA's proposals go against the principles of this, placing more weight on short-term cost minimisation, without any consideration of the harm that may be caused to customers. Additionally, the proposals are not fully defined creating uncertainty for both NERL and customers.

375 We believe that to apply these material changes to the regulatory mechanisms after NERL has completed the RP3 plan on the basis of the existing regulatory framework is contrary to the principles of good regulation and will effectively lead to the application of unsuitable assessments of NERL's delivery performance. We consider that a better approach would be to remove the CAA's proposed new governance incentives and to enhance the existing governance arrangements in line with the proposals on which NERL consulted our customers during 2018, gaining their support. [229]

376 Details of the respective positions of the CAA and NERL with respect to capex funding and capex governance are summarised in the table below.

[228] 'Economic Insights, Independent Review of Capex Governance, 22/11/2019, (**Independent Review of Capex Governance**'), (SOC068)
[229] Co-Chairs Report, 2018, (SOC016), p. 1 – 8

Table 11 Comparison of NERL and CAA position – Capex funding and capex governance

REG DEP'N	NERL RBP	CAA NPP	Delta	Rationale
Reg Depn (Lower Capex)			- £11m	CAA – Consequential impact of proposed RP3 capex cuts NERL – Based on capex cuts that are not appropriate
Reg Depn (CPI/RPI wedge)			- £13m	CAA & NERL – planning assumption, timing point only, due regulatory 'true-up' for actual inflation
TOTAL	£771m	£747m	- £24m	
Capex	*£715m*	*£667m*	*-£48m*	*CAA – 8% cut to non-airspace capex based on perceived efficiency opportunities which have not been evidenced or impact assessed NERL – the programme is highly integrated & complex & will require scope (& thus benefit) reductions to achieve the cuts, potentially impacting airspace development and which will have detrimental impact on future performance*
Governance	*Enhancements based on customer consultation.*	*Additional reporting governance and incentives*		*CAA – Enhanced transparency and an incentive to ensure capex is efficiently incurred to deliver agreed outcomes NERL – Incentives mean introduction of a de-facto fixed price regime, after NERL's plans had been developed on a pass-through basis. The proposed reporting mechanisms represent a significant burden to all parties to little clear benefit.*

11.2. Introduction

377 NERL's RBP set out our continuing and ambitious investment programme underpinning key customer priorities in line with high-level guidance provided by the CAA[230] ahead of the planning process. Completion of all elements of the programme, which is already well underway, is critical, as the culmination of a complex and interconnected range of activities to deliver a new flexible platform, and as an enabler for further developments during RP4. Meeting customer and regulator expectations for service performance during RP3 and beyond can only be achieved through the delivery of the plan. Further, the timescales for investment in airspace modernisation and ATM system change are long and it is essential that we are able to invest for the long term to meet future performance requirements in the light of anticipated traffic growth.

378 Once delivered, the investment programme will reduce costs, increase resilience and enable improvements to capacity and environmental performance through new tools and airspace change. However, delivery of the programme requires not only sufficient capital investment, but sufficient operational and engineering resources to support development, assurance, training and transition into operation. It also requires appropriate transparency and flexibility of governance to allow NERL to effectively manage and mitigate the risks that can arise in such a large investment programme.

[230] RP3 Business Plan Guidance, 2017, (SOC017)

379 These important technical transitions have to be secured whilst still delivering the day-to-day service. IT failures across the finance industry, as investigated by the recent Parliamentary Select Committee report, highlight the importance of adequate resourcing and investment to ensure technology programmes are delivered effectively.[231] Similarly, the independent review following TSB's migration onto a new IT platform highlights the need to revisit deployment dates when risks and issues arise.[232] These challenges are only heightened in a safety critical environment where both delivery of the day-to-day operation and assurance of change leave no room for error.

380 The CAA RP3 Decision does not support our ability to deliver on the intent of the RBP. It reduces the opex and capex allowances required to deliver the LTIP programme and introduces new governance requirements after the consultation on, and construction of, the plan, which undermine the basis upon which the programme was planned. This introduces new business risks resulting in a need to modify the programme, reducing our ability to meet customer priorities. It is important to recognise that the characteristics of our industry mean that customers are better served by a governance regime that is not unduly focused on short-term goals, reducing management discretion to deliver the programme in the way best assessed to provide the safety, service and capacity targets required by customers and set by the CAA.

11.3. Background

11.3.1. Infrastructure requirements for an ATM business

381 Providing a safe and efficient ATM service requires significant infrastructure both in ATC centres to directly support the ATCOs and at infrastructure sites across the country to provide communications, navigation and surveillance capabilities. As a result, NERL has a total RAB of c.£1bn used to provide ATM services.

382 Over time NERL has invested to sustain and maintain these systems as well as investing to consolidate our centres from four to two and introduced many new tools and capabilities to improve efficiency and capacity. These existing systems have performed well over many years, having been enhanced through hardware and software updates and the introduction of new capabilities.

383 Nevertheless, many of our core systems were originally deployed 20, 30 or even nearly 50 years ago (see Section 3.2.1.2 above). Many of these systems are well beyond their normal "end of life" and some are nearing the point at which it will be impossible to continue to support them. Furthermore, these older systems are not capable of enhancements to meet the challenges of the future ATM environment, are potentially vulnerable to modern cyber threats and do not meet specific European mandates for future capabilities.

384 As a result NERL needs to invest to replace, upgrade and enhance these capabilities to remove legacy systems and support future capabilities.

[231] Parliament UK, Regulators must act to reduce unacceptable number of IT failures in financial services sector, warns Treasury Committee, 28 October 2019, ('**IT failures in the Financial Services Sector Overview Article**'), (SOC069); and the full report House of Commons Treasury Committee, IT failures in the Financial Services Sector, Second Report of Session 2019–20, HC 224, 22 October 2019, ('IT failures in the Financial Services Sector, ('**IT failures in the Financial Services Sector**'), (SOC018)
[232] TSB Review, (SOC026)

11.3.2. Investment Programme Changes during RP2

385 NERL's original plan for RP2 was to deliver a major programme of lower level airspace change in the London area known as the London Airspace Management Programme (LAMP), including a change to the Transition Altitude (TA)[233] with relatively limited deployment of new technical capabilities. The requirements for the LAMP and TA programmes were set out in the NERL Licence. Changing the lower airspace that NERL is responsible for (the middle layer of airspace between approximately 7000ft and 20000ft) is totally dependent on the airports redesigning their airspace below 7000ft to connect into the NERL network.

386 As NERL commenced the LAMP programme in early RP2 it was completely unable to secure the support necessary from key London airports to deliver the programme and, therefore, our own airspace changes. The reluctance of the airports to redesign their lower level airspace was directly related to airport uncertainty over airspace policy – particularly related to noise, the airspace change process itself (both of which are the responsibility of the DfT and the CAA to define) alongside the highly politicised debate over the location of new runway capacity in the London area. Despite this, LAMP1a, the first stage of the programme (both NERL and airport), was ultimately delivered for London City airport in February 2016.

387 In this context NERL began consultation with the DfT, the CAA and customers about the potential need to re-frame the RP2 programme as the political and regulatory environment was not conducive to delivering large scale lower airspace change. With no overarching political support at the time for such contentious change affecting millions of residents of the South East of England, the entire industry, alongside the DfT and the CAA reluctantly agreed that delivery of such changes at that time was unlikely to be successful.

388 It was clear to all parties that three ingredients were required to ensure successful delivery: explicit government support for an infrastructure project of this scale; airspace policy in line with such government support; and a clear and navigable airspace change process from the CAA that the parties could follow to a successful conclusion. It was therefore decided by all aviation stakeholders that delaying later phases of the programme (LAMP2) to RP3 was the best option to allow time for the three critical ingredients to be secured. This was agreed through the Airports Commission Senior Delivery Group (SDG) in September 2015.[234] As a result, the CAA amended the NERL licence to remove the requirement for delivery of LAMP2 and TA during RP2 and instead asked NERL to produce revised Airspace and Technology Plans to describe the updated programme for RP2.

389 In parallel with discussion around airspace change, and recognising that airspace change was likely to be delayed, NERL took the initiative to accelerate deployment of new technology to earlier than previously planned, reducing the need for some legacy sustainment, improving resilience and providing an improved platform to support the required airspace change as well as new technology mandates from Europe. Importantly, taking advantage of this window of opportunity to accelerate new technology would now mean that the new airspace could be designed to benefit from the new technology, rather than rely on existing systems which would have constrained the designs and then required future modification to work on new systems. These plans were developed progressively over several years and were consulted

[233] The Transition Altitude is a published height above sea-level at which pilots change their basis of measurement from a regional pressure setting to a standard international setting.
[234] High Level Summary of the outcomes from the Sept 14th Senior Delivery Group, 23/09/15. (SOC165)

with the CAA and customers through specific briefings[235, 236] and the SIP consultation process.[237]

390 In the absence of the full LAMP2 programme during RP2, NERL proposed an extensive alternative airspace programme, utilising key aspects of LAMP2 designs that could be delivered without lower level airspace consultation and addressing key capacity and safety hotspots in London and Prestwick airspace. These changes were delivered primarily through our Swanwick Airspace Improvement Programme (SAIP) and Prestwick Lower Airspace Systemisation (PLAS). In total our airspace programme has delivered 20 key milestones during RP2 realising significant customer benefit despite a continuing challenge of gaining airport support for these changes.

391 In line with the licence change, NERL published our RP2 Airspace and Technology plans in March 2017[238] and has continued to deliver and report against these plans through the SIP process since then.

11.3.3. The RP2 transformation programme

392 As identified above, during RP2, following consultation with both the CAA and customers[239, 240], NERL commenced a substantial transformation programme which will replace NERL's older systems with a modern flexible and resilient architecture and provide the core capabilities needed to support the anticipated traffic growth and envisaged future requirements over the coming years. Critically it will provide a new infrastructure capable of supporting the necessary transition of UK lower airspace to a more "systemised" approach that will enable improved capacity and efficiency to support traffic growth in the busy London airspace including the potential for new runways. Further details of the planned transformation are set out in section 3.2.1.2.

11.3.4. Practical challenges in delivering change in the ATM industry

393 NERL runs a 24/7 operation and does not have any opportunity to voluntarily cease or interrupt services (see Section 3.2.1.1.3 above). The ATM service must continue to operate throughout all maintenance of existing systems and transition to new systems. This creates unique challenges in terms of managing change, especially in the context of delivering a safety critical service. Before any change is implemented, extensive testing, validation and training must be undertaken, leading up to a precisely managed sequence of transition activities allowing upgrade or replacement of operational systems.

394 As a result of the environment in which we operate, system developments tend to be complex and labour intensive, typically requiring extensive use of both engineers and controllers to support development, validation, training and transition. Even where Commercial off the Shelf (COTS) systems are used, NERL typically requires extensive validation and assurance activities to ensure that these systems are fit to be used in the safety critical ATM environment.

[235] NATS, Deploying SESAR update, 5/09/2014, ('**Deploying SESAR Update, 05/09/14**'), (SOC0987)
[236] Modernising the UK's Air Transport Network - A New Way Forward, Draft for Discussion, September 2015, ('**Modernising the UK's Air Transport Network**'), (SOC098)
[237] NATS, Service and Investment Plan (SIP) 2015, Form, Scope and Level of Detail Subject to CAA Approval, 2015, ('**SIP 2015**'), (SOC058);
NATS, Service and Investment Plan (SIP) 2015, Form, Scope and Level of Detail Subject to CAA Approval, 31/12/2015, ('**SIP 2016**'), (SOC053)
Service Improvement Plan (SIP) 2017 Final, Form, Scope and Level of Detail Subject to CAA Approval, December 2016, ('**SIP 2017**') (SOC076)
[238] C10 Airspace and Technology Plan 2017, (SOC070)
[239] Service Improvement Plan (SIP) 2017 Final, Form, Scope and Level of Detail Subject to CAA Approval, December 2016, ('**SIP 2017 Final**'), (SOC076)
[240] C10 Airspace and Technology Plan 2017, (SOC070)

395 This was illustrated, for example, by our successful ExCDS programme where we introduced a new paperless flight data system developed by NAV Canada. This was introduced with minimal customer impact through a meticulously planned transition programme and through close engagement with customers. This was considered a success by the airlines and has overachieved on benefits, an approach we intend to adopt for all future transitions. Further details about this are provided in a case study at section 14.

11.3.5. Scale and complexity of our investment programme

396 The scale and complexity of the investment programme is substantial. A large part of the investment programme is our DSESAR programme which will replace almost all of our control centre based systems in a single integrated programme with all of the major transitions taking place over a 4 year period.[241] As with any programme of this scale and complexity we can expect to experience challenges and concerns and our ability to respond quickly to these in order to keep the programmes on track is essential. No other ANSP has experience of this rate and scale of change, essential in this situation. As highlighted by Trax, the SESAR progress report shows that the UK is ahead of the other large ANSPs at the end of RP2 for its technology implementation. In addition, no other European ANSP faces such a fundamental change to the design of its airspace structure and route network in RP3.[242]

11.3.6. The importance of retaining some flexibility within the governance framework

397 During RP2, as the programme matured, we have tackled several programme issues (see Section 11.3.7 below) that have been addressed by consultation through the SIP process. This allowed them to be dealt with efficiently and demonstrates the effectiveness of the RP2 regulatory regime. We consider that it is important that the regulatory framework for RP3 should continue to support this flexibility.

11.3.7. Improvements to our internal governance arrangements

398 We have also taken the opportunity to strengthen our own internal governance through the introduction of a Portfolio/Programme/Project Office (P3O) to manage the investment programme. Key issues we have had to deal with include:

- unplanned costs to deal with new requirements (e.g. additional cyber security) or equipment failures; [243]
- additional work to comply with changes to mandates applied through SES legislation and licence conditions (e.g. new resilience requirements following the Independent Inquiry);[244]
- impact from delays to supplier delivery with wider programme impact; [245] and
- re-design to key functions to avoid safety risks. [246]

[241] NERL is replacing up to 80% of its centre's infrastructure over a 4 year transition period, compared to many industries where it is more normal to incrementally replace 3-5% per year.
[242] Trax International Report, NERL's performance relative to other large European ANSPs - Position Paper for the Competition and Markets Authority 27/11/2019, ('**Trax Report, November 2019**'), (SOC125), pp.10-13
[243] RP3 Business Plan, (SOC001), Appendix I, P69
[244] CAP1682; Decision on modifications to Condition 2 of NATS (En Route) plc licence in respect of resilience planning, policy statement on enforcement and resilience plan guidance. (SOC150)
[245] (NATS, Deploying DSESAR Update Presentation, 28/02/2019, ('**Deploying SESAR Update, 28/02/19**')(SOC091)
[246] SIP 2020 Draft, (SOC089), p45-46

399 Adopting a portfolio investment approach through the P3O office has allowed us to manage cost evolution (scope changes and risks materialising) within and across the reference period boundaries, identify savings and retain a focus on the desired outcomes that underpin the investments. The need to deal with challenges of this kind is not unusual and indeed is typical of many major programmes.[247]

400 Where we have experienced challenges in our programmes we undertake lessons learned activities to improve our performance for future projects and programmes and this has led to enhancements to our processes (e.g. for requirements management and supply chain management).[248]

11.4. Basis of NERL's Plan

11.4.1. We followed the CAA's guidance on the preparation of our plan

401 The CAA provided clear guidance to NERL for the preparation of our RBP, including the CAA's expectations on the investment programme and governance. For example the CAA stated that it would expect NERL to:

- ensure it understands and provides the appropriate level of systems resilience to achieve a high level of network performance, including as it safely deploys new ATM technologies;
- ensure it has in place robust procedures and processes to identify and plan for future operating requirements,
- consider the design and delivery of the London Airspace Management Programme and the individual airspace changes necessary to enable new runway capacity; and
- propose well designed plans for shared governance and assurance for NERL's capital programme.[249]

402 The CAA business planning guidance also asked NERL to propose revised governance arrangements to enhance transparency and customer engagement, as well as to provide greater evidence of capex efficiency.[250] In response to this NERL consulted with customers on revised governance arrangements[251] and provided evidence of capex efficiency to the CAA and their consultants, Steer/Helios, during the RP3 process. [252]

403 During the consultation process NERL presented an enhanced version of our proposals and also held a detailed review meeting with British Airways (acting on behalf of airlines) to review the proposal, consider areas of concern and develop joint proposals as to how these could be addressed. The outcome of this meeting was presented back to all airlines as part of the consultation process and formed the basis of NERL's final proposal. The enhancements

[247] Examples of challenge and complexity experienced by other major programmes:
National Audit Office and Department for Transport, Lessons from major rail infrastructure programmes, HC 267 Session 2014-15, 29 October 2014, ('**Rail infrastructure programmes analysis**') (SOC019)National Audit Office and Ministry of Defence, The Defence Information Infrastructure, HC 788 Session 2007-2008, 4 July 2008, ('**The defence information infrastructure**') (SOC020)National Audit Office, E-borders and successor programmes, Home Office, HC 608 Session 2015-16, 7 December 2015, ('**E-borders and successor programmes**') (SOC031)
[248] Lessons learned report in SIP 2019 Published in December 2018. (SOC144)
[249] Guidance for NERL in Preparing its Business Plan for RP3, 2018, (SOC030), para 3.22, p.25; para 3.40, p. 30 and para 4.14, p.38
[250] Guidance for NERL in Preparing its Business Plan for RP3, 2018 (SOC030)
[251] RP3 Business Plan, (SOC001)
[252] NERL Letter to CAA, Value for Money (VfM), NERL Evidence on Cost Efficiency of our RP3 Investment Plan, 09/05/2019, ('**VfM Letter to CAA**'), (SOC077)

proposed to the existing governance mechanisms included: more regular and transparent reporting; a clearer process for, and more regular, customer involvement in key decision making; and an escalation process when agreement could not be reached.

404 Both the plan and revised governance arrangements were largely supported by customers through the consultation process as documented in the Customer Consultation Co-Chairs Report[253] and we felt these provided a sound and agreed basis to proceed. NERL undertook our RP3 planning in the context of this guidance and in light of our proposed new governance arrangements (see Section 3.2.3 above).

11.4.2. We consulted with our customers

405 We consulted customers to understand their priorities ahead of our RBP development, ensuring we achieved the right balance between performance, capabilities and affordability (see Section 3.2.3.4 above). Customers identified safety, airspace modernisation, airspace tools/procedures and operational/technical resilience as their key priorities.[254]

406 Customers were then consulted in further detail through 16 workshops as part of our Customer Consultation Working Group meeting.[255] Part of the consultation, accepted by customers, noted that we were already part way through an agreed transformation programme and completion of this programme would form the centrepiece of RP3 investment.

11.4.3. Our investment programme is based upon a wide range of drivers

407 In this context, the content of NERL's investment programme for RP3 is influenced by a wide range of factors which together drive the shape and scale of the proposed investments. Key factors include the need to:

- ensure the safety of our operation at all times;
- sustain existing equipment to ensure the resilience of the ATM service;
- replace unsustainable legacy systems with a modern architecture to support future capabilities, completing the transformation started during RP2;
- comply with EU and UK legislation including SES Mandates for future capability deployment;
- support UK future aspirations as embodied within the government's Aviation 2050 strategy and the Airspace Modernisation Strategy;
- meet customer priorities for airspace change to support future capacity, efficiency and environmental performance (fuel savings); and
- ensure that the ATM infrastructure is capable of meeting the expected future capacity requirements throughout RP3 and into RP4.

[253] Co-Chairs Report, 2018, (SOC016)
[254] RP3 RBP Appendices, (SOC021), Appendix C p. 20 - 23
[255] RP3 RBP Appendices, (SOC021), Appendix C, Table Confirming our understanding of customer priorities and requirements, p. 21.

11.4.4. The impact of the governance framework on the development of our plan

408 A strong driver to the planning approach taken to create the programme was the existing regulatory regime for capex and associated governance arrangements. These arrangements provide for a pass-through mechanism for capex expenditure supported by a customer consultation and review through the Service and Investment Plan (SIP) and the scrutiny of an Independent Reviewer (IR).[256] In simple terms this involves:

- the price control includes an allowance for depreciation and rate of return based on an underlying RAB;
- efficiently incurred capital investment is subject to a capex pass-through mechanism with true-up (or down) arrangements at the end of each reference period; and
- the capex portfolio is subject to governance through a customer consultation process based around a SIP.

409 This approach was affirmed by the CAA in CAP 1625 "Guidance for NERL in preparing its business plan for Reference Period 3" which stated that:

> *"The regime for capital expenditure in RP2 involves the value-neutral treatment of expenditure variances and some shared governance of NERL's capital programmes. Following the challenges of making significant changes to the capital programme at the start of RP2, we consider the [Independent Reviewer's] role is central to making shared governance an effective alternative to a high level of pre-specification for capital programme outputs and associated strong performance incentives."*[257]

410 NERL regarded this as a clear indication of a continuation of the broad regime of capex pass-through, with the use of the role of the IR to avoid the need for a different approach to programme specification and incentives.

411 This mechanism, albeit initially without the IR role, had been used effectively during previous reference periods, allowing a reduction of capex during RP1 with costs returned to customers and allowing an increase during RP2 with associated increase in work scope. This increase during RP2 was subject to extensive consultation during 2016/17 and, while customers did not initially favour this increase, they ultimately did support it as the best way to allow acceleration of technical change and the earliest deployment of essential airspace change.[258]

412 NERL's RP3 planning was undertaken in this context, with an expectation of continuation of the agreed investment strategy with the same core governance regime. Specifically this drove the following key aspects of the proposed planning approach in line with previous reference periods:

[256] NERL Licence, 2018, (SOC005), Condition 10, p53 - 56
[257] Guidance for NERL in Preparing its Business Plan for RP3, 2018, (SOC030), para. 4.12, p. 35
[258] CAA Approval Letter to Martin Rolfe re NERL's 2017 Airspace and Technology Programmes, 26/07/2017, ('**CAA Approval Letter on Airspace and Technology Programmes**') (SOC092); and
CAA Conditional Approval Letter to Martin Rolfe re NERL's 2017 Airspace and Technology Programmes, 26/05/2017, ('**CAA Conditional Approval Letter on Airspace and Technology Programmes, May 2017**'), (SOC093)

- an investment programme based around completing the DSESAR technology programme and supporting airspace modernisation, notably in the London area; [259]
- ambitious plans based on use of most likely cost and date estimates (i.e. P50 likelihood) consistent with the envisaged capex regime rather than on guaranteed costs/timescales (typically based on P90 likelihood) that would be required under a fixed price regime; [260]
- no risk provision held against individual programmes but with central small contingency provision, consistent with the envisaged capex regime; [261] and
- revised governance arrangements building on the SIP, including enhanced transparency, consultation on options and an agreed escalation mechanism developed in line with the CAA guidance and based on feedback from customers and the IR. [262]

11.4.5. We proposed an integrated portfolio of programmes alongside enhanced governance

413 Based on this approach, NERL built an integrated portfolio of 8 programmes, each carefully planned and estimated to a level proportionate to this early stage in their lifecycles (typically 2.5 to 7 years ahead of when the programmes would be launched).[263] In total the RBP declared a target range for the capex programme of £725m-£800m based on the capex regime and uncertainty[264], and specified a most likely outcome of £763m including £34m contingency and up to £23m to be spent during late RP2 (all figures 2017 prices). [265]

414 This approach recognised the uncertainty so far ahead of deployment but also provided clarity to customers of the intended programme milestones and costs. In doing so it reflected a cost towards the lower end of the range of uncertainty thereby avoiding the need for customers to fund higher levels of investment unless these were needed.

415 Again this approach was applied consistent with the envisaged capex regime based on pass-through, with the ability for this to change subject to consultation if required. If we had known the CAA was going to impose such fundamental changes to the capex governance regime, most obviously the ability to retrospectively adjust our cash flows[266] with respect to investments already made, then we would have needed to create different plans/estimates based on this change and also allow additional risk provision/contingency.

11.5. The CAA's RP3 Decision

416 This section provides a simple description of the CAA's RP3 Decision in relation to capex funding and capex governance. Further analysis of the rationale for and implications of these decisions are provided in Section 11.6.

[259] RP3 RBP Appendices, (SOC021), Appendix L, p. 98 - 128
[260] RP3 CAPEX consultant's questions, iBP clarifications, 12 June, ('**CAPEX consultant's Questions, iBP Clarifications**'), (SOC079), Section 1.6, p. 2
[261] CAPEX consultant's Questions, iBP Clarifications (SOC079), Section 1.6, p. 2
[262] RP3 RBP, (SOC001), Chapter 9, p 72 - 80
[263] RP3 RBP Appendices, (SOC021), Appendix L, p. 98 - 128
[264] RP3 RBP, (SOC001), Executive Summary, p. 6 - 11
[265] RB3 RBP Appendices, (SOC021), Appendix L, p. 98 - 128
[266] Which can occur either through changes to our revenues or RAB under the CAA's proposals (this relates to the efficiency incentive, but retrospective changes also appear 'possible' under the information incentive).

11.5.1. Capex funding

417 The CAA's RP3 Decision reduced the NERL capex allowance for RP3 by £48m and stated that it considered this sufficient for NERL to deliver our full plan on the basis that we should be able to achieve additional programme efficiency. [267]

11.5.2. Capex governance

418 The CAA's RP3 Decision proposes a number of changes to the existing governance mechanisms which go far beyond anything envisaged in the original CAA guidance[268] or its draft Performance Plan Proposals[269] and place delivery of the investment programme at risk. Specifically the revised governance proposes three capex incentives:

- a delivery incentive designed to encourage timely and effective delivery of NERL's capex programme (the **Delivery Incentive**); [270]
- an ex-post efficiency incentive, which will consider NERL's RP2 (and in due course RP3) capex (the **Ex Post Efficiency Incentive**); [271] and
- an information incentive designed to ensure NERL provides stakeholders an appropriate level of detail as part of our engagement on our capex (the **Information Incentive**). [272]

419 Some explanation of these incentives is provided in the CAA's RP3 Decision but it does not provide full details of how they would be assessed or applied. [273] The RP3 Decision does identify, however, that these incentives mechanisms could lead to disallowing unspecified levels of capex investment, reduced return or an additional penalty of up to £36m. [274]

420 Additionally, the revised governance provides a considerable increase in the proposals for project re-approval based on a 5-stage consultation process operating in addition to the existing/enhanced SIP governance processes as well as additional constraints on the use of contingency. [275]

11.6. Why we believe the CAA's decision is not in the public interest

421 The CAA's RP3 Decision constrains our ability to deliver the intended outcomes of our RBP in three key ways: through insufficient capex allowance; insufficient opex allowance; and changes to the proposed capex governance arrangements. All of these changes inhibit our ability to deliver the capital investment programme whilst minimising the impact on other parts of the business including operational performance, opex and business risk.

[267] CAA RP3 Decision, (SOC012), para 5.95, p. 75
[268] Guidance for NERL in Preparing its Business Plan for RP3, 2018, (SOC030)
[269] CAP 1758: Draft UK Reference Period 3 Performance Plan proposals. (SOC002)
[270] CAA RP3 Decision Appendices, (SOC041), Appendix I8, p. 126
[271] CAA RP3 Decision Appendices, (SOC041), Appendix I13, p. 127
[272] CAA RP3 Decision Appendices, (SOC041), Appendix I14, p. 127
[273] CAA RP3 Decision Appendices, (SOC041), Appendix I, Part A, p. 125 - 134
[274] CAA RP3 Decision Appendices, (SOC041), Appendix I12, p. 127
[275] CAA RP3 Decision Appendices, (SOC041), Appendix I21, p. 129

11.6.1. Capex funding proposals

422 The CAA set out the following rationale for its capex proposals in the draft performance plan (note that while the conclusion remained unchanged this rationale was not repeated in the CAA's RP3 Decision):[276]

- the CAA has made the reduction "*based on a lack of confidence in the cost efficiency of NERL's proposed programme as a whole*", noting that there is a degree of uncertainty over the level of efficient spending; [277]
- the CAA has assumed that NERL will be able to realise £48m of savings; [278]
- the CAA notes that its proposal is less than a third of the total possible savings and contingency identified by Steer/Helios and represents one half of the costs of the TC FourSight programme; [279]
- the CAA notes that the regulatory framework provides for a true-up mechanism for capex, such that where NERL's efficient capex is greater than the CAA have allowed in the Determined Costs, we can recover our actual costs in future reference periods.[280, 281]

423 Despite feeding back to the CAA on these points, including providing additional evidence relating to both efficiency and impact,[282, 283] in its RP3 Decision the CAA states that "*NERL's comments on the adjustments we made at draft proposals and the lack of an impact assessment do not appear relevant or constitute compelling evidence such that we should change approach*".[284]

424 Given the lack of evidence of inefficiency in NERL's capex programme and in particular the lack of impact assessment of the cost reductions, we believe the reductions in the CAA's RP3 Decision are unsupported and create new risks to delivery of the customer priorities agreed through customer consultation. This is further supported by our impact assessment of the proposed changes. This impact assessment was carried out by an internal team with input from external consultants and Non-Executive Directors and the findings were captured in a paper presented to a sub-committee of the Board.

425 Each of these grounds, including our impact assessment of the CAA's RP3 Decision, is considered in turn in more detail in the following sub-sections.

11.6.1.1. The CAA's 'lack of confidence' is not supported by evidence

426 No evidence is provided by the CAA to support its assertion that it has a "*lack of confidence in the cost efficiency of NERL's proposed programme as a whole*". NERL has provided the CAA, customers and consultants with comprehensive details of our programme and the approaches we take to ensure value for money is assured, both during the consultation and in response to the draft proposals.[285] When providing additional information, NERL

[276] NPP, (SOC001)
[277] NPP, (SOC001), para 5.61, p. 66 - 67
[278] NPP, (SOC001), table 5.7, p. 67
[279] NPP, (SOC001), para 5.61, p. 66
[280] NPP, (SOC001), para 5.62, p. 67
[281] Note that the true-up mechanism for capex also works for reductions as was applied at the end of RP1.
[282] Response to NPP, (SOC003)
[283] VfM Letter to CAA, (SOC077)
[284] CAA RP3 Decision, (SOC012), para 5.97, p. 97
[285] NATS, RP2 Evolution - Initial Presentation to CAA Consultants Steer, 27/02/2018, ('**RP2 Evolution - Initial Presentation to CAA Consultants Steer**') (SOC094)

specifically asked the CAA to identify if the information we had supplied was insufficient, and that it was important to tell us this and let us know if the CAA considered that there were any gaps but no further request was received. [286]

11.6.1.2. The assumed efficiency savings of £48m are not credible

427 The CAA presents no impact assessment or rationale for the trade-off for the proposed £48m reduction. Given the highly integrated nature of NERL's plan, it is not credible for the CAA to make this assumption without assessing the impact on safety, service and environmental performance, costs, and on the airspace and technology programmes.

11.6.1.3. There are serious concerns with the Steer/Helios report

428 The CAA appears to place undue weight on the findings of the Steer/Helios report, despite recognising that the report is a very high level analysis and the importance that NERL's customers place on receiving a high quality service.[287] The Steer/Helios report also fails to provide any impact assessment of its proposed reductions.[288] Despite these apparent weaknesses, the CAA's efficiency assumptions appear to be strongly guided by the Steer/Helios report.

429 For example the CAA offers no explanation as to why the specific level of capex reduction is the correct level other than to state that "*we have assumed that NERL will be able to realise approximately £50 million of savings, which is less than a third of the total possible savings and contingency identified by Steer/Helios*". [289] The CAA also offers no impact assessment of the changes proposed.

430 In contrast, the CAA did not take into account the views of customers. As noted in the CCWG co-chairs report, there was good agreement on the scope of the investment programme. [290]

11.6.1.4. The potential safeguard offered by the 'true-up' is undermined by the new governance arrangements

431 The CAA notes that the regulatory framework for NERL allows the recovery of the costs of efficient capital expenditure from customers.[291] However, the changes to the governance arrangements described below leave NERL with less confidence that this could be achieved in a timely way in practice and suggests that NERL should not rely on the potential ability to recover increased costs through the true-up mechanism to fund the investment programme.

11.6.2. NERL Impact Assessment of the CAA's RP3 Decision

432 In order to understand the implications of the CAA's RP3 Decision for our business, we carried out an impact assessment. The key conclusions from that impact assessment are set out in this section.

[286] VfM Letter to CAA, (SOC077)
[287] CAA RP3 Decision, (SOC012), para 5.90, p. 74
[288] Steer, NERL's Forward-Looking Capital Programme and Expenditure Efficiency, February 2019, ('**Steer Report**'), (SOC063), table 11.6, p. 151
[289] NPP, (SOC002), para 5.61, p. 66
[290] Co-Chairs Report, 2018, (SOC016), p. 38 - 40
[291] CAA RP3 Decision, (SOC012), para 5.96, p. 75

11.6.2.1. The CAA's assumptions of additional programme efficiency are unsupported

433 The CAA RP3 Decision reduced NERL's capex allowance for RP3 by £48m and stated that it considered this sufficient for NERL to deliver our full plan on the basis that NERL should be able to achieve additional programme efficiency. [292]

434 However, our capex programme was already tightly constrained in terms of funding, based as it was on most likely rather than fully risk-inclusive estimates which would have added c£150m to our RP3 capex plan (see section 11.6.4.5 below). This leaves few options for NERL to save cost without removing or reducing scope. This is also influenced by the need to accommodate costs that have flowed from RP2 as part of our approach of managing the overall programme efficiently across the reference period boundary as reported, for example, in SIP 20.[293]

435 As a result of the reduced capex available we will therefore need to remove scope, primarily from the end of the reference period and also look to re-profile capital activities in order to ensure a more even capex profile and avoid stranded costs associated with peaks and troughs in investment.

11.6.2.2. Achieving the CAA's capex reductions will require re-prioritisation across the whole of our integrated investment programme

436 The CAA asserts that it has ring-fenced the costs associated with airspace change and anticipates that we will reduce capex costs in other areas of the programme. However, the capex reductions, in combination with the CAA's proposed opex cuts, will force NERL to prioritise differently, based on the need to first ensure safety and resilience, and recognising the integrated nature of the programmes. Specifically we would expect to need to allocate capital investment based on the following priorities:

- any investments required to maintain safety performance;
- sustainment of existing legacy systems to ensure resilience;
- replacement of ageing legacy systems at or beyond end-of-life;
- hot-spot projects to address short term service performance issues;
- deployment of new technology to meet future mandates and support airspace change;
- large scale airspace modernisation to enhance capacity and environmental performance; and
- separate airspace improvement indicatives e.g. linked to Time Based Separation. [294]

437 Due to our need to prioritise safety and sustainment, the programmes most likely to suffer under a reduced capex environment are discretionary programmes not directly required to sustain operations or meet legislative requirements. However, these discretionary programmes, which include airspace change and controller tools, are typically the ones that rank highest amongst customer priorities and provide the most tangible benefit in terms of

[292] CAA RP3 Decision, (SOC012), para 5.95, p. 75
[293] NATS, Draft Service Investment Plan (SIP) 2020, October 2019, ('**Draft SIP 2020**') (SOC089)
[294] Response to CAP1758, (SOC003)

improvements to safety, service and environmental performance. Hence, while they are to some extent discretionary they are in fact of critical importance to customers.

438 As a result of these capex reductions, together with the impact of opex reductions (see Section 11.6.3 below) NERL would need to develop a revised investment programme which could operate within the available resources and would lead to a delay to deployment of DSESAR capabilities, with a corresponding impact on the subsequent deployment of airspace change.[295]

439 Specifically we envisage that the DSESAR plan to deploy the new capability into lower airspace would be delayed by two years compared to the RBP, from 2022 to 2024, which would have a consequential impact to our airspace programme which would also be delayed by two years with the main milestones for deployment of changes to London airspace being deferred into RP4.[296] The consequences of these delays will be felt in a number of ways that will impact customers and the travelling public both directly and indirectly:

- delays to replacement of legacy systems leading to increased resilience risk with potential for service performance impact in the event of system failure;
- increased opex requirements of up to £12m per year associated with extended dual running of both new and old systems;
- delay to planned performance enhancements leading to increased delay and reduced environmental efficiency;
- delay to critical airspace change which is a key priority for customers and the CAA and which is required to safely accommodate increases in traffic notably in the London area; and
- an inability to comply with European mandates in line with required deployment dates.[297]

440 Over the long term, these changes would result in increased total capital and operating costs coupled with reduced resilience.[298] NERL will always prioritise safety at the expense of capacity where necessary, but the extended use of ageing systems does increase the resilience risk and makes the likelihood of this type of trade-off more likely (see Section 8.6.7 above).

11.6.3. The interaction between the capex and opex reductions

441 As set out in Section 8 above, having the right operational resources is critical to being able to implement our key investment projects because of the requirement for suitably qualified and experienced operational controllers to support validation and training. Our plans to deliver these changes rely on our ability to fund additional staff and the use of overtime where required.

442 The proposed reductions to our opex described in detail in Section 8 above will directly impact our ability to fund the required resources and therefore make it impossible to deliver these key operational transitions as planned whilst maintaining day-to-day operational performance. In

[295] Response to CAP1758, (SOC003)
[296] Response to CAP1758, (SOC003)
[297] Response to CAP1758, (SOC003)
[298] Response to CAP1758, (SOC003)

order to address the shortfall we will seek to re-schedule key aspects of the capex programme to align with the available resources (rather than scale resources to support the planned capex programme) thereby delaying key programme deliverables and increasing capital and operational costs.

11.6.4. Capex governance proposals

443 As we have explained in the preceding sections the delivery of NERL's proposed investment programme is constrained by reduced opex and capex allowances. It is also impacted by the CAA's new ability to retrospectively adjust our cash flows relating to capex via its new incentive mechanisms outlined in the CAA's RP3 Decision. In the following sub-sections we set out our key concerns with those incentive mechanisms in more detail. Additional supporting analysis is provided in the Economic Insights report.[299]

11.6.4.1. Why is it important to get the governance arrangements right?

444 Delivery of NERL's capital investment programme is critical to the ability of the business to deliver our services in the best interests of our customers. In order to ensure that this is possible it is essential that appropriate capex governance processes are in place that give NERL the flexibility and confidence to invest wisely to deliver the necessary changes while giving customers and regulators clarity and oversight of investments made. Processes and incentives must also be set within the context of our top priority, and the CAA's primary statutory duty, of delivering a safe service.

11.6.4.2. The CAA's proposals change the balance of risk for customers

445 Our first concern is that, as a whole, the CAA's proposals fundamentally change the balance of risk for customers, towards prioritising short term considerations (lower costs) and away from ensuring that efficient investment can proceed. Objective analysis of the industry highlights that in air traffic control, customers are better protected by prioritising avoiding underinvestment, rather than prioritising the risk of allowing inefficient investment. This is due to: (a) safety priorities; and (b) the fact that NERL's capex characteristics are very different from other regulated industries.[300]

446 This principle underpins the existing governance, which is based on the established use of a capex cost pass-through regime, rather than ex ante capex allowances. The CAA's proposals fundamentally contradict this. As a result, they will be detrimental to our customers.

11.6.4.3. The CAA's proposals materially increase business financial risk

447 Our second concern is that the proposals materially increase business financial risk. There are a number of dimensions to this.

448 For example, under the efficiency incentive, the 'ex-post' nature of the CAA's assessment of the efficiency of capex (already spent) raises the question of how the CAA will be able to objectively distinguish between the benefit of hindsight and efficiency. In addition, most of our investments are intangibles (software and airspace), which heightens the challenge of objectively appraising efficiency and the potential of understating the actual risks we face on

[299] Independent Review of Capex Governance, (SOC068)
[300] Independent Review of Capex Governance, (SOC068), Chapters 3 and 4

a forward-looking basis (noting that Economic Insight's report highlights that intangibles are generally more risky than tangible assets). [301]

449 In relation to the information incentive, the assessment of 'how low' information quality is, is inherently subjective – meaning the application of said mechanism and consequent risk exposure is hard for investors to assess (noting that where this test is not met, associated overspend on capex is only remunerated at the cost of debt, under the CAA's proposals).

450 The above factors, combined with the fact that the CAA's proposals appear underdeveloped, hand the CAA a large degree of discretion to intervene and retrospectively adjust our capex related cash flows. Taken as a whole, therefore, the proposals seem to materially increase regulatory risk exposure for investors where, as is well established, at least some element of which may be systematic.

451 Related to the above it is also noteworthy that none of the incentives include any element of positive incentive, they are all based on a penalty regime. As such, they skew our expected equity returns to the downside. Therefore, notwithstanding the above, this represents a further increase in business risk which has not been recognised elsewhere in the overall impact of the CAA's RP3 Decision.

11.6.4.4. Stakeholders have not been properly consulted on the impact of these proposals

452 Finally, we note that whilst the CAA cites airlines and other stakeholders being supportive of its proposals, this is disingenuous. This is because the CAA did not engage with stakeholders around its proposals in a way that properly framed the problem or question of relevance. Put plainly, stakeholders were merely asked if they would like to be 'more engaged', without any consideration of discussion of the inherent trade-offs arising from the increased risk of preventing or delaying efficient capex. [302]

11.6.4.5. Comments on the Delivery Incentive

453 The CAA is proposing a financial incentive on NERL's delivery of our capex programme as set out in the RBP. On the basis of the CAA's assessment, a penalty of up to £36 million (in 2017 CPI prices) may be applied in the next reference period. The incentive shall be based on both:

- a general assessment by the CAA of the Licensee's delivery of our programme during a calendar year; and
- delivery of specific milestones in our programme;

454 As explained above this incentive is a wholly new proposal introduced post the original RP3 planning guidance and the draft Performance Plan Proposals. It appears to be at odds with the existing approach to planning and reporting applied for the capex programme based on most-likely estimates and a capex true-up mechanism.

455 To date NERL has always planned on the basis of these most likely (P50) estimates and included only a small amount of risk provision, rather than create estimates more typical of

[301] Independent Review of Capex Governance, (SOC068)
[302] Draft UK Reference Period 3 Performance Plan proposals, CAP1758, (SOC002)

a fixed-price regime in which all risks are included. At face value the new governance represents a significant increase in risk for NERL beyond that envisaged during RP3 planning.

456 Had this incentive been in place during the RP3 planning phase NERL would have needed to plan on a more guaranteed basis (e.g. P90) which would reflect increased costs and timescales to allow for risk. The amount of additional risk provision required would depend on the nature and status of the project:

- for facilities management and sustainment projects we estimated 10% risk provision;
- for airspace projects we estimated 15%; and
- for the more complex technology and integration projects we estimated 35% risk provision at this very early stage of their development.

457 If we had included these risks estimates in our capex plan directly to create a fixed process estimate it would have added £150m to the total capex plan. Customers would have needed to pay for this up front, rather than the existing regime under which we would manage risks within the projects using the contingency provision and only seek additional funding from customers should we not be able to accommodate the risk. Our plans would also need to include extra time contingency to allow us manage the risks which would add 1-2 years to the delivery date for key milestones, notably in the airspace and technology transformation programmes. Our assessment is that this would increase costs for customers in the short term and risk extending the timeline of delivery for key programmes, particularly as major changes can only be transitioned during the quieter winter months.

458 One of the other potential unintended consequences of the delivery incentive is the pressure it could exert to stick to deadlines, even when there are risks or issues that should lead to dates to be changed. This is one of the key lessons learned from the recent review following the TSB migration to a new IT platform.[303] NERL has faced similar challenges and a recent example arose whereby we identified a risk associated with functionality within our DSESAR programme. During validation and safety assurance testing we identified that part of the iTEC system, our interim band-boxing and splitting[304] solution planned for Prestwick, would result in an unacceptable safety risk to the operation. As a result the only realistic option to ensure safety was to deploy the full solution which results in a reschedule of 14 weeks to the final deployment, a decision taken by a sub-committee of the Board on the recommendation of the Executive. NERL will always ensure that safety is given the highest priority, but it is also important to ensure that there are no pressures which serve to undermine this.

11.6.4.6. Comments on the Ex Post Efficiency Incentive

459 We accept the principle of assessing the efficiency of our capex expenditure which has always been part of the regulatory regime. However, existing assessments have been on the basis of assessing NERL's forward-looking plans and approach to ensuring efficiency, including programme management, risk management and supply chain management techniques, as well appropriate analysis of planned costs and benefits).[305] Introducing an

[303] TSB Review, (SOC026)
[304] Functionality that allows sectors to be combined and separated to allow variations In traffic levels to be managed efficiently.
[305] We note that previous forward looking assessments have been 'informed by' backwards looking evaluations of our capex efficiency. However, this is fundamentally different to the now proposed ex-post incentive where future cash flows are adjusted based on an 'after the event' assessment of capex already spent.

additional ex post efficiency incentive after the event introduces a new level of risk based on assessment with the benefit of hindsight and again is at odds with our operating environment.

460 NERL has proposed substantial and ambitious programmes for delivery during RP3 which include inherent risks that NERL will take on and manage, especially in relation to modern technology, low level airspace change, and the transition process within a safety critical environment. The presence of a an ex post incentive regime encourages a revised approach to risk management, typically leading to an increase in risk provision where appropriate, and also discouraging riskier projects even if they delivered greater benefits for customers. These risks are particularly high because no detailed proposals have been made to suggest the basis on which these assessments would be taken while it is suggested that the part of the assessment could be taken.

461 In addition, the CAA's proposals don't appear fully developed. For example, the frequency with which such assessments might be made is unclear, with the CAA variously referring to commissioning a 'review' or 'reviews', but also implying efficiency could be within the scope of the IR's SIP reports (which are 6 monthly) and ad-hoc reports (for which the frequency will be as and when the CAA requests such reports).[306] In our view, 'frequent' efficiency assessments are especially problematic for an investment programme of this scale and duration where some of the major projects/programmes may last 3-5 years and would result in significant effort and costs that would be disproportionate to any potential benefits.

11.6.4.7. Comments on the Information Incentive

462 We accept the need to provide clear and effective communication of the NERL capex portfolio to customers and to support the regulator which has always been part of the regulatory regime. NERL has consistently worked hard to provide this, delivering regular SIP reports in line with the Licence and enhancing the quality for the SIP reports through RP1 and RP2. Further NERL has responded positively to feedback received from customers, the regulator, the Independent Reviewer and an independent consultant commissioned at the CAA's request.[307,308] Despite these positive improvements and positive feedback from customers on NERL's consultation processes compared to other ANSPs, it has been difficult to secure the CAA's approval for the form, scope, and level of detail for the provision of information. [309]

463 In future the proposed capex Information Incentive allows the CAA to remunerate certain capex at the cost of new debt, rather than the WACC, where it considers there to be significant weaknesses in NERL's provision of information. The form of this penalty would be a one-off reduction in revenues or the RAB, at the start of RP4. Our specific concerns relating to this are as follows.

464 Firstly, the assessment of 'information quality' is inherently subjective as illustrated above by existing experience. Therefore, this hands material discretion to the CAA to determine 'where the bar' is set and 'whether we meet it', in a manner that is unpredictable and, therefore, difficult for investors to price (i.e. increasing risk and therefore, customer harm). Relatedly, we again note the specialised and intangible nature of our investments.

[306] CAA RP3 Decision Appendices , (SOC041) Appendix I
[307] SIP 2019 Independent Reviewer Report, Grant Bremer, Chase Partners Limited, 01/03/2019, ('**SIP 2019 Independent Reviewers Report**') (SOC079)
[308] Trax International Report, SIP Review of Format and Structure, July 2019, ('**Trax Report, July 2019**'), (SOC022)
[309] CAA Letter to Martin Rolfe, NERL's SIP 2019, Not Approved, 28/03/2019 , ('**CAA Letter, SIP 2019, Not Approved**'), (SOC096); and CAA Letter to Martin Rolfe re SIP 19 Approved, 22/05/2019, ('**CAA Letter, SIP 2019, Approved**'), (SOC095)

465 Secondly, the quality of information is itself unrelated to efficiency. Thus, the mechanism risks applying a lower rate of return to investment that is, in actual fact, inefficient (i.e. it is just that the regulator has itself made a decision regarding information). Hence, efficient investments may be deterred or delayed, harming customers unnecessarily.

466 Thirdly, there seems to be a risk that, like the Ex Post Efficiency Incentive, this could result in retrospective changes to our cash flows relating to capex already spent. This is not entirely clear, however, reflecting the CAA's underdeveloped proposals. For example, as described by the CAA, under this mechanism, the penalty applies to 'overspend' on capex. Thus, this raises the question as to what, in the event of the CAA deciding that our information quality is 'too low', does the penalty apply? For example, it could be: (i) all overspend since the start of RP3, irrespective of the fact that the information quality for most has been deemed sufficient and irrespective of the fact that some has already been spent; (ii) all overspend from the point at which the CAA makes the decision (in which case the adjustment would not be retrospective); or (iii) just the specific investment for which the CAA has deemed the information quality 'too low' (in which case it may, or may not be, retrospective).

11.6.4.8. The role of existing Service and Investment Plan (SIP) governance

467 NERL has long supported the existing SIP governance mechanism, putting considerable effort into developing and improving the process which has been praised by customers and their airline associations, including IATA, in comparison to the consultation approach taken by other ANSPs. As noted above in Section 11.4.2 we engaged with customers and proposed further enhancements as part of our RBP. These proposals have been largely accepted in the CAA RP3 Decision.

468 However, the CAA's RP3 Decision goes further in terms of requiring re-consultation (based on a 5-stage process) for all new projects over £10m. The CAA has not provided a specific rationale as to why this additional new arrangement is required.

469 This approach is at odds with the existing agreed process which only requires re-consultation where there are material changes to the portfolio. Planned projects included in the consulted portfolio are subject to transparent reporting through the existing SIP governance. The change proposed by the CAA's RP3 Decision would represent an additional and substantive overhead for NERL and customers with little benefit. It is likely to require detailed technical analysis of projects that have already been agreed as part of the portfolio and this will inevitably cause delay to the affected programmes. The constraints to contingency processes are also likely to inhibit our ability to support tactical management of the portfolio, thereby importing risk and delay into the programmes.

470 Our RBP proposal was to provide clear and transparent reporting on our programmes. When there is a need to change scope, costs or timescales of these programmes, or to add new projects we would consult customers on options and, if agreed, incorporate them into the programmes for future reporting. Where agreement was not reached this would be escalated through the agreed process. We consider that this approach is both proportionate and adequately protects the interests of customers.

11.6.5. Potential consequences of implementing the CAA's RP3 Decision

471 NERL is part way through delivering a hugely complex and interdependent investment programme which will only be completed during RP3 and which is critical to future resilience and performance. There is no alternative to completing this programme as legacy systems

cannot be sustained and delaying the programme will increase not only investment costs but also operating costs during a period of dual-running during transition. Our ability to deliver on this programme will be undermined if NERL does not have a sufficient allowance for both capex and opex. Without successful delivery we cannot:

- sustain existing systems;
- modernise ageing technical infrastructure;
- deliver essential airspace change;
- comply with EU / UK legislation; and
- ensure an effective and efficient ATM capability to meet future needs.

472 Additionally, we need a governance regime that strikes the right balance between encouraging the right planning and delivery behaviours for a complex programme of this nature, and that maintains confidence and oversight ensuring customers receive value for money.

473 The CAA's proposed governance arrangements fundamentally change this balance, and risks causing considerable harm to customers. Most obviously, they place considerable weight on 'short term' considerations – particularly cost minimisation – without recognising and carefully considering the trade-off relating to the risk of inadvertently preventing, or delaying, efficient investment necessary to deliver the services our customers want.

474 In addition, the relatively 'late' sight we had of the CAA's proposed incentive mechanisms in particular means that the RBP we submitted is misaligned to the risks to which we are now exposed. Nor has the impact of these mechanisms on other aspects of the price control, such as financeability, WACC and opex been given proper consideration. This is inconsistent with regulatory best practice and, again, may give rise to further customer harm.

475 As a result of the issues outlined above, if NERL is obliged to operate within the financial and governance constraints of the CAA RP3 Decision it would face a shortfall in resources required to deliver the programme and a significant increase in business risk associated with the proposed incentive mechanisms.

476 To respond to this, NERL would need to develop a revised investment programme that could operate within the available resources and would lead to a likely two year delay to deployment of DSESAR capabilities, with a corresponding impact on the subsequent deployment of airspace change. Over the long term, this would result in increased total capex and opex coupled with reduced resilience. Moreover, over the long-term, one cannot escape the linkage between investment and safety.

477 NERL will always prioritise safety at the expense of capacity where necessary, but the extended use of ageing systems would increase the resilience risk and makes the likelihood of this type of trade-off more likely. Ultimately, if we were not able to deliver the right investment programme we would be likely to face reduced resilience in the short term and/or increased costs. This could lead to potential service disruption in the short term and poorer service performance in the medium to longer term, increasing delays and environmental inefficiencies.

478 Nonetheless, regardless of our priorities, License conditions, and the CAA's statutory duties, it is an inescapable fact that, in the long-run, safety performance is reliant on efficient investment being secured.

11.7. Conclusion

479 In order to ensure that we can meet the expectations of our customers and regulators in terms of safety, service performance and delivering change we need to have access to sufficient opex and capex resources. Additionally, in order to allow NERL to deliver the plan without facing unacceptable business risk, the governance regime should be consistent with the basis on which the RBP was developed and reflect the fact that, in air traffic control, customers are better protected by prioritising avoiding underinvestment, rather than prioritising the risk of allowing inefficient investment.

480 We ask the CMA to consider our capex funding and governance proposals in this context and the CAA's obligation to apply Best Practice Regulation.

12. Oceanic

12.1. Overview

481 The purpose of this Chapter is to provide an overview of our RBP plan with respect to the Oceanic price control and our concerns with the CAA's RP3 Decision. In particular, we demonstrate that:

- **Oceanic is a standalone business:** The Oceanic business is a standalone operation that is subject to a separate economic regulatory regime from the en route business, as it involves control of air traffic in the Shanwick FIR over the north Atlantic, outside of EC jurisdiction (see Section 2.1of the Industry Overview).

- **Cross-subsidies between Oceanic and en route are prohibited**: Although Oceanic and en route share some infrastructure and staffing, those shared costs are appropriately and transparently allocated. Licence Condition 9 expressly prevents NERL from allowing a cross-subsidy between these two separate businesses.

- **The new technology increases customer prices but improves safety and capacity :** Our RP3 plan for the Oceanic business is based on technology-driven transformation through the introduction of satellite-based ADS-B surveillance data that will ensure compliance with ICAO safety standards. It will also increase capacity of the North Atlantic airspace. This will deliver benefits in terms of fuel efficiency and service quality. It will lead to an increase in costs to customers, but the financial benefits are expected to be between two and four times higher than the additional costs.[310]

- **The CAA's efficiency challenge is unsupported:** We have serious concerns with the efficiency challenges the CAA has applied to our Oceanic opex costs. We do not consider that these challenges are supported by evidence, and the effect of these cuts on Oceanic is greater than the cuts to the en route business, exacerbated because the cuts have been applied in every year of RP3, compared to a change made between the CAA's draft decision and final decision for en route, in which the cuts were no longer applied to the first three years. The scale of cuts is unjustified and may have been exacerbated due to an error by the CAA.

- **Oceanic will be loss-making on a standalone basis:** The scale of the CAA's proposed opex cost cuts for the Oceanic business means that is highly likely that the Oceanic business will be loss-making. Unless we can find a way to deliver those cost reductions, these lower revenues will lead to losses and require the Oceanic business to be subsidised by the en route business. This is contrary to the terms of our Licence.

- NERL proposes that the Oceanic ADS-B data charges be remunerated in full, and due care and attention paid to the scale, as well as the appropriateness, of any other adjustments proposed by the CAA in order to appropriately prioritise the Safety Duty and

[310] RP3 Business Plan, (SOC001), p. 67

the balance between the Efficiency Duty and the cost element of the Customer Interest Duty.

- We also consider that the CMA should take appropriate steps to ensure that its redetermination does not result in a cross-subsidy between the Oceanic and en route businesses. This should include carrying out an assessment of the financeability of each separate business unit, as well as NERL's price control settlement as a whole.

482 Details of the respective positions of the CAA and NERL with respect to the Oceanic price control are summarised in the table below.

Table 12 Comparison of NERL and CAA position - Oceanic

OCEANIC	NERL RBP	CAA NPP	Delta	Rationale
Opex	£88m	£85m	- £3m	CAA – 5% non-staff efficiency & applying the same en route efficiency assumption for staff costs * NERL – Opex cuts in en route are undeliverable. The CAA removed cuts in years 1-3 for en route but retained them for all years for Oceanic.
ADS-B charges **	£80m	£76m	- £4m	CAA – 5% of data costs not allowed due to lack of benchmarking comparators NERL – Aireon pricing is global tariff, there are no alternative providers
Pensions	£18m	£16m	- £2m	CAA – applying the same en route efficiency assumption for staff costs *
Reg Dep'n	£30m	£29m	- £1m	CAA – applying a 5% cut to Oceanic capex
Return	£10m	£6m	- £4m	CAA – mirroring application of en route
Traffic			+ £2m	CAA – adjustment for higher traffic levels
TOTAL	**£223m**	**£211m**	**- £12m**	

** NB: this is the same efficiency assumption used by the CAA for en route despite the two cost bases having a different make up. In addition, in the CAA's final decision it restored cost cuts made in its draft proposal, for years 1 to 3, but only for en route not Oceanic.*

Martin Rolfe, CEO, NERL

"In my 25 years in the aviation industry it is very rare that a technological advance comes through that is genuinely remarkable. Satellite based ADS-B is one of these. It is on a par with the first invention of radar – for the first time we will be able to pinpoint exactly where aircraft are over the most inhospitable regions of the planet rather than rely on position reporting and extrapolation. It will allow the UK State to meet its safety obligations under ICAO as well as deliver capacity and fuel savings. I cannot ever recall a technology change in ATM that improves safety and delivers additional capacity while saving fuel and money for the airlines. I therefore cannot understand a rationale for NERL being unable to recover the costs of such an advance in safety."

12.2. Introduction

483 Whilst the Oceanic business represents a small proportion of the NERL business from a financial perspective (it represented only 4% of NERL's revenues during RP2),[311] it is of vital strategic importance for airline customers and in turn the UK. The Oceanic airspace is the gateway to the US, Canada, the Caribbean and key destinations in South America, not just for the UK but the whole of Europe and beyond, with around 80% of all North Atlantic oceanic traffic routing through this airspace. As a result, NERL's airspace is the world's busiest Oceanic airspace.

484 The Oceanic region has experienced much stronger growth over RP2 than any other part of the UK operation (23% compared to 14% on average).[312] We are proposing to transform the way that we provide the Oceanic air traffic control service during RP3 using satellite-based surveillance data to increase the capacity and safety performance of this airspace, delivering fuel savings for our customers.

485 This transformation is part of the ICAO global strategy and requires the use of satellite-based ADS-B surveillance data that we will procure from Aireon LLC. NavCanada, the Canadian ANSP that operates in neighbouring Gander Oceanic airspace, is following the same approach. Several other ANSPs globally are making preparations to do the same.

12.2.1. Background

486 NERL is responsible, under our Licence and on behalf of the UK State, for air traffic control services over the Shanwick Oceanic airspace (see Figure 10 below and Section 2.1.4 of the Industry Overview). This responsibility is shared with the Irish Aviation Authority (IAA) on behalf of the Irish State who provide air traffic communications services. These services are subject to intergovernmental agreement with both States jointly assigned the responsibility for control of traffic by the International Civil Aviation Organisation (ICAO).

[311] Calculation is £29m Oceanic / £733m NERL total revenue = 4%; from NERL, Regulatory Accounts, 2018, (**Regulatory Accounts 2018**), (SOC071)
[312] Traffic Support Pack, (SOC011)

Figure 10 – Oceanic and en route airspace

Source: NERL[313]

487 The North Atlantic (NAT) was formerly classified as International Airspace and as such the services provided by NERL, in partnership with the IAA, for managing air traffic over the Ocean are governed by the United Nations through ICAO. These processes include the concept of operations, safety requirements and the technology deployed, as well as their interoperability across all States/service providers. The CAA is the UK's member of the ICAO North Atlantic Systems Planning Group (NATSPG) representing UK interests in this decision making regional planning group, with NERL acting as technical advisors at the request of the CAA.

488 ICAO's horizontal target levels of safety are fully achieved but vertical target levels of safety could not be complied with using previously available technology or historic procedural method of operations over the Ocean. However, NERL's procedures were deemed to be *as low as reasonably practical* and so that safety risk was accepted. However, the recent availability of satellite based ADS-B technology provides for the first time surveillance capability across the NAT, with it the ability to comply with the ICAO vertical target levels of safety. Therefore, the continued use of a procedural service without deploying this new ADS-B technology would no longer maintain the safety risk to *as low as reasonably practical*. Deploying satellite based ADS-B will make the operation significantly safer as well as complying with the ICAO safety mandate. The NAT business case for satellite based ADS-B deployment across all NAT States and within the area of NERL responsibility, which stated the safety and efficiency benefits, was unanimously agreed by the NATSPG members, including the CAA, following robust discussions in its safety, economic and technical implementation contributory bodies.

12.2.2. Structure of NERL's Oceanic operations

489 The Oceanic service is based in NERL's Prestwick Centre. It shares much of its infrastructure with the UK en route services that are provided from Prestwick Centre. The integrated nature of this arrangement means that the Oceanic business (as well as the UK en route business) benefits from many economies of scale – including sharing costs of the Prestwick Centre (facilities and associated engineering costs). These costs are largely fixed and cannot easily be adjusted because they are shared with the much larger en route business. Shared costs make up around half of the Oceanic operating cost base. The other half of Oceanic costs relate predominantly to Oceanic operational staff, mainly ATCOs and ATSAs. In RP3, we will

[313] NATS, Introduction to Airspace, NATS website ('Introduction to Airspace'), (SOC023)

need to recruit and train additional ATCOs to meet growing traffic and maximise benefits from satellite technology.

12.2.3. How is Oceanic air traffic control currently delivered?

490 We align our ways of working and our technology closely with Nav Canada, which manages the adjacent Gander airspace over the Atlantic Ocean. This helps to ensure that airlines receive the most efficient, effective and consistent service across the large volume of Oceanic airspace that we jointly manage. With no ground-based surveillance with sufficient range to cover the Atlantic ocean, traffic is separated - as described in the CMA 'teach in' - procedurally as it enters oceanic airspace with ATCOs having visual displays showing *estimates* of where the aircraft should be, based on their flight plans and in-flight updates that are received through datalink at 14 minute intervals, with each update taking another few minutes to reach the control centres.

491 Without the timely availability of aircraft positions, aircraft in Oceanic airspace must be procedurally separated flying with relatively large distances between them to assure that the risk of collision is appropriately managed (i.e. ATC separation standards). This limits the number of aircraft that can safely fly on the most efficient routes, thus requiring many to be displaced to less efficient flight trajectories, increasing fuel consumption and CO_2 emissions.

12.2.4. Technology transformation – the potential role of satellite technology

492 NERL has been investigating and considering satellite-based surveillance technology for almost ten years and in detail since 2016. Our strategy for transforming the Oceanic operation was agreed through ICAO in 2012, with our plan and implementation being approved in 2018.[314]

493 The Oceanic plan, which was agreed by the CAA, is based on the premise that the introduction of satellite-based technology is the best way to fulfil safety requirements and deliver the service levels desired by customers. We need to comply with the ICAO plan in order to deliver on the UK commitment to this international obligation, as well as to deliver the anticipated benefits to customers.

494 Satellite-based technology allows Oceanic controllers to see the precise location of aircraft over Oceanic airspace, updating every few seconds in the same way as ground-based radar infrastructure provides location for en route flights, allowing them to fly closer together safely, select optimal flight paths, fly at optimum speeds and save fuel. Using this technology, as evidenced already from our recent RP2 trials,[315] facilitates improvements in safety at the same time as increasing capacity in what is increasingly congested airspace. The fuel savings we expect airlines to realise will be between two and for times greater than the extra cost that they will pay associated with accessing the satellite data.

[314] Business Case Analysis for Space Based ADS-B – Net Present Value Phase 2 – ICAO NAT Region Preliminary Results, 26 – 28 April, 2017, ('**Business Case Analysis for Space Based ADS-B, 26-28/04/2017**'), (SOC084);
Business Case Analysis for Space Based ADS-B, Net Present Value Phase 2, ICAO NAT Region Preliminary Results, 26 – 28 April, 2017, ('**Business Case Analysis for Space Based ADS-B, 26-28/04/2017**'), (SOC085); and
Phase 2 Space-Based ADS-B Business Case Analysis for the NAT Region 13/06/2017, ('**Phase 2 Space-Based ADS-B Business Case Analysis for the NAT Region**'), (SOC086)

[315] ASEPS Update for NATS and ICAO, ASEPS Trial Implementation, Day 90/120 WebEx, 28/08/19, ('**ASEPS Update, 28/08/2019**'), (SOC081);
ASEPS Update Day 180, ASEPS Trial Implementation, 180 day ('6 month') WebEx, 01/11/2019, ('**ASEPS Update, 01/11/2019**'), (SOC082); and
ASEPS Update ASEPS Trial Implementation, Day 60 WebEx, June 5th, 2019, ('**ASEPS Update, 05/06/2019**'), (SOC083)

495 The CAA's analysis also demonstrates that even using very conservative assumptions, there would be advantages to customers from introducing ADS-B.[316]

12.2.5. Investment by NSL into Aireon LLC

496 As noted above, the ADS-B technology that forms the basis for the transformation proposals is being developed by Aireon LLC (**Aireon**). Aireon is the only operator currently active with the capability to provide this technology.

497 NAV Canada invested in Aireon at start up stage and, in May 2018, NATS also invested in Aireon on an arm's length basis through its commercial arm, NSL. The objective of both NATS and Nav Canada in making these investments has been that both recognise the future safety criticality of this service and want to ensure it develops appropriately, especially since we will be relying on it.

498 The pre-established governance model within Aireon means that NSL has no influence over pricing. Whilst the technology upon which the business is based is now established, the Aireon business model is high risk in cash flow terms and attracts a high premium on both debt and equity.

12.2.6. Relationship between the Oceanic and en route businesses

499 Whilst NERL is responsible for both the Oceanic and en route services, these are stand-alone business units. This is expressly provided for in NERL's Licence which establishes that they are to be treated as 'Separate Businesses'. 'Separate Business' is defined (in Condition 1) as meaning:

> *… each of the En route (UK) Business and the En route (Oceanic) Business taken separately from one another and from any other business of the Licensee, but so that where all or any part of such business is carried on by an affiliate or related undertaking of the Licensee such part of the business as is carried on by that affiliate or related undertaking shall be consolidated with any such business of the Licensee (and of any other affiliate or related undertaking) so as to form a single Separate Business.*

500 Condition 9.1 of NERL's Licence makes it clear that cross-subsidies between the Separate Businesses are not permitted:

> *Without prejudice to the provisions of Article 15(2)(e) of Regulation (EC) No 550/2004 on the provision of air navigation services in the single European sky (the "Service Provision Regulation"), the Licensee shall procure that no Separate Business or part of a Separate Business gives any cross-subsidy (whether in money or money's worth) to, or receives any cross-subsidy from, any other business or part of any other business of the Licensee or any affiliate or related undertaking of the Licensee (whether or not a Separate Business).*

501 A Commission Decision relating to alleged competition law infringements defines a cross-subsidy (at recital 6) as follows:

[316] NPP, (SOC002), Table 11.3, p. 115

> *From an economic point of view cross-subsidisation occurs where the earnings from a given service do not suffice to cover the incremental costs of providing that service and where there is another service or bundle of services the earnings from which exceed the stand-alone costs.* [317]

12.3. Basis of NERL's plan

502 In our RP3 business plan, we set out our proposals to transform the Oceanic service, by introducing satellite-based surveillance technology.[318]

503 In order to deliver the satellite-based service in RP3, we will pay Aireon for the satellite data feed. Aireon operate a global transparent pricing tariff for different types of airspace, including Oceanic airspace, which sets out the price payable depending on a number of factors. Typically the charge is lower where there are other surveillance options available (i.e. populated areas where there is existing ground based infrastructure) and higher where there are less available options (i.e. remote areas or over the ocean).

504 The price for satellite data in remote Oceanic regions such as Shanwick, is $40 per flight hour. Over the last three years, NERL's supply chain team has undertaken extensive negotiations with Aireon on data pricing. However, Aireon is not willing to adjust their global pricing tariff. In the absence of a benchmark, we commissioned an independent study.[319] The report concluded that the pricing was fair, and returns were commensurate with the level of investment and risk faced by them. We also held a one day workshop with customers and the CAA in relation to Aireon's pricing and the reasonableness of it. Key findings of external consultancy firm report were presented to, and shared with, customers and regulators under non-disclosure terms in August 2018.[320] The CAA has not referred to this at all within its RP3 Decision.

505 Our regulatory model provides shareholder returns based on the size of the RAB, and the cost of capital determined by the CAA. Because data charges are opex, rather than capex, there is no additional margin added to our prices in relation to these costs. Instead we based our business plan on passing these costs on to customers at cost.[321] As we are making no margin on this data, we set out proposals in our RBP for a 'true-up' mechanism in relation to data costs, to avoid windfall gains or losses for customers or NERL resulting from the under or over recovery of satellite data costs due to traffic variances.[322]

506 The Oceanic business represents a small proportion of the NERL business, and to date has had relatively low pricing compared to en route charges for airline customers. Although the safety and operational benefits are of strategic importance for airline customers, the increased cost of the ADS-B service creates a large percentage increase in the Atlantic

[317] Commission Decision of 20 March 2001 relating to a proceeding under Article 82 of the EC Treaty, Case COMP/35.141, (2001/354/EC), Official Journal of the European Communities Official Journal of the European Communities, 05/05/2001, ('**Case COMP/35.141 (2001/354/EC)**'), (SOC009), p. L125/27 – L125/44

[318] RP3 Business Plan, (SOC001), p. 9

[319] Euroconsult Presentation of Independent Assessment of Aireon L.L.C. and Iridium Communications, Inc, 15 August 2016, ('**Euroconsult Presentation**'), (SOC025) and NATS, Review of Euroconsult Assessment of Aireon Workshop, 05/08/2018, Non NDA Version, ('**Review of Euroconsult Assessment of Aireon Workshop**'), (SOC072)

[320] Euroconsult Presentation, (SOC025) and Review of Euroconsult Assessment of Aireon Workshop, (SOC072)

[321] RP3 RBP Appendices, (SOC021), Tables, p. 131 show that revenues are the same as projected costs. In 2017 prices, the average value of satellite data cost estimated to be £15.8m; RP3 RBP Appendices, (SOC021), Tables, p. 131 show revenues at £31.29 per flight; and RP3 RBP Appendices, (SOC021), Tables, p. 131 for 505k flights = £15.8m.

[322] NATS, Initial Business Plan (IBP) Appendices, for Customer Consultation, 2020-2024, 09/04/2018, ('**Initial Business Plan Appendices**'), (SOC027), Section, Proposed true-up for satellite data charges, p. 96

crossing charge.[323] However, even the proposed full Oceanic crossing charge is only equivalent to approximately 1/10th of the cost of an equivalent flight distance in en route airspace.[324]

12.4. The CAA's RP3 Decision

507 The CAA has made a number of cuts to the Oceanic part of the RBP totalling £12m, mainly reflecting the cuts proposed in the CAA's draft proposal:

- (£3m) reduction to operating costs, phased over all five years of RP3.
- (£2m) net reduction in ADS-B satellite data costs, comprising:
  - A £2m increase as a natural consequence of using a higher traffic forecast325
  - A (£4m) cut to data costs (only allowing 95% of costs incurred)
- (£2m) reduction to pensions costs, as a result of the operating cost cuts to staff costs
- (£1m) cut to regulatory depreciation as a result of a 5% cut to Oceanic capital expenditure
- (£4m) reduction to regulatory returns, mirroring the reductions on WACC made to Enroute

508 With the exception of the ADS-B data costs, the CAA's rationale for these cuts is the same as the rationale they have presented for the en route business (see, for example, Sections 8 and 10). However, while the CAA removed the cuts to the en route business made in the first three years of RP3 between their draft proposals and final decision, they retained the cuts to Oceanic in that period.

509 For ADS-B data, the CAA's rationale for reducing our revenue allowances is that we have failed to provide evidence of benchmarking of such data costs.[326] In addition, the CAA states, in its RP3 Decision, that if a benefits review (to be carried out in 2022) indicates that benefits significantly exceed costs, the CAA may review its decision to reduce data cost allowances by 5% for 2023 and beyond.[327] However, it does not refer to the potential for retrospective allowance of full data costs in 2020 to 2022, even if the benefits review proves to be overwhelmingly positive for those three years.

510 The proposal made by NERL for a 'true-up mechanism' for ADS-B costs in RP3 was rejected by the CAA with no clear explanation.[328]

[323] A 55% increase between the charge in 2019 (£56.44 per flight) and the combined core and data charge for a North Atlantic crossing in 2020 (£87.68 per flight)
[324] This is very roughly estimated as 2000km across the Shanwick Oceanic FIR is, ignoring aircraft weight, 20 SUs at £50/SU equals £1000, compared to c£100 charge per oceanic crossing
[325] NERL's RBP was based on the NATS Aug 2018 Forecast. The CAA adopted the NATS May 2019 Forecast in the RP3 Decision, which had a 2.6% increase in North Atlantic flight volumes. A larger flight volume will naturally increase the total data cost that is payable to Aireon. The CAA made this update.
[326] CAA RP3 Decision, (SOC012), para 11.42, p. 144
[327] CAA RP3 Decision, (SOC012), para 11.42, p. 134
[328] NPP, (SOC002)

12.5. Why we believe the CAA's decision is not in the public interest

511 This section focuses on our concerns to the CAA's approach specific to the Oceanic business. To the extent that its approach mirrors that applied to the en route business, we refer the CMA to the detail in Sections 8 and 10 above.

512 We believe that the CAA's cuts to the Oceanic business are arbitrary, not supported by adequate evidence or reasoning and contrary to the public interest for the reasons explained below.

12.5.1. Satellite data costs – Aireon

513 The CAA has allowed us only 95% of the actual satellite data costs charged by Aireon. This is apparently because Aireon's prices were not (and cannot be) benchmarked. But Aireon is a monopoly supplier of such data and there are no other suppliers from whom information would be available for a benchmarking exercise. Nonetheless, we commissioned an independent review of Aireon's pricing.[329] It concluded that Aireon's pricing was commensurate with the company's underlying cost and risk profile.

514 A further concern of the CAA which may explain its view on Oceanic costs is NSL's shareholding in Aireon. As explained in Section 12.2.5 above, the investment into Aireon was carried out by NATS' commercial arm, NSL, on an arms-length basis. As NSL was the last of the interested ANSPs to invest in Aireon, with a minority shareholding of approximately 9%, the shareholder rights, the business model and the governance were all firmly established before NSL made its investment. Consequently, NSL's investment analysis and due diligence was based on that pricing model. NSL has powers to object to more favourable trading terms being granted to any other ANSP shareholder than are made available to NERL, with each other ANSP investor having similar powers. This will protect the interests of our customers.

12.5.2. Inappropriate implied equivalence of the Oceanic and en route businesses

515 Around half of the Oceanic operating cost relates to costs that are shared with the en route business, many of which are fixed (e.g. the shared cost of the Prestwick Centre). The remainder are mainly front line operational staff costs. The only way that the Oceanic service can make cost savings to achieve the level of opex proposed by the CAA would be to reduce costs that relate to the Oceanic operational staff, which would be in direct contravention to what NERL agreed with our customers during the RP3 customer consultation – customers supported an increase of 5 ATCOs for Oceanic to support capacity, this represents a c10% increase in Oceanic controller numbers which is approximately equivalent to the value of the cuts required by the CAA.

516 In addition, if the CAA were correct in assuming that the en route and Oceanic cost bases are equivalent for the purposes of cost efficiency assessment, the CAA's decision to reduce operating cost allowances in all years for Oceanic is inconsistent with the CAA's RP3 Decision to make cuts to the en route business in only the final two years of RP3 (see Section 12 above).

[329] Euroconsult Presentation of Independent Assessment of Aireon L.L.C. and Iridium Communications, Inc, 15 August 2016, ('**Euroconsult Presentation**'), (SOC025)

12.5.3. Lack of proportionality

517 In addition to the inappropriate equivalence set out in section 12.5.2 we do not consider that the CAA has fully appreciated the scale of the cuts proposed to the Oceanic business. For example, the £8m reduction for Opex and ADS-B data costs is almost twice the equity return allowance made by the CAA (£4m over RP3).

12.5.4. Risks to international obligations, cooperation and interoperability in Oceanic airspace

518 The management of Oceanic airspace necessarily depends on supra-national regulation and inter-state cooperation. It is not feasible for NERL to abandon or delay the introduction of satellite technology because of our obligations to ICAO and its partners in providing the trans-Atlantic Oceanic service. Yet the CAA, without adequate rationale, is putting that service in jeopardy despite its International Obligations Duty.

519 The failure of NERL to invest in this technology would also considerably reduce the benefits that airlines would realise in neighbouring airspace, such as Gander Oceanic. This is because aircraft would have to slow down and/or increase the distances between them within Nav Canada's Gander airspace, even though this airspace was managed using satellite technology, in order for these aircraft to enter NERL's Shanwick airspace in a way that complies with current safety rules, based on existing technology. Integrating the old procedural tracks in one half of the North Atlantic with ADS-B derived traffic volumes and flight profiles in the other half of the North Atlantic would be a more complex and costly task than the current procedural tracks and customers would suffer disbenefits from the combination.

520 We have analysed the option of terminating the new satellite based service and reverting to a procedural service for RP3. For the time being this has not been actively considered for the following reasons:

- NERL is required to meet the ICAO safety standard for the ocean and the procedural service cannot achieve that;
- NERL's approach to our 2020 business plan in the light of the uncertainties of the outcome of the CMA process has been to not take any irreversible actions that would prevent NERL delivering our RBP if the CMA supports NERL's case;
- NAV Canada is committed to the service and it would be impracticable to operate one half of the Atlantic as a satellite service and the other half procedural;
- NERL is committed to providing the best service it can for customers within our Licence and a reversion to a procedural service would be a significantly retrograde step; and
- the benefits to customers and the wider travelling public have been clearly demonstrated, including by the CAA's own analysis.

12.5.5. Enforced cross-subsidy

521 If we do not have sufficient revenue allowances to pay for the cost of the satellite data and meet the cost of running the Oceanic operation, including operational air traffic control staff, it would require the en route service to bear the loss incurred by the Oceanic service, which

would amount to a cross-subsidy and put us in breach of our Licence. This is because the Oceanic business would not pass a financeability test as an independent business.

522 However, on the premise that NERL must comply with our Licence and our directors cannot commit to running a service at a loss on a permanent basis, NERL has agreed with Aireon that the ADS-B data contract is terminable if the CMA's redetermination does not result in 100% data costs included in the settlement. If that clause needs to be exercised the CAA will need to consider its position with regard to the priority of the Safety Duty.

12.5.6. The CAA's Safety Duty is not given priority over costs

523 In consultation, NERL's customers supported an increase of 10 per cent in ATCO numbers to deal with traffic growth but did not agree the Aireon[330] data costs required to implement ADS-B as a safety benefit. The CAA's Decision acknowledged the safety benefit and required NERL to implement the ADS-B service in RP3 for which it will need sufficient cost allowances.

524 Both NERL's and the CAA's cost benefit analyses along with, most importantly, the safety benefits and associated ICAO compliance, demonstrate an overwhelmingly positive case for introduction of ADS-B. We have also conducted an independent examination of Aireon's pricing. Against this background, there is no justification for the CAA withholding full funding of the ADS-B service from the beginning of RP3. It should not be dependent on a benefits review. However, even were that benefits review to be justifiable, the best outcome from the proposed review in 2022 does not include the potential for retrospective allowance of full data costs for 2020 to 2022, even if the benefits review demonstrates a positive outcome. It therefore seems certain that NERL will bear losses in these years and the CAA has not therefore provided sufficient costs for NERL to provide this safety requirement.

12.6. Conclusion

525 In RP3, we have the opportunity to transform the way that the Oceanic business operates with no additional profitability for NERL. The CAA's RP3 Decision, however, makes it almost inevitable that this business will be loss making if it is operated in the way that will deliver benefits to customers and comply with international mandates (which have been agreed by the CAA).

526 If NERL were to attempt to deliver those transformation aims through the use of satellite data, the inevitable losses would need to be funded by the en route business that would constitute a breach of Condition 9 of the Licence.

527 It is vital NERL is given the costs that are set out in our RBP. In doing so, required safety mandates will be achieved and customers will realise fuel savings that are between 2 and 4 times higher than the increases in charges relating to satellite data.

528 The CAA's decision does not comply with its obligation to prioritise the Safety Duty over the Efficiency Duty and also appears to have inappropriately given greater weight to the cost element of the Customer Interest Duty.

[330] Customers actually also agreed on ADS-B data pricing for the South East corner of the North Atlantic, but not the core oceanic charge

13. Cost of capital and financeability

13.1. Overview

529 The purpose of this Chapter is to set out NERL's views on the appropriate rate of return for RP3, as measured through the WACC. We highlight the key differences in the approaches taken by NERL and the CAA and identify the issues we consider merit particular attention by the CMA during its redetermination. We also discuss the financeability of the CAA's decision.

530 This Chapter should be read alongside the corresponding annexes, as referenced throughout the section. In particular, we draw the CMA's attention to the cost of capital work conducted by NERA on our behalf and the assurance report by Economic Insight (EI), which provides a detailed description, and independent review, of the evidence relating to the WACC at RP3.[331]

531 Under the RAB-based regulatory approach adopted by the CAA, the allowed rate of return is a critical input into the price control determination. Setting the allowed rate of return at the right level allows NERL to recover our costs in full, including the efficient cost of raising finance, and helps to ensure there are appropriate incentives to invest in our assets. This is particularly important at the time of a significant capital investment programme.

532 Our view as to the appropriate WACC for RP3 (4.21% real, vanilla) is substantially different to the CAA's (2.68% real, vanilla). We are greatly concerned that the CAA's position does not reflect the balance of risk to which we are exposed over the next five years and therefore underestimates the efficient cost of finance for RP3. This is the result of several methodological issues that underpin the CAA's WACC determination and markedly different interpretations of the risk facing NERL. The two most substantial differences are as follows.

- **In relation to total market returns (TMR) the CAA's proposed figure of 5.4% (RPI deflated) implies an implausibly large and rapid reduction in equity market returns relative to the RP2 determination, and precedent from other regulators (including the CMA).** While the TMR can change over time, economic theory is inconsistent with large and rapid adjustments due to the inverse relationship between the risk free rate and equity market premium and the close relationship between equity returns and overall economic performance (most obviously, productivity). The CAA's TMR decision is also inconsistent with other aspects of its proposals that imply productivity improvements.

- **Similarly, in relation to the asset beta, the CAA's proposals imply a step down in the systematic risk faced by investors.** There is broad agreement between the CAA and NERL on the need to conduct a relative risk assessment when estimating NERL's asset beta. This means that some judgement is inevitably required. However, the CAA's analysis suggests that NERL's exposure to systematic risk has reduced at a time where: (i) the main existing drivers of our systematic risk point to stable or rising risk; (ii) Brexit

[331] NERA, Updated Weighted Average Cost of Capital for NATS (En-Route) plc at RP3, September 2018, ('**Updated Weighted Average Cost of Capital for NATS (En-Route) plc at RP3**'), (SOC087).
Economic Insight, Assurance Review and Assessment of the Evidence on the WAAC at RP3, 22/11/2019, ('**Assurance Review and Assessment of the Evidence on the WAAC at RP3**'), (SOC113)

uncertainty potentially gives rise to additional risk; (iii) changes to the regulatory framework appear to considerably increase regulatory risk (some of which may be systematic) and skew equity returns to the downside; and iv) we are planning significant investment in our asset base. Moreover, the CAA's analysis does not adequately reflect the higher risk of NERL's business relative to other regulated sectors.

533 The net result of the above issues is that the CAA's final WACC estimate does not adequately reflect the cost of capital for an efficient ANSP over the RP3 period. As such, we consider that the CAA has not met its Financeability Duty (see Section 3.3.1 above).

534 The impact of these issues is material for NERL. The difference in revenues resulting from the gap between the WACC proposed in our RBP and the CAA's decision amounts to £125m over the RP3 period.[332] Given the substantial impact on our revenues, it is clearly of the utmost importance that we are set a WACC that properly reflects the risks we face – and the opportunity cost of capital for NERL's investors – in RP3. The substantial cuts to the allowed rate of return proposed by the CAA will not be in the public interest if this creates a financeability issue, does not allow NERL to recover our efficiently incurred costs, or deters future investment.

Table 13 Comparison of NERL and CAA position – Cost of capital

Cost of capital	NERL RBP	CAA NPP	Delta	Rationale
WACC			-£122m	CAA – market wide reductions in cost of equity and cost of debt – also an implied reduction in NERL's systematic risk. NERL – evidence does not support: (i) any NERL specific reductions in the cost of equity; (ii) the scale and speed of reductions in market-wide equity returns; nor (ii) the scale of reductions proposed to the cost of debt.
Capex impact			-£3m	CAA – Impact of capex cuts (see above) NERL – Capex cuts are not appropriate
TOTAL	**£277m**	**£152m**	**- £125m**	
Real pre-tax WACC	5.07%	2.91%	-2.16%	

** Real terms RPI basis*
Source: CAP 1830 CAA Decision Document page 11

[332] Noting that we subsequently revised our view on certain WACC parameters in response to the CAA's draft proposals, as shown in the previous table. In addition, we recognise that market data can move over time; and that, since our response, we commissioned an independent review of our WACC evidence by Economic Insights.

Alistair Borthwick, CFO, NERL

"As CFO of NERL I am challenged by shareholders to deliver a suitable return on their equity investment. They require that to be a balanced return in light of the risks they are exposed to and the alternative investment opportunities available"

13.2. Introduction

13.2.1. Context for the RP3 WACC

535 The CAA's estimate of the WACC is used to set the target rate of return NERL should expect to earn on our Regulatory Asset Base (RAB) if our performance is in line with the regulatory forecasts built into the price control. It is an important driver of our overall allowed revenues and the single largest difference in financial terms between NERL and the CAA at RP3.

536 Although NERL is subject to the same RAB-based regulatory framework as regulated UK networks, our cost structure and asset base are very different. This has important implications for the estimation of NERL's cost of capital, in particular the assessment of the asset beta. The most significant factors that we would urge the CMA to consider are that:

- NERL is much less capital intensive than the majority of other price regulated companies in the UK (e.g. airports, energy networks and water companies). This, as well as the regulatory mechanisms applying to some of those other sectors, means that our profitability is much more sensitive to cost and demand shocks than traditional utilities. Indeed, NERL's business could (at least to some extent) be regarded as closer to that of a system operator found in other sectors.[333]

- We have a relatively small asset base given the scale and strategic importance of our operations. The average UK Air Traffic Services (UKATS) RAB was £979.2m in 2018.[334] This is less than 6% of Heathrow Airport's RAB, around 7% of the size of National Grid Electricity Transmission's, and around 1.5% of the total regulatory capital value (RCV) of the England and Wales water sector.[335]

- Our assets are generally shorter lived than infrastructure companies. Our assets are depreciated over 15 years on average, compared to, for example, 45 years for gas transmission and distribution assets.[336]

537 As a result of these factors, our regulatory return (£152m) accounts for just 5% of our total determined costs (£2,956m) under the CAA's RP3 Decision. In comparison, Heathrow

[333] We note that Ofgem has taken account of similar considerations in its approach to setting the allowed rate of return for the National Grid Electricity System Operator. Ofgem, RIIO-2 methodology for the Electricity System Operator, 28 August 2019, ('**RIIO-2 methodology for the Electricity System Operator**'), (SOC102)
[334] Regulatory Accounts 2018, (SOC071)
[335] NATS calculations based on:
Heathrow Airport, Development of Regulatory Asset Base (RAB) of the Regulated Airports, June 2019, ('**Development of Regulatory Asset Base (RAB) of the Regulated Airports**'), (SOC103);
National Grid, National Grid Electricity Transmission plc, Annual Report and Accounts 2018/19, ('**National Grid Annual Report and Accounts 2018/19**'), p. 28; (SOC104) and
Ofwat, Regulatory capital values 2019, 16 May 2019, ('**Ofwat, Regulatory capital values 2019**'), (SOC105)
[336] Ofgem, RIIO-2 methodology for the Electricity System Operator Annex: Finance, 18 December 2018, ('**RIIO-2 methodology for the Electricity System Operator**'), (SOC102) para 7.4

Airport's regulatory return (£3,489m) accounted for over 30% of its total revenue requirement (£11,333m) for Q6.[337] Consequently, small changes in costs or revenues that would have a small financial impact for a company with a large RAB can have a considerable impact on our outturn profitability.

538 We also consider that the cost of capital assessment should reflect the specific circumstances and risks of RP3. We are planning a substantial investment programme involving the roll out of new technologies and systems. The CAA's decision allows for £667m of capex (2017 prices) over five years relative to the existing UKATS asset base of £979m, with projected RAB growth of over 27% between 2019 and 2024.[338] This involves replacing a high proportion of our asset base in a short period of time, while simultaneously operating in an increasingly complex, safety critical environment, meeting stretching service quality targets and growing traffic. The allowed rate of return should remunerate investors appropriately for this higher level of risk exposure.

13.2.2. Basis of our plan

539 Our approach to the WACC for RP3 was to identify an efficient rate of return, commensurate with the forward-looking risks NERL faces. This took account of the specific circumstances of NERL as a result of our asset base, risk profile and capital plans. Our position was based on a thorough and robust evidence base, which included providing supporting evidence relating to the issues expressly referenced in the CAA's business plan guidance.[339] This evidence included:

- regulatory precedent published since the RP2 decision;
- market evidence on cost of capital parameters;
- business risks; and
- risks arising from external factors, for example, uncertainty arising from Brexit.

540 In developing our proposals on the WACC, we took advice from NERA Economic Consulting (NERA).[340]

13.2.3. The CAA's Financeability Duty

541 In common with other economic regulators, the CAA is subject to a Financeability Duty that requires it to "*secure that licence holders will not find it unduly difficult to finance activities authorised by their licences*."

542 It is well established practice that an assessment as to whether a financeability duty is met will typically have two components:

- ensuring the regulated firm is able to earn a return that is consistent with that which would arise in a competitive market, typically in relation to a return on capital – as set by the WACC; and

[337] CAA, Economic regulation at Heathrow from April 2014: Notice granting the licence, CAP1151, 2014, ('**Economic regulation at Heathrow from April 2014: Notice granting the licence, CAP1151**'), (SOC109)
[338] CAA RP3 Decision, (SOC012), p. 74 and p. 92
[339] RP3 Business Plan Guidance, 2017, (SOC017)
[340] Updated Weighted Average Cost of Capital for NATS (En-Route) plc at RP3, (SOC087)

- ensuring the regulated firm generates cash flows consistent with it achieving a reasonable investment grade, so that it can raise finance on reasonable terms.

543 Such duties are further normally interpreted with respect to a 'notional' or 'hypothetically' efficient firm. This is to ensure that customers do not pay for 'inefficiency' and that customers do not suffer as a result of an efficient firm not being able to finance the investments necessary to deliver the services they want.

544 Critically, the WACC estimate should reflect the overall balance of risk faced by investors (i.e. it should fully compensate investors for systematic risk). We consider that a WACC estimate that is below the level required to fully compensate investors for systematic risk fails to meet the requirements of the Financeability Duty, even if there is sufficient cash flow to sustain an investment grade credit rating. Likewise, the CAA acknowledges that '*an important factor in determining that equity is financeable is setting an allowed weighted average cost of capital and cost of equity that provides appropriate compensation for the risks faced by equity investors*.'[341]

13.3. Key areas of disagreement

545 The CAA has proposed a real, vanilla WACC for RP3 of 2.68%, compared to 4.25% at RP2 (as summarised in Table 14 below).[342] This amounts to a reduction of nearly 160bps.

546 In our response, NERL proposed a real, vanilla WACC of 4.21%, resulting in a considerably smaller reduction relative to RP2.[343] The table below provides a comparison of the RP2 decision, NERL's RP3 proposal and the CAA's RP3 Decision for each of the WACC parameters.

Table 14 Comparison of WACC parameters

Real, RPI-deflated	**RP2 allowance**	**RP3 – NERL's response to CAA's draft proposals**	**RP3 – CAA RP3 Decision**
Risk free rate	0.75%	-1.40%	-1.70%
Total market return	6.25%	6.25%	5.40%
Asset beta	0.505	0.57	0.46
Equity beta	1.11	1.35	1.00
Debt beta	0.10	0.05	0.10
Post-tax cost of equity	6.87%	8.93%	5.40%
Gearing	60%	60%	60%
Cost of new debt	1.75%	0.40%	0.10%
Cost of embedded debt	2.50%	2.13%	2.30%
Proportion of new debt	20%	70%	70%
Issuance costs	0.15%	0.15%	0.10%
Pre-tax cost of debt	2.50%	1.07%	0.86%
Vanilla WACC	**4.25%**	**4.21%**	**2.68%**
Tax uplift	37%		9.9%
Pre-tax WACC	**5.86%**		**2.91%**

[341] CAA RP3 Decision Appendices, (SOC041), p. 83, para G30.
[342] CAA RP3 Decision Appendices, (SOC041), p. 69 - 70
[343] Draft UK Reference Period 3 Performance Plan proposals, CAP1758, (SOC003), p. 55

547 As highlighted by Table 14, the CAA and NERL have come to very different views of the RP3 cost of capital. The most important drivers of this difference are the respective parties' estimates of the total market return (TMR) and the beta. As a result, there is a significant delta between the CAA's view on the cost of equity and our view of what investors require.

548 At a high level, the CAA justifies its proposed substantial reduction in our WACC for RP3 as follows:

- Recent market trends and regulatory precedent point to sharp reductions in expected equity returns and the risk-free rate since RP2.
- Evidence relating to the risks NERL faces, relative to the market, points to reductions in the required cost of equity and the CAA states that the regulatory framework shields us from certain risks.
- Reductions in the cost of new investment-grade debt and the relatively high proportion of new debt that NERL expects to raise during RP3.[344]

549 In the following subsections we set out the key areas of disagreement between NERL and the CAA and explain why we believe the CAA's position in relation to the WACC at RP3 is not a robust estimate of the cost of capital for NERL. This is organised around each parameter of the WACC.

13.3.1. Total market return

550 It has become widespread practice in a UK regulatory context to use a 'TMR approach' to estimating the equity market parameters.[345] This involves directly estimating the TMR and risk-free rate (RfR), and calculating the equity risk premium (ERP) as the residual. Both NERL and the CAA adopted this approach for RP3.

551 In forming our view of an appropriate point estimate for the TMR at RP3, and in keeping with the guidance published by the CAA in CAP 1625,[346] we developed and considered extensive evidence relating to:

- Long-run realised historical returns. NERA undertook a highly detailed analysis on our behalf, estimating returns using Dimson, Marsh and Staunton (DMS) data from 1900 to 2017 and applying relevant adjustments.[347] In the interests of comprehensiveness, NERA deployed a range of methodologies including, for example, using a range of averaging techniques and assumed holding periods.
- Forward-looking evidence, based on the Bank of England's Dividend Growth Model.
- Regulatory precedent, including previous CMA views on the total market return.

552 Based on this evidence, NERA's latest TMR estimate for RP3, which informed our response to the CAA's Draft Proposals, was a range of 6.2% to 6.8%.[348] Given the CAA's proposed range

[344] CAA RP3 Decision, (SOC012), p. 100 - 101
[345] This approach was used by the CAA for Heathrow's Q6 review, and underpins Ofwat and Ofgem's current approaches.
[346] Guidance for NERL in Preparing its Business Plan for RP3, 2018, (SOC030).
[347] Updated Weighted Average Cost of Capital for NATS (En-Route) plc at RP3, (SOC087); NERA, Cost of Equity for RP3, Prepared for NERL, 12/04/2019, ('NERA, Cost of Equity for RP3'), (SOC110)
[348] NERA, Cost of Equity for RP3 (SOC110), p. 53

in its Draft Proposals was 5.0% - 6.25%, we considered that a point estimate of 6.25% was appropriate.[349] This estimate was (i) at the upper bound of the CAA's proposed range; (ii) at the lower end of NERA's estimates; and (iii) slightly below the most recent CMA/CC precedent of 6.5%.[350]

553 The CAA is proposing a marked reduction in TMR from 6.25% at RP2 to 5.4% at RP3 (real, RPI).[351] In estimating the TMR, the CAA drew heavily on a report prepared for the UK Regulators' Network by Wright et al (2018).[352] The CAA reduces the long run historical TMR range estimate identified in the UKRN study (6-7% CPI deflated) by 100bps for the CAA's estimate of the RPI-CPI wedge.[353] The CAA also presented evidence on dividend-growth models; recent consultations by Ofwat, Ofcom and Ofgem; and international TMR estimates.[354]

554 We consider the 'scale' and 'speed' of reduction implied by the CAA's position to be implausible, from both a theory and evidential perspective. We urge the CMA to focus on two key intuitive considerations that underpin TMR. Firstly, that TMR should be relatively stable over time, given the expected inverse relationship between the RfR and ERP. Secondly, there is a clear and well-established relationship between equity returns and productivity, which means the assessment of TMR should be rooted in a time-consistent view of the UK economy. We discuss these in turn below.

13.3.1.1. Expected stability of TMR over time

555 As outlined in our response to the CAA's Draft Proposals, and supported by NERA's analysis, we believe there is little evidence to support the CAA's premise that the TMR has fallen by 85bps since the RP2 review.[355] In its April 2019 report, NERA demonstrates that:

- A robust assessment of historical data shows no reduction in realised returns over the recent period across global equity markets, despite the fall in the RfR since RP2. NERA's analysis of the historical realised returns for the five largest global equity markets showed an upward trend in returns in three markets (US, Germany and Japan) and no discernible trend in the UK and France.[356]
- Forward-looking evidence from dividend growth models (**DGM**), including analysis by the CAA's consultants PwC, shows no reduction in expected TMR estimates, relative to RP2.[357]
- Forward-looking survey evidence on the TMR from over 40 countries shows no systematic decline in expected TMR either.[358]

[349] Draft UK Reference Period 3 Performance Plan proposals, CAP1758, (SOC003), p. 57
[350] The CMA estimated a TMR of 6.5% in the Bristol Water (2015) and Northern Ireland Electricity (2014) determinations. CMA, Final Determination - Bristol Water: A reference under section 12(3)(a) of the Water Industry Act 1991, 05/10/2015, ('**Bristol Water Final Determination**'), (SOC111), para 10.186
CMA, Final Determination - SONI Limited v Northern Ireland Authority for Utility Regulation. 10/11/2017, ('**Final Determination - SONI Limited v Northern Ireland Authority for Utility Regulation**'), (SOC114)
[351] CAA RP3 Decision Appendices, (SOC041) para E87, p. 45
[352] Estimating the cost of capital for implementation of price controls by UK Regulators.' Wright, Burns, Mason & Pickford; UKRN (2018), ('**Estimating the cost of capital for implementation of price controls by UK Regulators**'), (SOC112)
[353] CAA RP3 Decision Appendices, (SOC041) para E34, p. 33
[354] CAA RP3 Decision Appendices, (SOC041) p. 38 - 42.
[355] Response to CAP1758, (SOC003), p. 57
[356] NERA, Cost of Equity for RP3, (SOC110), p. 45-47.
[357] NERA, Cost of Equity for RP3, (SOC110), p. 48-49.
[358] NERA, Cost of Equity for RP3, (SOC110), p. 49-50.

556 NERA concludes that all of this evidence supports the notion of a broadly constant TMR, and provides no reason for the CAA to reduce its estimate from RP2. [359]

557 Consistent with the above, Economic Insight's assurance review of evidence on the RP3 WACC highlights a range of theoretical and empirical studies, which demonstrate that equity returns are relatively stable in the long-run. [360] This includes the paper by the UK Regulators' Network, relied upon by the CAA, which repeatedly emphasises this point, noting both that: "*long-run stock returns are stable in real terms*"[361] and that methods for estimating TMR should be evaluated against criteria that include an assumption "*that it [TMR] is constant*".[362]

558 We do not, however, suggest that the TMR 'cannot change' across price controls. Indeed, as noted in the UKRN study, the relationship between the RfR and ERP is unlikely to be one-for-one. [363] Consistent with this, EI's assurance report identifies reasons as to why TMR might change over time and provides data showing that the TMR determinations made by regulators have been, very gradually, trending down over time. However, given the intuition, plainly 'large' and 'sudden' changes in TMR should not be considered credible.

559 We note that the CMA's position has been consistent with this view historically. For example, when setting TMR in the Bristol Water redetermination, the CMA was mindful not to depart from an assessment made 18 months earlier for Northern Ireland Electricity, describing it as an appropriate comparator, being "*relatively up to date*."[364]

560 Following from the above, as recently as June of this year, Ofcom found the real (RPI-deflated) TMR to be 5.8%.[365] Thus, the CAA's proposals indicate a further significant reduction, relative to recent determinations, in the space of just two months.

13.3.1.2. The relationship between TMR and productivity and the need for consistency

561 The potential for TMR to change over time can be better understood when one considers the strong, positive, relationship between equity returns and productivity (i.e. UK economic performance). This relationship is non-contentious and is: (i) widely established in the theoretical and empirical literature; (ii) readily observable in UK data on equity returns and productivity; and (iii) a point repeatedly emphasised by the UK economic regulators and their advisors.[366]

562 This has important implications for how TMR is set within the context of a price control. Most obviously, it means that when setting TMR, there must be clarity as to the 'time period' in question and 'assumed economic performance' over that time period. Following from this, the other parameters of the price control must be similarly set such that they are internally

[359] NERA, Cost of Equity for RP3, (SOC110)
[360] Economic Insight, Assurance Review and Assessment of the Evidence on the WAAC at RP3, (SOC113)
[361] Estimating the cost of capital for implementation of price controls by UK Regulators, (SOC112), p 38.
[362] Estimating the cost of capital for implementation of price controls by UK Regulators, (SOC112), p 48.
[363] The authors state that: 'Here we simply stress again that, while evidence for counter-cyclical risk premia is strong…this should not be taken as a claim that the ERP instead moves precisely one-for-one in the opposite direction to the RFR'. Estimating the cost of capital for implementation of price controls by UK Regulators, (SOC112), p. 39
[364] Bristol Water CMA Decision, (SOC111), para 10.185
[365] Ofcom, 'Review of the physical infrastructure and business connectivity markets, June 2019, ('**Review of the physical infrastructure and business connectivity markets**'), (SOC133)
[366] Gordon, M. (1959), 'Dividends, Earnings and Stock Prices', Review of Economics and Statistics, 41:2, (SOC167) pp. 99-105;
P. Baker, D., DeLong J.B., and Krugman, P, 'Asset Returns and Economic Growth', Brookings Papers on Economic Activity; Europe Economics (2012), 'The Relationship between Sustainable Growth and the Risk-free Rate: Evidence from UK Government Gilts',2005, ('**Asset Returns and Economic Growth', Brookings Papers on Economic Activity; Europe Economics (2012)**'), (SOC132)

consistent with those assumptions. Taken in this context, Economic Insight highlight the following shortcomings with the CAA's position. [367]

- Suppose one intentionally adopted a 'short term' perspective to setting the WACC (noting that it is not clear that the CAA has done so, nor would we endorse such an approach). In that case, *some* reduction in TMR can be rationalised at RP3. This follows from the fact that the UK's productivity performance has been weak since the financial crisis and is expected to remain so. However, on this view, the 'speed' and 'scale' of the CAA's proposed TMR must imply an additional and marked deterioration in the UK's economic performance in RP3 relative to RP2. This is, however, inconsistent with the Office for Budget Responsibility's latest short-term forecasts for the UK. [368]

- Alternatively, if one adopts a 'longer-term' perspective to setting the WACC—which we consider is appropriate in the context of Brexit uncertainty and given the benefits of providing a stable and predictable regulatory environment—such a reduction can only be rationalised if the UK has re-based to a new 'low returns/ low productivity' equilibrium.' However, the evidence on the UK's projected economic performance over the medium term shows this to be unfounded, with the Office for Budget Responsibility projecting average productivity gains of 1.8% per annum over the next 50 years.[369] Thus, from this perspective, the CAA's position is not justified.

563 It appears that the CAA and its consultants have not carefully considered its approach to TMR in a way that ensures consistency with assumptions regarding the UK's economic performance. As a result, the CAA's approach is inconsistent with other key elements of its price control. For example, in relation to efficiency, the CAA has set NERL a challenge for RP3 that is at least 'as big' as that for RP2 (see Section 8 above).[370] Intuitively, this position implies productivity that is stable or rising. Yet, in relation to TMR, the CAA is implicitly assuming a pronounced decline in productivity. Consequently, we consider that the CAA's approach to estimating the TMR lacks robustness when considered in isolation but also relies on applying an inconsistent set of assumptions across the price determination as a whole.

13.3.1.3. Technical issues with the estimation of the historical TMR

564 Finally, given the weight that the CAA has seemingly placed on the findings of the UKRN study, it is important that these findings are robust and correctly interpreted. NERA has provided evidence that the UKRN report understates the historical TMR by:

- drawing on a hybrid RPI/CPI historical inflation series and thus understating historical real CPI-deflated returns; and

- applying an excessive adjustment for long holding periods and predictability of returns.[371]

565 Correcting for these errors, NERA estimate a range for TMR from historical evidence of 6.2% to 6.8%. We understand that this is currently a 'live' debate in several regulated sectors, and therefore ask that the CMA considers it in its analysis of the TMR.

[367] Assurance Review and Assessment of the Evidence on the WAAC at RP3, (SOC113), para 2.3.4.1
[368] OBR, Economic and Fiscal Outlook, March 2019, ('**Economic and fiscal outlook, March 2019**'), (SOC135)
[369] OBR, Fiscal sustainability report, July 2018, ('Fiscal sustainability report, July 2018'), (SOC136), p. 57
[370] Operating Cost Support Pack, (SOC106) , p. 25.
[371] Cost of equity for RP3.' NERA (April 2019), (SOC110) pp. 50-53.

13.3.1.4. Summary

566 In summary, in relation to TMR, we advocate a strong focus on the underlying economic intuition, in order to ensure that any proposed figure for RP3 is: logical; rooted in a transparently articulated view of UK economic performance; and internally consistent with other aspects of the determination.

13.3.2. Asset beta

567 The beta measures a company's exposure to systematic risk (i.e. risk that cannot be diversified away by holding a portfolio of assets). If the company is publicly listed, it is possible to directly calculate the beta by conducting a regression of the company's share price against a relevant market index.

568 Given that NERL is not publicly listed, NERL's beta has typically been estimated by analysing the betas of comparator companies and then adjusting for differences in relative risks to estimate a NERL beta. Evidence on how NERL's exposure to risk has changed over time is also relevant to the assessment.

569 We based our beta estimate on analysis conducted by NERA relating to the betas of (i) publicly listed international airports; and (ii) ENAV (the Italian, and only publicly listed, ANSP).[372] NERA then undertook a 'relative risk' assessment to consider how much weight to place on the various comparators and whether adjustments were needed to reflect differences in risk between NERL and the comparators. As a cross-check, we considered, qualitatively, how our exposure to systematic risk is likely to have evolved for RP3.

570 NERA concluded that:

- International airports represented a valid comparator set, though NERL appeared to face greater demand risk than airports after accounting for operating leverage.[373] More specifically, once risk characteristics are compared more closely, Groupe ADP (which operates Paris Charles De Gaulle and Orly airports) was found to be our closest comparator.[374] NERA estimated the Groupe ADP beta to be 0.58.

- The asset beta for ENAV was between 0.53 and 0.58.[375] NERA suggested that the appropriate beta for NERL would be at the upper end of this range, due to NERL facing greater traffic risk than ENAV.[376]

571 Based on this evidence, we proposed a beta of 0.57 for RP3. This represented an increase on the CAA's RP2 determination (0.505), which we considered to be consistent with increasing exposure to systematic risk in the next regulatory period. In its RP3 Decision, the CAA set an asset beta of 0.46. [377] Our key concerns with this decision are set out below.

[372] The analysis can be found in section 2 of: NERA, Cost of Equity for RP3, (SOC110)
[373] NERA, Cost of Equity for RP3, (SOC110), p. 31.
[374] NERA rejected the notion of using UK airports (e.g. Heathrow) as a comparator, as they themselves are not listed. Hence, their beta can only be proxied in the first place. So, using estimates for these simply introduces further measurement error risk.
[375] NERA, Cost of Equity for RP3, (SOC110), p. 33.
[376] NERA, Cost of Equity for RP3, (SOC110), p. 33.
[377] CAA RP3 Decision Appendices, (SOC041), p. 59.

13.3.2.1. The CAA's position implies a marked reduction in systematic risk for RP3

572 Firstly, we are especially concerned that the CAA's position implies a marked reduction in systematic risk for RP3 relative to RP2, which the CAA has failed to adequately address or justify. On the contrary, there is strong evidence to suggest that systematic risk has been stable or increasing.

- Our operating leverage (and potentially revenue) risk is likely to be the same or higher at RP3.[378] There is evidence to suggest that NERL's operating leverage has increased in recent years. For example, the table below shows that the metric of opex as a percentage of the RAB has steadily increased since 2015. Opex as a percentage of total revenue was stable between 2014 and 2017, but increased in 2018. These figures exclude Defined Benefit Pension cash costs.

Table 15 Opex as a % of RAB and total revenue

	2014	2015	2016	2017	2018
Opex as a % of RAB	30.1%	30.0%	33.4%	35.5%	40.7%
Opex as a % of total revenue	48.8%	50.5%	50.9%	49.5%	56.5%

Note: The table covers UK Air Traffic Services. Opex excludes the Defined Benefit Pension cash cost.
Source: NERL regulatory accounts.

- Brexit related uncertainty will likely be a source of increased systematic risk for NERL at RP3, as intuitively the impact of this on the volatility of demand for air travel will be greater, on average, than the volatility impact on the market as a whole. While this effect is difficult to evaluate quantitatively, we do think it should be taken under consideration in the determination of beta. The CAA has not taken any steps to capture Brexit risk in its WACC approach.

- The CAA's own proposed reforms for RP3 – and most obviously its governance proposals – appear to give rise to a considerable increase in regulatory risk, allowing the regulator to adjust our cash flows ex-post, based on a backwards-looking assessment of the efficiency of our capex. The capex incentive mechanisms, which have yet to be fully defined, would also hand significant discretion and latitude to the CAA. At least some element of the associated risk would be systematic. We also note that, the mechanisms being penalty only, this results in an asymmetric skew to the downside in expected equity returns. This is further described in Section 11 above.[379]

573 Given this, and in the absence of any distinguishable general reduction in asset betas of listed airports and utilities over this period, which in fact have generally increased, there appears to be no justification for a reduction in asset beta at RP3. In contrast, directionally, our proposed asset beta of 0.57 is more intuitively sensible.

13.3.2.2. Risk relative to UK comparators

574 We recognise that the fact that NERL is not listed means it is necessary to analyse the betas of comparator companies and then adjust for differences in relative risks to estimate a NERL beta. This invariably requires a degree of judgement, particularly given that there are few close comparators that are listed. However, we do not consider that the CAA's approach is robust

[378] Assurance Review and Assessment of the Evidence on the WAAC at RP3, (SOC113), section 2.5.4.8
[379] Independent Review of Capex Governance, (SOC068)

either in terms of the selection of the comparator set or the approach to applying risk adjustments.

575 The CAA has used regulated utilities as the lower bound for the beta, and the average beta of a selection of airports as the upper bound. If these comparators are to be used as the basis for estimating NERL's beta, the assessment needs to appropriately adjust for underlying differences in risk. The analysis underpinning the CAA's Decision does not fully reflect the differences in risk between these companies and NERL for the following reasons.

- A major part of our investment programme is in new, modern technologies, rather than 'like for like' asset replacement. Rolling out 'first of a kind' technologies that are new to NERL and our supply chain conveys much higher risk than a (fairly) standardised asset replacement in the utilities sectors.
- We operate in a safety critical environment with high reliance on the resilience of our technical systems and the ability to provide only limited capacity fall-back modes.
- We are exposed to higher volume risk than utilities, which are typically subject to revenue caps. Moreover, NERA provided evidence to suggest that NERL has greater operating leverage and is more exposed to profit volatility as a result of demand shocks than UK airports, despite the traffic risk sharing mechanism that is in place, due to our thin capital structure.[380]
- The regulatory framework applied by the CAA provides a different balance of risk and reward to the frameworks applied by other regulators. Unlike water and energy networks, NERL does not have cost sharing rates for differences between forecast and actual opex. This means we bear higher opex risk than utilities. We also have less flexibility to shift expenditure between opex and capex than water and energy networks, which operate under a total expenditure (totex) approach. We have historically had greater regulatory protection around movements in capex than other regulated companies, but the CAA's RP3 capex governance proposals mean we would be more closely aligned with other sectors.
- NERL has high fixed operating costs as a proportion of our total cost base. We cannot adjust our cost base sufficiently quickly to mitigate the revenue impact of demand changes or exogenous cost factors because staff numbers cannot be easily increased or reduced unless changes in demand are sustained over a long period of time.
- The provision of air traffic control services is considerably less capital intensive than many other regulated companies (e.g. airports, energy transmission, wholesale water activities and telecoms), such that our asset base is small relative to costs/revenues. Consequently, we have higher operating leverage than traditional network industries.

576 The last of these differences is particularly critical to the beta assessment. The asset beta should reflect the sensitivity of the pre-financing returns on the RAB to revenue and cost risks. This is not only a function of the sensitivity of revenues and costs to business risks, but also the structure of the business. In particular, the scale of the operating cash flows relative to

[380] See Table 2.7 in 'NERA, Cost of Equity for RP3, (SOC110), p. 30.

the asset base (capital intensity) and the proportion of fixed and variable costs have a big impact on the relative risk profile of returns on capital.

577 NERL's position over multiple regulatory periods has been that our high operating leverage increases our exposure to systematic risk and should therefore be reflected in the asset beta estimate used when setting our allowed rate of return. The CAA has acknowledged this issue but has not adequately reflected our high operating leverage in its RP3 determination. A failure to adjust for operating leverage risks ignoring or understating a key dimension of NERL's equity risk: namely, that we have relatively 'thin' cash flows which, when considered with our cost structure, means that fluctuations in demand can materially impact equity returns. Indeed, we note that the CAA recognises this in its financeability assessment, where it states: "*in our stress tests, RORE reduces to close to zero or negative. This reflects the relatively high sensitivity of RORE to changes in regulatory returns from lower traffic and higher costs, given the relatively small size of NERL's RAB.*"[381] However, it has not reflected this in its prior assessment of the appropriate WACC.

578 Accurately quantifying the effect that higher operating leverage has on the asset beta is not a straightforward exercise. We recognise that it relies on a degree of judgement, both in terms of how to measure operating leverage and how to convert this into a beta effect. However, we note that the CMA has previously accepted that higher operating leverage can result in a higher asset beta in its 2010 and 2015 redeterminations for Bristol Water, and used a range of proxies for operating leverage in coming to its decision.[382] In 2015, the CMA adjusted Bristol Water's asset beta upwards (by around 13%) relative to the rest of the sector based on differences in operating cash flow as a proportion of revenue.[383] The relationship between operational leverage and the beta has also been recognised by the Northern Ireland Authority for Utility Regulation (NIAUR) in its determination for the electricity system operator, SONI.[355] The CMA considered the arguments on the asset beta as part of the SONI appeal, and concluded that the regulator's decision, which included an uplift for the effects of high operating leverage, was not wrong.[384]

579 The table below demonstrates the high share of opex as a percentage of the RAB and as a percentage of allowed revenues for NERL's business relative to example comparators. For purposes of comparison, the NERL estimates exclude DB Pension Cash Costs. Including these costs would lead to a higher percentage.

Table 16 Opex as a % of RAB and total revenue - comparators

	NERL UKATS (2018)	Heathrow (2018)	Southern Water – wholesale (2018/19)
Opex as a % of RAB	40.7%	7.0%	5.7%
Opex as a % of total revenue	56.5%	38.3%	36.2%

Note: The NERL UKATS figures do not include the Defined Benefit Pension Cash Cost. Including this would increase opex as a % of RAB to 47.7% and opex as a % of total revenue to 66.4%.

Source: Various regulatory accounts.

[381] CAA RP3 Decision Appendices, (SOC041), p .29 , para G29.
[382] Bristol Water Final Determination, (SOC111)
[383] Bristol Water Final Determination, (SOC111), para. 10.152
[384] CMA, Final Determination - SONI Limited v Northern Ireland Authority for Utility Regulation. 10/11/2017, ('Final Determination - SONI Limited v Northern Ireland Authority for Utility Regulation') (SOC114), para 7.203.

580 The CAA's point estimate gives insufficient weight to NERL's operating leverage relative to the comparators used to estimate the beta. We therefore consider that it is important that the CMA explicitly considers the effect of our high operating leverage as part of its assessment of the asset beta.

13.3.2.3. Risk relative to ENAV

581 NERA and the CAA's consultants both considered evidence on the beta of ENAV, the Italian air navigation service provider, in estimating NERL's beta. ENAV was publicly listed in July 2016 and it is therefore possible to calculate its beta directly.

582 We consider that ENAV is a relevant comparator given that it also provides air navigation services. However, care must be taken in drawing inferences from analysis of its beta as it will face different risks to NERL. Our view is that the CAA's analysis does not take account of how differences in national regulatory frameworks impact demand and cost risk. The CAA's evidence includes an adjustment to ENAV's beta relating to en route being more diversified than terminal services. However, differences in regulatory regime can also impact relative systematic risk (i.e. because regulatory regimes can set the extent of demand and cost risk exposure). In practice, evidence from an ENAV investor presentation (see Table 17) shows that the revenue and cost risks faced by terminal services are manifestly lower than for en route in ENAV's case. Put simply, the impact of the respective regulatory regimes would drive an adjustment in the opposite direction to the one made in the evidence on which the CAA relies.

583 In addition, Europe Economics (the CAA's consultant) acknowledged that NERL has higher operating leverage compared to ENAV.[385] As for the airport and utility comparators discussed above, we do not consider that this is adequately captured in the CAA's analysis.

Table 17 ENAV risk comparison

	% of reg. revenues	Airports	Difference from en-route
Terminal Zone 1 (over 225,000 IFR movements)	5%	Rome Fiumicino	Same as en-route
Terminal Zone 2 (70,000 to 225,000 IFR movements)	7%	Milan Linate Milan Malpensa Venice Bergamo	Full traffic protection
Terminal Zone 3 (less than 70,000 IFR movements)	14%	Other airports	Full cost recovery

Source: ENAV (January 2019), Investor presentation, p.9.

13.3.2.4. European or domestic indices

584 Finally, we consider that there is a methodological error in how Europe Economics has calculated the ENAV beta, which leads to a lower beta estimate. We consider that a more theoretically correct approach is to derive ENAV betas using 'broader' European indices, rather than also taking account of estimates using domestic indices.

[385] Europe Economics, Comments on NERA/NERL critiques of Europe Economics, June 2019, ('**Comments on NERA/NERL critiques of Europe Economics**'), (SOC115), p. 22.

585 Europe Economics' range of asset beta for ENAV draws on estimates derived from both a domestic Italian index and a wider European index, placing equal weight on each.[386] However, both NERA and EI conclude that, for ENAV, it is most appropriate to refer to the European index. This reflects the fact that ENAV's investor base is highly international and as such the European index represents a more plausible set of potential investments than just the Italian market. [387]

13.3.3. The risk free rate

586 In our response to the CAA's Draft Proposals, we stated that it should not set a real RfR lower than -1.4% (RPI deflated).[388] However, the CAA's RP3 Decision proposed a RfR of -1.7%.[389]

587 The CAA's estimate is based only on the yield on index-linked gilts.[390] While this is a valid source of evidence, we believe that the CAA should also have drawn on evidence from the yields on deflated nominal gilts (which, on the CAA's own analysis, would imply a figure of -1.3%).[391] The key reasons for this are as follows:

- It is accepted that the yield on nominal gilts will include an inflation risk premium; and that the yield on index-linked gilts may include a liquidity risk premium. As part of their assurance review of the WACC evidence developed by NERL and the CAA, EI examined this matter and found that, empirically, the difference in the real RfR implied by index-linked gilts and deflated nominal gilts cannot be easily explained by these factors.[392] As such, EI find that the difference must be accounted for by 'other' matters; most obviously, market distortions.[393] Given this, both approaches are valid, and evidence from each should be taken into account.

- Consistent with the above, regulatory precedent shows both the yield on index-linked gilts and deflated nominal gilts are often relied upon by regulators. Indeed, EI found that in 6 out of 11 regulatory cases, evidence from both sources was drawn on directly to set the RfR and in a greater number of cases, even where the yield on deflated nominal yields was not used to estimate the number directly, it was at least used as a 'cross check', or to 'inform' the determination of the appropriate figure.[394]

- We note that in its previous redeterminations, whilst the CMA/CC has favoured using the yield on index linked gilts from an 'in principle' perspective, 'in practice' it has also reviewed the yield on deflated nominal gilts.[395] We understand that this is precisely because the CMA/CC has been concerned regarding the potential for market distortions, as noted above.

- The CAA's advisors (Europe Economics and PwC) have historically consistently advised that the real RfR should be based on both the yield on index-linked gilts and deflated

[386] Comments on NERA/NERL critiques of Europe Economics (SOC115)
[387] NERA, Cost of Equity for RP3, (SOC110), p. 13-14 and Assurance Review and Assessment of the Evidence on the WAAC at RP3, (SOC113), section 2.5.4.3
[388] Response to NPP, (SOC003)
[389] CAA RP3 Decision, (SOC012)
[390] CAA RP3 Decision Appendices, (SOC041), pp. 46-48.
[391] CAA RP3 Decision Appendices, (SOC041), p. 48, para E100.
[392] Assurance Review and Assessment of the Evidence on the WAAC at RP3, (SOC113), section 2.2.3
[393] Assurance Review and Assessment of the Evidence on the WAAC at RP3, (SOC113), section 2.2.3
[394] Assurance Review and Assessment of the Evidence on the WAAC at RP3, (SOC113), table 7.
[395] Bristol Water Final Determination, (SOC111), para 10.107.

yields on nominal gilts. Thus, the CAA appears to be ignoring the well-established positions of its own advisors.[396]

588 We note that the CAA's use of a lower risk-free rate estimate has no impact under a TMR approach, with an equity beta of 1. However, it could have a greater impact if the CMA's approach were to differ in these areas.

13.3.4. Debt beta

589 We applied a debt beta of 0.05. Our position is primarily based on direct econometric based evidence developed by Professor Ania Zalewska from the University of Bath.[397] Professor Ania Zalewska derived direct econometric estimates of our debt beta, using both the NERL and Heathrow Airport bonds, as well as iBoxx indices. Professor Zalewska concluded that there was evidence that the debt beta from the NERL bond is significantly smaller than 0.10 and not statistically different from zero.[398]

590 In addition to referring to Professor Zalewska's evidence, NERA conducted a sensitivity analysis, using the 'indirect' bottom-up method, starting from the estimates relied upon by the CAA. NERA found that, once errors in the approach taken by the CAA's consultants were corrected for, the analysis implied a debt beta range of 0.05 to 0.10.[399] The 0.05 figure was consistent with PwC's assumed debt beta (on behalf of the CAA) for Heathrow's H7 price control.[400]

591 Taking the above into account and, in particular, the extensive analysis by Professor Zalewska, we consider that a point estimate of 0.05 for the debt beta is appropriate.

592 Our concern regarding the CAA's position is that it places undue weight on 'indirect' methods whereby the debt beta is estimated 'bottom-up', based on assumptions regarding default risk and loss on default, over 'direct' econometric methods.

593 It appears that the CAA had conflated the 'transparency' of the indirect method with it being 'more accurate' than the direct method. Because the 'uncertainty' inherent in the direct method can be observed (e.g. through the statistical goodness of fit of a model), there is a tendency to suppose the indirect method, for which the uncertainty cannot be observed, is intrinsically more reliable. In practice, the reliability of the indirect method turns entirely on the plausibility of the input assumptions.[401]

594 As a result of the above, we consider the CAA has likely overstated the debt beta at RP3.

13.3.5. Cost of debt

595 We estimated that our cost of debt for RP3 is 1.07%. This is a decrease of 143bps relative to the CAA's RP2 determination (2.50%). This estimate was based on combining:

[396] Assurance Review and Assessment of the Evidence on the WAAC at RP3, (SOC113), section 2.2.3 for examples.
[397] Professor Zalewska, Estimation of the Debt Beta of the Bond Issued by NATS (En-Route) plc, April 2019, ('**Estimation of the Debt Beta of the Bond Issued by NATS**') (SOC117)
[398] Estimation of the Debt Beta of the Bond Issued by NATS, (SOC117), p. 1 summarises the findings.
[399] NERA, Cost of Equity for RP3, (SOC110); p. 42
[400] PwC, Estimating the cost of capital for H7 - A report prepared for the Civil Aviation Authority (CAA), November 2017, ('**Estimating the cost of capital for H7**'), (SOC118)
[401] Assurance Review and Assessment of the Evidence on the WAAC at RP3, (SOC113), section 2.7.4.3

- *a cost of embedded debt of 2.13%.* Our existing bonds were issued in 2003 at an initial yield to maturity of 5.4% p.a. NERA estimated the cost of existing debt to be 2.13% for RP3, based on this initial yield to maturity and the Treasury's forecasts for RPI.[402]

- *a cost of new debt of 0.40%.* NERA estimated the cost of new debt after consideration of: (i) current yields on our bonds; (ii) forward curves for UK gilts; (iii) a maturity adjustment (as the weighted average remaining life of the existing bonds is currently only around five years); and (iv) an adjustment of 50bps to reflect the increased risk to debt holders arising from our 'short' licence termination notice period (consistent with advice given to the CAA by its advisors).[403]

- *a weighting of 70% on new debt* reflecting relatively significant refinancing needs in RP3.

- an allowance for transaction costs of 15bps, in line with RP2.

596 The CAA's RP3 Decision allows for a cost of debt of 0.86%. The difference is driven by a lower assumption regarding the cost of new debt and a lower allowance for issuance and liquidity costs (0.10% rather than 0.15%).

Table 18 Comparison - Cost of debt

	CAA RP2	NERL response to CAA draft proposals	CAA RP3
Cost of embedded debt (real)	2.50%	2.13%	2.30%
Cost of new debt (real)	1.75%	0.40%	0.10%
Proportion of new debt	20%	70%	70%
Issuance costs	0.15%	0.15%	0.10%
Cost of debt (real, pre-tax)	**2.50%**	**1.07%**	**0.86%**

597 We are concerned that the CAA has understated our future debt costs. We consider that it is essential to apply an adjustment for our notice period termination risk, as this logically must increase risk to debt holders. Financial theory would suggest that this is a risk for which debt holders need to be compensated. There is a range of evidence consistent with this adjustment being essential and of termination periods impacting debt costs.[404] We understand that there are practical difficulties in quantifying the exact size of this adjustment but that the CAA's consultants considered that a 50bps uplift was warranted.

13.4. Why we believe the CAA's decision is not in the public interest

598 The public interest is served when NERL's price cap is set in such a way that we are able to recover efficiently incurred expenditure, including a return on the capital investments we make in the business. Setting the allowed rate of return at a level that reflects the riskiness of the business is critical to ensuring that investors have appropriate incentives to invest. If the

[402] Updated Weighted Average Cost of Capital for NATS (En-Route) plc at RP3, (SOC087), p. 15
[403] Updated Weighted Average Cost of Capital for NATS (En-Route) plc at RP3, (SOC087), p. 15-16
[404] EI cites a number of examples in its assurance review. Assurance Review and Assessment of the Evidence on the WAAC at RP3, (SOC113) p. 110 -11. Examples include Ofcom (2010), Ofcom, Renewal of the Independent National Radio licences - Methodology for review of financial terms, 13 August 2010, ('**Renewal of the Independent National Radio licences**'), (SOC119) p. 23;
Ofcom, Annual Licence Fees for 900 MHz and 1800 MHz frequency bands - Annexes, 17 December 2018, ('Annual Licence Fees for 900 MHz and 1800 MHz frequency bands – Annexes), (SOC120), p. 9; and
Department for Transport, Updating the licence modification process for the en-route air traffic licence, 03/11/2016, ('**Updating the licence modification process for the en-route air traffic licence**') (SOC129), p. 13

allowed rate of return is set too low, the incentive for investment will be diluted, with potentially significant long-term costs for users and the wider economy.

599 The CAA's proposals regarding the allowed rate of return for RP3 do not reflect the general risk characteristics of NERL's business or how these are changing in RP3. The allowed rate of return should reflect that:

- we are a business with high operating leverage, such that, relative to most regulated networks, our profitability is highly sensitive to traffic and exogenous cost shocks;
- Brexit related uncertainty will increase the demand volatility of air travel relative to the market as a whole;
- our RP3 capital programme bears substantial risk given our size, its focus on new technologies and the need to ensure safety and resilience during implementation, particularly in relation to airspace modernisation.

600 Moreover, the price control package introduces material additional regulatory risk and uncertainty that is not reflected in the cost of capital estimate. In the context of what is acknowledged to be a period of serious challenge, NERL believes that the CAA's proposals for RP3:

- impose open-ended, uncertain accountability in respect of new matters outside our control without allowing adequate resources to perform those additional functions;
- introduce a performance regime that is unlikely to allow NERL to earn any rewards and will put it at material risk of unavoidable penalties;
- introduce ex-post capital cost recovery risk for this first time under the proposed new capex governance framework;
- with no recognition in the economic settlement of the increased regulatory risk borne by NERL as a result of the reduced predictability and transparency and the greater risk of breach or penalty.

601 We therefore do not believe that the CAA's proposals allow for a fully risk-reflective rate of return and hence do not enable NERL to recover our efficiently incurred costs, including a fair return on capital. This risks undermining future investment in the asset base as the allowed rate of return underpins investors' expectations of the returns they will earn on capital invested in the business.

13.5. Conclusion

602 In conclusion, we ask the CMA to consider the following issues in its redetermination:

- What is an efficient rate of return, consistent with the characteristics of our business, including the important differences between NERL and regulated networks, and the risks we face over RP3; and
- What would be the negative implications of setting the allowed rate of return too low for NERL, especially in combination with other aspects of the CAA's RP3 Decision.

14. Annex - ExCDS Case Study

14.1. Context

603 Since operations began, paper strips have been used as a primary means for controllers to record information about aircraft, and to support the transfer of control of aircraft from one air traffic control position to another. However, in order to cope with forecast increases in air traffic demand and maximise the benefits from modern communications, surveillance and data processing tools, the business needed to move to an integrated electronic system. The Extended Computer Display System (ExCDS) solution was devised to replace the current paper strips used by ATCOs.

604 Launched in January 2015, the ExCDS project was the next step in a wider programme to upgrade the infrastructure and technologies used to control aircraft in the UK FIR.

605 The entirety of the Electronic Flight Progress strips project forms part of a broader ten-year £1bn technology transformation programme within NERL, which will update many of the core systems used to manage air traffic in order to meet forecast growth, improve efficiency and reduce our impact on the environment, whilst maintaining and improving levels of safety.

14.2. Objectives

606 NERL is undertaking a major transformational change programme that is focusing on standardising the technology used throughout the business using common technology and operating systems and introducing new features and capabilities to the ATCO to reduce workload, improve fuel efficiency and / or improve service. The most recent major step in this transformational change programme is the delivery of ExCDS into Swanwick Terminal Control (TC) which is the subject of this case study. The objectives of this particular stage in the transformation were to:

- Introduce automatic strip movement, including departures from selected airfields
- Introduce conformance monitoring of flight level,
- Introduce electronic coordination between sectors
- Enable automatic onward transmission of flight data
- Improve legibility of flight strip information.

607 Together these objectives would lead to reductions in controller workload and consequential improvements in safety, capacity and cost efficiency.

14.3. Project Management

608 In order to ensure success, the project had to focus its activities across three key areas of capability: people, process and technology.

609 People: The ATCO community are individually licenced to control aircraft. As such, each ATCO is required to participate in a 'sign off' process, to accept that they have been suitably trained and feel competent and confident enough to use the new system. Hence engaging closely with this community as well as assessing their behaviours and sentiment to ensure project success and acceptance, was critical to the project.

610 Process: The Method of Operations (MOPs) used by ATCOs to control aircraft was based on the use of paper strips. These needed to be updated and approved to support use of the new technology, including associated fall-back and failure modes.

611 Technology: Finding an appropriate solution that was capable of working in the complex TC airspace whilst providing efficiencies compared to the previous paper-based system was technically challenging. A safety argument had to be made that the paper based system could be replaced by digital technology with sufficient resilience to provide efficiencies, further flexibility and enhanced integration to the live operational environment.

14.4. Development and Evaluation

612 ATCOs continue to be one of the biggest influencers of the transition. As part of their role, ATCOs have to maintain a license which requires them to personally "sign off" with any introduction of new technology or change. This level of authority makes the end user a key influencer in the process, as they have the ability to approve or reject a project.

613 NERL utilised a number of project management techniques that were appropriate to the particular phase and work with the project. Agile development was used to progress the adaptation for ExCDS whereas traditional waterfall techniques were used for the other elements, particularly for integration of new COTS elements into our environment. The agile approach allowed for engagement of ATCOs in the adaptation and validation process providing a rapid turnaround loop for feedback and enhancement.

614 A major component of enrolling the ATCO community was the introduction of the Evaluation Technical and Development (E-TAD) facility in March 2017, which provided a high fidelity (excellent representation of the live environment) shadowing-only capability within the current operations room. This provided the ATCOs with the ability to practice and enabled the project to seek critical feedback to ensure the product was fit for purpose. In addition, the project implemented a controlled evaluation known as Evaluation Limited Operational Service (ELOS) in the live environment – the first of its kind for NERL. The evaluation enabled ATCOs to use the equipment live under certain controlled conditions which provided confirmation on the product's suitability and tangible areas that needed improvement prior to full release. It provided controllers with an excellent insight in a controlled manner and assisted their understanding as to where improvements were needed.

615 For ATCOs, the ability to test the technology and provide feedback removed the subjectivity surrounding the introduction of the change and resulted in the cultural shift in attitudes. In summary this gave the ATCOs confidence in the solution and their ability to use it safely and efficiently.

616 ELOS has been positively received throughout NERL's business and is now being considered for future deployments to improve insight into the implications that need to be made prior to any transition. It also provided critical data to assess the ATCO capabilities and took away a lot of the subjectivity that was inherent with this change.

14.5. Transition

617 The external impacts of ExCDS have largely affected NERL's prime customer base and other stakeholders. Although the technology is only being implemented in UK airspace, any delays or disruptions may have a consequential effect on customers travelling in neighbouring airspace; therefore, the understanding, clarity and general communications received became crucial.

618 Our Human Factors team determined that ATCOs using ExCDS should begin to do so managing only 80% of the traffic they would normally manage. This was deemed a safe level at which ATCOs would be able to safely manage the traffic levels using ExCDS in their initial few days, with the traffic levels gradually increasing first up to 90% after 10 days and then back to 100% after 20 days.

619 Delays to customers were minimised by close co-operation between all stakeholders and planning to ensure that airlines, airports and neighbouring ATC providers were aware of the transitions and had a joint plan to minimise disruption. The TC transition had the potential to affect UK airspace through flight cancellations, significant delays and direct impacts on airlines and shareholders. A detailed series of investigations and studies were undertaken to minimise the impact on customers and stakeholders alike. In total five transitions took place between November 2017 and June 2018 with lessons learnt from each transition being incorporated into subsequent stages to ensure transitions into more complex areas of airspace were understood and mitigations put in place to minimise customer impact.

620 ExCDS was delivered with 20% less C2 delay than forecast (216,000 minutes of transition delay versus forecast 260,000 minutes of delay). NERL worked closely with customers, airport operators and other ANSPs to achieve success. Customer and Network Manager feedback on NERL's engagement activities around the transition was very positive and held up as an exemplar as to how other ANSPs could manage transitions.

621 Although this target of transition delay was agreed with customers, and we beat the target, this still contributed to an increase in our C2 delay performance for 2018 from 7.7s to 12.5s per flight. It is noteworthy that we also incurred C3 delay (weighted for delay time of day and duration) but the impact of this was offset by the use of agreed exemption days which reduced the declared total C3 delay for 2018 from 30.3s to 17.1s per flight.

14.6. Benefits Realisation

622 Overall the project met or exceeded all of its benefits targets and has provided a positive improvement to overall performance of the TC operation. Specifically the project has delivered the following key benefits:

- Safety improvement in TC 2.4% (target 1.8)
- Capacity Improvement in TC 1.7% (no specific target)
- Cost efficiency through reduction in headcount of 25 air traffic assistants (target 25).

14.7. Conclusion

623 ExCDS represents a key step in the overall transformation programme for our operational services and represents the first introduction of full electronic support into London Terminal

Control. This is one of the busiest terminal areas in the world and introducing large scale change is always challenging. Nevertheless through innovative approaches and close working with our ATCO community and customers we have delivered a successful programme achieving five major transitions while minimising impact to customers.

624 Delay during transitions is inevitable and careful advanced planning with customers can ensure that the impact of this is minimised and also managed in a predictable way so that customers are best able to prepare. Customers were appreciative of the way in which were able to work together to minimise this impact and have supported the use of exemption days to allow these to be managed effectively by NERL.

625 The experience we have gained from ExCDS has been invaluable and we are using the lessons learned from this programme to feed into planning for subsequent transitions which are expected over the next 2-3 years. The forthcoming transitions are expected to be even larger than ExCDS and hence pre-planning the transitions and carefully managing the impacts will be consequently more challenging and more important to get right The right regulatory support to transition planning (e.g. through exemption days / transitional allowance) can help to ensure the right approach to minimising impact for all parties.

626 Experience from ExCDS has also allowed us to improve our approach to benefits realisation which will also be used to help us maximise the benefits that can be delivered out of future projects / programmes.

15. Appendix – List of Supporting Documents

Reference No.	Short Name:	Full Name:
SOC001	RP3 Business Plan	Review Period 3 Business Plan (2020-2024)
SOC002	Draft UK Reference Period 3 Performance Plan proposals, CAP1758	Draft UK Reference Period 3 Performance Plan proposals, For Consultation, CAP1758
SOC003	Response to CAP1758	NERL's Response to the National Performance Plan CAP1758, 12/04/19
SOC004	SES Regulations	Commission Implementing Regulation (EU) 2019/317 of 11 February 2019 laying down a performance and charging scheme in the single European sky and repealing Implementing Regulations (EU) No 390/2013 and (EU) No 391/2013, L 56/1 Official Journal of the European Union, 25/02/2019
SOC005	NERL Licence, 2018	Air Traffic Services Licence for NATS (En Route) PLC, June 2018
SOC006	Regulation (EC) No 261/2004	Regulation (EC) No 261/2004 of the European Parliament and of the Council of 11 February 2004 establishing common rules on compensation and assistance to passengers in the event of denied boarding and of cancellation or long delay of flights, and repealing Regulation (EEC) No 295/91, Official Journal of the European Union, L 46 Volume 47, 17 February 2004
SOC007	JRG Cost of Capital and Financeability report	Joint Regulators Group (JRG), Cost of Capital and Financeability, March 2013
SOC008	CAA Decision on Charge Control	NATS' Application to Reopen the Eurocontrol Charge Control, CAA Decision, March 2003
SOC009	Case COMP/35.141 (2001/354/EC)	Commission Decision of 20 March 2001 relating to a proceeding under Article 82 of the EC Treaty, Case COMP/35.141, (2001/354/EC), Official Journal of the European Communities Official Journal of the European Communities, 05/05/2001
SOC010	Project Oberon Report	Investigation under Section 34 of the Transport Act 2000: Project Oberon, Final

		Report Non-Confidential, CAP1578, July 2017
SOC011	Traffic Support Pack	NATS, Traffic Support Pack, 2019
SOC012	CAA RP3 Decision	CAA, UK RP3 CAA Decision Document, CAP1830, August 2019
SOC013	Air Navigation Guidance 2017	Department for Transport (DfT) Moving Britain Ahead – Guidance to the CAA on its environmental objectives when carrying out its air navigation functions, and to the CAA and wider industry on airspace and noise management. October 2017
SOC014	CEPA Cost Allocation and Non-Regulated Income Report	CEPA, NERL's Cost Allocation and Non-Regulatory Income Forecasts, 15 January 2019
SOC015	Decision on Licence Modifications in Respect of Governance and Ring-Fencing	CAA, Decision on Modifications to NATS (En Route) plc Licence in Respect of Governance and Ring-fencing, CAP1380, March 2016
SOC016	Co-Chairs Report, 2018	RP3 Customer Consultation Working Group Report of the Co-Chairs, 2018
SOC017	RP3 Business Plan Guidance, 2017	CAA, Guidance for NERL in Preparing its Business Plan for Reference Period 3: Consultation Document, CAP1593, 2017
SOC018	IT failures in the Financial Services Sector	House of Commons Treasury Committee, IT failures in the Financial Services Sector, Second Report of Session 2019–20, HC 224, 22 October 2019
SOC019	Rail Infrastructure Programmes Analysis	National Audit Office and Department for Transport, Lessons from Major Rail Infrastructure Programmes, HC 267 Session 2014-15, 29 October 2014
SOC020	The Defence Information Infrastructure	National Audit Office and Ministry of Defence, The Defence Information Infrastructure, HC 788 Session 2007-2008, 4 July 2008
SOC021	RP3 RBP Appendices	Revised Business Plan – Appendices (Confidential), 2020-2024, 26/10/18
SOC022	Trax Report, July 2019	Trax International Report, SIP Review of Format and Structure, July 2019
SOC023	Introduction to Airspace	NATS, Introduction to Airspace, NATS website
SOC024	Euroconsult Report	Euroconsult, Independent Assessment of Aireon L.L.C. and Iridium Communications, Inc, 30 September 2016
SOC025	Euroconsult Presentation	Euroconsult Presentation of Independent Assessment of Aireon L.L.C. and Iridium Communications, Inc, 15 August 2016

SOC026	TSB Review	Slaughter and May, TSB Review - An Independent Review Following TSB's Migration on to a New Platform in April 2018, October 2019
SOC027	Initial Business Plan Appendices	NATS, Initial Business Plan (IBP) Appendices, for Customer Consultation, 2020-2024, 09/04/2018
SOC028	UK-Ireland FAB Performance Plan for RP2	UK-Ireland FAB Performance Plan for Reference Period 2, Consultation, CAP1245, 27/06/2014
SOC029	Palamon Indicative Timetable	Investigation under Section 34 of the Transport Act 2000: Project Palamon, October 2018
SOC030	Guidance for NERL in Preparing its Business Plan for RP3, 2018	CAA, Guidance for NERL in Preparing its Business Plan for Reference Period 3, CAP 1625, 2018
SOC031	E-borders and Successor Programmes	National Audit Office, E-borders and Successor Programmes, Home Office, HC 608 Session 2015-16, 7 December 2015
SOC032	Siim Kallas Letter	Letter from Siim Kallas, The Commission's finding regarding the performance plan and associated targets adopted by the United Kingdom for the reference period 2012-2014, in application of Article (14)2 of Commission Regulation (EU) No 691/2010, 2012
SOC033	Seven Year Forecast, 2019	Eurocontrol, Seven-Year Forecast, Flight Movements and Service Units 2019-2025, February 2019
SOC034	RP3 CCWG Terms of Reference	RP3 Customer Consultation Working Group (CCWG), Terms of Reference Final V1.2, 23/05/19
SOC035	Performance Review Report 2018	Eurocontrol, Performance Review Report – reviews the performance of air traffic management in Europe during the calendar year, May 2019
SOC036	CAA Letter – Palamon Revised Indicative Timetable	Letter from CAA to NERL, Palamon Revised Indicative Timetable, 21/11/2019
SOC037	Palamon Revised Indicative Timetable	Palamon Revised Indicative Timetable, 21/11/2019
SOC038	CAA RP3 3Di Requests	CAA RP3 3Di requests - Provides Additional Information on the Environmental KPI/3Di
SOC039	Review of Cost Efficiency	Economic Insights, Review of Cost Efficiency, 22/11/2019
SOC040	Met Office Jet Stream Advice	Met Office, Latitudinal Changes of the North Atlantic Jet Stream: Update on Past Literature Review, April 2018

SOC041	CAA RP3 Decision Appendices	UK RP3 CAA Decision Document Appendices, CAP 1830a, 2019
SOC042	RP3 Incentive Schemes	NATS, RP3 Incentive Schemes, 2019
SOC043	Actuarial Valuation Report at 31 December 2017	AoN Hewitt, Actuarial Valuation Report, 31/12/2017
SOC044	CAA RP1 Decision	CAA Decision, NATS (En Route) plc CP3 Price Control Review 2011-2014, December 2010
SOC045	Actuarial Valuation Report at 31 December 2018	AoN Hewitt, Actuarial Report at 31 December 2018, 28/03/2019
SOC046	ToaP Deed	Trust of a Promise Deed, 26/07/2001
SOC047	Pensions MoU	NATS, Memorandum of Understanding in Relation Changes to the Pension Arrangements of NATS Employees, 27/02/2009
SOC048	Regulatory Accounts 2017	NERL Regulatory Accounts 2017, 05/07/2018
SOC049	Scheme Funding Analysis 2019	The Pensions Regulator, Scheme Funding Analysis 2019
SOC050	Pensions Update, Winter 2014/15	CAAPs Pensions Update, Winter 2014/15
SOC051	GAD Report	GAD, Analysis of Pension Costs for NATS (en route) plc, 24/09/2018
SOC052	Letter to Reject the CAA RP3 Decision	NATS, Letter from Martin Rolfe, NERL to Richard Moriarty, CAA,10/09/2019
SOC053	SIP 2016	NATS, Service and Investment Plan (SIP) 2015, Form, Scope and Level of Detail Subject to CAA Approval, 31/12/2015
SOC054	Operational Service: Resourcing and Resilience	NATS, Operational service: resourcing and resilience, June 2018
SOC055	RP3 CCWG Co-Chair Code of Conduct	RP3 Customer Consultation Working Group (CCWG), FINAL Co-Chair Code of Conduct v1.0, 15/02/2018
SOC056	Code of Practice 2014	NERL Licence - Condition 16, Code of Practice, Updated December 2014
SOC057	Explanatory Note - Draft Airspace Modernisation Licence Condition	CAA, Explanatory Note - Draft Airspace Modernisation Licence Condition, 17/06/2019
SOC058	SIP 2015	NATS, Service and Investment Plan (SIP) 2015, Form, Scope and Level of Detail Subject to CAA Approval, 01/10/2015
SOC059	ACE Benchmarking Report, 2017	ACE 2017 Working Group, Air Traffic Management Cost-Effectiveness (ACE) Benchmarking Report for 2017, 2018 - 2022 Outlook, May 2019
SOC060	ACE Benchmarking Report, 2016	ACE 2016 Working Group, Air Traffic Management Cost-Effectiveness (ACE)

		Benchmarking Report for 2016, 2017 - 2021 Outlook, May 2018
SOC061	Staff Operating Expenditure for Air Traffic Control Report	NERA, Staff Operating Expenditure for Air Traffic Control Report, 21/03/2018
SOC062	Staff Headcount in RP3	NERA, Appendix E, Staff Headcount in RP3: A Response to Steer's Analysis, 09/04/2019
SOC063	Steer Report	Steer, NERL's Forward-Looking Capital Programme and Expenditure Efficiency, February 2019
SOC064	Planned and Historical Operating Costs for RP2 and RP3	NATS, Planned and Historical Operating Costs for NERL ATS (RP2, RP3), 16/04/2018
SOC065	CCWG RP3 Manpower Planning Workshop	NATS, Customer Consultation Working Group RP3 Manpower Planning Workshop, 23/08/19
SOC066	Response to Questions on Operational Manpower and Planning	NATS, Response to SDG Questions on Operational Manpower and Planning, 15/06/2018
SOC067	Other Revenue Analysis	CEPA, Other Revenue Analysis, 2018
SOC068	Independent Review of Capex Governance	Economic Insights, Independent Review of Capex Governance, 22/11/2019
SOC069	IT failures in the Financial Services Sector Overview Article	Parliament UK, Regulators must act to reduce unacceptable number of IT failures in financial services sector, warns Treasury Committee, 28 October 2019
SOC070	C10 Airspace and Technology Plan 2017	NATS, RP2 Capital Investment Plan (2015 -2019) for Condition 10, March 2017
SOC071	Regulatory Accounts 2018	NERL, Regulatory Accounts, 2018
SOC072	Review of Euroconsult Assessment of Aireon Workshop	NATS, Review of Euroconsult Assessment of Aireon Workshop, 05/08/2018, Non NDA Version
SOC073	Letter from NTUS to Stephen Hand, DfT	Letter from NTUS (NATS Trade Unions) to Stephen Hand, Submission following the publication of the CAA RP2 UK-Ireland Performance Plan, 30/05/2014
SOC074	Air Traffic Services Safety Requirements	CAA, Air Traffic Services Safety Requirements, CAP 670 - Third Issue, Amendment 1/2019, 1 June 2019, Effective 1 August 2019
SOC075	NATS Section of CAA Pension Scheme Schedule of Contributions	NATS Section of CAA Pension Scheme Schedule of Contributions (4 June 2018)
SOC076	SIP 2017 Final	Service Improvement Plan (SIP) 2017 Final, Form, Scope and Level of Detail Subject to CAA Approval, December 2016
SOC077	VfM Letter to CAA	NERL Letter to CAA, Value for Money (VfM), NERL Evidence on Cost Efficiency of our RP3 Investment Plan, 09/05/2019

SOC078	CAPEX consultant's Questions, iBP Clarifications	RP3 CAPEX Consultant's Questions, iBP Clarifications, 12 June 2018
SOC079	SIP 2019 Independent Reviewers Report	SIP 2019 Independent Reviewer Report, Grant Bremer, Chase Partners Limited, 01/03/2019
SOC080	Actuarial Valuation Report at 31 December 2015	AoN Hewitt, Actuarial Report at 31 December 2015, 02/12/2016
SOC081	ASEPS Update, 28/08/2019	ASEPS Update for NATS and ICAO, ASEPS Trial Implementation, Day 90/120 WebEx, 28/08/19
SOC082	ASEPS Update, 01/11/2019	ASEPS Update Day 180, ASEPS Trial Implementation, 180 day ('6 month') WebEx, 01/11/2019
SOC083	ASEPS Update, 05/06/201	ASEPS Update ASEPS Trial Implementation, Day 60 WebEx, June 5th, 2019
SOC084	Business Case Analysis for Space Based ADS-B	Business Case Analysis for Space Based ADS-B – Net Present Value Phase 2 – ICAO NAT Region Preliminary Results, 26 – 28 April, 2017
SOC085	Business Case Analysis for Space Based ADS-B, 26-28/04/2017	Business Case Analysis for Space Based ADS-B, Net Present Value Phase 2, ICAO NAT Region Preliminary Results, 26 – 28 April, 2017
SOC086	Phase 2 Space-Based ADS-B Business Case Analysis for the NAT Region	Phase 2 Space-Based ADS-B Business Case Analysis for the NAT Region, 13/06/2017
SOC087	Updated Weighted Average Cost of Capital for NATS (En-Route) plc at RP3	NERA, Updated Weighted Average Cost of Capital for NATS (En-Route) plc at RP3, September 2018
SOC088	The Weighted Average Cost of Capital for NATS (En-Route) plc at RP3	NERA, The Weighted Average Cost of Capital for NATS (En-Route) plc at RP3, 20/03/2018
SOC089	Draft SIP 2020	NATS, Draft Service Investment Plan (SIP) 2020, October 2019
SOC090	EU Commission Decision (EU) 2019/903	European Commission Implementing Decision (EU) 2019/903 of 29 May 2019, Setting the Union-wide Performance Targets for the Air Traffic Management Network for the Third Reference Period Starting on 1 January 2020 and Ending on 31 December 2024, Official Journal of the European Union, L44/49 - L44/55, 03.06.2019
SOC091	Deploying SESAR Update, 28/02/2019	NATS, Deploying DSESAR Update Presentation, 28/02/2019
SOC092	CAA Approval Letter on Airspace and Technology Programmes, July 2017	CAA Approval Letter to Martin Rolfe re NERL's 2017 Airspace and Technology Programmes, 26/07/2017

SOC093	CAA Conditional Approval Letter on Airspace and Technology Programmes, May 2017	CAA Conditional Approval Letter to Martin Rolfe re NERL's 2017 Airspace and Technology Programmes, 26/05/2017
SOC094	RP2 Evolution - Initial Presentation to CAA Consultants Steer	NATS, RP2 Evolution - Initial Presentation to CAA Consultants Steer, 27/02/2018
SOC095	CAA Letter, SIP 2019, Approved	CAA Letter to Martin Rolfe re SIP 19 Approved, 22/05/2019
SOC096	CAA Letter, SIP 2019, Not Approved	CAA Letter to Martin Rolfe, NERL's SIP 2019, Not Approved, 28/03/2019
SOC097	Deploying SESAR update, 5/09/2014	NATS, Deploying SESAR update, 5/09/2014
SOC098	Modernising the UK's Air Transport Network - A New Way Forward	Modernising the UK's Air Transport Network - A New Way Forward, Draft for Discussion, September 2015
SOC099	UK Airspace Policy	UK Airspace Policy: A framework for balanced decisions: on the design and use of airspace: Moving Britain Ahead, Department for Transport, February 2017
SOC100	Traffic vs Operating Costs 2001-2018	NATS, Traffic vs Operating Costs 2001-2018
SOC101	Consultation on proposals for a revised airspace change process, CAP 1389	CAA, Consultation on proposals for a revised airspace change process, CAP 1389, March 2016
SOC102	RIIO-2 methodology for the Electricity System Operator	Ofgem, RIIO-2 methodology for the Electricity System Operator, 28 August 2019
SOC103	Development of Regulatory Asset Base (RAB) of the Regulated Airports	Heathrow Airport, Development of Regulatory Asset Base (RAB) of the Regulated Airports, June 2019
SOC104	National Grid, Annual Report and Accounts 2018/19	National Grid, National Grid Electricity Transmission plc, Annual Report and Accounts 2018/19, p.28;
SOC105	Ofwat, Regulatory capital values 2019	Ofwat, Regulatory capital values 2019, 16 May 2019
SOC106	Operating Cost Support Pack	NATS, Operating Cost support pack, 2019
SOC107	Airspace Modernisation Strategy, CAP 1711	CAA, Airspace Modernisation Strategy, CAP 1711, December 2018
SOC108	RIIO-2 Sector Specific Methodology Annex: Finance, 2018	Ofgem, RIIO-2 Sector Specific Methodology Annex: Finance, 18 December 2018
SOC109	Economic regulation at Heathrow from April 2014: Notice granting the licence, CAP1151	CAA, Economic regulation at Heathrow from April 2014: Notice granting the licence, CAP1151, 2014
SOC110	NERA, Cost of Equity for RP3	NERA, Cost of Equity for RP3, Prepared for NERL, 12/04/2019

SOC111	Bristol Water Final Determination	CMA, Final Determination - Bristol Water: A reference under section 12(3)(a) of the Water Industry Act 1991, 05/10/2015
SOC112	Estimating the cost of capital for implementation of price controls by UK Regulators	Wright, Burns, Mason & Pickford, Estimating the cost of capital for implementation of price controls by UK Regulators, UKRN, 2018
SOC113	Assurance Review and Assessment of the Evidence on the WAAC at RP3	Economic Insight, Assurance Review and Assessment of the Evidence on the WAAC at RP3, 22/11/2019
SOC114	Final Determination - SONI Limited v Northern Ireland Authority for Utility Regulation	CMA, Final Determination - SONI Limited v Northern Ireland Authority for Utility Regulation. 10/11/2017
SOC115	Comments on NERA/NERL critiques of Europe Economics	Europe Economics, Comments on NERA/NERL critiques of Europe Economics, June 2019
SOC116	Ryanair Response, September 2012	Ryanair, Response to CAA Consultation on process for developing economic framework for RP2, September 2012
SOC117	Estimation of the Debt Beta of the Bond Issued by NATS (En-Route) plc	Professor Zalewska, Estimation of the Debt Beta of the Bond Issued by NATS (En-Route) plc, April 2019
SOC118	Estimating the cost of capital for H7	PwC, Estimating the cost of capital for H7 - A report prepared for the Civil Aviation Authority (CAA), November 2017
SOC119	Renewal of the Independent National Radio licences	Ofcom, Renewal of the Independent National Radio licences - Methodology for review of financial terms, 13 August 2010
SOC120	Annual Licence Fees for 900 MHz and 1800 MHz frequency bands - Annexes	Ofcom, Annual Licence Fees for 900 MHz and 1800 MHz frequency bands - Annexes, 17 December 2018
SOC121	NERL plc 2014	Accounts, NERL plc 2014
SOC122	NATS Holdings Limited, Annual Report and Accounts, March 2019	Accounts, NATS Holdings Limited, Annual Report and Accounts, Year ended 31 March 2019
SOC123	NATS (En Route) plc Financial Statements 31032009	Accounts, NATS (En Route) plc Financial Statements 31032009
SOC124	NATS En Route Plc 2010	Accounts, NATS En Route Plc 2010
SOC125	Trax Report, November 2019	Trax International Report, NERL's performance relative to other large European ANSPs - Position Paper for the Competition and Markets Authority 27/11/2019
SOC126	Consultation on proposals for a revised airspace change process CAP 1389	CAA, Consultation on proposals for a revised airspace change process CAP 1389

SOC127	Government decides on new runway at Heathrow	UK Parliament, Government decides on new runway at Heathrow, 25/10/2016
SOC128	Commission Implementing Regulation (EU) No 391/2013	Commission Implementing Regulation (EU) No 391/2013
SOC129	Updating the licence modification process for the en-route air traffic licence	Department for Transport, Updating the licence modification process for the en-route air traffic licence, 03/11/2016
SOC130	CAA Letter to Martin Rolfe re NERL's RP3 business plan, 25/09/2018	CAA Letter to Martin Rolfe re NERL's RP3 business plan, 25/09/2018
SOC131	CAA Letter to David Curtis, FASI-S, 02/11/2018	CAA Letter to David Curtis, FASI-S, re UK Airspace Modernisation Commission to NERL to Lead a Coordinated Implementation Plan for Airspace Changes in Southern England, 02/11/2018
SOC132	Asset Returns and Economic Growth', Brookings Papers on Economic Activity; Europe Economics (2012)	Baker, D., DeLong J.B., and Krugman, P, 'Asset Returns and Economic Growth', Brookings Papers on Economic Activity; Europe Economics (2012), 'The Relationship between Sustainable Growth and the Risk-free Rate: Evidence from UK Government Gilts',2005
SOC133	Review of the physical infrastructure and business connectivity markets	Ofcom, 'Review of the physical infrastructure and business connectivity markets, June 2019
SOC134	Special Interests Paper	RP2 Airline Community - Special Interests Paper, December 2013
SOC135	Economic and Fiscal Outlook, March 2019	OBR, Economic and Fiscal Outlook, March 2019
SOC136	Fiscal sustainability report, July 2018	OBR, Fiscal sustainability report, July 2018
SOC137	CAA Letter to NERL setting out CAA requirements for NERL Revised Business Plan	CAA Letter to NERL setting out CAA requirements for NERL Revised Business Plan, 09/09/2013
SOC138	Plan for RP2 - Stakeholder consultation	UK-Ireland FAB Performance Plan for RP2 - Stakeholder consultation, 16/06/2013
SOC139	RP2 Customer Consultation Opex Minutes	RP2 Customer Consultation Opex Minutes, 16/06/2013
SOC140	Prospect and PCS Submission on RP2 Performance Plan Consultation Document	Prospect and PCS Submission, CAA/IAA Draft, UK-Ireland RP2 Performance Plan Consultation Document, 14/04/2014
SOC141	Proposal to modify NATS (En Route) plc licence, CAP1352	Proposal to modify NATS (En Route) plc licence in respect of reporting of certain plans under Condition 10a: Notice under section 11(2) of the Transport Act 2000, November 2015, CAP 1352

SOC142	Draft FAB UK-Ireland RP2 Performance Plan - Consultation Document	CAA, Draft FAB UK-Ireland RP2 Performance Plan Consultation Document, February 2014
SOC143	C10 Addendum June 2017	RP2 Capital Investment Plan Condition 10 (C10) Addendum, June 2017
SOC144	SIP 2019	NERL SIP 2018, Form, Scope and Level of Detail subject to CAA Approval, December 2018
SOC145	SIP 2018	NERL SIP 2018, Form, Scope and Level of Detail subject to CAA Approval, December 2017
SOC146	NERL performance at Stansted	NERL performance at Stansted, 19 September 2016
SOC147	NERL RP2 plan	RP2 Revised Business Plan (2015-2019) Revised following Customer Consultation and PRB advice on 27th September 2013 to the Commission on EU-wide performance targets, 18/10/2013
SOC148	Airspace Change Proposals in the FAS S and FASI N Programmes	Airspace Change Proposals in the FAS S and FASI N Programmes
SOC149	ACOG Initial Mobilisation Plan	ACOG Initial Mobilisation Plan, 10/12/2018
SOC150	Decision on modifications to Condition 2 of licence, CAP 1682	CAA, Decision on modifications to Condition 2 of NATS (En Route) plc licence in respect of resilience planning, policy statement on enforcement and resilience plan guidance, CAP 1682, 2018
SOC151	RP2 Evolution to CAA Consultants - Full	RP2 Evolution to CAA Consultants - Full 20190509_Enclosure 01 20180226_RP2 Evolution to CAA Consultants, Full, 09/05/2019
SOC152	Consultants Portfolio Question, Final	20190509_Enclosure 02, Consultants Portfolio Question vD Final, 13/06/2018
SOC153	VfM Benchmarking	20190509_Enclosure 03, VfM Benchmarking, June 2018
SOC154	Consultants iBP question, Final	20190509_Enclosure 07, Consultants iBP question v3_FINAL, 14/06/2014
SOC155	Customer P3O Technical Architecture Deep Dive	20190509_Enclosure 08, Customer P3O Technical Architecture Deep Dive, 08/06/2017
SOC156	RP3 CCWG Evolving the Service Slides Final	20190509_Enclosure 09, RP3 CCWG Evolving the Service Slides Final, 23/05/2018
SOC157	RP3 CCWG Additional Customer Requests	20190509_Enclosure 10, RP3 CCWG Additional Customer Requests slides, 21/06/2018
SOC158	RP3 Business Plan Appendices	20190509_Enclosure 11, NERL RP3 Business Plan Appendices 261018

SOC159	NERL SIP 2018 Consultation, British Airways Response Final	20190509_Enclosure 06, NERL SIP 2018 Consultation, British Airways Response Final, 08/12/2017
SOC160	Deep Dive Slidepack	20190509_Enclosure 05, Deep Dive Slidepack, 31/10/2017
SOC161	Customer Deep Dive Workshop Slides	20190509_Enclosure 04, Customer Deep Dive Workshop Slides, 01/03/2017
SOC162	Letter to Andrew Walker, NERL response to CAP1593	Letter to Andrew Walker, NERL response to CAP1593 (Guidance for RP3 iBP), 10/11/2017
SOC163	Letter to Martin Rolfe, Summary of CAA RP3 conclusions	Letter to Martin Rolfe, Summary of CAA RP3 conclusions, 05/08/2019
SOC164	Technical and Metrics Presentation	Customer Consultation: RP3 Initial Business Plan, Technical and Metrics Presentation, 27/06/2018
SOC165	Summary of SDG outcomes, September 2015	Airports Commission Senior Delivery Group, High level summary of the outcomes from the Sept 14th Senior Delivery Group, 23/05/2015
SOC166	Letter to Andrew Walker, Assumptions underlying NERL's RP3 Initial Business Plan	Letter to Andrew Walker, Assumptions underlying NERL's RP3 Initial Business Plan, 12/09/2017
SOC167	Dividends, Earnings and Stock Prices	Gordon, Dividends, Earnings and Stock Prices, The Review of Economics and Statistics, Vol. 41, No. 2, Part 1, May 1959, p. 99-105
SOC168	RP3 IBP for Consultation	RP3 Initial Business Plan for Customer Consultation 2020-2024, 09/04/2018
SOC169	EU-wide target ranges for RP3 - Annex 2. Air Navigation Service Providers: Advice on benchmarking of ANSPs and EU-wide cost targets	PRB, EU-wide target ranges for RP3 - Annex 2. Air Navigation Service Providers: Advice on benchmarking of ANSPs and EU-wide cost targets, 03/06/2018

16. Appendix – Glossary of Terms

16.1. NATS Glossary of key acronyms and technical terms used within the report

Term	In Full	Brief explanation
1, 2, 3….		
3Di	Three dimensional inefficiency score.	The UK domestic environmental KPI, that NERL has chosen to use as the incentivised environmental target rather than the EU horizontal-only measure, KEA. 3Di is a metric developed by NERL that encompasses both vertical and horizontal flight elements of a flight to measure the deviation from the preferred 3D profile to the actual radar track of each flight in UK airspace. Lower 3Di scores represent better environmental performance.
A		
AAS	Advanced Automation System	FAA led ATM automation project that was the forerunner to the UK's NERC project and the foundation of the ATM system for LAC.
	Airspace Capacity	Airspace Capacity (sometimes just referred to as "Capacity"). Capacity for an airspace sector is normally defined as an entry count (maximum number of aircraft entering an airspace sector in a given period of time). A complementary measure is occupancy count (maximum number of aircraft within an airspace sector in a given period of time).
AC/ACC	Area Control / Area Control Centre	See "LACC" for full description.
A-CDM	Airport Collaborative Decision Making	Concept and supporting systems which aim to improve operational efficiency at airports by sharing key information between partners, including airport operators, aircraft, operators/ground handlers, ATC and Eurocontrol.
ACE Reports	Eurocontrol ATM Cost Effectiveness Reports	Eurocontrol's ATM Cost Effectiveness (ACE) reports present yearly factual data and analysis on cost-effectiveness and productivity ANSPs in Europe. The analysis focuses primarily on costs that are under ANSPs' direct control and responsibility, namely the ATM/CNS provision costs.

ACM	Airspace Capacity Manager	The Airspace Capacity Manager role acts as the focus for Air Traffic Flow and Capacity Management (ATFCM) within NERL, fulfilling the requirements and responsibilities of the Flow Management Position (FMP) within both the London and Scottish FIRs.
ACOG	Airspace Change Organising Group	The independent organisation currently within NERL that is commissioned by the DfT and CAA with coordinating and project managing the airspace changes needed to modernise the UK's airspace (see AMS).
ACP	Airspace Change Proposal	A proposal to change the design of a discrete part of UK airspace, submitted to the CAA by a 'change sponsor' (usually an airport or air traffic control service). ACPs are put forward for decision by CAA on whether the proposed changed will be approved for implementation.
ADS-B	Automatic Dependent Surveillance – Broadcast System.	This is a surveillance technology in which an aircraft determines its position via satellite navigation and periodically broadcasts it, enabling the aircraft to be tracked independent of traditional radar. The receivers for ADS-B signals have to date been land based but the most recent development is a space based receiver system which is being implemented by Aireon LLC, hosted on Iridium-owned satellites.
AFL	Actual Flight Level	Flight Levels are a measure of altitude expressed in hundreds of feet based on a standard sea-level pressure. Actual Flight Level is the current altitude of an aircraft expressed as a Flight Level based on this standard pressure setting.
AIM	ATFM Information Message	A message transmitted by the Network Manager Operations Centre (NMOC) to provide information, advice and to promulgate instructions relating to the application of current Air Traffic Flow & Capacity Management (ATFCM) measures. It is also used for the initial publication of the Network Operations ATFCM operating procedures that affect all users.
AIRAC	Aeronautical Information Regulation And Control	Process whereby changes to aeronautical information (e.g. airspace routes and procedures) are coordinated internationally and published according to a regular 28 day cycle.

	Aireon LLC	Aireon is an American company based in McLean, VA. Founded in 2011. It manufactures, deploys, and operates a global aircraft tracking and surveillance system, utilising satellite-based receivers to monitor the existing ADS-B transmissions of aircraft, for global air traffic surveillance Aireon are in partnership with leading ANSPs from around the world, like NAV Canada, ENAV, NSL, the Irish Aviation Authority (IAA) and Naviair, as well as Iridium Communications.
	Airprox	An Airprox is a situation in which, in the opinion of a pilot or ATCO, the distance between aircraft, as well as their relative positions and speeds, have been such that their safety was or may have been compromised. The causes and severity are assessed periodically by the UK Airprox Board, an independent body, in the interests of enhancing flight safety. Incidents are graded based on the degree of risk of collision. The most severe incidents are graded A (risk of collision) or B (safety not assured).
AIS	Aeronautical Information Services	The Aeronautical Information Service (AIS) is a service established in support of international civil aviation, whose objective is to ensure the flow of information necessary for the safety, regularity, and efficiency of international air navigation. NERL provides the Aeronautical Information Service as a specified service under our Licence.
AMS	Airspace Modernisation Strategy	This sets out the ways, means and ends of modernising airspace through 15 initiatives that will modernise the design, technology and operations of airspace, initially focusing on the period until the end of 2024. The AMS was drafted by the CAA in response to the DfT tasking them with preparing and maintaining a co-ordinated strategy and plan for the use of UK airspace up to 2040, including modernisation.
ANS	Air Navigation Services	A generic term for air navigation services, which includes Air Traffic Services (ATS), Aeronautical Information Service (AIS), Communication, Navigation, Surveillance (CNS) and Meteorological Service (MET).
ANSP	Air Navigation Service Provider	Air navigation services provider, which is a standard term for the organisations that provide Air Traffic Control services within a state or region.
AOD	Analysis, Options and Design	NERL process for carrying out structured analysis of potential changes to the NERC system in order to assess their complexity, consider options to deliver a solution and ultimately to create a formal baseline for the preferred solution suitable for incorporating in a build.

APD	Air Passenger Duty	Air passenger duty, which is an excise duty charged on the carriage of passengers flying from a United Kingdom or Isle of Man airport. It is unrelated to the air navigation charges that fund NERL and other ANSPs which are generally charged by aircraft weight x distance travelled in controlled airspace.
ASBU	Aviation System Block Upgrade	The Aviation System Block Upgrades (ASBUs) are the ICAO defined framework for harmonising avionics capabilities and the required air traffic management (ATM) ground infrastructure as well as automation. An ASBU is a package of capabilities (modules) which has essential qualities of: • Clearly defined measurable operational improvements with appropriate metrics to determine success. • Necessary equipment and/or systems in aircraft and on the ground along with an operational approved or certification plan. • Standards and procedures for airborne and ground systems. • Positive business case over a clearly defined period of time.
ATC	Air Traffic Control	A service operated by appropriate authority to promote the safe, orderly and expeditious flow of air traffic which when aggregated with all the airborne and ground-based functions (air traffic services, airspace management and air traffic flow management) is technically referred to as Air Traffic Management (ATM). In practice, the terms are used interchangeably.
ATCE	Air Traffic Control Engineer	An Engineer who specialises in Air Traffic Management Systems.
ATCOs	Air Traffic Control Officer	Air Traffic Control Officers are trained and licensed personnel responsible for the safe, orderly, and expeditious flow of air traffic in an air traffic control system.
ATFCM	Air Traffic Flow & Capacity Management	ATFM - extended to include the optimisation of traffic patterns and capacity management. Through managing the balance of Capacity and Demand the aim of ATFCM is to enable flight punctuality and efficiency, according to the available resources with the emphasis on optimising the network capacity through the collaborative decision-making process.

ATFM	Air Traffic Flow Management	Air traffic flow management is the regulation of air traffic in order to avoid exceeding the limit on airport or air traffic control capacity in an area of controlled airspace (hence the alternative name of Air Traffic Flow and Capacity Management - ATFCM), and to ensure that the available capacity is used.
ATICCC	Air Traffic Incident Co-ordination and Communication Cell	The NERL Air Traffic Incident Co-ordination and Communication Cell (ATICCC) has been established to provide a management focus to co-ordinate the post incident business recovery process following the loss of any substantive parts of the aviation industry support infrastructure, particularly Air Traffic Control. A team of experienced operational managers comprising representatives from NERL. Airports, Airlines and other appropriate organisations will man the ATICCC to co-ordinate and manage the recovery process.
ATM	Air Traffic Management	See ATC.
ATMs	Air Traffic Movements	Air traffic movements are when an aircraft takes-off or lands at an airport. For airport traffic purposes, one arrival and one departure is counted as two movements. In both cases, a 'flight' is considered as the operation of an aircraft on a stage or number of stages with the same flight number.
ATS	Air Traffic Services	In aviation, an air traffic service (ATS) is a service which assists aircraft in real-time to ensure their safe operations. It includes air traffic control services, air traffic advisory services, flight information service and an alerting service.
ATSAs	Air Traffic Services Assistant	Air traffic services assistants (ATSAs) give help to air traffic controllers in their everyday working tasks. Assistants working for NERL are known as ATSAs. Those employed by non-NATS controlled airports are often called air traffic control assistants (ATCAs).
B		
	Band-box	LAC is divided into a maximum of 32 sectors that can be operated independently. When traffic is light it is efficient to combine sectors together to be operated by one sector team. This process of combining sectors is known as band-boxing and as a result the sectors are said to be band-boxed.
	Big 5	These are deemed as the 5 biggest ANSPs in Europe and they include DFS for Germany, DSNA for France, ENAIRE for Spain, ENAV for Italy and NERL for the UK.

	Bronze Team	BRONZE teams are the tactical level in the response teams to an event or an incident. They can be any shape or size and are set up by SILVER to undertake specific tasks.
C		
C1	Capacity Target 1	Average minutes of en route air traffic flow management delay attributable to air navigation services. C1 is the only EU framework en route capacity KPI for RP3, against which targets are set.
C2	Capacity Target 2	The UK capacity metric against which financial incentives are set. It is calculated by adjusting the C1 score for certain categories of delay attributable to NERL.
C3	Capacity Target 3	C3 is an Impact Score, which places greater weight on long delays and delays in the morning/evening peaks. It is determined with reference to C2 target. It is subject to an incentive – max penalty of 0.75% of Determined Costs; max bonus 0.25%.
C4	Capacity Target 4	C4 measures and incentivises NERL to avoid days of particularly severe and exceptional disruption. It is subject to a penalty-only incentive - max penalty of 0.25% of Determined Costs.
CAA	Civil Aviation Authority	Responsible for economic regulation of NATS as well as safety regulation and UK airspace responsibility.
CAAPS	Civil Aviation Authority Pension Scheme	The defined benefit pension scheme split into two separately governed sections since PPP – one for CAA members and for NATS Group members.
CANSO	Civil Air Navigation Services Organisation	CANSO is an organisation that brings the world's air navigation service providers, leading industry innovators and air traffic management specialists together to share knowledge, develop best practice and shape the future for secure and seamless airspace. The purpose of CANSO is to create value for its Members by being the global and regional voice of ATM and by facilitating and supporting improvements in global and regional ATM performance.
capex	Capital Expenditures	Capital expenditures, commonly known as capex, are funds used by a company to acquire, upgrade, and maintain physical assets such as property, buildings, an industrial plant, technology or equipment. Capex is often used to undertake new projects or investments by the firm.

CAPM	Capital Asset Pricing Model	The Capital Asset Pricing Model (CAPM) describes the relationship between systematic risk and expected return for assets, particularly stocks. CAPM is widely used throughout finance for pricing risky securities and generating expected returns for assets given the risk of those assets and cost of capital.
CAS	Controlled Airspace	Controlled Airspace in which pilots require clearance from air traffic controllers to enter and remain under the control of those controllers until they leave CAS.
CAP 670	Civil Aviation Publication 670	CAA publication titled ATS Safety Requirements and which sets out the safety regulatory framework and requirements associated with the provision of an air traffic service.
CCWG	Customer Consultation Working Group	Programme of customer consultation established by NERL to consult on its initial business plan over 2018. A co-chairs' report was produced at the end of the process and is published on the CAA website.
CCOs & CDO	Continuous Climb Operations / Continuous Decent Operations	Continuous Climb and Descent Operations (CCOs and CDOs) are aircraft operating techniques enabled by airspace design, instrument procedure design and facilitated by ATC. CCO and CDO allow aircraft to follow a flexible, optimum flight path that delivers major environmental and economic benefits - reduced fuel burn, gaseous emissions, noise and fuel costs - without any adverse effect on safety. CCO and CDO operations allow arriving or departing aircraft to descend or climb continuously, to the greatest extent possible.
CEPA	Cambridge Economic Policy Associates	CEPA is a boutique economic consulting firm.
CGW	Communications Gateway	A processor that interfaces the LAC data processing environment to wider NERL engineered environment.
CM	Configuration Management	Configuration management refers to a discipline for evaluating, coordinating, approving, and implementing changes in artefacts that are used to construct and maintain software systems. An artefact may be a piece of hardware or software or documentation
CMA	Competition and Markets Authority	
CMG	Competition and Markets Group	

CMP	Configuration Management Plan	Plan for how configuration management will be undertaken for a specific organisation or system.
CNS	Communications, Navigation & Surveillance	Communication, Navigation and Surveillance (CNS) services - the main functions that form the infrastructure for air traffic management.
COTS	Commercial Off The Shelf	Standard technology products that require minimum adaptation or customisation before implementation.
CP1, CP2, CP3	Control Period 1/2/3	Prior to the creation of Reference Periods under SES, NERL was regulated by the CAA under a UK only scheme. Price controls were set for Control Periods commencing at the time of the PPP in 2001. CP1 and CP2 were 5 year periods while CP3 was a 4 year period from 2011 to 2014 to bring its conclusion into line with the European Reference Periods.
CPI / RPI Wedge		RPI inflation differs from CPI inflation for a number of reasons. Collectively the difference between the two measures is referred to as the 'wedge'.
CR	Change Request	A document containing a call for a specific change to a systems or process.
CRCO	Central Route Charges Office	The EUROCONTROL Central Route Charges Office (CRCO), located at EUROCONTROL's headquarters in Brussels, which is responsible for billing en route charges to airlines and distributing the revenues appropriately to member ANSPs such as NERL.
CSU	Chargeable Service Units	Chargeable service units (unit of traffic volume) that does not include military and other exempt flight service units.
CTC	Corporate and Technical Centre	NATS Group's corporate headquarters and home to many key functions including engineering, programmes, HR, Communications, Training, Strategy, Supply Chain, Simulation, Safety and Information Systems.
CTOT	Calculated Take-Off Time	A time calculated and issued by the appropriate Central Management Unit, as a result of tactical slot allocation, at which a flight is expected to become airborne.
D		

Datalink / CPDLC	Controller Pilot Data Link Communications	This enables ATCOs and Pilots to communicate on a one-to-one basis via a simple, text-based messaging system. This is a two-way system, meaning that communication can be initiated by either side. ATC messages are displayed to pilots in the cockpit via the Flight Management Systems. Pilots can then respond to ATC clearances by datalink. They also have the capability to make requests by datalink (e.g. Requested Levels, Routes etc) Either side will also be able to send a "free text" message to the other.
DB	Defined Benefit (pensions)	The CAAPS Defined Benefit pensions scheme open to NATS Employees up until 2009.
DC	Defined Contribution (pensions)	The Defined Contribution pension scheme that replaced the DB pension scheme when it was closed in 2009.
DC	Determined Costs	Determined costs are costs pre-determined by the Member State.
DfT	Department for Transport	UK Department for Transport.
DGM	Dividend Growth Models	Dividend growth model is a valuation model, that calculates the fair value of stock, assuming that the dividends grow either at a stable rate in perpetuity or at a different rate during the period at hand.
DMO	Delivery Monitoring and Oversight	Delivery Monitoring and Oversight It is the route of escalation for delivery groups and acts as a gateway and conduit between the individual initiative delivery groups/PMOs and the co-sponsors (who may in turn escalate to the Minister).
DP En Route	Deploying SESAR technology programme (iTEC trajectory management & FourSight)	En Route is a deployment point milestone in our Deploying SESAR technology programme. It is the most significant deployment deliverable as it will be the first time we realise our operational objective of one operation, across two centres, on a common platform. We are coupling the core iTEC software with the highly advanced FourSight toolset already deployed by NERL in parts of the UK airspace. Used with our current systems and as part of our new systems integrated with iTEC, FourSight gives the ATCO unparalleled predictive capabilities to identify trajectory conflicts up to 18 minutes in advance.
DSS	Data Systems Specialist	Role with responsibility to lead and direct a rostered watch, providing 24 hour immediate support of major computer systems and associated peripherals in support of ATC operations.

	Deploying SESAR	The Deploying SESAR programme is a material part of NERL's investment programme throughout RP2/3 and will transform our operations in support of Europe's Single European Sky. The three main outcomes of the programme will be the replacement of many ageing legacy ATM systems; deployment of a modern ATM platform and the introduction of the SESAR concepts of operation to enable increased flexibility, capacity and efficiency
DSESAR	Deploying Single European Sky ATM Research and programme that delivers it all.	Deploying Single European Sky ATM Research (DSESAR) is a collaborative project to overhaul European airspace and its Air Traffic Management (ATM). The actual programme is managed by the SESAR Joint Undertaking as a public–private partnership (PPP). DSESAR is also a NERL programme that will deliver major technology changes within the UK in line with the overall EU programme.
DUC	Determined Unit Cost	Determined Unit Cost – ratio between the determined costs and forecast traffic for a whole calendar year in a charging zone, established for each year of a reference period. The year-on-year percentage change between DUC is the cost efficiency target under the European performance scheme.
DVOR	Doppler Very high frequency Omni-directional Radio range	DVOR is a type of short-range radio navigation ground based beacon for aircraft, enabling aircraft with a receiving unit to determine their position and stay on course by receiving radio signals transmitted by a network of fixed ground radio beacons. NERL owns and maintains these in the UK and currently has a programme underway to decommission a majority of them as other more modern methods of navigation are now being employed.
E		
EASA	European Aviation Safety Agency	European Aviation Safety Agency, which is responsible for safety regulation at a European level.
EBITDA	Earnings Before Interest, Tax, Depreciation and Amortisation	Earnings before interest, tax, depreciation and amortisation (EBITDA) is a measure of a company's operating performance. Essentially, it's a way to evaluate a company's performance without having to factor in financing decisions, accounting decisions or tax environments.
EC	European Commission	The European Commission is the executive body of the European Union responsible for proposing legislation, implementing decisions, upholding the EU treaties and managing the day-to-day business of the EU.

EE	Europe Economics	European Economic Research Limited, trading as Europe Economics, is a consultancy specialising in economic regulation, competition policy, and the application of economics to public and business policy issues.
EFG	Emergency and Fallback Guidance	Guidance on how to manage emergency and fallback situations for the UK Flow Management Position.
EI	Economic Insight	Economic Insight is an economics consultancy firm that are providing advice to NERL.
ELOS	Evaluation Limited Operational Service	A controlled evaluation run by NERL in the live environment. The evaluation enabled controllers to use the equipment live under certain controlled conditions which provided confirmation on the product's suitability and tangible areas that needed improvement prior to full release.
EMS	Error Management System	Error Management System (EMS) are processes / systems often used in in high- hazard industries, whereby occurrences that do not cross the above safety thresholds are nevertheless captured and the data used to inform independent trend analysis and risk management.
ENAV	Ente Nazionale di Assistenza al Volo	ENAV is the Italian state ANSP.
	en route	The en route phase is that part of the flight from the end of the take-off and initial climb phase to the commencement of the approach and landing phase.
EoSM	Effectiveness of Safety Management	Effectiveness of safety management – the safety key performance indicator under the performance scheme against which targets are set. It is measured by the level of implementation of five management objectives of the ANSP – safety policy and objectives; safety risk management; safety assurance; safety promotion; and safety culture. Approach to each of the objectives is measured by verified responses to questionnaires.
E-TAD	Evaluation Technical and Development facility	This facility was introduced for ATCOs in March 2017. It provides a high fidelity (excellent representation of the live environment) shadowing-only capability within the current operations room.

ETIC	Engineering Technical Incident Cell	ETIC is an engineering communication and coordination cell that can be convened following the occurrence of an engineering event. The ETIC will be the means of communication to upper management and external assistance and will provide an engineering focal point for incident management away from the ATC operational environment.
EU	European Union	Union of 28 European member states.
	EU Centralised Services Provision	A "centralised service" is an ANS service or ATM function exercised at a pan-European and central network level for harmonisation and cost-efficiency purposes avoiding parallel investments. Centralised service provision involves a clear network dimension. The concept of centralised services does not exclude the ANSPs, consortia of these, or joint ventures, including the ATM equipment manufacturers, from taking part in this service provision. Any ANSP or manufacturer, or groupings thereof, can bid to provide one or more centralised services. The creation of a European market for a limited number of centralised services will allow ANSPs to provide services beyond the current national boundaries.
EU SESAR JU	European Union SESAR Joint Undertaking	Consortium of industry Stakeholders in the ATM Industry including manufacturers and ANSPs brought together by the EU to share EU funding and carry out R&D projects as to the feasibility and benefits of SESAR technology.
	Eurocontrol	A Brussels based international treaty organisation that carries out a number of flight plan co-ordination and billing activities on behalf of its member ANSPs, which are EU based or closely associated with the EU states. See also NM – Network Manager.
	European ACE Benchmarking Report	European Air traffic management cost-effectiveness benchmarking report produced by Eurocontrol.
ExCDS	Extended Computer Display System	This advanced electronic coordination system offers controllers automated flight data management using touch-sensitive display screens. It replaces the system of paper flight strips which previously held the information required by controllers for each flight. The system allows electronic coordination between controllers and is a stepping stone to future technology updates in the ATM system.

	Exemption Day	Where C3 weighted delays and C4 Daily scores for the relevant day shall not be counted for the purposes of calculating or where all the following conditions apply: • The day falls into a period designated by the Licensee in advance as a period when major changes are being introduced to the operation; • Users have been notified and consulted in advance over the timing of such exemptions; • The total number of days falling into such periods designated by the Licensee shall not exceed 75 in aggregate for the period of the five Eurocontrol relevant years 2015 to 2019 inclusive, considered as a whole.
F		
FAA	Federal Aviation Administration	The aviation supervisory authority (including the ANSP function) for the USA.
FAB	Functional Airspace Block	Functional Airspace Block - An airspace block based on operational requirements and established regardless of State boundaries, in which the provision of air navigation services and related functions are performance-driven and optimised with a view to introducing, in each Functional Airspace Block, enhanced cooperation among ANSPs or, where appropriate, an integrated service provider. For RP2, the UK was part of the UK-Ireland FAB.
FAS	Future Airspace Strategy	The Future Airspace Strategy is the CAA's strategic framework for UK airspace. Its aim is to provide a policy structure to enable a modernised air traffic management system that provides safe, efficient airspace, that has the capacity to meet reasonable demand, balances the needs of all users and mitigates impact on environment.
FASIIG	Future Airspace Strategy Industry Implementation Group	FASIIG is a far reaching industry body including representatives from Airlines, ANSPs, Business Aviation, large and small Airports, the Ministry of Defence, General Aviation, Industry trade bodies and UK CAA. DfT also attend FASIIG to update the group on changes to UK policy. The role of FASIIG is primarily to bring together all stakeholders involved in deploying the Future Airspace Strategy (FAS) with the intent of aligning investment plans and associated policy and guidance that supports the modernisation of the UK's Air Transport Infrastructure.

FASI-S Airports	Future Airspace Strategy Implementation (South)	The Future Airspace Strategy Implementation (South) (FASI(S)) is the overall combined effort of Industry to achieve a once-in-a-generation change to the legacy air traffic route structures in the southern part of the UK. The Airports included are Heathrow, Gatwick, Luton, Stansted, London City, Southend, Biggin Hill, Southampton, Cardiff, Bournemouth, Bristol, East Midlands, RAF Northolt. Then there is Farnborough, Birmingham, Exeter and Manston who are part of the FASI-S programme but without having specific ACPs in at this time.
FCM	Flight Confirmation Message	A message to be sent to Enhanced Tactical Flow Management System confirming the operation of the flight.
FDP	Flight Data Processor	The Flight Data Processor is a core ATM system which coordinates flight plan and track data and distributes real time flight information to controller working positions. Modern FDP systems process flight plan, adaptation, manual input and other data to provide an accurate 4D trajectory calculation for a given flight.
FEP	Front End Processor	A data communication interface that enables NAS to exchange data with SFS.
FIR	Flight Information Region	Flight Information Region is an airspace of defined dimensions within which flight information services and alerting services are provided. There are three FIRs in UK airspace – London (covers England and Wales), Scottish (covers Scotland and Northern Ireland) and Shanwick Oceanic (covers area of the North East Atlantic).
FMARS	Future Military Area Radar Service	Future Military Area Radar Service (non-regulated) is the contractual and operational relationship between NERL and the MoD under which MoD shares parts of NERL's ATM infrastructure resulting in a joint and integrated approach to military and civil airspace use in the UK. It is the major source of NERL non-regulated income. It does not include the UK military air defence capability.
FMP	Flow Management Position	A working position established in appropriate air traffic control units to ensure the necessary interface between local ATFCM partners (i.e. ATCs, AOs and Airports) and a central management unit on matters concerning the provision of the air traffic flow and capacity management service

	FourSight	FourSight is the name of the set of tools which are designed to act and behave as iFacts does today in Swanwick AC. The tools remain very much the same and current iFacts users will recognise these including: • Interaction monitor • Vertical monitor • Radar interaction vectors • Data entry roulette
FRA	Free Route Airspace	Free Route Airspace (FRA) is specified airspace within which users can freely plan a route between a defined entry point and a defined exit point, with the possibility of routing via intermediate (published or unpublished) waypoints, without reference to the air traffic services (ATS) route network, subject to availability. Within such airspace, flights remain subject to air traffic control. Initially in the UK it will be introduced in six sectors Prestwick Control Upper Airspace.
FTE	Full Time Equivalent	An FTE is the hours worked by one employee on a full-time basis.
G		
GA	General Aviation	General Aviation represents the private transport and recreational flying component of aviation, as well as the manufacturing or building process of those aircraft.
	Galileo	The EU's Global Navigation Satellite System (GNSS).
	Gander OACC	Gander Oceanic Area Control Centre ("Gander Centre", CZQX) is responsible for controlling aircraft in the western half of the North Atlantic oceanic airspace. The Gander oceanic airspace is bounded to the north by the Icelandic Control Centre on the east by the Prestwick, Scotland, Control Centre (Shanwick), to the south by the Portuguese control centre in the Azores, and finally to the southwest by the New York Air Route Traffic Control Centre.
GAD	Government Actuary's Department	Hired by the CAA as external consultancy support to review NERL's pension arrangements as part of its preparations for RP2 and RP3.
GANP	Global Air Navigation Plan	The Global Air Navigation Plan (GANP) is the strategy to achieve a global interoperable air navigation system offering safe, secure and efficient air transport for people and goods worldwide, while limiting the impact of aviation on the environment.

GDP	Gross Domestic Product	Gross Domestic Product (GDP) is the monetary value of all finished goods and services made within a country during a specific period.
GNSS	Global Navigation Satellite System	Global Navigation Satellite System (GNSS) refers to a constellation of satellites providing signals from space that transmit positioning and timing data to GNSS receivers. The receivers then use this data to determine location.
	Gold Team	GOLD represents strategic level command in the event of an incident. It comprises the NATS Executive team and focuses on strategic matters including corporate communications, interfacing with Government and customers and on continuing to run the business.
GPS	Global Positioning System	GPS, which stands for Global Positioning System, is a radio navigation system that allows land, sea and airborne users to determine their exact location, velocity and time 24 hours a day, in all weather conditions, anywhere in the world.
	Groupe ADP (Aeroports de Paris)	Groupe ADP designs, builds and manages 3 important Parisian airports: Paris-Charles de Gaulle, Paris-Orly and Paris-Le Bourget.
H		
HAL	Heathrow Airport Limited	Heathrow Airport Limited (formerly BAA) owns and runs London Heathrow Airport.
HAR	Hazard Analysis Report	The Hazard Analysis Report presents the results of the Hazard Analysis conducted on the operational equipment supporting a specific Air Traffic Service (ATS) The hazard analysis supports the safety case and specifically the assurance for the design in Safety Case Part 2.
HF	Human Factors	Human factors is the discipline of designing products, systems or processes to take proper account of the interaction between them and the people who use them so as to minimise the impact of human error and maximise safe human performance.
HF	High Frequency	These frequencies are used for long-distance communication across intercontinental distances and for mountainous terrains or over the oceans which prevent line-of-sight communications.
HMI	Human Machine Interface	An HMI is the software application which presents information to an operator and allows them to enact control operations in order to fulfil their task.

HOEC	Heathrow Operational Efficiency Cell	The HOEC provides an to collaboration and early decision making at Heathrow, by enabling key stakeholders to work together with access to common shared information.
I		
IAG	International Airlines Group	International Airlines Group, that owns BA & others.
IATA	International Air Transport Association	Trade association for the world's airlines with some 250 airline members.
IBP	Initial Business Plan	This is NERL's Initial Business Plan submitted to the CAA.
ICA	Intercompany Agreement	Intercompany agreements are contracts made among two or more businesses or divisions owned by the same parent company.
ICAO	International Civil Aviation Organization	The International Civil Aviation Organization (ICAO) is a UN specialised agency, created in 1944 upon the signing of the Convention on International Civil Aviation (Chicago Convention). ICAO works with the Convention's 191 Member States and global aviation organizations to develop international Standards and Recommended Practices (SARPs) which States reference when developing their legally-enforceable national civil aviation regulations.
iFACTS	Interim Future Area Control Tools Support	A Trajectory Prediction (TP) and Medium Term Conflict Detection (MTCD) system that identifies and display predicted conflict information to controllers to support decision making.
IFR	Instrument Flight Rules	Instrument flight rules – flight rules that apply when an aircraft is not able or chooses not to fly using visual flight rules (VFR). It means that flight is carried out by reference to instruments in the cockpit rather than visual reference to landmarks.
IPA	Independent Parallel Approaches	Simultaneous approaches to parallel or near-parallel instrument runways where radar separation minima between aircraft on adjacent extended runway centre lines are not prescribed. NERL is currently working with HAL (Heathrow Airport Limited) to deliver IPA for Heathrow.
IR	Independent Reviewer	

iTEC	Interoperability Through European Collaboration	iTEC brings together the air navigation service providers of Spain (ENAIRE), Germany (DFS), the UK (NERL) and the Netherlands (LVNL) – alongside systems provider Indra. It was initially established in order to develop a next- generation Flight Data Processing (iTEC-FDP) system and to explore collaboration on a Controller Working Position (iTEC-CWP).
J		
JRG	Joint Regulators Group	Joint Regulators Group (JRG), brings together the Heads of the various regulators, usually the Chair or Chief Executive, and meets four times a year to discuss issues of mutual concern and to report on recent developments in their own particular sector. The current members of JRG are: • Ofwat • Office of Gas and Electricity Markets (Ofgem) • Office of Rail Regulation (ORR) • Postal Services Commission (Postcomm) • Office of Communications (Ofcom) • Water Industry Commission for Scotland • The Utility Regulator • Civil Aviation Authority (CAA) • Competition and Markets Authority (CMA) The CMA attends the regular meetings in recognition of the importance of the interplay between sectoral regulation and general competition policy and because many of the regulators have concurrent powers under the Competition Act 1998.
K		
KEA		The horizontal en route flight efficiency of the actual aircraft trajectory flown. This is the EU framework's only environmental KPI for RP3.
KEP		The horizontal en route flight efficiency of the last filed flight plan.
KPI	Key Performance Indicator	A Key Performance Indicator is a measurable value that demonstrates how effectively a company is achieving key business objectives.

L		
	Legacy Systems	A legacy system is an old method, technology, computer system, or application program, "of, relating to, or being a previous or outdated computer system," yet still in use. Often referencing a system as "legacy" means that it paved the way for the standards that would follow it. This can also imply that the system is out of date or in need of replacement.
	London Approach	Radar approach services for the six airports inside the London TMA in order to maximise the capacity and efficiency of the busy Terminal Manoeuvring Area (which is amongst the most complex airspace in the world) as well as the interfaces with the London airports and the wider en route network.
LACC	London Area Control Centre	London Area Control Centre (LACC), manages en route traffic in the London Flight Information Region. This includes en route airspace over England and Wales up to the Scottish border. This is sometimes referred to as just AC = Area Control.
LAIMM	London Area In Manual Mode	LAIMM is a fallback mode for LAC which is entered into as a consequence of certain failure events, e.g. NAS failure, when some automation features become unavailable for controllers.
LAMP	London Airspace Management Programme	NERL programme to re-organise the operation of airspace around London airports to improve capacity, safety and environmental performance. The Future Airspace Strategy Implementation (South) (FASI(S)) is the overall combined effort of Industry to achieve a once-in-a-generation change to the legacy air traffic route structures in the southern part of the UK. LAMP is NERL's part in this – concerning air traffic structures at and above 7,000ft.
LM	Lockheed Martin	US aerospace and defence contractor and the prime contractor for the original NERC system. That LM business has transferred to Leidos in the UK who remain one of a number of suppliers who continue to provide systems support to the LAC system under a single team managed by NERL.
LTCC	London Terminal Control Centre	London Terminal Control Centre (LTCC), which handles traffic below 24,500 feet flying to or from London's airports. This area, one of the busiest in Europe, extends south and east towards the coast, west towards Bristol and north to near Birmingham. This is sometimes referred to as just TC = Terminal Control or LTC = London Terminal Control.
LTIP	Long Term Investment Programme	The LTIP is the name given to NATS capital investment plan which forms the underpinning for the Service and Investment Plan.

LTMA (Airports)	London Terminal Manoeuvring Area	London Terminal Manoeuvring Area (LTMA), which is one of the busiest and most complex pieces of airspace in the world. It covers the following Airports - Heathrow, Gatwick, Stansted, Luton, London City and (for RP3) Biggin Hill.
M		
MATS	Manual of Air Traffic Services	The Manual of Air Traffic Services contains procedures, instructions and information, which are intended to form the basis of ATS within the UK. It is published for use by civil Air Traffic Controllers and may also be of general interest to others associated with civil aviation.
MET	The MET Office/MET Data	The MET Office - (officially the Meteorological Office until 2000) this is the United Kingdom's national weather service. MET is also the generic term used for MET Data which is data relating to weather.
	Mercer	NERL's actuarial advisors.
MDI	Minimum Departure Interval	A minimum time interval that is required between successive departures on the same Standard Instrument Departure from a runway.
MOD	Ministry of Defence	
MOPs	Method of Operations	Method used by ATC to control aircraft.
MOR	Mandatory Occurrence Report	The objective of the MOR Scheme is to contribute to the improvement of flight safety by ensuring that relevant information on safety is reported, collected, stored, protected and disseminated. The sole objective of occurrence reporting is the prevention of accidents and incidents and not to attribute blame or liability. The MOR scheme is fully described in CAP 382 - The Mandatory Occurrence Reporting Scheme. This document collates the relevant rules and regulations and provides guidance on occurrence reporting, including examples of what should be reported and by whom.
MSA	Master Services Agreement	A form of intercompany trading between NERL and NSL for shared back office functions.
MTCD	Medium Term Conflict Detection	Software algorithms that compare the predicted future trajectories of multiple aircraft in order to identify potential conflicts.
N		

NAS	National Airspace System	Civil Flight Data Processing system operating centrally for the whole of the UK.
NATPG	North Atlantic Policy Group	The CAA is the UK's member of the ICAO North Atlantic Policy Group (NATPG) representing UK interests.
NATS	National Holdings Limited or NATS Group	NATS Holdings Limited, commonly referred to as NATS, is the holding company of the group of companies that provide air navigation service in the United Kingdom. NATS is a public private partnership between the Airline Group, which holds 42%, NATS staff who hold 5%, UK airport operator LHR Airports Limited with 4%, and the government which holds 49%, and a golden share. It includes NERL (economically regulated business) and NSL (commercial business).
	Nav Canada	Canadian state ANSP.
NERA	NERA Economic Consulting.	NERA Economic Consulting – advisors to NERL for the CAA's RP3 process
NERC	New En-Route Centre	The project name for the London Area Control computer systems.
NERL	NATS (En Route) plc	NERL (formerly NATS (En Route) Limited) is the sole provider of air traffic control services for aircraft flying 'en route' in UK airspace and the eastern part of the North Atlantic. It is economically regulated by the Civil Aviation Authority (CAA) within the regulatory framework of the European Commission's (EC) Single European Sky (SES) and operates under licence from the Secretary of State for Transport.
NLMCC	NATS Licence Management Coordination Committee	The CAA's NERL Licence Management Coordination Committee.
NM	Network Manager	SES Network Manager - Function provided by the Eurocontrol Network Manager Directorate (NMD) as described in the Network Manager Implementing Rule of the European Commission.
NMOC	Network Manager Operations Centre	The NMOC is the primary operational capability of the Network Manager and delivers core operational services including flow and capacity management and flight planning operations.
NOP	Network Operations Plan	The European Network Operations Plan (NOP) 2019-2024 (approved by the Network Management Board) provides a short to medium-term outlook of how the ATM Network will operate, including expected performance at network and local level.

NOP	Network Operations Portal	The Network Operations Portal (NOP) is a collaboration application (owned by Eurocontrol), which enables operational stakeholders to interact and collaborate with the Network Manager Operations Centre (NMOC). The main purposes of the NOP Portal are: • To monitor the real-time status of traffic, airspace and air traffic flow and capacity management (ATFCM) measures; • To identify bottlenecks; • To optimise the use of available ATM capacity through collaborative planning of pan-European operations from the strategic to the tactical phases.
NPP	National Performance Plan	RP3 National Performance Plan.
NPV	Net Present Value	Net present value (NPV) is the difference between the present value of cash inflows and the present value of cash outflows over a period of time.
NSA	National Supervisory Authority	National Supervisory Authorities (NSAs) ensure the supervision of the regulatory framework in all Member States. They are responsible, in particular, for certifying and overseeing air navigation service providers as well as for the preparation of national performance plans of the Member States concerned. In the UK this is the CAA.
NSL	NATS (Services) Limited	NSL is a subsidiary of NATS Holdings Limited and provides air traffic control (ATC) and aviation related services. Its core business is UK Airports. NSL provides ATC to 13 of the UK's major airports under competitive contract. In addition, it provides engineering support and airport optimisation services to UK airport operators.
NTCA	Northern Terminal Control Airspace	NATS programme to re-organise the operation of airspace primarily around Manchester airport to improve capacity, safety and environmental performance.
O		
Ofcom	Office of Communications	

OFF	Opex Flexibility Fund	A fund of £42m over RP3, established to support NERL's costs that were unknown at the time of setting the performance plan and in relation to NERL's delivery of airspace modernisation. The OFF is part of NERL's cost base in the NPP.
Ofgem	Office of Gas and Electricity Markets	
Ofwat	Water Services Regulation Authority	
OPC	Oceanic Price Control	The CAA regulates NERL's Oceanic service – that covers air traffic services NERL provides to aircraft in the Shanwick area of Oceanic airspace over the North Atlantic – by a price control that is implemented through the NERL Licence.
opex	Operational Expenditure	Operating expenses are the costs a company incurs for running their day-to-day operations. These expenses must be ordinary and customary costs for the industry in which the company operates. Companies report opex on their income statements and can deduct opex from their taxes for the year in which the expenses were incurred.
OPNOT	Operational Notice	Notice to disseminate information which, although significant, does not warrant the issue of a Temporary Operating Instruction. OPNOTs may contain information and/or guidance relating to ATC procedures, but must not contain instructions. OPNOTs exist to provide short term operational information, on a limited distribution basis.
OS	Operations Supervisor	Key operational management role responsible for the provision of clear people leadership and direction of ATC operations to the Watch in the Operations Room ensuring a safe, efficient and effective service delivery.
P		
P3O		A Portfolio / Programme / Project Office. A P3O model provides a decision-enabling/delivery support structure for all change within an organization. This may be provided through a single permanent office which may exist under several different names, for example Portfolio Office, Centre of Excellence, Enterprise or Corporate Programme Office.

P50/P90		P50: Probability 50%. Most likely estimate (also called best estimate) which is likely to exceed the final outcome 50% of the time. P90: Probability 90%. High confidence estimate which is likely to exceed the final outcome 90% of the time.
PAM	Passenger Allocation Model	The National Air Passenger Allocation Model (NAPAM) forecasts passenger demand at 31 UK airports plus four competing overseas hubs. It forecasts how passengers might choose between the airports in reaction to their relative estimated attractiveness. In particular, in relation to European models, it assumes that passengers move to different airports when capacity is reached instead of other transport modes.
PBCS	Performance Based Communication and Surveillance	The Performance-Based Communication and Surveillance (PBCS) concept provides a framework for managing performance of the communication and surveillance aspects of air traffic management (ATM) with a purpose of ensuring that emerging technologies for communication and surveillance that are designed to support ATM operations are implemented and operated safely. On the 29th March 2018 PBCS was introduced into North Atlantic Operations – airlines should have complied with ICAO requirements by this date in order for reduced separation standards to be applied by NERL and NAV Canada – however, a transition period has been agreed to accommodate non-compliant aircraft as not all operators were able to meet the requirements on time.
PBN	Performance Based Navigation	The level of accuracy, safety and integrity that these satellite navigation systems must reach is set out in the international requirements for Performance-based Navigation (PBN). PBN is being used by NERL and airlines in place of the previous conventional navigation methods.
PC	Prestwick Centre	NERL control centre at Prestwick which provides ATC services for the Scottish FIR, part of the London FIR covering lower level airspace in the North of England and a large are of Oceanic airspace over the North Atlantic.
PCP	Pilot Common Project	Common Projects are a means of regulation that aims to ensure that the Air Traffic Management functionalities developed within the SESAR Research and Innovation are deployed in a timely, coordinated and synchronised way. The PCP is the first such common project.

PPP	Public Private Partnership	NATS is a public private partnership between the Airline Group, which holds 42%, NATS staff who hold 5%, UK airport operator Heathrow Airports Limited with 4%, and the Government which holds 49%, and a golden share.
	Pension Pass-Through	The Regulatory mechanism that allows for the costs of the DB pension scheme to be passed onto customers through NERL's prices. Increases in pension costs that are due to market conditions are allowable but increases that are due to higher than planned pensionable pay increases must be borne by the company.
PRB	Performance Review Board	Performance Review Body, the European Commission's advisor on performance and charging issues related to Single European Sky.
PwC	Price Waterhouse Cooper	PwC is a global network of firms specialising in assurance, tax, and consulting services. They are advisors to NERL.
	Project Guardian	This is a MoD project to replace the UK Air Defence system.
	Project Oberon	This was a formal investigation of NERL by the CAA under section 32 of the TA00, following a complaint from Ryanair about alleged unmet demand and discrimination.
	Project Palamon	This is an ongoing formal investigation of NERL by the CAA under section 32 of the TA00, following a complaint from Ryanair and Stansted Airport about alleged unmet demand and discrimination.
Q		
QA	Quality Assurance	Quality assurance (QA) is a system of checks designed to ensure that products are free of faults. A quality assurance system involves regular quality control inspections that test and monitor the quality, accuracy and fitness for purpose of the product, from the design stage through to manufacture
QWPM	Quality Work Package Manager	The QWPM is responsible for the routine delivery of quality services, for example: design and code inspections; test witnessing and concession and defect prevention process management.
R		
R&D	Research & Development	
RAB	Regulatory Asset Base	Regulatory Asset Base.

	Reg Dep'n	Regulatory Depreciation.
RBP	Revised Business Plan	This is the NERL Revised Business Plan.
RfR	Risk Free Rate	The risk-free rate is the theoretical rate of return on an investment with zero risk. As such, it is the benchmark to measure other investments that include an element of risk. Government bond yields are the most commonly used risk-free rates for assets.
RIIO-2	Revenue = Incentives + Innovation + Outputs	This is the name for Ofgem's next price controls for the network companies running the gas and electricity transmission and distribution networks.
RORE	Return on Regulated Equity	Return on regulated equity is calculated as historical cost profit before tax, less tax, divided by regulatory capital value (RCV) equity.
RP1, RP2	Reference Period 1, Reference Period 2	The Performance scheme of the SES is one of the key pillars of the Single European Sky aiming at achieving improved safety performance and efficiency. The Performance scheme is organised around fixed Reference Periods (RPs) before which performance targets are set both at EU-wide level and National/FAB level. The first reference period (RP1) runs for three years from 2012 to 2014. The second reference period (RP2) will be from 2015-2019
RP3	Reference Period 3	RP is Reference Period under SES regulation. This is the third Price Control, for period 2020 to 2024. Hence 2020 is year 1 and 2024 is year 5.
RP4	Reference Period 4	Reference Period 4 effective from 2025 to the end of 2029.
RPI	Retail Price Index	The retail prices index or retail price index (RPI) is a measure of inflation published monthly by the Office for National Statistics. It measures the change in the cost of a representative sample of retail goods and services.
RPS	Regulatory Policy Statement	This is a policy statement by the CAA in relation to aspects of economic regulation of NERL, in particular its approach to Defined Benefit pension costs.
S		
SARG	Safety and Airspace Regulation Group	Safety and Airspace Regulation Group is a sub-sector of the CAA, which works to make sure that civil aviation standards are set and achieved in the UK.

SDM	SESAR Deployment Manager	The SESAR Deployment Manager (SDM) is the body that synchronises and coordinates the modernisation of Europe's air traffic management system under the political oversight of the European Commission.
	Sector	To manage the airspace in a FIR, the ANSP – will divide it into 'Sectors'. These Sectors are like 3D jigsaw puzzle pieces with differing heights and sizes that interlock to cover the sky.
	Shanwick OACC	Shanwick Oceanic Area Control Centre is the air traffic control (ATC) name given to the area of international airspace which lies above the northeast part of the Atlantic Ocean. The Shanwick Oceanic Control Area abuts Reykjavik Oceanic Control Area to the north, Gander Oceanic Control Area to the west and Santa Maria Oceanic Control Area to the south. Shanwick also has eastern boundaries with the Scottish, Shannon, London, Brest and Madrid domestic flight information regions.
SES	Single European Sky	Single European Sky - is an initiative launched by the European Commission in 2004 to reform the architecture of European air traffic management. It uses a legislative approach to drive ambition and initiatives to meet future capacity and safety needs at a European rather than a local level.
SES Regulation	Single European Sky Regulation	The SES regulations imposed performance targets on EU air traffic control operators, and provided the context against which the CAA set its price control for NERL.
SESAR	Single European Sky ATM Research	SESAR (Single European Sky ATM Research) is the technological pillar of the Single European Sky. It aims to improve Air Traffic Management (ATM) performance by modernising and harmonising ATM systems through the definition, development, validation and deployment of innovative technological and operational solutions. These innovative solutions constitute what is known as the SESAR concept of operations.
SFS	System Flight Server	Software that stores and distributes the next 4 hours of flight data in Swanwick Area Control and records which sector is being operated from which workstation
	Silver Team	SILVER is the operational command level during an incident. It comprises senior managers at individual sites and manages the response to an incident within the Site

SIP	Service and Investment Plan	NERL's Service and Investment Plan - NERL is required by Condition 10 of our licence to submit to the CAA each year a Service and Investment Plan (SIP). The purpose of the Plan is to provide an annual update of NERL's investment plans and to show whether there have been material changes to those plans.
SMS	Safety Management System	A SMS is an organised approach to managing safety, including the necessary organisational structures, accountabilities, policies and procedures. Additionally it focuses on ensuring that safety management is integrated into the day to day activities of the organisation with an organisational culture that reflects the safety policy and objectives. At the core of the SMS is a formal Risk Management process that identifies hazards and assesses and mitigates risk.
SSP	State Safety Programme	UK's State Safety Programme is run by the CAA and aims to maintain and enhance safety and protection in the UK.
STAR	Safety Tracking and Reporting (system)	The Safety Tracking and Reporting (STAR) system is a single, authoritative NATS-wide safety data tracking and reporting system. It enables timely and accurate passage of safety data across NATS, and a completely electronic safety investigation process including an audit trail.
STATFOR	Statistics and Forecasts	A team within Eurocontrol that provides statistics and forecasting services. Its objective is to monitor and analyse the evolution of the Air Transport Industry in Europe.
	Steer/Helios	Producers of a Cost Efficiency report for the CAA (consultants) for the RP3 process.
T		
TA	Transition Altitude	The Transition Altitude is a published height above sea-level at which pilots change their basis of measurement from a regional pressure setting to a standard international setting.
TA00	Transport Act 2000	The Transport Act 2000 is an Act of the Parliament of the United Kingdom. It provided for a number of measures regarding transport in Great Britain. The Act laid down the framework for the creation of a public-private partnership (effectively privatisation) of National Air Traffic Services.
TANS	Terminal Air Navigation Services	Terminal air navigation services (TANS) are the air traffic management (ATM) services at an airport and are traditionally provided by air navigation service providers (ANSPs).
TC	Terminal Control	Part of the Swanwick ACC that deals with the part of en route airspace that sits above all the London airports

TBS	Time Based Separation	TBS, where landing aircraft are separated by time rather than distance over the ground, was introduced by NERL at Heathrow in March 2015 and has greatly reduced arrival delays at the airport. Enhanced TBS (ETBS), introduced in March 2018, has provided additional runway resilience by utilising the European Wake Vortex Re-categorisation programme (RECAT EU), a new, more optimised categorisation of wake vortex separation developed by Eurocontrol, and also includes aircraft separated to the runway threshold rather than separation to 4DME (4 nautical miles) on final approach.
TDL	Tactical Data Line	Simple display of data for an aircraft providing the controller with key tactical information.
TEI	Temporary Engineering Instruction	TEIs are formal instructions raised for an operational asset or process, e.g. as given in a System File or System Management Manual, where it is necessary to: • Temporarily supplement the standard operating instructions • Temporarily vary the standard operating instructions • Temporarily add a new instruction in lieu of a formal procedure
TMA	Terminal Manoeuvring Area	A TMA in Europe is an aviation term to describe a designated area of controlled airspace surrounding a major airport where there is a high volume of traffic. The London TMA is one of the busiest and most complex in the world.
TMR	Total Market Return	Total return, when measuring performance, is the actual rate of return of an investment or a pool of investments over a given evaluation period. Total return includes interest, capital gains, dividends and distributions realized over a given period of time.
TP	Trajectory Prediction	Software algorithms that predict the future position of aircraft over time based on their filed plan and clearances and taking into account a range of factors including aircraft performance, and weather conditions (wind).

	Transport Bill	The government has introduced the Air Traffic Management and Unmanned Aircraft Bill to modernise airspace and tackle illegal use of unmanned aircraft. The bill will grant the Transport Secretary new powers to ensure that airports modernise their airspace, and fine those that don't implement changes quickly enough. The bill will also hand police powers to tackle the unlawful use of unmanned aircraft. This includes giving police the ability to require a person to land an unmanned aircraft, issue fixed penalty notices for certain offences and introduce new stop and search powers where particular offences involving an unmanned aircraft have been committed.
TSU	Total Service Units	Total Service Units – includes military and exempt flights. The performance regulation requires DUCs to be expressed using TSUs.
TVRS	Traffic Volume Risk Sharing	The Regulatory mechanism that allows NERL to change its prices if traffic levels deviate from the planned forecast in a material way. The first 2% variation is borne by NERL, the next 8% is shared with customers 30:70, any remainder is borne by Airline Customers.
U		
UAV	Unmanned Aerial Vehicles & Drones	
UIR	Upper Information Regions	Upper Information Region – the upper section of an FIR that has been split vertically.
UKRN	UK Regulators Network	The UK Regulators Network is an association of 11 regulators from the United Kingdom's utility, financial and transport sectors.
UTC	Universal Time Coordinated	UTC, or Greenwich Mean Time, is the primary civil time standard by which the world regulates clocks and time and which is used throughout ATM
UTM	Unmanned aircraft system Traffic Management	Low-Altitude airspace that will enable Unmanned Aircraft System Operations.
V		
Vanilla WACC		WACC, using pre-tax cost of debt and a post-tax cost of equity

VFR	Visual Flight Rules	Visual flight rules - apply to flying in certain meteorological conditions and when the pilot has visual reference to the ground.
W, X, Y, Z		
WACC	Weighted Average Cost of Capital	Weighted Average Cost of Capital.
ZRR	Zero Rate Regulation	Regulations are methods of matching traffic demand to available capacity by limiting the number of flights planned to enter an airspace or aerodrome, achieved by the issuing of departure slots. A Zero Rate Regulation which sets this limit for regulated traffic to zero are applied in circumstances e.g. of system failure when ANSPs need to severely constrain traffic in order to ensure safety.

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