

NR23 price control review: support on cost assessment for NR23 period and reconciliation review (2020-2022)



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- A Summary of operating cost efficiency ranges for total costs on a cash pension cost basis**

Executive Summary

Overview

The Civil Aviation Authority (CAA) is assessing NATS (En Route) plc's (NERL's) operating¹ and capital expenditure over 2020-22 to inform its Reconciliation Review and NERL's operating and capital expenditure projections in preparation for the next price control period "NR23", beginning on 1 January 2023 and running for five years to the end of 2027. This assessment will inform the CAA's Initial Proposals.

The NERL business plan (BP) development process has involved engagement between NERL, its airline customers and other stakeholders over summer and autumn 2021, followed by the submission of a NR23 Building Block Update (BBU) to the CAA in December 2021. NERL submitted its NR23 business plan in February 2022, which also included evidence in relation to the Reconciliation Review.

Steer has been supporting the CAA as part of the NR23 cost assessment, including by attending some of the Customer Consultation Working Group (CCWG) sessions in autumn 2021 and producing a summary note of the CCWG process; reviewing the BBU; and reviewing the Reconciliation Review evidence and NR23 BP. Steer's work was largely undertaken during the first half of 2022.

The aim of this report is to provide an independent view on:

- the efficiency of NERL's costs over the 2020-22 reconciliation period, taking into account the significant uncertainties surrounding NERL's decisions at the time; and
- a reasonable, efficient range of cost estimates for NR23.

In summary, NERL took a number of actions during the reconciliation review period (2020-2022) resulting in a reduction in operating costs over the period of -13.5% (or -£234 million)² relative to the CMA determination for RP3 across staff, cash pensions, non-staff and exceptional costs. Given the information available to NERL at the time, we have identified potential further savings of -£5.5 to -£12.2 million. Following assessment by the CAA, these potential savings could form the basis of a cost disallowance by the CAA for the reconciliation period. Capital expenditure was also reduced during the 2020-2022 period by -£231 million or -44% relative to the CMA determination for RP3³. Steer did not find the basis for any potential capital expenditure savings, as projects are part way through implementation and will need further review once complete.

In its NR23 BP, NERL's operating costs are forecast to be £2,614 million over the period, while its capital expenditure forecast is £574 million. Based on the analysis undertaken, we propose an overall operating cost efficiency range of between -0.7% and -2.7% relative to the NERL's NR23 BP (equivalent to between -£20 million and -£70 million over NR23), before CAA CMG Fees are reallocated from the NERL cost base. We also propose an overall capital expenditure adjustment of -2.8% (equivalent to -£16 million) related to the risk and contingency allowance

¹ Operating costs exclude defined benefit pension costs and capital costs (e.g. depreciation).

² Source: NERL response to CAA's request for information relating to the reconciliation review for NR23 (CAP 2291).

³ Idem.

in the plan. Following assessment by the CAA these could form the basis of cost efficiency differences to the NERL BP identified for NR23.

One of the key drivers of cost in the BP is the approach taken by NERL for the implementation of the new Common Platform⁴ and the decommissioning of legacy systems (“legacy escape”). As part of our review, we have proposed an alternative scenario that reprioritises investments (for the same total capital expenditure over NR23) and provides a different path towards legacy escape which could result in operating cost savings of -0.8% (or -£20 million). This is presented separately from the efficiencies identified above, as the technical viability of this approach would have to be further investigated by NERL if airline stakeholders, NERL and the CAA agree to pursue it.

Methodology

To come to our independent view on the efficiency of costs, we collected a range of evidence and data, using a structured process, and undertook analysis. This evidence was augmented by stakeholder meetings and workshops to gather opinions and evidence on the key issues arising from the NERL BP forecasts for operating and capital costs.

We analysed information provided by NERL, asking follow-up questions where we perceived that further detail could be provided, or where the information was unclear. We worked to reconcile data from different sources (e.g. from the Service and Investment Plan (SIP) and Technical Customers' Advisory Board (TCAB) processes and the BP).

There were four key types of analysis carried out.

- Review of NERL historical data since 2015, examining trends, including unit costs, productivity and relationships between NERL cost and traffic growth and other key drivers;
- Benchmarking analysis to other Air Navigation Service Providers (ANSPs), other comparable companies in the UK aviation sector, and the general economy;
- The development of a ‘shadow operating cost model’, to help fully understand the drivers of NERL’s NR23 BP operating cost projections and to estimate the impact of alternative assumptions; and
- Analysis of the capital programme, using NERL’s pre-pandemic plans as a starting point, benchmarking to other ANSPs, and considering the drivers of the capital programme including SESAR and the ATM Master Plan.

We undertook all our analysis in real 2020 terms and applied the base case traffic forecast provided by NERL in its NR23 BP, based on the October 2021 STATFOR base case. As part of our review, NERL’s costs are often compared throughout this document to equivalent costs in previous periods or plans.

- For the reconciliation review, we use three reference points, comparing what actually happened over the 2020-2022 period to i) actual costs in 2019; ii) the CMA determination for RP3; and iii) the NERL RP3 revised plan. Each of these reference points represents a

⁴ The Common Platform is the deployment of NERL’s target collaboration common version of the current iTEC across upper and lower airspace on one architecture, utilising the iTEC Flight Data Processor (FDP), it will enable capabilities, such as trajectory based operations, that have been developed through SESAR to date. It will also enable a high degree of interoperability with European partners for future enhancements.

valid comparison and provides relevant insights in different ways. Comparison to 2019 shows how costs evolved from the last year of actual costs before the COVID-19 crisis (and facilitates a comparison to cost and actions taken by other benchmark organisations). Comparison to the CMA determination and NERL revised RP3 plan shows the extent to which NERL adapted relative to its plans.

- For the NR23 BP review, we use four key reference points, comparing NERL’s planned costs over the 2023-2027 period to i) actual costs in 2019; ii) average costs across RP2 (2015-2019); iii) costs in 2022; and iv) costs over the 2020-2022 period. As above, each of these reference points represents a valid comparison and provides relevant insights in different ways. Comparison to 2019 shows how planned costs relate to the last year actual costs before the COVID-19 crisis. Comparison to average costs across RP2 shows how planned costs across NR23 relate to costs across the last full 5-year reference period. Comparison to costs in 2022 and over the 2020-2022 period shows how costs are planned to evolve from the last year before NR23, the last year of actual costs available at the time of this review (2021⁵), and costs on average across the reconciliation period, capturing the impact of the forecast recovery in traffic and its impact on planned costs.

In general, we sought to identify where the BP did not appear to provide a supporting narrative for NERL’s cost submissions. Where possible, we developed our own approach and assumptions to provide an independent view, for example in relation to projections of staff numbers. A key tool in assessing the BP narrative and developing our own assumptions was the “shadow operating cost model” which was developed by Steer and calibrated against the NERL BP. Where our assessment differs from the narrative provided by NERL, we identified a range of potential differences to operating cost lines and specific capital programmes, making transparent the basis of these differences by explaining our assumptions. These form the basis of our estimated ranges for cost efficiency contained in the tables at the end of this section.

Stakeholder views

After receiving the BBU and NERL NR23 BP, we ran workshops with airline stakeholders, with representatives of NERL and its Staff Trade Unions attending as observers, to discuss and identify key issues for investigation. Common issues raised by stakeholders included:

- **Reconciliation review:** concern that some of the actions on cost reduction did not go far enough compared to industry peers and the redundancy programme was very costly, requiring a long payback period. Trade Unions observe that the implementation of the voluntary redundancy (VR) scheme has impacted both day-to-day support in operations and the capacity to deliver change.
- **NR 23 Staff costs:** stakeholders want to ensure there are enough ATCOs to cope with the traffic levels in the recovery period, recognising the continued uncertainty surrounding traffic forecasts – so some airlines wanted to err on the side of overprovision. Trade Unions observe that this needs to be supported by sufficient training capacity and improved pass rates. Some airlines remain concerned about pensions costs, suggesting that a different, less generous, defined contribution scheme for new joiners should be considered. Trade Unions pointed out that the background to the existing DC scheme as an alternative to the DB scheme, as well as the level of equity in the organisation ought to be borne in mind.

⁵ Full-year costs for 2021 are based on actual costs over January to September, and estimates for October to December.

- **NR23 Legacy escape:** stakeholders do not fully understand the strategy leading to significantly higher sustainment capital costs and asset management operating costs and delay in the delivery of the capital programme and benefits for DP En-route/Common Platform. Airlines consider that insufficient information and explanation has been provided for the approach proposed by NERL and are concerned about the capability to implement legacy escape to the original timeframe being impacted by redundancy of engineers and capital project contractors.
- **NR23 Cyber costs:** stakeholders generally support increased cyber-security costs, but welcome clarity around any transfer in costs in relation to the shift towards the use of software as a service.
- **NR23 Capital expenditure programme:** airlines support a programme of expenditure of the approximate size proposed, and specific parts of the programme especially e.g. airspace change, but do not see that the benefits and consequences of the programme in total have been demonstrated (both in terms of benefits in terms of cost efficiency and/or quality of service to NERL and other industry participants). The interaction between capital expenditure and any operating cost savings has not been explained clearly by NERL.
- **NR23 2+5 approach:** airlines expressed some concern about how this will work in the context of the five-yearly price control, and wanted further clarification from the CAA as to how it would work in practice (given existing SIP and TCAB processes).
- **NR23 Options to cope with uncertainty:** stakeholders view that greater consideration should have been given to options to cope with different traffic profiles, and alternatives around acceleration of iTEC implementation (leading to sustainment capital cost reductions and operating cost savings). Within the chosen plan it is not always clear why specific options have been chosen and what their relative benefits are compared to other potential options.

Reconciliation Review (2020-2022): NERL actions and cost savings

Like most UK airports and airlines, NERL took a range of actions to reduce staff numbers and overall costs in response to the impacts of COVID-19 on passenger demand, revenue and consequent challenges to financial liquidity. The impact of NERL actions on annual costs over the reconciliation period are summarised in Table 1.

The most significant cost savings came from NERL's actions to reduce staff costs. While net cost savings in 2020 were minimal due to the costs incurred in relation to the voluntary redundancy programme, significant cost savings in 2021 and 2022 were reported by NERL, as a result of staff number reductions (some 450 fewer FTEs than 2019 in 2021 and 402 fewer in 2022), leading to staff costs in 2021 being some £43 million or 12% less than in 2019. Like other UK airports and airlines, NERL also accessed the UK Government's Coronavirus Job Retention Scheme, implemented recruitment and bonus freezes, and voluntary pay cuts.

NERL also took a range of actions on non-staff costs. Non-staff cost savings were made across the reconciliation period (2020-2022) and amounted to £22m in 2021 or 17% less than compared to 2019. The level of savings for non-staff costs achieved by NERL was towards the top quartile of European ANSPs in percentage reduction over 2019 cost levels.

Table 1: Changes in costs over Reconciliation 2020-2022 period (real 2020 values)

	2019 (Actual)	2020 (Actual)	2021 (Actual)	2022 (Forecast)	2020 vs 2019 %	2021 vs 2019 %	2022 vs 2019 %
Staff costs (incl. pensions and redundancy, less capitalised labour)	364	413	321	338	13.7%	(11.8%)	(7.1%)
Non-staff costs	151	134	129	161	(11.2%)	(14.3%)	7.1%
Exceptional costs	2	(6)	(22)	1	(357%)	(1,030%)	(65.2%)
Total costs *	516	541	428	500	4.8%	(17.1%)	(3.2%)
Unit cost per Service Unit**	41	106	79	47	158.6%	93.4%	14.7%
Total staff numbers	3,477	3,488	3,026	3,085	+0.3%	-13.0%	-11.3%
Capital expenditure	157	78	105	123	(50.1%)	(32.9%)	(21.6%)

Source: NERL BP, Opex template, Steer analysis

* Total costs include pensions on a P&L basis, which are not charged through the price control (because cash pensions are used instead), so these costs do not directly correspond to prices.

** Total costs per en-route service unit shown to illustrate the broad relationship of costs and traffic (these values do not include other unit rate adjustments (inflation, traffic risk sharing etc.) and do not correspond to prices).

NERL also took actions on capital costs and achieved significant reductions in capex spend in 2020 and 2021. Spend is expected to return closer to 2019 (and to historic averages) in 2022. These actions were necessary to address financial liquidity concerns and included decisions by NERL to significantly reduce, halt and postpone parts of its capital programme in 2020 and 2021. These actions were within the range of approaches taken by European ANSPs. The choice of strategy had the following impacts:

- Delivered an overall capex cost saving over the reconciliation period of -44% (-£231 million) compared to the CMA determination.
- A shift in the planned date of legacy escape, from the originally foreseen 2023-2024 to mid-NR28 (2029-2030). Dual running of legacy and new iTEC systems leading to higher asset management operating costs throughout most of NR23.
- A change in the approach to sustainment-related investments, partially driven by the shift in legacy escape, but also by the revised overall sustainment strategy and the application of a risk-based approach, compared to the “fix on fail” approach adopted during the 2020-2022 period.
- The reduced capacity of the organisation to carry out change and implement new developments, leading to a reduced capital programme. This consequence is carried over to NR23 as one of the basic assumptions by NERL underpinning the capital programme.

Overview of potential adjustments and cost efficiencies

Reconciliation review

Based on the analysis undertaken, we summarise in Table 2 alternative actions for the NERL reconciliation period (2020-2022) based on our assessment of actions that could have been taken based on information available at the time and without the benefit of hindsight. Following assessment by the CAA these could form the basis of a cost disallowance by the CAA for the reconciliation period.

Table 2: Overview of alternative actions for the reconciliation period 2020-2022 (£m 2020 prices)

Item	NERL actions	Steer observations	Steer alternative suggestion	Range Low £m change to NERL 2020- 2022	Range High £m change to NERL 2020- 2022
Operating costs					
Voluntary salary reductions during the pandemic	Management grades were asked to take a 10% voluntary pay cut for three months. Of these, 50% agreed to the reduction.	Voluntary salary reductions in many other organisations were requested of both operational and management staff, especially if the individuals were on furlough reduced activity working, etc.	All other grades asked to take a 10% voluntary pay cut for three months. Assuming 50% agree to a pay cut of this scale, the savings in 2020 would have been approximately £2.5 million. No difference in assumption between low and high cases.	(£2.5m)	(£2.5m)
Costs of the redundancy programme	NERL implemented a voluntary redundancy scheme. NERL identified costs of £61 million relating to the Scheme (£185k per leaver on average), recognising a 21-month payback period. This was based on the redundancy arrangements that had been	Many organisations across the UK aviation sector brought forward exceptional redundancy arrangements in the context of the pandemic. Therefore, if possible, we consider that NERL could have sought to negotiate a change to the VR scheme terms in	The impact of providing 12 months rather than 21 months of staff costs on average would have saved approximately £26 million. However, NERL has argued that it was bound by the terms of its Redeployment & Redundancy Agreement (RRA) with staff. Notice to terminate this (12 months) was served in May 2020 to avoid any future redundancy programmes being bound by the same terms, but in the meantime – given	(£3m)	(£9m)

Item	NERL actions	Steer observations	Steer alternative suggestion	Range Low £m change to NERL 2020- 2022	Range High £m change to NERL 2020- 2022
	<p>negotiated with Trade Unions before the pandemic.</p>	<p>2020 under these exceptional circumstances.</p>	<p>the pressure to restructure costs – NERL went ahead with the VR programme under the existing terms after securing new bank facilities in August 2020.</p> <p>Steer estimates the impact of the VR programme being implemented in Q4 2020 with a 21-month payback to be equivalent to that of a programme that might have been implemented under new terms with a 12-month payback, following adoption of a new RRA in May/June 2021 and a subsequent consultation period of c.2 months. However, there could have been a 1 to 3 month benefit in terms of cost, had a VR programme been implemented promptly in May 2021, the earliest time that a new RRA could have been adopted. This assumes a timely new RRA, a parallel consultation period in the run-up to it being adopted and the same take-up by staff.</p> <p>We present the cost if the renegotiated VR programme with a 12-month payback period had been implemented from May 2021. It is for the CAA to take a view on whether an even earlier implementation of a renegotiated VR scheme in 2020 could have been achieved in practice.</p>		

Item	NERL actions	Steer observations	Steer alternative suggestion	Range Low £m change to NERL 2020- 2022	Range High £m change to NERL 2020- 2022
UTM development costs	NERL assumes that a package of measures is funded through the NR23 cost base to maintain a level of safety-related activity that (a) upholds the safety of the UK Flight Information Region (FIR) for commercial aviation as the range and volume of new airspace users increases, and (b) ensures that services (both in controlled and uncontrolled airspace) are fit for purpose and support safe integration.	The activities covered by these costs are generally driven by new airspace users and include activities like managing the safety risk and operational impact on conventional aircraft from the range of new airspace users. The inclusion of these costs in the cost base is not in line with the “user pays” principle.	The costs during the reconciliation period are small, however the approach taken towards them by the CAA ought to be consistent with that adopted for NR23 (see Table 6). For the reconciliation period: <ul style="list-style-type: none"> The low range estimate allows NERL to incur some costs to manage the operational impact of new airspace users on conventional airspace users, during the reconciliation period (i.e. the costs incurred over 2020-2022 are not disallowed). For the high range estimate, we assume that none of the UTM development costs put forward by NERL in its Business Plan satisfy the user pays principle and are disallowed, resulting in a saving of £0.7 million during the reconciliation period. 	Zero	(£0.7m)
Cumulative range low operating cost disallowance (2020-2022)				(£5.5m)	
Cumulative range high operating cost disallowance (2020-2022)					(£12.2m)
Capital expenditure					
Capital programme for 2020-2022	NERL has taken the following actions: <ul style="list-style-type: none"> Pausing the capital programme (apart from essential services and sustainment) for six months in 2020; Releasing 149 contractors; 	NERL’s chosen strategy had implications for: <ul style="list-style-type: none"> Speed of implementing legacy escape 2029/30 vs 2023/24. Capability of NERL to deliver a certain size of capital programme for NR 23. Impacted the approach to sustainment capital programme and asset management operating costs. <p>European ANSPs’ approaches to handling COVID-19 impacts broadly fall into three groups:</p>		We recommend that the CAA reviews the efficiency of NERL’s capex covering the 2020-2022 period as part of its review of capex in NR23, and when projects are complete.	

Item	NERL actions	Steer observations	Steer alternative suggestion	Range Low £m change to NERL 2020- 2022	Range High £m change to NERL 2020- 2022
	<ul style="list-style-type: none"> • Voluntary redundancy of 200 technical staff; • Moving to a “fix on fail” approach in the sustainment of the systems; and • Capital spend in 2021 was also significantly reduced compared to plan. 	<ul style="list-style-type: none"> • Most ANSPs decided to temporarily pause or postpone their major projects, as a consequence of the COVID-19 related restrictions hindering work in simulation facilities (due to social distancing requirements) (‘Stop-and-go’ strategy). • A handful of ANSPs focused their reactions on scaling their businesses down as much as possible, in order to respond to the drop in traffic demand, and to provide at least some cost efficiency benefits to their customers (most notable example is LPS Slovakia). These ANSPs tried to reshape and re-plan their operations, including investments and airspace redesign projects as well (‘Scale down’ strategy). • Some ANSPs (MUAC, HCAA, ROMATSA, LFV, etc.) undertook to carry on with their investment programmes, and even considered speeding them up, as otherwise scarce ATCO resources became available in times of the traffic downturn (‘Fly forward’ strategy). <p>The actions and decisions taken by NERL during the reconciliation period fall within the ‘Scale down’ strategy group. The approach taken is within the range of actions taken by other ANSPs and as a result is seen as reasonable and proportionate. Based on experience with other European ANSPs, it must be highlighted, that the level of engagement with customers, the level of detail offered and the overall quality of information provided to airspace users about the actions taken were of high quality (noting however that some room for improvement may nevertheless exist from the perspective of airlines).</p> <p>Based on the above, no alternative capex baseline is proposed for the 2020-2022 period.</p> <p>Under ordinary circumstances, the capital expenditure portfolio over 2020-2022 and its efficiency would be assessed against their impact on operational efficiency and service quality. We note here, that due to the global pandemic, and its effect on</p>			

Item	NERL actions	Steer observations	Steer alternative suggestion	Range Low £m change to NERL 2020- 2022	Range High £m change to NERL 2020- 2022
		<p>traffic volumes, the outcomes of the KPIs and service quality measurements are not representative of the actual impacts of the portfolio and cannot be compared to 2019 and before. The impact of the implemented capex programmes will have to be assessed once the traffic volumes recover and allow for a reasonable comparison with previous figures. Moreover, many of the projects are part complete, so it is too early to assess their impacts and efficiency.</p> <p>We recommend that the CAA reviews the efficiency of NERL's capex covering the 2020-2022 period as part of its review of capex in NR23, and when projects are complete.</p>			

Overview of NR23 business plan: NERL assumptions

Operating costs

Over the 2021 to 2027 period, staff costs and numbers are forecast to remain below 2019 levels even with staff growth over 2022-2027. Staff costs include wages, contractor costs, bonuses, pensions, social costs (national insurance contributions) and redundancy costs, and remains the most significant cost item, representing 74% of total operating expenditure in 2019 (and before labour is capitalised).

Non-staff costs include facilities management, non-operational IT, asset management and business support, and represent the remaining 26% of operating expenditure. By the end of 2027, non-staff costs are forecast to be significantly higher than 2019 levels, driven principally by higher asset management costs which are associated with the dual running of the legacy and new systems throughout NR23.

The table and figure below show NERL's planned operating costs for each main category over the period 2019-2027. In these BP forecasts, NERL has used the STATFOR October 2021 base case traffic forecast. In this forecast, service units exceed 2019 levels in 2025, while flights⁶ only exceed 2019 levels in 2026.

Table 3: Changes in operating costs over NR 23 period (real 2020 values)

	2019 (A)	2020 (A)	2021 (A)	2022 (F)	2023 (F)	2024 (F)	2025 (F)	2026 (F)	2027 (F)	2022 vs 2019 %	2027 vs 2019 %
Staff costs (incl. pensions and redundancy, less capitalised labour)	364	413	321	338	344	350	351	353	356	(7.1%)	(2.1%)
Non-staff costs	151	134	129	161	168	172	172	172	168	7.1%	11.5%
Exceptional costs	2	(6)	(22)	1	1	2	2	2	1	(65%)	(38%)
Total operating costs *	516	541	428	500	513	524	525	527	525	(3.2%)	1.7%
Unit cost per Service Unit **	41	106	79	47	44	43	42	42	41	14.7%	(0.4%)
Total staff numbers	3,477	3,488	3,026	3,085	3,214	3,288	3,323	3,356	3,372	(11.3%)	(3.0%)

Source: NERL BP, Opex template, Steer analysis

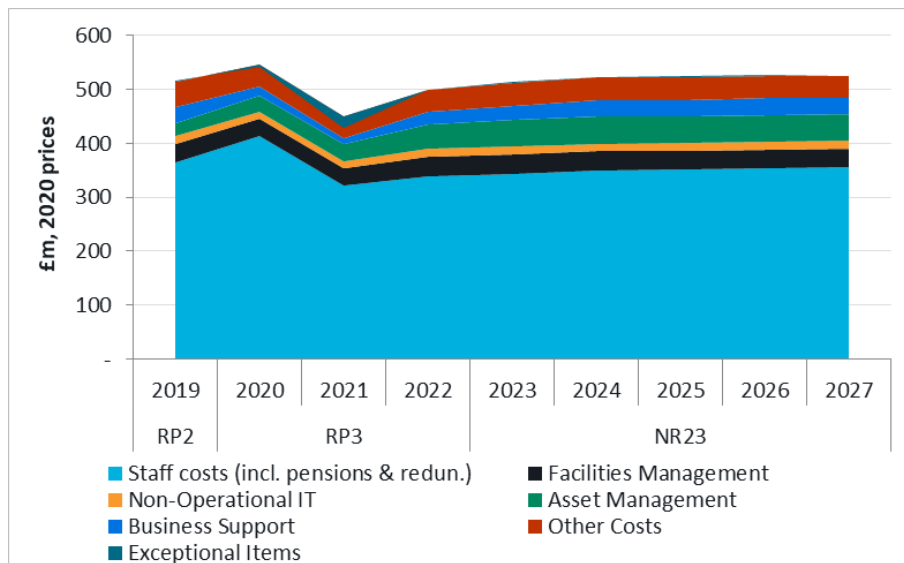
A = Actual, F = Forecast

* Total costs include pensions on a P&L basis, which are not charged through the price control (because cash pensions are used instead), so these costs do not directly correspond to prices.

** Total operating costs per en-route service unit shown to illustrate the broad relationship of costs and traffic (these values do not include other unit rate adjustments (inflation, traffic risk sharing etc.) and do not correspond to prices).

⁶ Instrument flight rule (IFR) movements

Figure 1: Staff, non-staff and total cost trends (real 2020 prices)



Source: Steer analysis of NERL BP

The key assumptions underpinning these trends are reviewed in Table 6 below where we suggest alternative assumptions to be tested in the estimated ranges.

Capital expenditure

NERL has three main objectives for its investment portfolio: Sustainment (which includes sustaining existing services; ensuring resilient ATM services); Airspace (which includes Delivering Increased Network Capacity, Enhanced Safety, Improved Environmental Performance & Reduced Fuel Burn for Customers); and Deploying SESAR (Replacing ageing infrastructure; and consolidating to a single platform, with improved tools and standardising operations).

The table below provides an overview of the planned capital expenditure over the NR23 period. The capital programme is largely driven by the headline programmes:

- Airspace and Ops enhancements;
- DP En-route & Voice and Common Platform; and
- Sustainment and Surveillance.

These programmes represent almost 78% of the total capex planned for NR23, although it is noted, that the Sustainment and Surveillance programme is more of a collection of smaller investment projects, rather than a single investment programme. The capital programme evolves over NR23 with long term programmes like the Common Platform carrying on into NR28. There is greater certainty in the first two years of the forecast as compared to the final three years as reflected in the timing of NERL’s risk & contingency provision.

Table 4: Overview of the NR23 capex portfolio (real 2020 prices)

CY, £m	2023 (F)	2024 (F)	2025 (F)	2026 (F)	2027 (F)	NR23 (F)
Airspace and operational enhancements	21	22	18	14	8	83
DP En Route and Voice	26	10	1	0	0	38

CY, £m	2023 (F)	2024 (F)	2025 (F)	2026 (F)	2027 (F)	NR23 (F)
Sustainment and surveillance	36	45	43	43	40	206
Common platform	18	17	29	23	34	120
Business resilience	16	11	9	7	9	54
Oceanic	6	7	6	3	1	23
ATC training	0	2	2	2	0	7
Risk & contingency	0	0	9	18	18	44
Total	123	114	117	110	110	574

Source: NERL NR23 business plan

F = Forecast

NR23 Operating cost efficiency ranges

Steer undertook both top-down and bottom-up analyses of the NERL NR23 BP, which were informed by the benchmark and historical analysis conducted by Steer and a detailed review of the drivers and assumptions of NERL’s NR23 BP operating cost projections. Taking these top down approaches, alongside our detailed bottom-up assumptions, provides the basis for the proposed cost efficiency range of between -0.7% and -2.7% relative to the NERL’s NR23 BP (equivalent to between -£19 million and -£71 million over NR23), before CAA Fees are excluded from the NERL cost base – see Table 5⁷. While the top-down analysis of salary levels provides the potential for greater cost savings, we consider different time periods over which this transition may take place. If the CAA considers a faster transition is possible then the range could be higher, up to 5.3% if a five year transition is assumed. Following assessment by the CAA these could form the basis of cost efficiency differences to the NERL BP identified for NR23.

Note that some potential further operating cost savings resulting from taking an alternative approach to legacy escape and facilitated by a restructured/reprioritised capital programme are presented in the next sections. These are presented separately as they would require NERL to adopt a different strategy over NR23, rather than exploring ways of realising efficiencies within its proposed plan.

Table 5: Overview of Steer top down analysis of potential efficiency savings relative to total costs in NERL’s NR23 BP (£m 2020 prices)

Item	Steer Analysis	Range Low % change to NERL 2023-2027	Range High % change to NERL 2023-2027
Staff cost, salary benchmarking	The results of our top-down staff cost benchmarking show that over the 2003 to 2019 period salary growth for all NERL staff has outperformed comparators for the Transport & Storage sector, which was -5.4% lower in 2019. Meanwhile, the review of individual roles identified differences between the upper quartile of the benchmarks and NERL in the range of -9% for MSGs to -34% for ATSAs. Applying these top-down assumptions as a step change from the start of NR23 would result in a saving of between -3.2% of total costs (in the case of a -5.4% reduction in all salaries) and -10.7% of total costs (in the case of reductions in the benchmarked roles of -21% for ATCOs, -34% for ATSAs, -24% for ATCEs and -9% for MSGs). We acknowledge that a step change in a single year would not be practical, so have considered a glide path to these benchmarks. Were such savings to be implemented gradually over a five-year period by the end of NR23, it would result in	(£18.8m) (0.7%)	(£64.5m) (2.5%)

⁷ See Appendix A for the equivalent results presented against NERL’s total costs on a cash pension cost basis.

Item	Steer Analysis	Range Low % change to NERL 2023-2027	Range High % change to NERL 2023-2027
	<p>total costs being between -1.6% and -5.4% lower. If it was to take longer, say a 10 year period, the range would be -0.7% to -2.5% lower.</p> <p>It would be for the CAA to consider the timing of any transition and broader implications of adopting cost savings towards the top end of this range, e.g. for industrial relations.</p>		
Total factor productivity improvements	Regulators over recent price controls in the aviation, energy and water sectors have applied a +1% p.a. assumed improvement in total factor productivity (TFP) ⁸ . Applying this level of improvement to NERL's NR23 cost base with the exception of Rates, Utilities (which are assumed to be costs outside the control of NERL) and Cyber Security costs (for which the planned growth is supported by airline stakeholders) would imply savings in total costs of around -2.7% over the NR23 period. A low case, assuming a +0.75% p.a. TFP improvement would lead to a -2.0% saving in total costs.	(£52.3m) (2.0%)	(£71.3m) (2.7%)
Historical unit cost trends	Over RP2, real unit operating costs per en-route service unit ⁹ reduced on average by -3.6% p.a. Applying these average unit cost reductions for 2026 and 2027, following the forecast recovery of service units to 2019 levels in 2025, results in a saving of -1.3% compared to the NR23 BP.	(£33.0m) (1.3%)	(£33.0m) (1.3%)
Top down range	<p>Note this range represents Steer's estimate of the savings from each of the individual top-down analyses. In principle the staff cost savings could be combined with the total factor productivity improvements but Steer has sought to avoid any potential for double counting. This could be reconsidered by the CAA.</p> <p>Steer has also applied the staff cost savings assuming a 10-year transition period, the CAA could consider a different time period is appropriate.</p>	(£18.8m) (0.7%)	(£71.3m) (2.7%)

⁸ see CAP2266A for H7 p.119.

⁹ Total costs include pensions on a P&L basis, which are not charged through the price control (because cash pensions are used instead), so these costs do not directly correspond to prices. Total costs per en-route service unit used to illustrate the broad relationship of costs and traffic (these values do not include other unit rate adjustments (inflation, traffic risk sharing etc.) and do not correspond to prices).

Item	Steer Analysis	Range Low % change to NERL 2023-2027	Range High % change to NERL 2023-2027
Bottom up range	See Table 6 for detailed assumptions (including CAA CMG fees in NERL cost base (i.e. the denominator), but disallowing them (i.e. removing them from the nominator))	(£37.5m) (1.4%)	(£55.8m) (2.1%)
Steer range	Top down and bottom up are used as alternatives to produce the range across all techniques. The bottom up range is within that of the top down approaches.	(£18.8m) (0.7%)	(£71.3m) (2.7%)
Steer range (excluding CAA CMG fees from NERL cost base)		(£13.6m) (0.5%)	(£66.1m) (2.5%)

Based on the analysis undertaken, we summarise in Table 6 alternative assumptions based on our assessment of the NERL BP assumptions and other supporting evidence provided by NERL, resulting in a range of bottom-up cost efficiencies for NR23, using the results from our ‘shadow operating cost model’ which has been calibrated to NERL’s BP¹⁰.

Table 6: Overview of alternative assumptions for NR23 for operating costs and resulting efficiency ranges (£m 2020 prices)

Item	NERL assumptions	Steer observations	Steer assumption	Range Low £m change to NERL 2023-2027	Range High £m change to NERL 2023-2027
Operating costs					
ATCO productivity	NERL assumes no improvements in ATCO productivity during NR23. NERL states that productivity gains could be generated by	Historically NERL has improved ATCO productivity on average 1.75% per annum over the 2009-2019 period, linked to	During traffic recovery it is recognised as difficult to achieve productivity improvements. Therefore after 2025 assume ability to achieve productivity linked to	(£15.2m) (0.6%)	(£22.4m) (0.9%)

¹⁰ See Appendix A for the equivalent results presented against NERL’s total costs on a cash pension cost basis.

Item	NERL assumptions	Steer observations	Steer assumption	Range Low £m change to NERL 2023-2027	Range High £m change to NERL 2023-2027
	improvements in controller tools and other technology, by increasing levels of controller skills and experience, by changes in airspace structures which reduce complexity, and by changes in the organisation and coordination of controllers with the available technology. None of these factors is likely to have a material positive impact on productivity in the NR23 period.	growth in traffic and improved processes and systems. The implementation of DPER in 2025 would be expected to deliver some productivity improvements, while the reduction in controller workload enabled by airspace changes could be shared between productivity improvements and improved service performance outcomes, particularly given the added resilience that is separately being built into the operational resourcing plan.	improved processes and capital programme. Taking into account the expected level of traffic growth and capital programme, an improvement range 1% per annum from 2025 (low) and 1.5% improvement from 2025 (high) is applied. This results in a need to train fewer TATCs in the early years of NR23 and reduces the ATCO headcount requirement in the final years of NR23.		
Salary increments for all staff	[Redacted – commercially sensitive]	[Redacted] salary increments often associated with productivity improvements. We remain in a recovery period for the industry in 2022-2024 at least. High inflation (2022 CPI estimate of 6% to 7% (March 2022)), calls into question the affordability of [redacted] pay awards over the next years.	Low range: [Redacted – commercially sensitive] High range: [Redacted – commercially sensitive] Leads to lower wage escalation across all staff grades.	(£7.0m) (0.3%)	(£12.7m) (0.5%)
Graduate scheme	Graduates grow across the period from 56 in 2019 to 93 in 2027. Following a reduction of -	The Graduate scheme provides extra capacity to support the management and other NERL	Assuming an existing staff attrition/turnover rate of c.1.6%	(£4.5m) (0.2%)	(£4.5m) (0.2%)

Item	NERL assumptions	Steer observations	Steer assumption	Range Low £m change to NERL 2023-2027	Range High £m change to NERL 2023-2027
	60% in 2021, Graduates grow by +45 in 2022 and then approximately triple in number by 2024 to 93 FTEs and remain at this level for the rest of NR23, in part driven by the formalisation of a two-year early careers programme.	<p>HQ grades. There is a significant increase in the number of graduates over the NR23 period, which if directly observed in (or allocated to) the roles these graduates are supporting, would require more justification.</p> <p>An intake of around 47 graduates a year into the staff categories corresponds to 3.2% of FTEs across ATCEs, STARS, MSGs and PCGs at the end of NR23, which implies a high rate of staff attrition/turnover.</p>	<p>would imply a low level of graduate retention (c.50%).</p> <p>Steer assumes a higher retention rate of 75% which consequently leads to a need for 60 graduates rather than the 93 assumed in the NERL plan to fill the same number of positions at the end of the programme, whilst increasing the overall number of roles by a smaller amount.</p>		
DC scheme	NERL assumes no change to the current scheme with a maximum contribution of 18% and assumed average over NR23 of 16%	<p>Airlines have raised concerns that the scheme is overly generous and have suggested a new scheme for new joiners in NR23 could be introduced. Steer has benchmarked the DC scheme to comparable former public entities in the UK the average level of contribution is 12%.</p>	<p>DC Contribution rate for new joiners from 2024 assumed to be 12% rather than 16% assumed by NERL.</p> <p>The low range estimate assumes the contribution rate for members on the existing scheme matures over time, moving up from an average of 16% towards 17%, as new members on a lower contribution rate are no longer joining the existing scheme to balance this average.</p>	(£1.0m) (0.04%)	(£1.8m) (0.07%)

Item	NERL assumptions	Steer observations	Steer assumption	Range Low £m change to NERL 2023-2027	Range High £m change to NERL 2023-2027
			The high end estimate assumes that the contribution rate for members on the existing scheme evolves from 16.1% to 16.3% per NERL’s response to a clarification question, which stated that contribution levels are consistent across all staff groups.		
UTM development costs	UTM development costs grow to an average of £1.2m in NR23.	The rationale for the allocation of costs relating to Uncrewed Aircraft Systems to NERL’s cost base is not clear, given airlines’ feedback through the consultation on the “user pays” principle.	<p>The inclusion of these costs in the NR23 cost base may not be in line with the “user pays” principle.</p> <p>For the low range, recognising that NERL may need to incur some costs as part of the NR23 cost base to manage the operational impact of new airspace users on conventional airspace users, the 2022 level of costs could be maintained.</p> <p>In the high case, adhering to the user pays principle would result in all UTM development costs being excluded during NR23.</p>	(£3.5m) (0.1%)	(£6.0m) (0.2%)
CAA fees	NERL includes CAA CMG fees in its NR23 cost base.	Based on CAP 2282, Steer understands that CAA CMG fees will be levied directly by the CAA on airspace users from 2023, and will not be charged through NERL.	Removal of CAA CMG fees from NR23 cost base.	(£5.2m) (0.2%)	(£5.2m) (0.2%)

Item	NERL assumptions	Steer observations	Steer assumption	Range Low £m change to NERL 2023-2027	Range High £m change to NERL 2023-2027
DB pension management costs	DB pension management costs increase from £2.4M in 2022 to £3.2M in 2027.	DB pension management costs increase despite a reduction in membership over the period, while the Government Actuary's Department (GAD) has found the cost per member to be significantly higher than other typical UK DB schemes of a similar size.	For the low range maintain costs at 2023 levels, accepting that of the increase in DB pension management costs between 2022 and 2023 may be driven by the same factors as the increase explained by NERL for DC pension management costs, namely higher life assurance and income protection premiums which have increased as a result of market conditions. For the high range, maintain costs at 2022 levels.	(£1.3m) (0.05%)	(£3.5m) (0.13%)
NERL assumed level of operating costs 2023-2027				£2,614m	£2,614m
Cumulative estimated range low				(£37.5m)	
Cumulative estimated range high					(£55.8m)
Range of operating costs				£2,576m	£2,558m
% change to NERL plan				(1.4%)	(2.1%)
Excluding CAA fees from NERL cost base	NERL assumed level of operating costs 2023-2027			£2,609m	£2,609m
	Cumulative estimated range low			(£32.3m)	
	Cumulative estimated range high				(£50.5m)
	Range of operating costs			£2,576m	£2,558m
	% change to NERL plan			(1.2%)	(1.9%)

NR23 Capital expenditure adjustments

Based on the analysis undertaken, we summarise in the sections below alternative assumptions from our assessment of the NERL BP assumptions and other supporting evidence provided by NERL on its capital expenditure plans. Following assessment by the CAA these could form the basis of adjustments to the NERL BP identified for NR23.

NERL's NR23 BP provides a reduced capex programme as compared to those planned for RP3 and RP2 reflecting the reduced capability of NERL following the VR programme. During consultation and our analysis of materials provided by NERL we have noted the lack of developed business cases for the capital projects. However, at the same time we have noted that airline stakeholders recognise the need for investment and have stated concerns about the comparatively smaller size of the programme (even though they maintain some concerns about NERL's limited capability to deliver it on time). Given support from airline stakeholders for investment, and in the absence of detailed business cases to facilitate a more bottom up analysis, we have focussed our review on areas of the capital programme where there is clear need for adjustment. As a result we are proposing a -2.8% saving in capital expenditure (equivalent to -£16 million) over NR23 through a reduction in the risk and contingency allowance. An alternative approach to legacy escape, facilitated by a restructured/reprioritised capital programme, is presented in the next section.

Risk and contingency allowance – NERL assumptions

NERL's BP provides range estimates for the headline investment programmes. These ranges reflect the uncertainty in the costs and prices incurred during the various investment programmes, as well as the general variability of the contents of those. Based on discussions with NERL, these ranges are provided for information purposes in the business plan, and are not used to establish a capex envelope.

NERL also introduces the '2+5' approach as a proposed governance mechanism for capex related decisions. The key concept of the approach is a rolling investment planning cycle, which is iterated in each year. Each iteration evaluates the capital portfolio, defines the capex planned for the subsequent two years in detail, and sets out a 5-year strategic plan on capex, without trying to build each year beyond the 2-year threshold from a bottom-up, technical approach. Following the discussions with NERL, and the responses it provided to clarification questions, we understand that under the '2+5' approach NERL would plan to keep capex within the overall level that is established as a point estimate, including risk and contingency allowance.

The business plan includes a Risk and Contingency line of £44m for the period, planned from 2025 onwards, which equates to 7.7% of the total portfolio (looking at only those years, which have risk and contingency values planned (2025 to 2027), this ratio goes up to 16.4%). Based on the evidence presented by NERL, the £44m risk and contingency allowance is composed of two components: a £27m risk and contingency allowance for DP En route originally planned from 2025 onwards (£9m p.a.) and a contingency of £18m for emerging opportunities for 2026 and 2027 (£9m p.a.).

Risk and contingency allowance – Steer observations

As noted above, we understand that the range estimates in the business plan are not used to cover risks and contingencies in combination with the '2+5' approach, and that all risks and

contingencies are planned to be covered from the £44m Risk and Contingency allowance. This is an allowance held centrally, an approach supported by stakeholders.

We note that the 7.7% (£44m/£574m) risk and contingency allowance for is substantially higher than that of RP2, when the risk and contingency allowance at the portfolio level was around 4% (at £30m), and that of RP3, when the risk and contingency allowance was 5% (at £31m). These allowance figures include the portfolio, programme and project level risks, as no project specific allowance have been included in the final plans for RP2 and RP3, similarly to the NR23 business plan. It is also noted that the business plan only considers risk and contingency related spending from 2025 onwards, and in 2026 and 2027, the allowance accounts for 16.4% of the annual spend. We assess that unforeseen events or complications can affect earlier years as well, and thus we see that a uniform distribution of risk and contingency would be reasonable, particularly since capital expenditure is almost evenly distributed across the years of the period as well.

Further to this, we understand that the '2+5' approach should help reduce uncertainty and risk in the capital portfolio allowing consulted upon adjustments to the programme and level of capital spend according to rules set by the CAA, and not result in increased risk and contingency allowances compared to previous reference periods.

Risk and contingency allowance – Steer assumptions

Based on the comparison to the risk and contingency allowances in previous regulatory periods, we assess that the risk and contingency allowance should be adjusted both in its total value and % of total costs. We suggest using a risk and contingency allowance of 5% following the RP3 approach. On this basis, the risk and contingency allowance would be a total of £28m over NR23.

Given the overall capex programme is of a similar magnitude in each year, the risk and contingency allowance is distributed evenly across the 2024-2027 period (assuming the capex spend for 2023 is largely fixed). Table 7 below provides a summary of the suggest change in risk and contingency allowance over NR23.

Table 7: Summary of alternative assumptions for NR23 capital expenditure (£m 2020 prices)

Item	£m change to NERL 2023-2027
Capital expenditure	
NERL assumed level of capital costs 2023-2027	£574m
Estimated cost saving	(£16m)
Revised capital costs	£558m
% change to NERL plan	(2.8%)

Legacy escape alternative

Based on the analysis undertaken, we summarise below an alternative scenario for the legacy escape profile for NR23, recognising that stakeholders are concerned about the option chosen

by NERL and whether alternative courses of action are possible¹¹. Following assessment by the CAA this could be considered as part of the Service and Investment Plan (SIP) and Technical Customer Advisory Board (TCAB) processes¹². Stakeholders support the idea of bringing forward the delivery and benefits from legacy escape. The delivery of the scenario presented below could be supported by appropriate incentives/penalties built into the NERL regulatory system designed by the CAA.

NERL scenario

The capex in the NERL scenario foresees the full implementation of iTEC v2 in the en route environment, followed by a prolonged period of parallel operations, where lower airspace operations are still based on legacy systems, until the iTEC v3 common platform is implemented (in mid-NR28). Once the Common Platform is in place, en route operations are then transitioned to iTEC v3 as well, and legacy escape is realised.

Scenario (£ 2020 prices)	2023	2024	2025	2026	2027	Total
NERL BP	£123m	£116m	£116m	£110m	£110m	£574m

Alternative capex profile: Stepwise legacy escape

The alternative scenario suggests a reprioritisation of investments, and a different path towards legacy escape ('Stepwise' legacy escape). This scenario is based on the logic of the baseline RP3 plans of NERL, which foresaw a transition of lower operations to iTEC in 2023-2024. This scenario uses the following assumptions:

- It is possible to increase NERL's capacity to change, and to restore this capacity at least to pre-COVID-19 levels.
- Development and implementation of iTEC v3 is highly uncertain, and also dependent on the decisions of iTEC collaboration partners, thus it is not reasonable to bring the iTEC v3 implementation earlier.
- Lower airspace operations can be transitioned to iTEC v2, deployed for en route operations.

The impact of this option could be further investigated if it is agreed by stakeholders, NERL and the CAA to pursue. Based on the discussions and the feedback received from NERL on the interim report and the alternative legacy escape profiles, this scenario has been retained as potentially viable, even though it is understood, that NERL would have to overcome challenges to ramp up its capacity to implement changes, and that transitioning lower airspace operations onto the iTEC platform earlier than the collaboration partners might result in potentially higher development costs. In order to account for these impacts, the alternative capex profile has been readjusted in this scenario.

There are two major components of this capex scenario:

¹¹ A further alternative scenario was considered and is described in the main body of this report, however this was not assessed to be as readily feasible in practice, and is not recommended for further consideration as a result.

¹² The SIP and TCAB processes allow NERL to present its evolving capital plans and consult with stakeholders on them on an annual basis.

- Firstly, it is assumed, that investments into transitioning Lower operations onto iTEC v2 are brought forward to the earlier years of NR23, and are also increased, partially due to some investments being transferred from NR28, but also because of the potential increase in development costs as stated above. At the same time, investments into the iTEC collaboration and the upper airspace builds are reduced. This results in a total of £174m for the Common Platform (vs. the original £120m).
- Secondly, it is assumed, that lower airspace operations could be transitioned to iTEC v2 in 2026, in which case legacy systems supporting lower operations could be decommissioned. This would have an effect on sustainment related capex, starting from 2024, as the sustainment needs are lower if the period of sustainment is significantly reduced. Therefore, a reduction of £36m over the NR23 period is included in this scenario, resulting in a total of £170m for Sustainment and Surveillance (vs. the original £206m).
- Thirdly, the alternative scenario also includes the reduction in risk and contingency allowance discussed above, for completeness.

Scenario	2023	2024	2025	2026	2027	Total
Alternative capex profile: Stepwise legacy escape	£145.0m	£145.5m	£114m	£90m	£81m	£575m

The stepwise legacy escape scenario would also have an impact on operating costs, which are also estimated here. Based on the information provided by NERL, Steer assumes, that once legacy escape is realised, and legacy systems are decommissioned, -£10m of operating costs could be saved per annum as a result of reduction in asset management needs. The stepwise scenario assumes that legacy escape happens in 2026, and therefore a saving of -£20m in operating costs is included here for NR23.

Scenario	2023	2024	2025	2026	2027	Total
Alternative opex profile: Stepwise legacy escape	-	-	-	(£10m)	(£10m)	(£20m)

In addition, not included in NR23, a further -£20m saving in asset management costs would occur in NR28, as the business plan foresaw legacy escape to happen by 2030. This additional saving in 2028 and 2029 is not captured above, since it is outside of NR23.

1 Introduction

1.1. Background

- 1.1.1. The Civil Aviation Authority (CAA) is assessing NATS (En Route) plc's (NERL's) operating and capital expenditure projections in preparation for the next price control period "NR23", beginning on 1 January 2023 and running for five years to the end of 2027. Additionally, the CAA is reviewing NERL's operating and capital expenditure for the reconciliation period of 2020 to 2022 to take account of the impact of COVID-19 on flight volumes and efficient costs.
- 1.1.2. The NERL business plan (BP) development has involved engagement between NERL, its airline customers and other stakeholders over Summer and Autumn 2021, followed by the submission of an NR23 Building Block Update (BBU) to the CAA in December 2021 and its business plan (BP) in February 2022.

1.2. About NATS, NERL and NSL

- 1.2.1 NATS Limited operates through its subsidiaries NERL and NSL.

Services provided

By NERL

- 1.2.2 NERL (NATS (En Route) plc) 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 ("Oceanic"). It operates under a licence granted by the Secretary of State under the Transport Act 2000. The Act gives the CAA the role of economic regulator. En-route, London Approach, Oceanic and North Sea helicopter advisory services are regulated by this licence. NERL also provides the Ministry of Defence (MOD) with engineering, surveillance and communications services.
- 1.2.3 The CAA establishes revenue allowances for NERL's economically regulated services. These remunerate NERL's efficient investment (capex), operating costs (opex), pensions, depreciation and an allowed return on the capital invested in the Regulatory Asset Base (RAB) to recover the cost of capital. The RAB is adjusted to reflect asset additions, disposal proceeds, regulatory depreciation and the rate of inflation. Income generated outside of NERL's economically regulated activities is deducted under a 'single till', leaving a net revenue allowance. A price per service unit is set to recover this based on forecast traffic for the reference period. The CAA does not determine how NERL operates its service. NERL retains the responsibility to provide a safe, resilient service that provides the required level of service.

By NSL

- 1.2.4 NSL provides services to UK Airports, to the UK MOD through its Defence services, to other UK customers such as airlines and airspace users and to international customers, mainly in Asia Pacific and the Middle East. NSL is not within the scope of this study as it operates within a commercial environment and is not regulated by economic licence.

- 1.2.5 The UK Airports service provides ATC services to 13 of the UK's major airports as well as engineering support and airport optimisation services to UK airport operators. NSL operates in a contestable market and faces competition from other Air Navigation Service Providers (ANSPs).

1.3. Terms of reference

- 1.3.1 The study is to support the CAA in developing its overall view on the cost elements of the NERL NR23 BP. The CAA will set out its view on whether the proposals NERL has submitted in its BP are reasonable, efficient and deliverable as part of its initial proposals document in Autumn 2022.
- 1.3.2 The study is also supporting the CAA in setting an updated efficient cost baseline for the 2020-2022 period through a review of the efficiency of NERL's costs during this period (although without the benefit of hindsight), given the reduction in traffic as a result of the COVID-19 pandemic.
- 1.3.3 The study was undertaken by a team comprising experienced consultants who have worked in the Air Navigation Services (ANS) and regulated industries from Steer and Integra. Steer is responsible for the study, with Integra providing support across the issues, with a focus on the capital expenditure plan.

1.4. Purpose and structure of report

- 1.4.1 This report presents the findings from the review of NERL's BP for NR23 and the review of costs over the reconciliation period (2020-2022). It covers an analysis of historical performance from 2015, a review of the actions taken by NERL over 2020-2022 and their outcomes, and a review of the NR23 BP which identifies key issues with the plan and presents the potential impact of alternative assumptions around these issues.
- 1.4.2 The remainder of the report is structured as set out below.
- The next section provides an overview of the methodology used in the study.
 - Chapter 2 focuses on staff costs, covering historical performance, the reconciliation period and NERL's BP projections for NR23.
 - Chapter 3 focuses on non-staff costs, covering the same areas.
 - Chapter 4 covers capital expenditure, providing an overview of the evolution of NERL's capex plan, the actions and outcomes during the reconciliation period, and a review of the suitability and deliverability of the NR23 BP for capex.

1.5. Overview of methodology

Data collection

- 1.5.1 The data and inputs used in the study can be grouped into three broad areas:
1. Publicly available data and data provided by the CAA;
 2. Material provided by NERL as part of its NR23 Virtual Exhibition during its consultation with customers and other stakeholders in Autumn 2021; and
 3. Submissions to the CAA on 7 February 2022 by NERL of its NR23 business plan and its response to the CAA's request for information (RFI) on the reconciliation period (including the BBU previously provided in December 2021 and responses to clarification questions raised after 7 Feb).
- 1.5.2 The table below provides more detail:

Table 1.1: Data collected

Source	Data
Publicly available data and data provided by the CAA	Previous benchmarking and efficiency assessments for the CAA
	ACE benchmarking reports
	Route Charges tables
	SIP reports and independent reviewer reports on SIP
	RP3 reports and the CMA report on RP3
	NERL annual financial and regulatory reports
	PRB reports
	RP3 Performance plans
ONS, OBR, BEIS, Eurostat data on CPI, wage levels, energy prices etc.	
NERL NR23 Virtual Exhibition	Including briefing materials, SIP, TCAB, slide packs, minutes, NERL responses to actions emerging during the consultation, co-chairs report on the consultation process.
NERL submissions to the CAA	Building block update (11 December 2021)
	NR23 business plan and supporting materials (7 February 2022)
	Response to CAA's RFI on the reconciliation period (7 February 2022)
	Responses to clarification questions

Engagement with NERL

- 1.5.3 Engagement with NERL during the process was mainly aimed at ensuring that a common understanding was reached with respect to the information being requested by the CAA and Steer/Integra in advance of the BP submission, and with respect to the rationale of the CAA and its advisors' clarification questions (following submission of the BP) to which NERL subsequently responded in writing.

Meeting	Date
Kick-off meeting with NERL, the CAA and Steer/Integra	19 October 2021
Meeting with NERL, the CAA and Steer/Integra on capex part of RFI	11 January 2022
Meeting with NERL, the CAA and Steer on opex template and BBU	20 January 2022
Presentation by NERL to CAA and Steer/Integra on capex submission	10 February 2022
Meeting with NERL, the CAA and Steer on opex submission and initial clarification questions	10 February 2022
Meeting with NERL, the CAA and Steer/Integra on interim report findings	12 April 2022
Meeting with NERL, the CAA and Steer/Integra on capex programme and potential alternative strategies	25 April 2022

- 1.5.4 Additionally, Steer participated as an observer in the final two consultation sessions (on 3 and 11 November) between NERL, its airline customers and other stakeholders. Due to the timing of Steer's engagement by the CAA, we were unable to participate in the earlier consultation sessions, but as noted above, we have had access to all of the consultation materials through the Virtual Exhibition website provided by NERL.

Engagement with stakeholders

1.5.5 As part of the study, the CAA and Steer/Integra coordinated three workshops:

- A post-consultation workshop with airlines and other stakeholders on 9 December 2021. The aim of this workshop was to get input from airlines on the key forward-looking operating and capital cost issues that the cost assessment should focus on.
- NR23 business plan workshop with airlines and other stakeholders on 3 March 2022. The aim of this workshop was to provide an overview of the key issues identified to date as part of the NR23 review for the forward-looking business plan (2023-27) and the reconciliation review (2020-22), and get input from the airlines on these and any other issues they viewed as key.
- Workshop with airlines and other stakeholders on Steer/Integra interim findings in relation to NERL's NR23 business plan on 19 April 2022. The aim of this workshop was to provide an overview of the adjustments proposed in the key areas identified as part of the NR23 review for the forward-looking business plan (2023-27) and the reconciliation review (2020-22), and to get feedback from the airlines on these.

Analytical approach

1.5.6 Steer and Integra adopted an independent approach to the analysis of the information provided by NERL, other stakeholders and public sources. We analysed information provided by NERL, asking follow-up questions where we perceived that further detail could be provided, or where the information was unclear. We worked to reconcile data from different sources (e.g. from the SIP process and the BP) and we undertook benchmarking against external sources where appropriate (e.g. to understand salary levels or cost trends in relation to volume growth).

As part of our review, NERL's costs are often compared throughout this document to equivalent costs in previous periods or plans.

1. For the reconciliation review, we use three reference points, comparing what actually happened over the 2020-2022 period to i) actual costs in 2019; ii) the CMA determination for RP; and iii) the NERL RP3 revised plan. Each of these reference points represents a valid comparison and provides relevant insights in different ways. Comparison to 2019 shows how costs evolved from the last year of actual costs before the COVID-19 crisis (and facilitates a comparison to cost and actions taken by other benchmark organisations). Comparison to the CMA determination and NERL revised RP3 plan shows the extent to which NERL adapted relative to its plans.
2. For the NR23 NP review, we use four key reference points, comparing NERL's planned costs over the 2023-2027 period to i) actual costs in 2019; ii) average costs across RP2 (2015-2019); iii) costs in 2022; and iv) costs over the 2020-2022 period. As above, each of these reference points represents a valid comparison and provides relevant insights in different ways. Comparison to 2019 shows how planned costs relate to the last year actual costs before the COVID-19 crisis. Comparison to average costs across RP2 shows how planned costs across NR23 relate to costs across the last full 5-year reference period. Comparison to costs in 2022 and over the 2020-2022 period shows how costs are planned to evolve from the last year before NR23, the last year of actual costs available at the time

of this review (2021¹³), and costs on average across the reconciliation period, capturing the impact of the forecast recovery in traffic and its impact on planned costs.

- 1.5.7 In general, we did not try to second-guess analysis provided by NERL (e.g. in relation to the capital programme benefits or air traffic controller staff deployment), but sought to identify where the BP did not appear to provide a supporting narrative. Where possible, we developed our own approach and assumptions to provide an independent view, for example in relation to projections of staff numbers. A key tool in assessing the BP narrative and developing our own assumptions was the shadow operating cost model which was developed by Steer and calibrated against the NERL BP. The model was a tool used to test the impact of different assumptions on NERL's planned costs. The assumptions were developed based on evidence obtained from various sources (e.g. the top down analysis and bottom up analysis informed the assumptions tested in comparison to NERL's assumptions). Where our assessment differs from the narrative provided by NERL, we identified a range of potential differences to operating cost lines and specific capital programmes, making transparent the basis of these differences by explaining our assumptions.

Overview of our approach

- 1.5.8 Our approach used the following steps:
- Collection of data, stakeholder meetings, written questions to support the understanding of data and NERL forecast assumptions;
 - Review of historical data since 2015, examining trends, including unit costs, productivity and relationships between cost and traffic growth and other key drivers;
 - Benchmarking analysis to other Air Navigation Service Providers (ANSPs), other comparable companies in the UK aviation sector, and the general economy;
 - The development of a shadow operating cost model, to help fully understand the drivers of NERL's NR23 BP projections and to estimate the impact of alternative assumptions on operating costs; and
 - Analysis of the capital programme, using NERL's pre-pandemic plans as a starting point, benchmarking to other ANSPs, and considering drivers of the capital programme including SESAR and the ATM Master Plan.

1.6. Overview of NR23 business plan

- 1.6.1 As detailed above, NERL submitted its NR23 business plan on 7 February 2022, alongside its response to the CAA's request for information on the reconciliation review for the 2020-2022 period. The business plan submission includes:
- A prospectus outlining the NR23 BP;
 - 17 supporting appendices;
 - Additional supporting material (Customer consultation co-chairs' report; Passenger research report; Cost of capital study; Wages benchmarking study; NR23 opex template); and
 - The NATS financial model (V15.33_Board_NR23_CAA_Final).

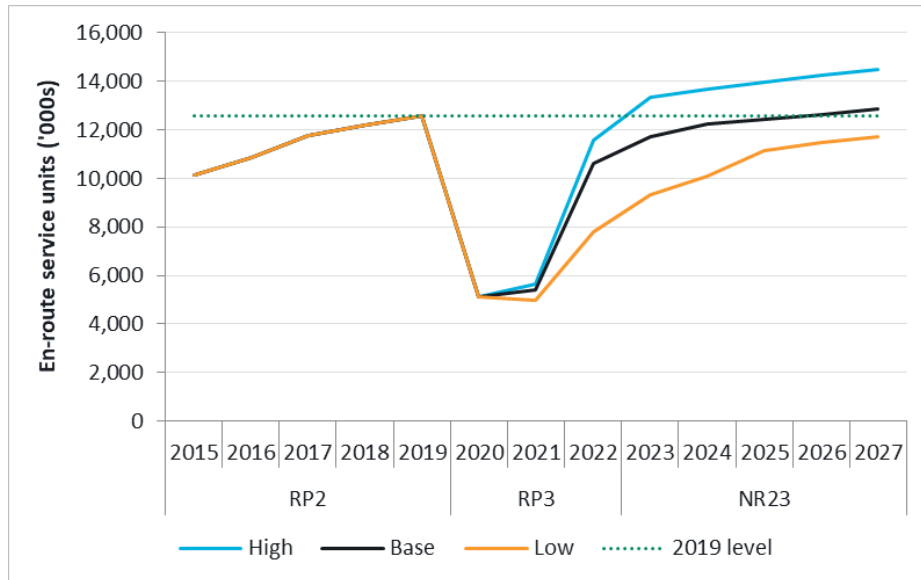
¹³ Full-year costs for 2021 are based on actual costs over January to September, and estimates for October to December.

1.6.2 This material is supplemented by NERL’s responses to the clarification questions raised by the CAA and its advisers.

Traffic forecasts

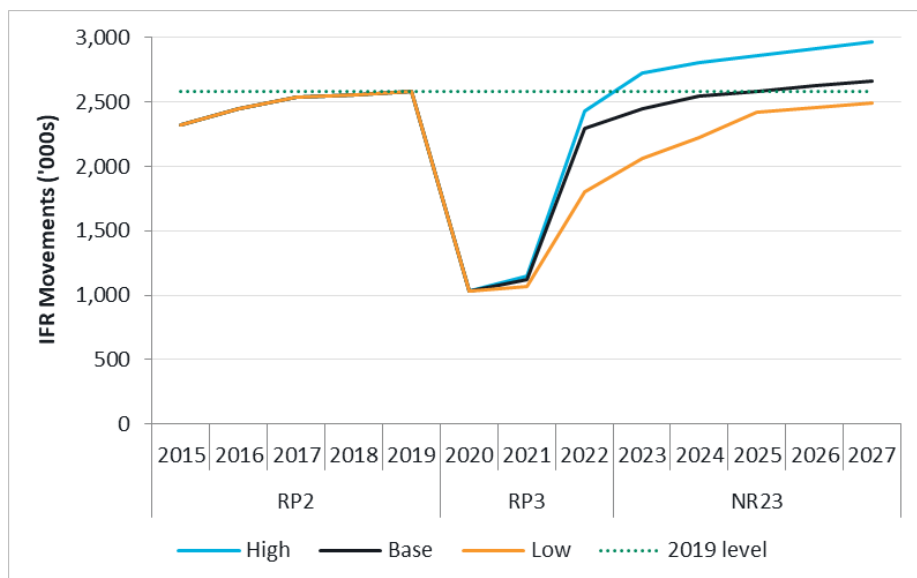
1.6.3 NERL has used the STATFOR October 2021 base case traffic forecast for developing its BP. Figure 1.1 and Figure 1.2 show STATFOR October 2021 High, Base and Low scenarios for en-route service units and IFR movements. For the Base case, service units exceed 2019 levels in 2025, while IFR movements only exceed 2019 levels in 2026.

Figure 1.1: STATFOR Oct 2021 traffic forecast: en-route service units



Source: STATFOR

Figure 1.2: STATFOR Oct 2021 traffic forecast: IFR movements



Source: STATFOR

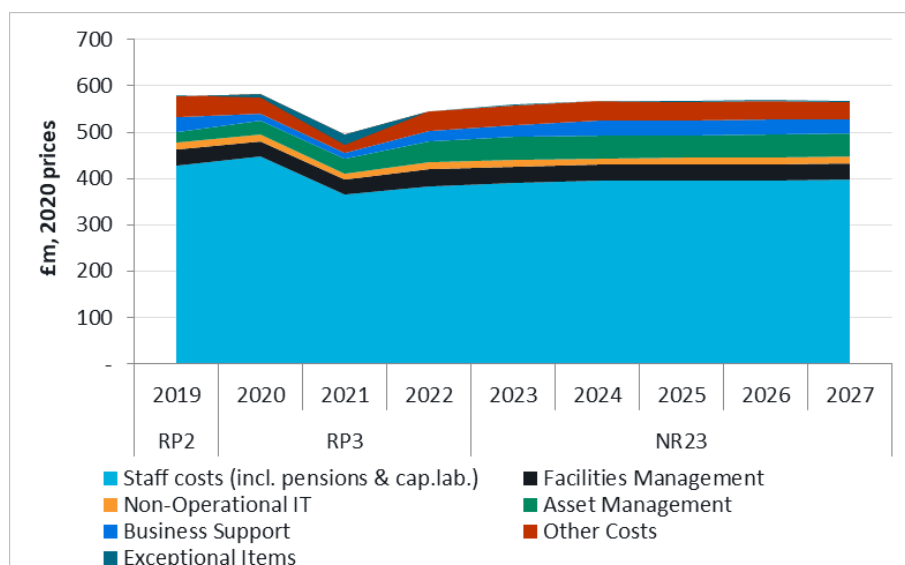
1.6.4 An assessment of the traffic forecast is not within the scope of this study, however it does form a key driver for some of the operating costs. Alternative traffic scenarios have not been tested by Steer.

NR23 business plan

Operating costs

1.6.5 Figure 1.3 shows NERL’s operating costs (including pension and redundancy costs, as well as retaining labour costs which have been capitalised in NERL’s accounts) for 2019, 2020 and 2021 actuals, latest forecasts for 2022, and its projections for NR23.

Figure 1.3: NERL’s historical and projected operating costs in RP3 and NR23 (2020-2027)



Source: 'NR23 opex template FINAL' received on 07/02/2022

1.6.6 The figure demonstrates the dominance of staff costs in the overall operating cost base, as well as the impact of the cost mitigation measures adopted in 2020 and 2021 in response to the COVID-19 crisis. Overall, in 2021 total costs were -18.4% lower than in 2019, driven by a reduction of -14.4% in staff costs (incl. pensions, redundancy and capitalised labour) and a reduction of -29.7% in non-staff operating costs.

1.6.7 As shown in Table 1.2, following an increase of +15.2% in 2022 as traffic recovers, total operating costs are projected to grow with a CAGR (2022-2027) of +0.8% over NR23. Staff costs grow by +4.7% in 2022 and +0.8% CAGR over NR23. Non-staff costs grow by +51% in 2022 and +0.9% CAGR over NR23.

Table 1.2: Real terms changes in operating costs

Costs	Change 2019-2021 (real terms)	Change 2021-2022 (real terms)	CAGR 2022-2027 (real terms)
Staff costs (incl. pensions, redundancy and capitalised labour)	-14.4%	+4.7%	+0.8%
Non-Staff costs	-29.7%	+51%	+0.9%
Total operating costs	-18.4%	+15.2%	+0.8%

Source: 'NR23 opex template FINAL' received on 07/02/2022

- 1.6.8 In unit cost terms (£/service unit), total operating unit costs are projected to be -4.1% lower in real terms in 2027 compared to 2019, through a combination of -8.7% lower staff unit costs and +8.5% higher non-staff unit costs.

Capital expenditure

- 1.6.9 NERL defined a set of three main objectives for its investment portfolio:

- Sustainment:
 - Sustaining existing services.
 - Ensuring resilient ATM services.
- Airspace:
 - Delivering Increased Network Capacity, Enhanced Safety, Improved Environmental Performance & Reduced Fuel Burn for Customers.
- Deploying SESAR:
 - Replacing ageing infrastructure.
 - Consolidating to a single platform, with improved tools and standardising operations.

- 1.6.10 NERL proposes what it characterises as a balanced investment portfolio: the planned investments are to “strike a balance between priorities and benefits, costs, deliverability and service risk”. NERL also provided information on the strategies considered during the planning of the portfolio. These strategies were characterised by the level of effort and capex spending, as well as the benefits and the corresponding outcomes. NERL defined a “low effort – low benefit” strategy, a “higher effort – higher benefit” strategy, and a middle strategy where the effort and the benefits would fall in between of those of the two options.

- 1.6.11 NERL concluded that the two extreme strategies are not viable, as the low effort strategy would induce operational and performance risks, whereas the high effort strategy would have a significantly higher deliverability risk. Thus, NERL proposes to follow a strategy, which balances these risks.

- 1.6.12 Table 1.3 below provides an overview of the planned capex over the NR23 period. The capital programme is largely driven by the headline programmes:

- Airspace and Ops enhancements;
- DP En-route & Voice and Common Platform; and
- Sustainment and Surveillance.

- 1.6.13 These programmes represent almost 78% of the total capex planned for NR23, although it is noted, that the Sustainment and Surveillance programme is more of a collection of smaller investment projects, rather than a single investment programme.

Table 1.3: Overview of the capex portfolio

CY, 2020 CPI prices, £m	2023	2024	2025	2026	2027	NR23
<i>Airspace and operational enhancements</i>	21	22	18	14	8	83
<i>DP En Route and Voice</i>	26	10	1	0	0	38
<i>Sustainment and surveillance</i>	36	45	43	43	40	206
<i>Common platform</i>	18	17	29	23	34	120
<i>Business resilience (information solutions)</i>	9	8	7	5	7	36

CY, 2020 CPI prices, £m	2023	2024	2025	2026	2027	NR23
<i>Business resilience (property and facilities management)</i>	7	3	2	2	2	18
<i>Oceanic</i>	6	7	6	3	1	23
<i>ATC training</i>	0	2	2	2	0	7
<i>Risk & contingency</i>	0	0	9	18	18	44
Total	123	114	117	110	110	574

Source: NERL NR23 business plan

2 Staff costs

2.1. Staff cost overview

Reconciliation review for 2020-2022

NERL took a range of actions on staff numbers and costs during the pandemic. These actions were driven by the reduction in demand and revenues, and the need to retain liquidity in the business. Actions to reduce staff numbers included a voluntary redundancy (VR) programme; a recruitment freeze; the release of contractors; the interruption of air traffic controller training; and use of furlough. Actions to reduce staff costs included freezing pay; voluntary pay cuts for management grades; and the cancellation of management bonuses. While net cost savings in 2020 were minimal due to the costs incurred in relation to the voluntary redundancy programme, significant cost savings in 2021 and 2022 were reported by NERL (some 20% and 14% of 2019 staff costs respectively).

Most European ANSPs and UK aviation industry participants needed to take similar unplanned actions to mitigate the impacts of COVID-19. For Staff costs ANSPs and UK airports and airlines took a range of actions including redundancies, salary and working-hours reductions, and recruitment and bonus freezes. Airports and airlines in the UK, like NERL, made extensive use of the furlough programme.

Having reviewed the approach taken by NERL and compared it to those taken by other organisations, we consider different steps might have reasonably been taken, without the benefit of hindsight, to result in a more efficient outcome with respect to voluntary pay cuts and the voluntary redundancy programme.

In many other organisations, voluntary pay cuts were requested of both operational and management staff, especially if the individuals were on furlough, reduced activity working, etc. If like management grades, all other grades had been asked to take a 10% voluntary pay cut for three months and 50% had agreed, the savings in 2020 would have been approximately £2.5 million.

Many organisations brought forward exceptional redundancy arrangements in the context of the pandemic. However, given the pressure to restructure costs, NERL proceeded with the VR programme based on the arrangements that had been negotiated with Trade Unions ahead of the pandemic. The impact of providing 12 months rather than 21 months of staff costs on average would have saved approximately £26 million.

NERL has stated that it was bound by the terms of its Redeployment & Redundancy Agreement (RRA) with staff. The impact of the VR programme being implemented in Q4 2020 with a 21-month pay back is understood to be equivalent to that of a programme that might have been implemented under new terms in Q2 2021 with a 12-month pay back. There could though have been a 1 to 3 month benefit had a VR programme been implemented at the time of a new RRA potentially being adopted in May 2021, which is equivalent to savings of between £3 million and £9 million.

In addition to the above areas, we note that a small cost disallowance relating to UTM development costs could be applied during the reconciliation period, to ensure consistency in the treatment of

these costs across the reconciliation period and NR23. Mainly informed by the review of these costs in NR23, if the CAA assess that NERL may incur some costs to manage the operational impact of new airspace users on conventional airspace users, then the costs incurred over 2020-2022 could be allowed. On the other hand, if the CAA assesses that none of the UTM development costs satisfy the user pays principle and are disallowed, this would result in a saving of £0.7 million during the reconciliation period.

Staff costs in the NR23 business plan

Staff costs (including pensions and redundancy costs) represented nearly 74% of total operating expenditure (before labour is capitalised) in 2019. These costs are driven by changes in staff numbers (a volume driver), changes in working arrangements (e.g. working hours; a volume driver) or changes in pay (a unit cost driver). Overall, staff costs grow by +0.8% CAGR (2022-2027) over NR23, and are -6.7% lower in 2027 compared to 2019. The growth in staff costs is driven by additional staff FTEs (+1.5% CAGR over NR23) and changing total unit employment costs per FTE (+1.0% CAGR over NR23).

The level of disaggregation within the analysis is based on the key issues that have been identified with the BP, as discussed with airlines and other stakeholders at the business plan workshop on 3 March 2022. We have analysed staff costs through the following approaches:

- Analysis of FTE requirements for ATCOs (operational, non-operational and trainees (TATCs));
- Analysis of FTE requirements for central management and support staff (specifically Graduates);
- Analysis of alternative salary growth profiles at a total staff level; and
- Analysis of alternative DC pensions arrangements at a total staff level.

FTE requirements for ATCOs

For ATCO staff in operational roles, it is possible to define a productivity measure, namely the “composite flight hours” of aircraft handled by the ANSP per operational hour worked by ATCOs. NATS, along with the German ANSP DFS, has the most productive ATCO staff in its peer group according to this measure. Based on analysis of ACE benchmarking report data over RP2, NERL achieved improvements in ATCO-hour productivity of +3.0% CAGR over 2015-2019 – although this was in part driven by higher than expected traffic, which resulted in ATCOs on average controlling higher levels of traffic than had been planned for. Over the longer term, ATCO productivity improved on average by +1.75% per annum over the 2009-2019 period.

Despite historical performance, one of the key assumptions made by NERL in developing its resourcing plan for NR23 is that there will be no improvement in underlying ATCO-hour productivity over NR23. It states that productivity gains could be generated by improvements in controller tools and other technology, by increasing levels of controller skills and experience, by changes in airspace structures which reduce complexity, and by changes in the organisation and coordination of controllers with the available technology. However, NERL expects that none of these factors is likely to have a material positive impact on productivity from a cost-efficiency perspective in the NR23 period.

Acknowledging that NERL is delivering high levels of productivity compared to benchmarks, but also that productivity gains may be shared between service quality and cost efficiency, we have assumed that between a +1.0% p.a. and +1.5% p.a. underlying productivity improvement for ATCOs in OPS could be realised from 2025, when DP En route is planned to be implemented and traffic levels are expected to have recovered. This impacts the operational ATCO requirement, as well as that for ATASAs and TATCs, resulting in a combined change in total costs of between -0.6% and -0.9% over NR23.

FTE requirements for central management and support staff

Central management and support staff are comprised of ATCEs, STARs PCGs, MSGs and Graduates. Comparing the number of FTEs planned at the end of NR23 to those in 2019 (before the pandemic) shows that for all categories except Graduates, FTEs are planned to go down by between -0.4% and -2.2% p.a., whereas Graduate FTEs are projected to increase by +6.6% p.a. to 93 FTEs.

NERL explained that its plan assumes graduates undertake a two year placement, and then take up a vacancy created through retirement or attrition of existing employees, or leave the business. The majority of the increase in graduate FTE requirements is attributed to the standardisation of the scheme duration, while the annual intake in terms of headcount remains consistent with previous requirements and no new roles have been created in the plan for graduates once they are assumed to have completed the programme.

Assuming an existing staff attrition/turnover rate of c.1.6% would imply a low level of graduate retention (c.50%), which corresponds to 23 graduates a year taking up roles in the business. On this basis, we have assumed that the size of each annual intake could be reduced to 30 FTEs, with the assumption that NERL can achieve higher graduate retention rates (c. 75%) from its programme to realise the same outcome, while reducing the size of the combined cohort from over 90 FTEs to 60. This would result in a small saving (-0.17% of total costs) over 2023-2027.

Staff pay

The results of our staff cost benchmarking show that over the 2003 to 2019 period salary growth for all NERL staff has outperformed comparators for the Transport & Storage sector, which was -5.4% lower in 2019. Meanwhile, the review of individual roles identified differences between the upper quartile of the benchmarks and NERL in the range of -9% for MSGs to -34% for ATSAs.

Applying these top-down assumptions as a step change from the start of NR23 would result in a saving of between -3.2% of total costs (in the case of a -5.4% reduction in all salaries) and -10.7% of total costs (in the case of reductions in the benchmarked roles of -21% for ATCOs, -34% for ATSAs, -24% for ATCEs and -9 for MSGs). We acknowledge that such a step change would not be possible to be implemented in practice, so these ranges are illustrative only. Were such savings to be implemented gradually over a five-year period by the end of NR23, it would result in total costs being between -1.6% and -5.3% lower, if over a ten-year period between -0.7% and -2.5%.

Our analysis also shows that pensionable pay awards have generally accompanied improvements in operational productivity (although we note that productivity improvements are the result of a combination of factors both endogenous to NERL (technology, ways of working, etc.) and exogenous (traffic)). In its NR23 BP, NERL has assumed the pensionable pay award to be in line with prior calendar year average CPI plus 0.5% (i.e. a real terms increase of +0.5% per year). However, CPI forecasts have moved substantially since those used by NERL for developing its BP, with higher inflation generally expected over the short-term. Although inflation risks to the business plan more widely are mitigated by the inflation true-up mechanism in the regulatory framework, we consider that uncapped CPI-linked pensionable pay award is not in line with approaches used by some other large organisations, including organisations with unionised workforces. Moreover, we consider that real increases to the pay scale should be more closely linked to higher levels of activity (i.e. following the recovery of traffic to historic levels) and improved productivity.

Delaying real terms pay awards by capping increases at CPI (from the prior calendar year) for a period until traffic is expected to make more of a recovery towards 2019 levels, would result in a saving of

between -0.3% (in the case of a 1-year CPI cap in 2023) and -0.5% (in the case of a 2-year CPI cap in 2023 and 2024) of total costs over 2023-2027.

Defined Contribution pension costs

Benchmarking of NATS's DC pension arrangements shows that NATS has the fifth highest level of contribution across the sample of 17 ANSPs in Europe, however the different local basis and national legislation for these schemes make it challenging to make like for like comparisons. While other UK ANSPs have similar DC scheme parameters to NATS, the average level of contribution in practice is found to be lower according to their financial statements. Compared to other comparable UK companies (former public transport and utilities companies), NATS is also found to provide a more generous scheme.

NERL has stated that it would not be possible to change the structure of the DC scheme (including implementing a new scheme) until 2024 at the earliest, due to the terms of the Memorandum of Understanding which was put in place at the closure of the DB scheme to new entrants

We have modelled the impact of new staff joining a DC scheme from 2024 with a maximum employer contribution of 12%, in line with the average of benchmarks. The resulting impact on DC contribution costs ranges from -£1.0m to -£1.8m lower than those assumed by NERL in NR23, corresponding to -0.04% to -0.07% saving on total costs during this period.

Summary

Overall, the top-down analysis results in potential total costs savings over NR23 of between -1.6% and -5.3%, based on the staff pay benchmarking based on an assumed five-year transition period, -0.7% and -2.5% if based on a ten-year transition period – and potential combined total costs savings of between -1.1% and -1.6%, based on the bottom up analysis of ATCO and support staff numbers, staff pay and an alternative DC pension scheme. These ranges are considered alongside those for the non-staff costs, with a combined view on operating costs provided in the Executive Summary.

2.2. Introduction

- 2.2.1 Staff costs (including pensions and redundancy costs) represented nearly 74% of total operating expenditure (before labour is capitalised) in 2019. They are driven by changes in staff numbers (a volume driver), changes in working arrangements (e.g. working hours; a volume driver) or changes in pay (a unit cost driver). In this chapter we consider historical staff costs, staff costs over the reconciliation period (2020-2022) and staff costs in the NR23 BP, examining these underlying drivers.
- 2.2.2 The assessment of staff costs is required to inform the CAA's assessment of the overall efficient cost allowance for NERL during NR23. The CAA's assessment is not to determine how many staff NERL should employ or how much they should be paid; these decisions are for NERL to make.
- 2.2.3 In the remainder of this chapter we provide the following sub sections:
- Historical analysis: providing the context of how NERL staff costs have evolved over the 2015-2021 period for readers ahead of assessment of the reconciliation period and NR23 BP;

- Reconciliation review 2020-2022: analysing trends and actions of NERL in this period to comparators and making an assessment of possible disallowances to costs during this period; and
- NR 23 BP period: analysing NERL's plan and potential for cost efficiency improvements based on top down and bottom up analysis.

2.3. Historical analysis

2.3.1 In this section we consider each of the key drivers of staff costs in turn, looking actual total staff costs, staff numbers and pay. We benchmark the trend and level of staff costs for NATS against the wider UK economy, other major European ANSPs and other comparable sectors.

2.3.2 We then consider how staff productivity at NERL has evolved and how it compares to productivity trends in the wider economy. The analysis and benchmarking presented in this section is then drawn upon for the review of the NR23 BP.

Staff costs

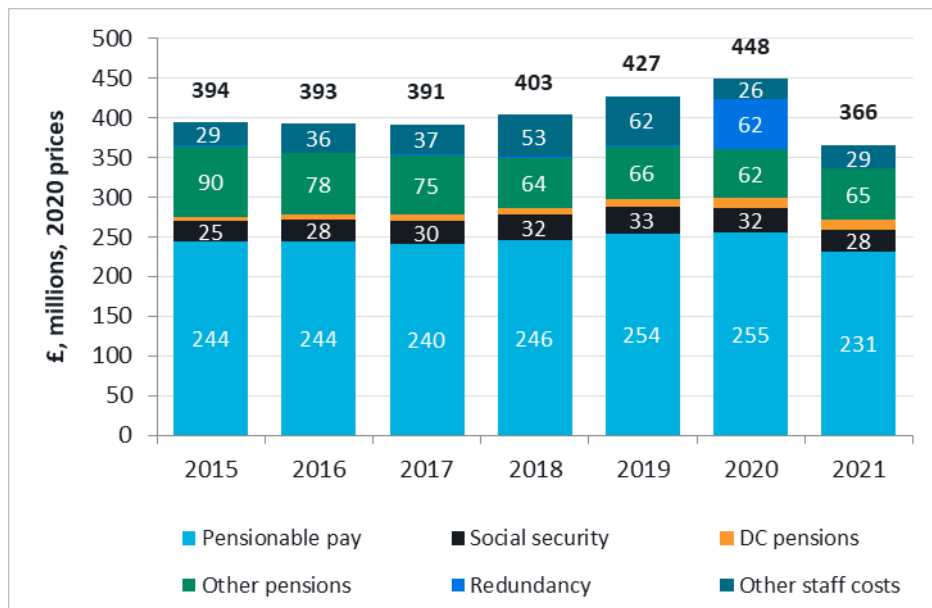
2.3.3 Staff costs are made up of the following:

- costs of wages and salaries;
- other staff costs (including contractor costs, overtime, company-wide and management bonuses, holiday pay, share scheme etc.);
- pension costs; and
- social (National Insurance) contributions.

2.3.4 Pension costs form an important part of overall staff costs. While NERL's pension costs do form part of the terms of reference of the study, this only includes ongoing contributions to the defined contribution scheme and not defined benefit pension costs. In addition, we have only reviewed information on pension costs at an aggregate staff level (not by individual staff group). For these reasons, pension costs are excluded from some of the analysis and comparisons below. A separate section on pensions is included later in the section.

2.3.5 Figure 2.1 below shows the staff costs (including pensions and redundancy costs) in real terms for NERL over 2015 to 2021. Staff costs were £394 million in 2015 and remained effectively constant in real terms until 2017, before increasing in subsequent years to £448 million in 2020 (+4.7% CAGR 2017-2020) driven by increasing staff numbers and increasing unit staff costs per FTE. Total staff costs were reduced by -18% in 2021 as a result of a range of cost-mitigation measures taken by NERL in the context of the COVID-19 crisis. These changes are analysed in more detail in the sections that follow.

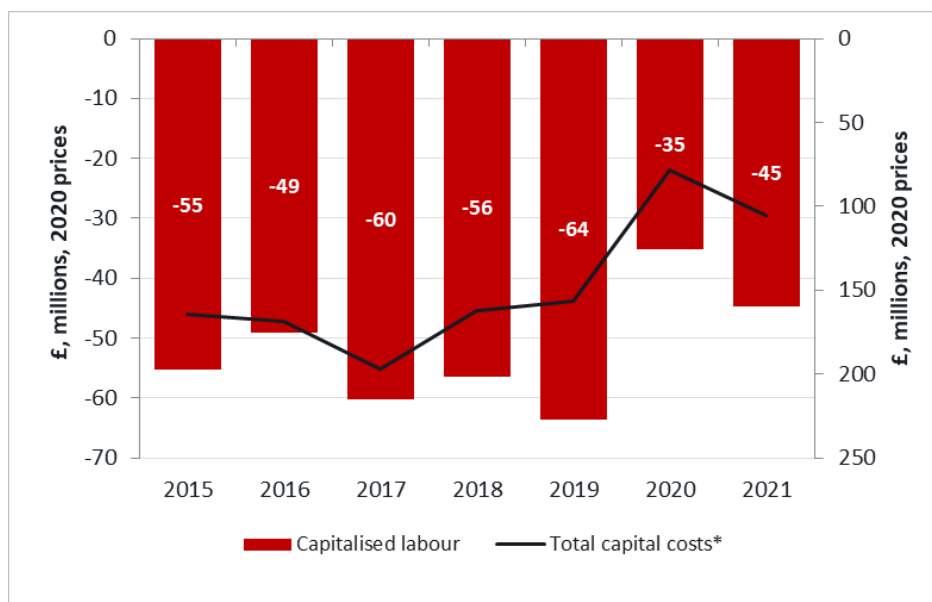
Figure 2.1: NERL staff costs (2015-2021)



Source: 'NR23 opex template FINAL' received on 07/02/2022

2.3.6 Figure 2.2 shows the capitalised labour costs since 2015 in real terms, alongside capex spend over the same period. Capitalised labour costs mainly represent internal engineering and technical services staff, along with specialist contractors supporting the implementation of the capital investment plan. ATCO resources dedicated to airspace projects, validation, testing and simulation of new technology account for around 13% of capitalised labour costs.

Figure 2.2: NERL capitalised labour costs and total capital expenditure (2015-2021)



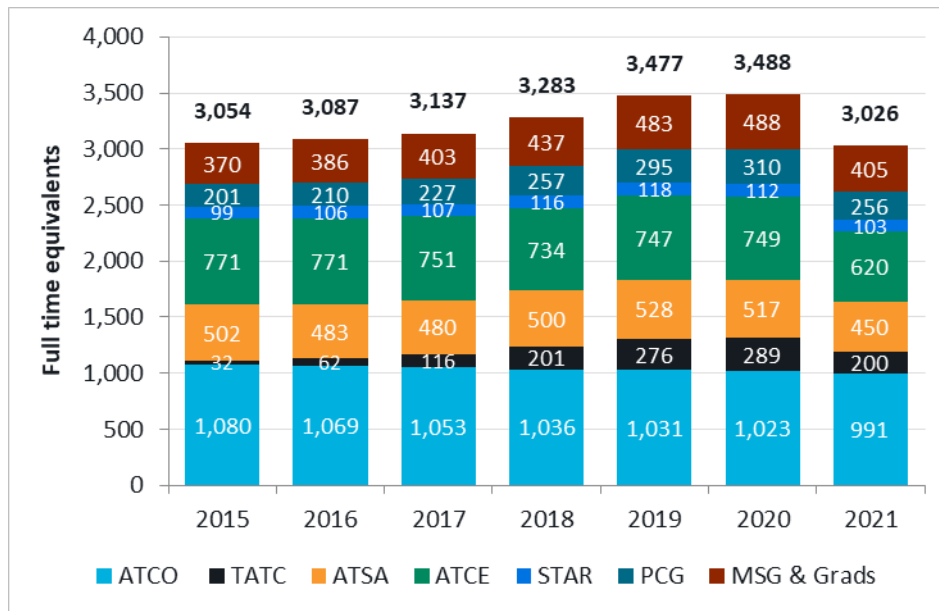
Source: 'NR23 opex template FINAL' received on 07/02/2022. Capital expenditure for 2021 are a forecast.

2.3.7 The level of labour costs that were capitalised fell from an average of £57 million p.a. over 2015-2019 to £35 million in 2020, as capital investment was paused in the context of COVID-19 crisis. Capitalised labour costs increased to £45 million in 2021 as some capital projects resumed.

Staff numbers

2.3.8 Figure 2.3 shows the staff numbers by employee function since 2015, excluding contractors. Staff numbers increased by +3.6% CAGR between 2017 and 2020, after having grown at a slower pace earlier in RP2 (+1.3% CAGR 2015-2017). The growth between 2017 and 2020 was driven by increased trainee ATCOs (TATCs) and increased management staff (PCG, MSG and graduates). Total staff decreased by -13% in 2021, driven mainly by reductions in non-operational staff as a result of the voluntary redundancy programme implemented by NERL and a pause in ATCO training, reducing the number of TATCs.

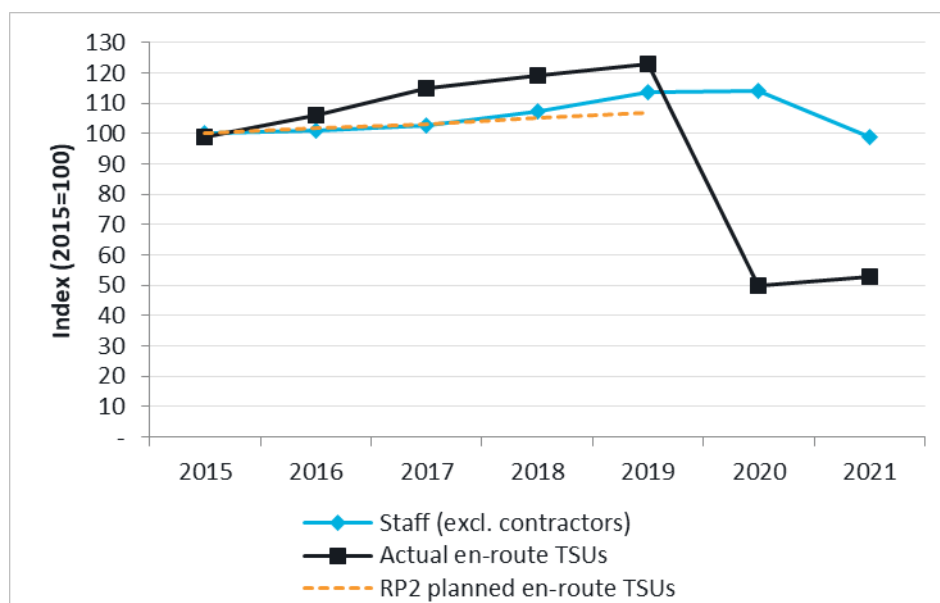
Figure 2.3: NERL staff by function (2015-2021)



Source: 'NR23 opex template FINAL' received on 07/02/2022

2.3.9 Figure 2.4 shows NERL staff alongside planned en-route service units for RP2 and actual en-route service units between 2015 and 2021, indexed to 2015. Staff numbers grew by +1.3% CAGR between 2015 and 2017 in the context of modest assumed traffic growth (+1.6% CAGR 2015-2017 and +1.7% CAGR 2015-2019). In practice traffic was higher than planned over RP2, which is partly reflected in the lagged increase in staff numbers in the later years of the reference period. En-route service units fell by -56% in 2020 as a result of the COVID-19 crisis, with only a small recovery (+5.8%) seen in 2021.

Figure 2.4: Index of NERL staff en-route Total Service Units (2015-2021)



Source: 'NR23 opex template FINAL' received on 07/02/2022, PRB monitoring reports

Pay

- 2.3.10 There are two approaches to calculating and escalating pay, one covering Personal Contract Group (PCG) staff, mainly managers not covered by collective negotiations, and one covering negotiated grades, comprising ATCO, TATC, ATSA, ATCE, STAR and MSG grades.
- 2.3.11 NATS Staff are represented by three trade union groups:
- PCS (Public & Commercial Services) – ATSAs, MSGs.
 - Prospect ATSS (Air Traffic Systems Specialists) – ATCEs, STARs.
 - Prospect ATCO Branch (Air Traffic Control Branch) – ATCOs, TATCs.
- 2.3.12 PCGs are not represented by a recognised trade union collectively, although some PCGs are members of the unions above.
- 2.3.13 For PCG staff:
- Salaries are market-based and jobs are evaluated through the Hay methodology for benchmarking and standardising job levels.
 - There is one annual pay settlement in April which is based on performance and subject to an agreed overall budget determined by the Board.
 - An annual management bonus scheme is in place which is based on company and individual performance.
- 2.3.14 For negotiated grade staff:
- Pay is negotiated between NATS and Unions and changes are effective from 1 January each year.
 - Progression arrangements are effective from 1 April each year and linked to historical agreements.
 - Pay deals are split between a standard inflationary award and a performance-related award. Progression along salary scales is either based on performance or tenure and apply until individuals reach the top of their pay grade.

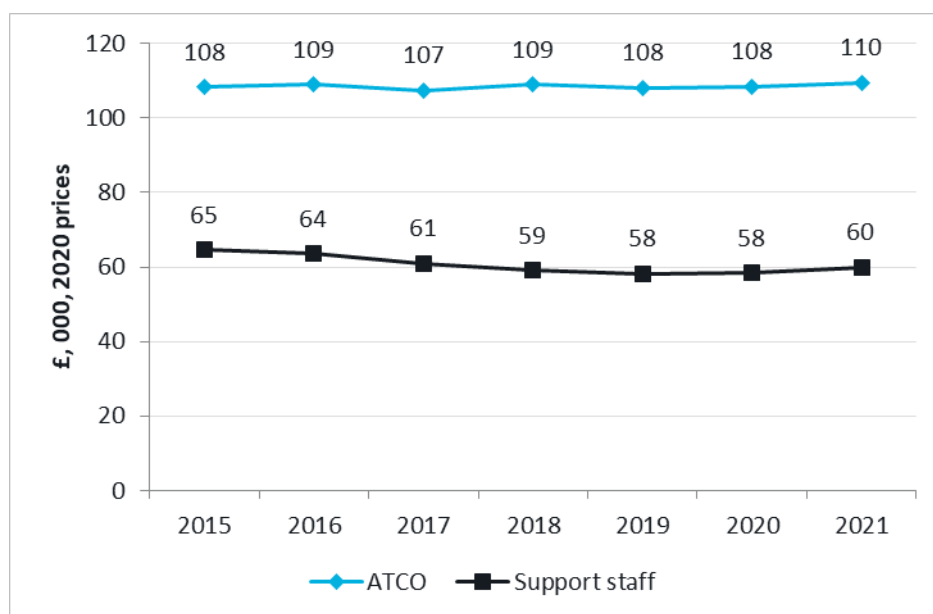
- For ATCO grades, due to the nature of these safety critical roles, performance awards are based on years of experience.

2.3.15 Figure 2.5 shows the average pensionable pay for ATCOs and support staff in real terms. Support staff is defined as all employees other than ATCOs.

- Average ATCO pensionable pay remained relatively stable in real terms over the 2015-2021 period, growing by +0.2% CAGR (2015-2021).
- Average support staff pensionable pay decreased in real terms over RP2 by -2.5% CAGR (2015-2019), before then increasing by +1.4% CAGR over 2020 and 2021.

2.3.16 This combines the effect of annual pay awards and effect of the progression of existing staff along the salary scales, new joiners and leavers.

Figure 2.5: NERL average pensionable pay (2015-2021)



Source: 'NR23 opex template FINAL' received on 07/02/2022

Benchmarking of labour costs

2.3.17 The labour market for ATCOs is restricted to a relatively small number of organisations in the UK, where, in addition to NATS, there are also opportunities for ATCOs working for alternative Terminal ANS providers at a number of airports, including Gatwick¹⁴, Edinburgh, Birmingham and the HIAL airports in Scotland. In most other European countries, the situation is similar or, in some cases, even more restricted with a single monopoly supplier of ANS. This means that any benchmarks must be considered to be in the context of labour markets generally with little competition between employers and a unionised, highly skilled workforce. In many countries there are tight labour conditions with a shortage of available ATCO staff.

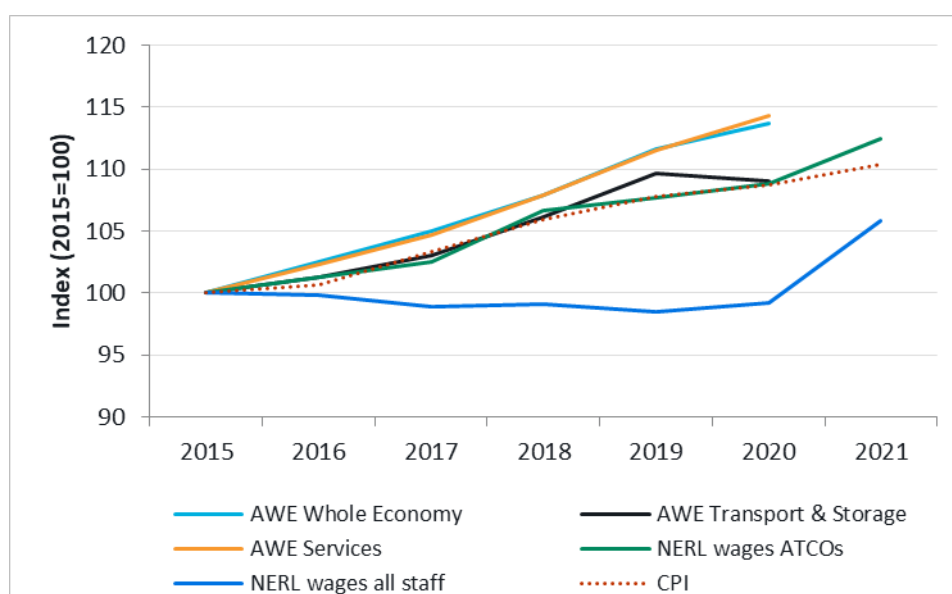
2.3.18 Here we benchmark the trend of staff costs for NATS against the wider UK economy, and the level of NATS staff costs against those of other large ANSPs. We also show how ATCO wages and salaries compare with those of other safety-critical jobs in transport.

¹⁴ NATS will take over TANS provision at Gatwick from October 2022.

Evolution of NERL's salaries

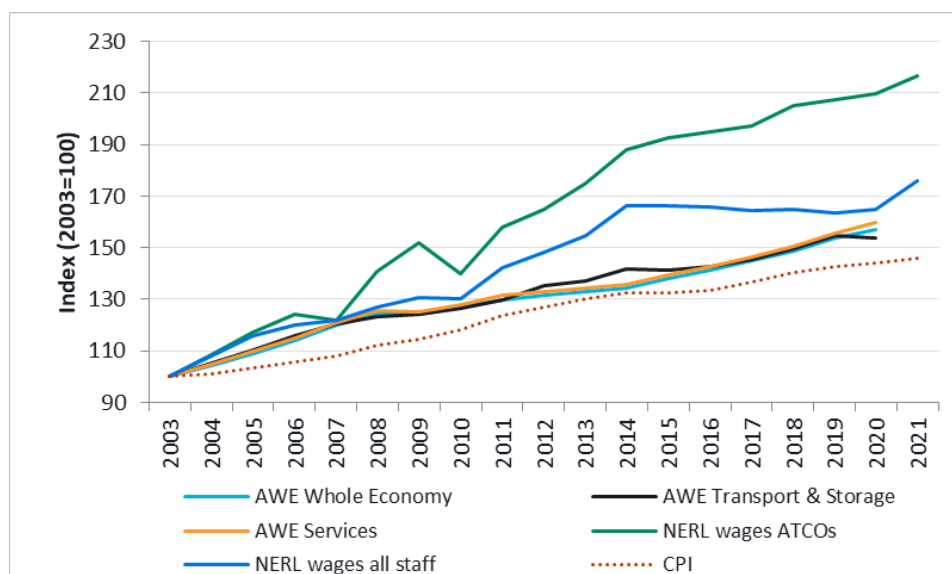
- 2.3.19 The evolution of nominal average wages for ATCOs and average wages for all staff at NERL is shown in Figure 2.6 alongside the trends in CPI and in average weekly earnings (AWE) for the whole UK economy, for the services sector and for the transport & storage sector. Over the 2015-2020 period, average wages at NERL for ATCOs and, particularly, for other staff have grown more slowly than those in the broader transport and service sectors and across the wider economy. This is the result of a combination of pay award, incremental progression and changes in the mix of staff, with growth in lower paid support staff numbers keeping the growth in average wages for all staff low. The increases observed in 2021 are understood to be driven by the combination of a +2.3% nominal pay award reinstated from November 2021 and a mix change effect following the (non-operational staff) redundancies in 2020.

Figure 2.6: Index (2015=100) of nominal Average Weekly Earnings (AWE) (2015-2021)



Source: 'NR23 opex template FINAL' received on 07/02/2022 & Office for National Statistics

- 2.3.20 While NERL has been able to control unit pay costs in more recent years, drawing on analysis from the assessment for RP3, Figure 2.7 provides the longer-term context of the evolution of pay at NERL between 2003 and 2021. Although not particularly prominent in the scale used below, AWE in transport & storage outperformed those in the wider economy between 2003 and 2007, were impacted negatively and underperformed compared to the wider economy in 2008, before returning to stronger growth and consistently outperforming the wider economy from 2009 through to 2014, slowing slightly in 2015. In the context of AWE in transport & storage generally outperforming those in the wider economy and the overall growth in air traffic over the period, it is not surprising to find that wages for the highly specialised roles at NERL grew more strongly than the wider economy and the relevant sub-sectors. Despite being more volatile than the sector averages, nominal ATCO and all staff wages, respectively, grew by an average of +4.4% (CAGR 2003-2020) and +3.0% (CAGR 2003-2020) annually, compared with +2.6% (CAGR 2003-2020) for AWE in transport & storage and +2.7% (CAGR 2003-2020) in the wider economy.

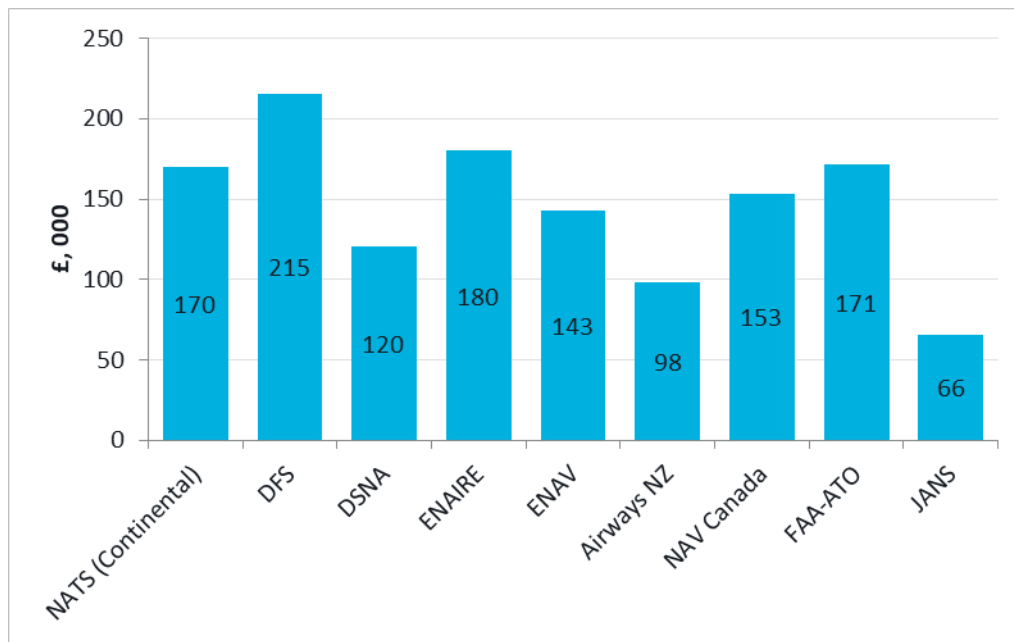
Figure 2.7: Index (2003=100) of nominal Average Weekly Earnings (AWE) (2003-2015)

Source: NATS RP2 Financial model, 23 April 2018 data submission, 'NR23 opex template FINAL' received on 07/02/2022 & Office for National Statistics

Comparisons with other ANSPs

- 2.3.21 The unit costs of NERL's ATCO staff can be compared with those of other ANSPs, based on data from international organisations including CANSO and EUROCONTROL. Given the necessarily monopolistic nature of en route air traffic control, no ANSP operates in a perfectly competitive labour market, while labour market conditions and salary rates differ across different countries, so that any comparison with other ANSPs can only be indicative. Employment costs are benchmarked for 2019, before the COVID-19 crisis impacted operations and ANSPs adopted different cost mitigation measures (including the use of government job support schemes, which are reported in different ways by different organisations).
- 2.3.22 The resolution of the benchmarking data does not allow for us to distinguish NERL from the operations of the wider NATS group, including terminal (NSL). It is also not possible to isolate ATCO wages and salaries from total ATCO staff costs. ATCO unit employment costs (including salaries, pensions and social costs) for 2019 are shown in Figure 2.8, comparing those of NATS with corresponding costs from other major ANSPs in Europe and across the globe. It indicates that ATCO costs at NATS were towards the higher end of the sample of ANSPs, although not at the top of the range.
- 2.3.23 The ANSPs included in the analysis are:
- NATS (Continental): the UK ANSP, covering en-route, London approach and terminal services, but excluding oceanic;
 - DFS: the German ANSP;
 - DSNA: the French ANSP;
 - ENAIRE: the Spanish ANSP;
 - ENAV: the Italian ANSP;
 - Airways NZ: the New Zealand ANSP;
 - NAV Canada: the Canadian ANSP;
 - FAA: the US ANSP; and
 - JANS: the Japanese ANSP.

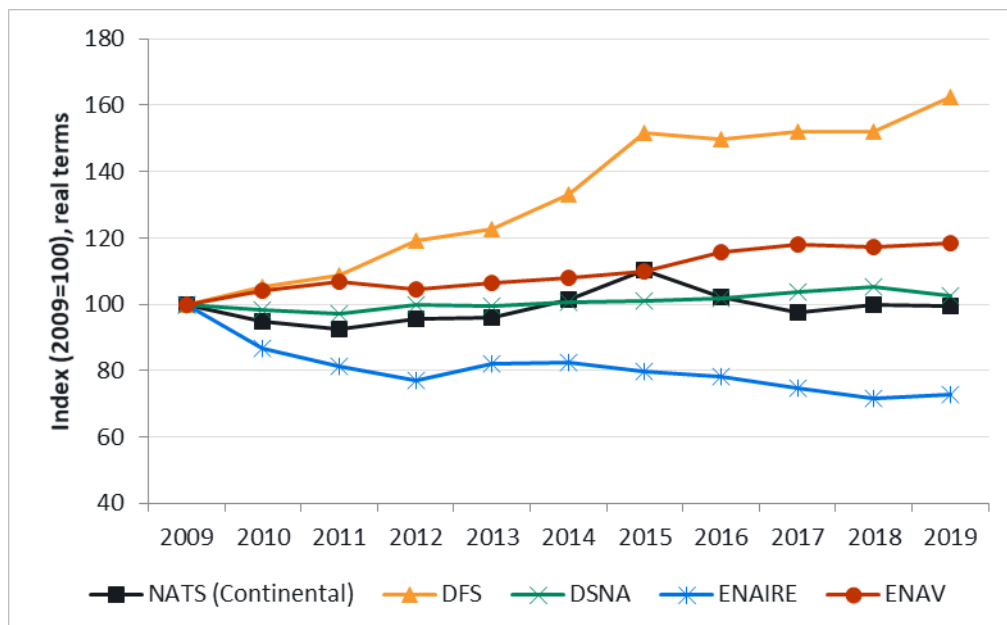
Figure 2.8: Annual employment cost (incl. social costs and pensions) per ATCO in OPS (2019)



Source: CANSO benchmarking data (in USD) & exchangerates.org.uk for USD to GBP 2019 average exchange rate

2.3.24 The chart below shows historical trends (in real price terms) in employment costs per ATCO hour for the five largest European ANSPs. This combines the impact of salary and other unit cost changes with any efficiency gains. NATS’ real unit costs per hour have been relatively stable over the period 2009 to 2019, similar to DSN (the French ANSP). In contrast, unit costs at DFS (Germany) have risen significantly, while those at ENAIRE (Spain) have fallen significantly.

Figure 2.9: Trend in gate-to-gate employment costs per ATCO-hour (2009-2019)

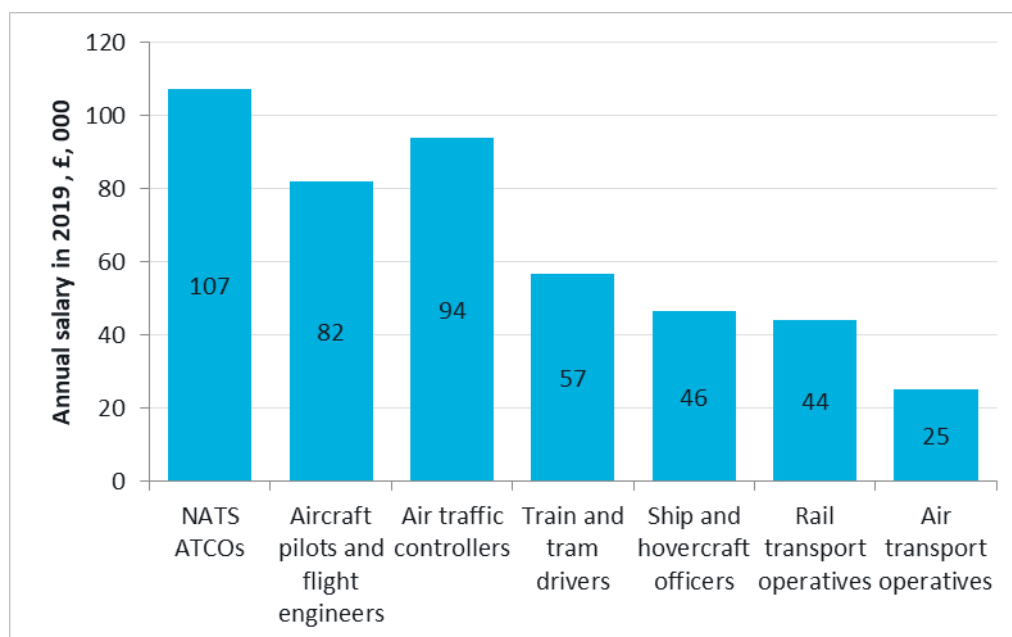


Source: Eurocontrol ACE benchmarking data

Comparisons with similar roles in the UK

- 2.3.25 In addition to the international comparisons presented above, NATS’ (and hence NERL’s) salary and other unit staff costs can also be benchmarked against comparable job roles in the UK labour market. While this removes the international aspect, it does allow a much wider range of staff roles at NERL to be benchmarked.
- 2.3.26 The charts below are based on an analysis of ONS data from the Labour Force Survey using the Standard Occupational Classification (SOC) data for 2019. This information is presented in its raw form and focuses only on salaries (rather than also including pension and other social costs). See also the discussion about the work NERL commissioned from consultants NERA, discussed below.
- 2.3.27 For both the charts presented below and the NERA analysis, a fundamental consideration is the choice of the comparator job roles, which can only be judgement-based. It should also be noted that the comparisons are limited to the constraints of the SOC classification scheme, which aggregates individual roles into groups (for example, incorporating ATCOs and ATSAs into the “air traffic controller” category (SOC code 3511)) and amalgamating all airline pilots, whether First Officers or more highly paid Captains into the same group (SOC code 3512).
- 2.3.28 The chart below shows NATS ATCO annual salaries (excluding social costs and pensions) compared with relevant roles in aviation (e.g. pilots, air traffic controllers) and related industries (e.g. train drivers and ships’ officers). NATS’ ATCO salaries are the highest of all the benchmark categories (+26% higher than the upper quartile of the benchmarks).

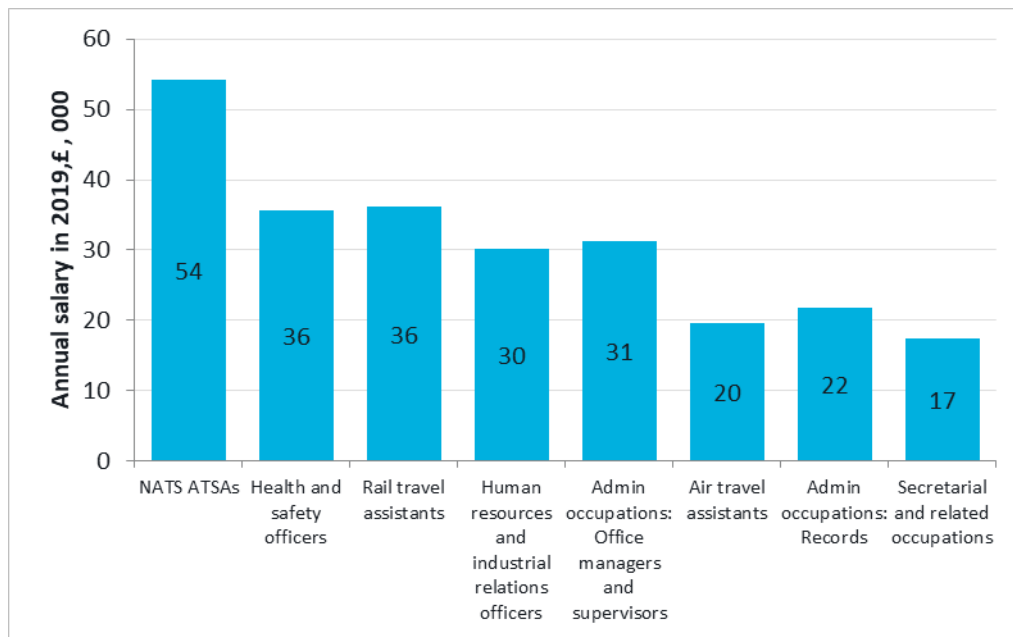
Figure 2.10: NATS ATCO salary benchmarking with other industries (2019)



Source: ‘NR23 opex template FINAL’ received on 07/02/2022 & Office for National Statistics. Air traffic controllers (SOC code 3511) includes ATCOs and ATSAs at NERL and across other UK ANSPs.

- 2.3.29 The chart below shows NATS’ ATSA salaries in comparison with a range of different comparable roles across other industries. ATSA salaries are significantly higher than any of the comparator groups (+52% higher than the upper quartile of the benchmarks).

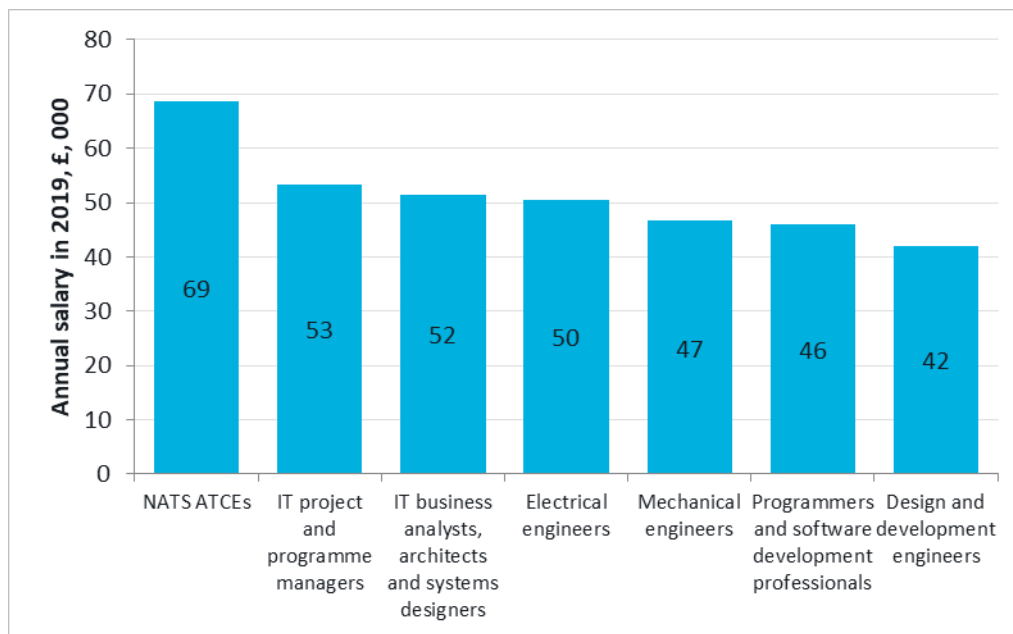
Figure 2.11: NATS ATSA salary benchmarking with other industries (2019)



Source: 'NR23 opex template FINAL' received on 07/02/2022 & Office for National Statistics

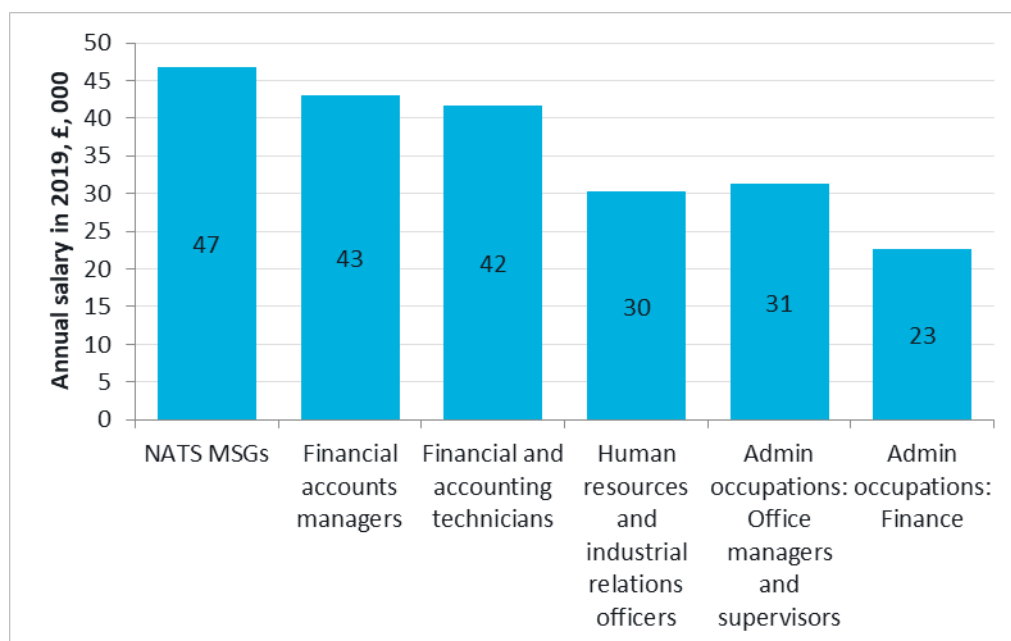
2.3.30 The chart below shows NATS' ATCE salaries in comparison with a range of comparable engineering and IT roles in UK industry. ATCE salaries are significantly higher than those of any comparator group (+32% higher than the upper quartile of the benchmarks).

Figure 2.12: NATS ATCE salary benchmarking with other industries (2019)



Source: 'NR23 opex template FINAL' received on 07/02/2022 & Office for National Statistics

2.3.31 The chart below shows NATS' MSG salaries in comparison with corresponding support roles such as financial accounts and human resources in UK industry. MSG salaries are at the top of the range of the comparator values (+10% higher than the upper quartile of the benchmarks).

Figure 2.13: NATS MSG salary benchmarking with other industries (2019)

Source: 'NR23 opex template FINAL' received on 07/02/2022 & Office for National Statistics

2.3.32 As introduced at the beginning of this benchmarking section, we acknowledge that the unique characteristics of the ATCO workforce, including being highly skilled, requiring extensive training, being internationally mobile, and being strongly unionised have led to stronger growth in salaries than some of the comparators presented here – although some comparators (e.g. airline pilot captains) are also highly skilled and potentially internationally mobile. On the other hand, the justification for the high salaries of less specialist roles (e.g. ATSA, ATCE, and MSG) is less clear and may be a side-effect of being part of the negotiations including ATCOs. NERL's ability to adjust salaries for any of the staff categories may be limited by the constraints on the ATCO labour market and the impact of unionisation of both ATCOs and support staff.

Analysis by NERL's consultants NERA

2.3.33 As noted above, NERL commissioned NERA to undertake a benchmarking exercise of NERL's staff salaries. NERA reported back to NERL in September 2021.

2.3.34 NERA's analytical approach is based on "wage equations", which attempt to estimate the appropriate salary levels for particular jobs, based on an econometric analysis of comparable roles, using the ONS' Labour Force Survey data classified according to the SOC scheme described above. NERA states that the "wage equation" approach is well recognised as an appropriate means to estimate market salary levels.

2.3.35 NERA has developed wage equations for the salaries of each of NERL's staff groups by estimating the relationship of hourly employee pay to:

- employer characteristics (e.g. company size);
- employee characteristics (qualifications, length of service, union membership);
- job characteristics (hours worked, location);
- demographics (sex, marital status, ethnicity); and

- a range of indicators relating to non-linear relationships, interactions between effects and time-related effects.

2.3.36 The analysis was dependent on comparing each NERL staff group to comparator occupations, using similar selections to those in the charts above (Figure 2.10 to Figure 2.13). As with those charts, there is an element of judgement involved, in addition to the quantitative analysis used in developing the wage equations.

2.3.37 NERA developed a range of wage equations, using different selections from the variables described in paragraph 52.3.35 above (but keeping the selection of comparator occupations unchanged). These different wage equations led to range of estimates for the appropriate market salary rates for each of the NERL staff groups: the corresponding NERL salary (expressed as hourly pay) was then compared to the minimum and maximum values of these market salary rates.

2.3.38 NERA's analysis indicates that:

- ATCO pay is within the range of market pay for comparator roles, with "benchmark pay equal to between 75 to 106 per cent of ATCO actual wages";
- ATSA pay is above the top of the range of comparators, with its models predicting "pay equal to between 69 to 84 per cent of ATSA actual wages";
- ATCE pay is above the top of the range of comparators, with its models predicting "pay equal to between 85 to 94 per cent of ATCE actual wages";
- MSG and STAR pay is within the range of market pay for comparator roles, with benchmark pay "equal to between 88 to 106 per cent of MSG actual wages, and between 100-107 per cent of STAR actual wages"

2.3.39 Despite the sophistication of its approach, NERA's analysis appears to confirm the indication, based on the direct salary comparisons in Figure 2.11 and Figure 2.12, that ATSA and ATCE pay is above market rates (although NERA does provide qualitative reasons why it considers that, nevertheless, ATSA and ATCE pay is not excessive for example due to imperfect comparator roles). It is less conclusive about ATCO, MSG and STAR pay.

2.3.40 The results of our staff cost benchmarking show that over the 2003 to 2019 period salary growth for all staff has outperformed comparators for the Transport & Storage sector by +5.7% and the review of individual roles identified differences relative to the upper quartile of the benchmarks in the range of +10% for MSGs to +52% for ATSAs. The expected evolution in real terms of salaries that are found to be above market rates is considered in more detail in the section on staff costs in NR23, particularly given the high-inflation context that is expected over the short- to medium-term.

Defined Contribution pension costs

2.3.41 Pensions alongside wages and salaries are the one of the main components of NERL staff costs. Steer has been asked to review the costs from the Defined Contribution pension scheme, with the CAA and other advisors reviewing the costs from the Defined Benefit pension scheme and other pensions costs. In this section we describe the NATS Defined Contribution pension schemes and compare it to other ANSPs and companies in other comparable sectors.

NATS Defined Contribution scheme

- 2.3.42 Until 31 March 2009, NATS offered an occupational defined benefit (DB) scheme which provides benefits based on final pensionable salary. From 1 April 2009, all new joiners were enrolled to the new defined contribution (DC) scheme.
- 2.3.43 In defined contribution plans, the payments made into the plan are specified, but the benefits depend on the performance of the investments comprising the pension fund. Investment risk and investment rewards are therefore assumed by each member and not by the sponsor. In a defined contribution plan, pension contributions are paid into an individual account for each member. The contributions are invested, for example in the stock market, and the returns on the investment (which may be positive or negative) are credited to the individual's account. On retirement, the member's account is used to provide retirement benefits, sometimes through the purchase of an annuity which then provides a regular income.
- 2.3.44 The company operates a salary sacrifice arrangement whereby employees sacrifice an element of their salary in favour of contributions to the pension scheme (salary sacrifice reduced employer national insurance contributions). The company matches employee contributions to the scheme in a ratio of 2:1, up to a maximum employer contribution of 18%.
- 2.3.45 The default pension contribution rate at NATS is set at 6% for employees and 12% for the employer. Employees can contribute between 4% and 9% of pensionable pay by the employer making the employer cost between 8% and 18% of pensionable pay. NERL stated that the DC scheme was introduced as an enabler for closing the DB scheme and that the DC contribution rates were set in this context following a three-year negotiation and at a level which balanced the aspirations of the trade unions against affordability and benchmarks.
- 2.3.46 The average employer contribution rate for all staff was 16.3% in 2021. It was 17.6% for ATCOs due to the level of ATCO vs other staff self-contribution on average being higher. This average level of contribution shows a trend of increasing over the 2015-2021 period as highlighted from the extracts from the business plan and NERL financial statements contained in the tables below.

Table 2.1: NERL defined contribution costs, rate and members (2015-2021)

	2015	2016	2017	2018	2019	2020	2021
Defined contribution costs (£m, 2020 prices)	4.8	5.4	7.4	7.8	10.4	12.3	12.1
Average employer contribution rate	No data	15%	No data	No data	15.6%	16.1%	16.3%
Members	527	619	768	1,020	1,319	1,471	1,325

Source: 'NR23 opex template FINAL' received on 07/02/2022, clarification responses received on 17/02/2022 & PRC pension study 2018

Table 2.2: NERL defined contribution costs, rate and members (FY2016-FY2021)

	FY2016	FY2017	FY2018	FY2019	FY2020	FY2021
Defined contribution costs (£m, nominal)	4.0	4.8	6.0	8.1	11.1	12.4
Average employer contribution rate	14.8%	15.0%	15.0%	15.2%	15.7%	16.1%
Members	592	722	961	1,287	1,537	1,388

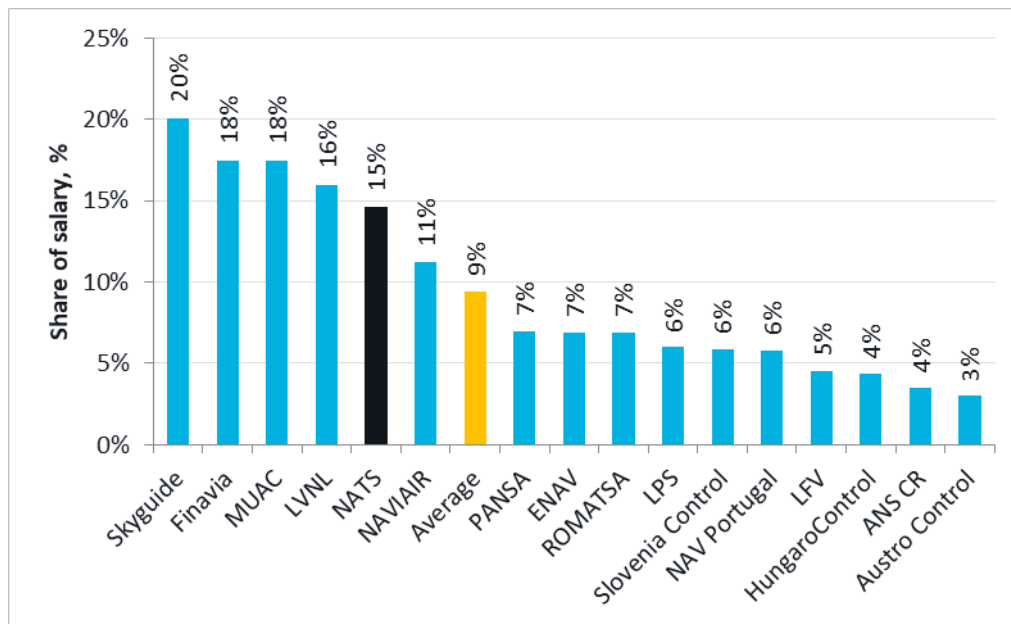
Source: NATS (En Route) plc Financial statements

2.3.47 A significant proportion of ANSPs across Europe still offer defined benefit schemes to their staff but there has been a gradual shift in some States towards defined contribution schemes, particularly for new joiners.

Comparison with European ANSPs

2.3.48 Figure 2.14 shows the average contribution rate for defined contribution schemes across European ANSPs. The information relates to 2016 and is taken from the 2018 Pensions study for EUROCONTROL’s Performance Review Commission. A review of the annual PRB monitoring reports for 2017-2020 indicated that material updates to the ANSPs’ pension schemes have not been reported.

Figure 2.14: Defined contribution scheme average contribution rate (2016)



Source: PRC pension study 2018.

2.3.49 It is important to note that the results shown in Figure 2.14 do not take into account the basis on which the contributions have been calculated. Some ANSPs will make the contributions based on a basic salary, while other ANSPs might include bonuses and other employee benefits. NATS has the fifth highest level of contribution across the sample of ANSPs, however the different basis and national legislation for these schemes make it challenging to make like for like comparisons. It should also be noted that for some ANSPs the principal pension benefit is provided by the state through employer social security contributions at rates set by the state and which represent a very significant proportion of staff costs, in some cases exceeding DC level contribution rates.

2.3.50 The various pension information and data included in the PRB monitoring reports published in 2017, 2018, 2019 and 2020 have not indicated any evolution of the contribution rates since 2016, when the primary research for the PRC pension study was undertaken, for the selected ANSPs.

Comparison with other UK ANSPs

- 2.3.51 To benchmark the pension cost of NATS we have considered alternative Terminal Air Navigation Services (TANS) providers at airports including:
- Air Navigation Solutions Limited (ANSL), which provides TANS at Gatwick and Edinburgh airports;
 - Birmingham Airport Air Traffic Limited (BAATL); and
 - Highlands and Islands Airport Limited (HIAL) in Scotland.
- 2.3.52 The benchmarking recognises that new UK comparators do not have the same legacy pension arrangements of NERL.
- 2.3.53 As of 2016, ANSL and BAATL offer a defined contribution occupational scheme. HIAL has a career-average scheme (defined benefit scheme) for employees that has been in place since 2010. HIAL makes contributions of 22% of employees' salary to the HIAL pension scheme.¹⁵ HIAL also offers a defined contribution scheme according to their 2020/2021 annual report.
- 2.3.54 NSL provided TANS at Gatwick Airport until 2016, at which point these services were transferred to ANSL. Existing staff transferring from NSL and new recruits were provided with a similar defined contribution scheme to the one that had been offered by NATS (though not identical in terms of allowance).
- 2.3.55 Similarly, BAATL offered all ATCOs a defined contribution scheme which matched NSL's defined contribution terms and conditions.
- 2.3.56 Because ANSL and BAATL appear to have all their employees enrolled in defined contribution pension schemes, their average pension contribution rate can be estimated using information published in their annual reports. Their contribution rates are presented in Table 2.3 below and appear on average to be lower than for NERL even if the conditions are similar.

Table 2.3: Average employer contribution rates for each UK ANSP

ANSP	Period	Average Contribution Rate
NERL	2019	15.6%
ANSL	2019	11.5%
BAATL	FY 2020	10.2%

Source: Clarification responses received on 17/02/2022 & annual reports.

Contribution Rates (DC schemes)

- 2.3.57 Employer contribution rates vary across the different companies. This can be a result of the agreements made when transitioning from a defined benefit scheme and the competitive market which the companies operate in. Most employers will match the employees' contributions and some will contribute additionally up to a certain contribution rate. The companies reviewed alongside NATS include:
- British Airways
 - Gatwick Airport Limited
 - Heathrow Airport Limited

¹⁵ HIAL Trainee Air Traffic Control Officers – Information for Candidates 2017

- Network Rail
- Centrica
- Thames Water
- Royal Mail.

2.3.58 The default pension contribution rate at NATS is set at 6% for employees and 12% for the employer. Employees can contribute between 4% and 9% of pensionable pay; this is matched on a 2:1 basis by the employer making the employer cost between 8% to 18% of pensionable pay. NATS offers a maximum employer contribution of 18%, which is achieved through the salary sacrifice scheme; maximum contributions are not automatically made. The average employer contribution rate for all staff was 16.3% in 2021. The different contribution rates at each of the benchmarked companies are shown in Table 2.4 below.

Table 2.4: Employer contribution rates for each company

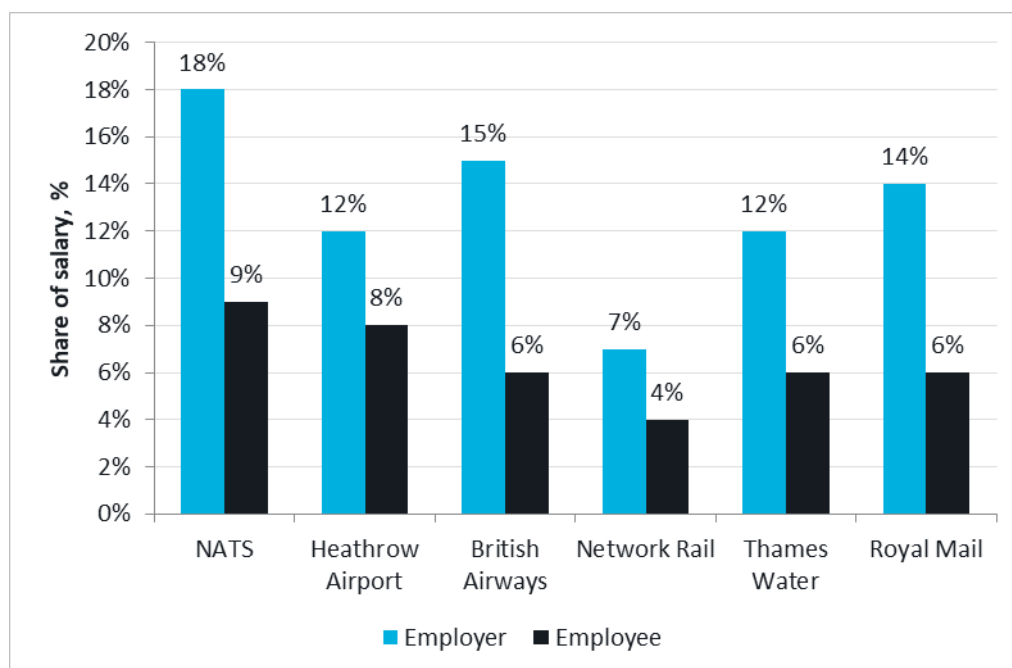
Company	Plan Name	Contribution rate (2022)
NATS	NATS defined contribution scheme	Employer contribution rate is 16% on average. A salary sacrifice arrangement where employees can sacrifice an element of salary in favour of contributions to scheme in a ratio of 2:1, up to maximum employer contribution of 18%.
Heathrow Airport	BAA defined contribution plan	The standard employer contribution rate is set at 10% with the employee contributing 5%. This can be increased up to 12% or down to 8% if the employee adjusts their contribution rates to 8% and 3% respectively.
Gatwick Airport	Defined contribution plan	Rate specified in the rules of the scheme - not available.
British Airways	British Airways Pension Plan	Choice of contribution rates with the option to take cash instead of pension. Employer contribution rate of 14% for pilots and 11% for other staff. The employer contribution can be between 5% and 15% if employees adjust their contribution rates between 0% and 6%.
Network Rail	Network Rail Defined Contribution Pension Scheme	The current normal contribution range for employees is 0% to 4% with employer contributions from 3% to 7%, based on employees' pensionable pay.
Centrica	Centrica Pension Scheme - Defined contribution	Not available.
Thames Water	Defined contribution 'stakeholder' pension scheme	Automatically enrolled with employer contribution rate of 6% with employee contributing 3%. For each additional 1% that employees contribute, the employer will contribute an additional 2% up to a maximum company contribution of 12%.
Royal Mail	Collective defined contribution scheme	Employer contribution of 13.6% with employees contributing 6% themselves. ¹⁶

¹⁶ <https://www.employeebenefits.co.uk/issues/february-2018/royal-mail-confirms-pay-and-collective-dc-pensions-scheme-for-110000-postal-employees/>

Source: Annual reports, company websites and pension booklets

- 2.3.59 Figure 2.15 shows the maximum employer contribution rate, with the corresponding employee contribution rate, for NATS compared with other previous public companies in the transport, utilities and logistics sector. The maximum employer contribution rate at NATS is 18% achieved through the salary sacrifice scheme. This is relatively high compared to the average of 12% across the benchmarked companies.¹⁷

Figure 2.15: Maximum employer and employee contribution rate benchmarking



Source: Annual reports, company websites and pension booklets

- 2.3.60 Based on this analysis, it appears that NERL makes more generous contributions to staff pensions in its DC scheme than comparable UK employers.

Summary

- 2.3.61 NATS introduced a defined contribution pension scheme for new joiners in 2009. The default pension contribution rate at NATS is set at 6% for employees and 12% for the employer. Employees can contribute between 4% and 9% of pensionable pay by the employer making the employer cost between 8% and 18% of pensionable pay. The average employer contribution rate for all staff was 16.3% in 2021. This average level of contribution has increased over the 2015-2021 period.
- 2.3.62 NATS has the fifth highest level of contribution across the sample of 17 ANSPs in Europe, however the different local basis and national legislation for these schemes make it challenging to make like for like comparisons. While other UK ANSPs have matched the NATS defined contribution scheme, the average level of contribution is lower according to their financial statements.

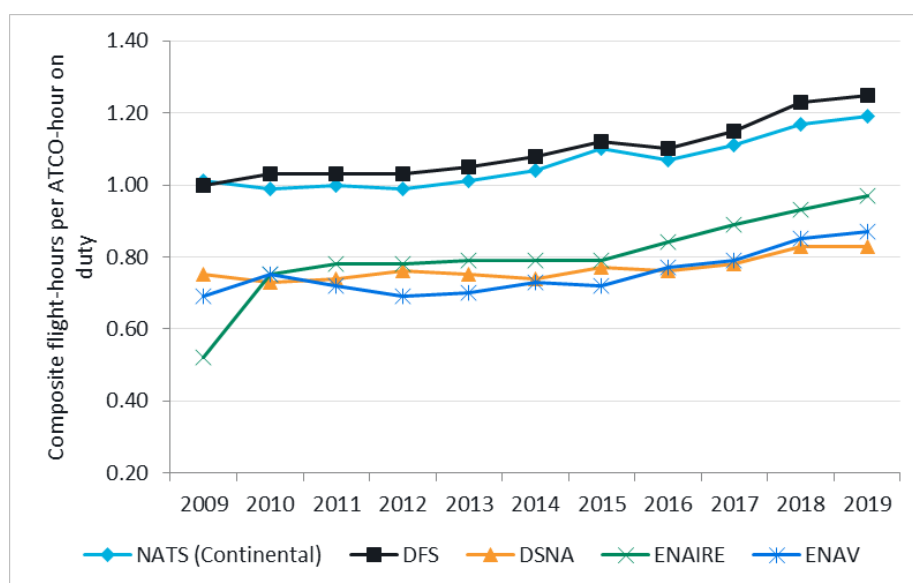
¹⁷ Note: Gatwick Airport and Centrica have not been included in the benchmarking as contribution rates for these companies were not available.

- 2.3.63 Compared to other comparable UK companies (former public transport and utilities companies), NATS provides a more generous scheme.
- 2.3.64 Airline stakeholders have suggested that in the context of significant number of new joiners expected in the 2022-2027 period that NERL should consider introducing a new, less generous scheme given the cost pressures on the aviation industry.

Staff productivity

- 2.3.65 For ATCO staff in operational roles, it is possible to define a productivity measure, namely the “composite flight hours” of aircraft handled by the ANSP per operational hour worked by ATCOs. This is shown in the chart below, and indicates that NATS, along with the German ANSP DFS, has the most productive ATCO staff according to this measure, with continuing improvement over the years between 2016 and 2019.

Figure 2.16: ATCO-Hour productivity at selected ANSPs (2009-2019)



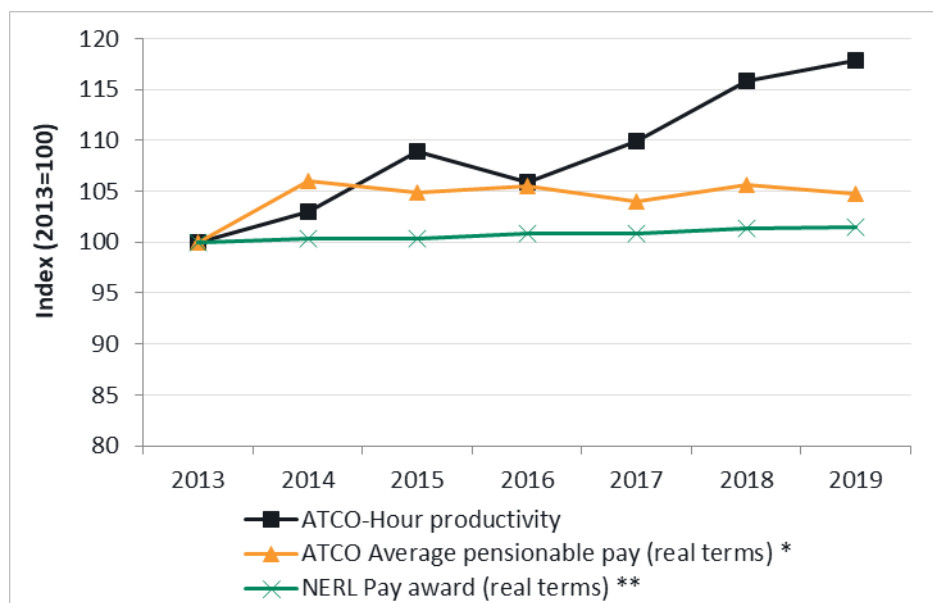
Source: ACE benchmarking data

- 2.3.66 Although from a lower base, productivity improvements were also seen at the other three large European ANSPs, as may have been expected during a period of strongly growing traffic.
- 2.3.67 While corresponding data for 2020 and 2021 are not yet available, productivity will have dipped markedly during these years due to the impact of the COVID-19 pandemic. Traffic fell by over 50% across the pan-European system during 2020 but, while many ANSPs including NERL made significant cost savings including reducing ATCO numbers and hours, these were of a much lower magnitude, leading to lower productivity.
- 2.3.68 Figure 2.17 below shows the evolution of ATCO pay alongside the change in ATCO-productivity over the 2013-2019 period. The evolution of average salaries is driven by:
 - Changes in the mix of staff within each category, reflecting a movement in the share of staff across different grades (i.e. pay scales);
 - Pensionable pay award, reflecting annual increases in salaries;
 - Incremental progression, reflecting contractual increases within pay scales linked to length of service and performance; and

- Attrition and retirements, reflecting the effect of experienced staff (often at the top of the pay scale) leaving and new staff joining (at the bottom or lower on the pay scale).

2.3.69 The ATCO average pensionable pay shown in orange in the figure combines all of the above movements, while the NERL pay award shown in green shows the change in the second item only, which represents an increase in all salaries across the pay scale. As can be seen, pensionable pay awards have accompanied improvements in productivity (although we note that productivity improvements are the result of a combination of factors both endogenous to NERL (technology, ways of working, etc.) and exogenous (traffic)).

Figure 2.17: ATCO-Hour productivity and pay evolution (2013-2019)



Source: ACE benchmarking data, 'NR23 opex template FINAL' received on 07/02/2022, NATS RP2 Financial model, 23 April 2018 data submission. Notes: (*) Includes various staff movements such as promotions, retirements and new entrants; (**) Based on real increment from CPI of the previous year

2.4. Reconciliation review for 2020-2022 on staff costs

- 2.4.1 In this section we review the actions NERL took on staff costs over the 2020-2022, compare these to other ANSPs in Europe and other aviation industry participants in the UK before assessing their reasonableness and efficiency as a foundation for the NR23 business plan forecasts, without the benefit of hindsight. We go on to identify potential areas of cost disallowance during 2020-2022 based on this analysis.
- 2.4.2 Following the onset of the pandemic in March 2020, the significant reduction in air traffic's use of NERL's services and the consequential reduction in cash revenues collected led to the need for significant actions to be taken. This was in the context of a changing situation, the pandemic was novel, and expectations of duration and recovery level and timings were under constant review. The UK had a number of lockdowns and restrictions on air travel which alongside restrictions on travel between Europe and the United States of America had a significant impact on use of NERL's airspace over this period.

Stakeholder views

- 2.4.3 Airlines express some concern that some of the actions on cost reduction during the reconciliation period did not go far enough compared to industry peers and the redundancy programme was very costly, requiring a long payback period. Trade Unions observe that the implementation of the voluntary redundancy (VR) scheme has impacted both day-to-day support in operations and the capacity to deliver change. Airlines also noted that the actions taken during the reconciliation period had a lasting impact on the capability of NERL to deliver its capital programme.

Actions taken by NERL

- 2.4.4 Over the 2020 and 2021 period NERL took a number of actions listed below. The costs of these actions (mainly for the voluntary redundancy programme) were incurred during 2020, which meant that material reductions in total costs were reported during 2021 onwards.

Table 2.5: 2020-2022: NERL actions on staff numbers

Actions
Voluntary redundancy: Almost 330 reduction in headcount (9% of the total workforce) through a voluntary redundancy programme.
Freeze recruitment: all but non-essential recruitment was halted.
Contractor release: all contractors working on non-essential projects were released.
ATCO training interruption: ATC training college was closed, and 122 part-trained controllers were released through compulsory redundancy.
Furlough: NERL made extensive use of the UK-wide government furlough scheme. In particular NERL put the case to the DfT for what eventually became referred to as 'flexible furlough', whereby they were able to rotate individual employees onto and off from furlough to support the operational needs. At its peak, NERL had 1,829 members of staff furloughed, representing about 50% of the total workforce.

Table 2.6: 2020-2022: NERL actions on staff costs

Actions
Pay freeze: Staff pay was frozen at 2019 levels from April 2020 through to November 2021. 2020 pay awards effective in January 2020 were reversed from April 2020.
Voluntary pay cuts: NERL asked its management group (around 10% of the total workforce) to volunteer for a 10% pay-cut to their basic pay for a three-month period from May 2020. Around 50% of this group volunteered for these reductions.
Cancellations of management bonuses: management bonus schemes were cancelled in 2020/21. To reduce cash outgoings, the 2019/20 bonuses were deferred until December 2020.

Outcomes

- 2.4.5 According to the submissions of NERL, the voluntary redundancy programme cost a net £61 million (with an average cost per head across 330 staff of approximately £185,000). NERL stated that the average payback on the redundancy is 21 months, so is expected to be a net saving to the business by late 2022. It also noted that approximately £6 million of these costs was pay in lieu of notice (PILON), which employees were contractually entitled to and would have been incurred as staff costs if not included within the redundancy costs.
- 2.4.6 Across the staff initiatives, NERL estimate the saving by year in their business plan as presented in the table below.

Table 2.7: NERL estimate of cost savings by staff initiative (costs 2020 prices)

Action	2020	2021	2022	Total
Voluntary redundancy programme	-£61m	£34m	£34m	£7m
Freeze recruitment	£15m	£23m	£19m	£57m
Contractor release	£13m			£13m
Furlough scheme receipts	£26m	£9m		£34m
Reverse pay award, voluntary pay cuts, unpaid leave and suspended bonuses	£9m	£20m	£8m	£38m
Total staff related actions	£2m	£86m	£61m	£149m
Total staff costs 2019	£427m			
% of 2019 staff costs	0%	20%	14%	

Source: NERL business plan, Steer presentation

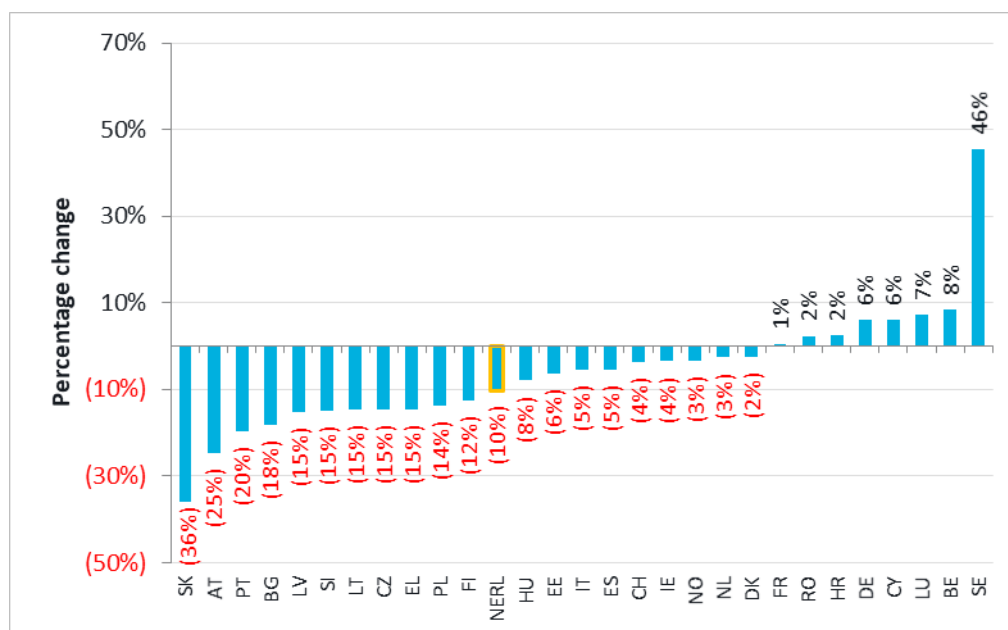
Defined contribution pension costs

- 2.4.7 As a consequence of the actions on staff numbers and costs, the cost of the defined contribution scheme was also lower. Actions to restrain pay and the voluntary redundancy of 78 members of this scheme, as well as the freeze on recruitment, have resulted in a lower pensionable payroll (by according to NERL around 16% by the end of the period) than was assumed in the CMA settlement. This has been partly offset by the rate at which staff have elected to contribute to the scheme which has resulted in an increase in the employer cost from 15% assumed in the CMA settlement to 16% in this period.

Comparisons to other ANSPs in Europe

Overview

- 2.4.8 All European ANSPs were required to provide updated RP3 business plans to the Performance Review Body (PRB) in December 2020 in response to the COVID-19 pandemic outlining cost containment measures their implication on operating costs throughout RP3. In this section expected cost reductions planned by all European ANSPs were analysed and compared with the NERL data received to allow its relative performance to be evaluated. It is recognised that given the timing of the data provision actual performance may have been different to planned and therefore we have focussed the comparison on the actions taken across ANSPs in Europe.
- 2.4.9 Figure 2.18 presents changes in en-route staff costs between 2019 & 2020. Due to the inclusion of governments' payroll support in the cost containment measures submitted, it was assumed that the staff cost changes also account for that governments' payroll support—information for NERL has been included on the same basis.

Figure 2.18: Change in ANSP en-route staff costs, 2020 versus 2019 (real)

Source: Steer analysis of PRB data & 'NR23 opex template FINAL' received on 07/02/2022.

- 2.4.10 Eight ANSPs expected their staff costs to increase in 2020, whilst the remaining 21 expected costs to reduce.
- 2.4.11 Slovakia submitted the largest expected staff cost reductions for 2020, representing a -36% reduction in costs versus 2019. This is followed by Austria, Portugal and Bulgaria, which are expected to make savings of -25%, -20% and -18% respectively. Five ANSPs (Latvia, Slovenia, Lithuania, Czechia and Greece) expected to make staff cost reductions of -15%. The average cost reduction expected across all ANSPs in 2020 was -5.7%.
- 2.4.12 The NERL made staff costs savings of -10% in 2020 versus 2019, ranking it 12th out of the 29 ANSPs as reported to the PRB. It is recognised that each ANSPs will have local rules and labour arrangements and that NERL's cost savings for voluntary redundancies did not emerge till 2022.

Composition of savings

- 2.4.13 Information submitted by ANSPs was grouped into:

- Headcount rationalisation;
- Reduction of staff working hours/salaries;
- government support; and
- staff pension costs.

Headcount rationalisation

- 2.4.14 Table 2.8 presents ANSPs which specified headcount rationalisation (including early retirements) as a measure to reduce staff costs. Headcount rationalisations measures were mentioned in 17 ANSP submissions to the PRB. Note that for NERL the figures presented are actuals, whereas for other ANSPs the information relates to planned savings. Compared to other European ANSPs' plans, NERL has made significant reductions in staff levels, many of the largest ANSPs did not make permanent job reductions, with most ANSPs with a higher percentage of cost reduction being smaller in size.

Table 2.8: Actions taken by ANSPs to reduce headcount, 2020-2021

ANSP	Action taken	Total Saving specified (2020-2021)
NERL	Recruitment freeze Voluntary redundancies benefits	£38m By end of 2021 still a net cost
NO	Voluntary severance scheme	£2.4m
SK	Recruitment freeze and rationalization of organizational structure	£10.1m
LV	Personnel reduction (unspecified)	£4.3m
CZ	Personnel reduction (unspecified)	£6.4m
SI	Recruitment freeze and early retirements	£0.2m
IT	Personnel reduction (unspecified)	£16.0m
EE	Personnel reduction (40 FTEs in 2020 including ATCOs)	£6.0m*
IE	Moratorium on recruitment	£5.2m
	Early retirements	£0.4m
PL	Recruitment freeze	£3.6m
CH	FTE reduction (unspecified)	£2.0m
NL	Non-ATCO recruitment freeze for RP3; ATCO recruitment freeze in 2021; rationalisation in labour conditions.	£4.9m*
HU	Freeze of non-ATCO headcount due to the pandemic	£3.1m
HR	Recruitment freeze	£13.4m
	Early retirements (unspecified)	£0.8m
FR	2020 ATCO recruitment was postponed until year-end; 50% reduction in 2021 ATCO recruitment.	Not specified
RO	Recruitment freeze	£0.2m
DK	No rehiring on vacant positions in 2020	£1.3m
	Voluntary resignations (77 by end of 2020) with effect from 2022 and temporary reduction in recruitment.	£4.0m
SE	Adaptation of staff volumes to current situation (includes less overtime, more leave of absence and vacancies).	£19.6m*
	Rationalisation of safety department (reduction of 2 FTE)	£0.4m

Source: Steer analysis of PRB data, Avinor. Note: (*) includes the effect of other actions.

Reduction of staff working hours/salaries

- 2.4.15 Table 2.9 below summarises the actions taken by European ANSPs to reduce staff working hours and/or salaries. Please note that savings specified in the cost containment reports are with respect to each ANSPs original RP3 business plan and should not be viewed as savings versus 2019 staff operating costs. As above, note that for NERL the figures presented are actuals, whereas for other ANSPs the information relates to planned savings. Compared to other European ANSPs' plans, NERL has made mid-level reductions in staff costs, but higher than the other largest five ANSPs in Europe (France, Germany, Spain and Italy).

Table 2.9: Actions taken by ANSPs to reduce staff working hours/salaries, 2020-2021

ANSP	Action taken	Total Saving specified (2020-2021)
NERL	Reverse pay award, voluntary pay cuts, unpaid leave and suspend bonuses	£29m
NO	Temporary redundancy: 471 FTE-months of unpaid leave	39 FTEs
	4 months of voluntary salary reductions were implemented for 38 staff in management roles	Not specified
SK	Salary reduction (60% of basic salary)	£1.0m
	Pay freeze (unspecified)	£1.0m
	Cancellation of bonuses and other rewards	£16.5m
AT	Reductions to vacation accruals and overtime provisions (unspecified)	£4.4m
	Reduction in staffing and working hours (unspecified)	£20m
	Removal of salary inflation adjustments	£5.3m
PT	Salary freeze in 2020 and 2021 (unspecified)	£10.7m
	Overtime reduction (unspecified)	£16.0m
LV	Reduction of working hours (to 4 days per week)	£2.0m
	Pay freeze (unspecified)	£1.8m
CZ	Reduction of basic salary (unspecified)	£15.1m
	Suspension of monthly performance pay	£7.7m
	Reduction in variable pay (unspecified)	£5.6m
	Reduction in overtime (unspecified)	£3.3m
SI	Reduced holiday allowance to minimum legally prescribed	£0.2m
	Salary reduction (-15% from Q2 to Q4 2020) compared to existing collective agreements	£1.9m
	Reduced performance bonus (unspecified)	£2.8m
	Reduced allowances (unspecified)	£0.2m
LT	Agreed salary increase (+4%) cancelled	£0.4m
	Variable salaries cancelled £1.6m	£1.6m
IT	Overtime reduction (unspecified)	£13.8m
IE	Reduction of working week (unspecified)	£1.4m
	Reduced pay (unspecified)	£4.7m
	Pay freeze (unspecified)	£4.4m
	Reduced variable pay (unspecified)	£3.9m
PL	Working hours reduction (unspecified)	£5.6m
	Salary reduction by 23.5% (except for the lowest earners)	£20.7m
CH	Pay freeze (unspecified)	£6.0m
	Variable salary reduction (unspecified)	£1.3m
	Personnel expenses reduction (unspecified)	£2.0m

ANSP	Action taken	Total Saving specified (2020-2021)
HU	Reduction in planned salary increase and staff performance bonuses (unspecified)	£16.2m
HR	Salary cut (unspecified)	£2.7m
RO	Salary freeze	£8.4m
	Removal of salary inflation adjustment	£4.3m
	Reduced additional benefits (unspecified)	£3.1m
CY	Overtime reduction	£4.0m

Source: Steer analysis of PRB data, Avinor.

- 2.4.16 14 ANSPs introduced measures to reduce staff costs through reduced working hours and salaries. Slovakia implemented the most impactful measure, reducing basic salaries by 40%. In Poland, salaries were reduced by 23.5%, whilst the introduction of a four-day working week Latvia essentially manifests a 20% reduction in pay. However, the respective periods during 2020 which these savings were implemented were not indicated, but usually covered part year. We review all the evidence including analysis comparator aviation companies in the United Kingdom before assessing what additional actions NERL may have taken over the 2020-22 reconciliation period.

Government subsidy

- 2.4.17 Table 2.10 presents ANSPs which specified government subsidies as a means by which staff costs could be reduced. Five ANSPs mentioned government subsidies in their PRB submissions. This indicates the availability of direct government subsidy was rare across Europe, relatively small where offered, and was not available to NERL.

Table 2.10: Government subsidies received by ANSPs, 2020-2021

ANSP	Action taken	Total Saving specified (2020-2021)
SK	Government subsidy	£1.2m
AT	Government subsidy	£6.2m
IE	Government subsidy	£2.5m
PL	Government subsidy	£2.2m
NL	Government subsidy	£11.0m

Source: Steer analysis of PRB data

Staff pensions costs

- 2.4.18 Table 2.11 presents ANSPs which specified reducing staff pensions costs as a means of reducing staff costs could be reduced. Five ANSPs mentioned reducing the employer's contribution rate to pension schemes, whilst in Poland the ANSP temporarily suspended contributions to its pension scheme in addition to temporarily suspending health insurance. Apart from Portugal, all of the ANSPs reducing pensions costs were in Central and Eastern Europe.

Table 2.11: Actions taken by ANSPs to reduce staff pension costs, 2020-2021

ANSP	Action taken	Total Saving specified (2020-2021)
PT	Employer pension contribution rate reduction	£25.1m
CZ	Employer pension contribution rate reduction	£3.6m
SI	Employer pension contribution rate reduction	£0.4m
LT	Employer pension contribution rate reduction	£0.2m
PL	Temporary suspension of contributions to the occupational pension scheme (and group health insurance)	£4.8m*
RO	Employer pension contribution rate reduction	£4.6m*

Source: Steer analysis of PRB data. Note: (*) includes the effect of other actions

2.4.19 The tables above show that ANSPs across Europe took significant action on staff costs and numbers, these were in the context of local circumstances in relation to government support schemes and the organisational and financial circumstances of each ANSP. On staff costs, NERL took similar actions to many other ANSPs (recruitment freeze, postponement of pay awards, suspension of bonuses, extensive use of government job support schemes). In some cases, pay reductions were introduced across all grades (e.g. -10% in the case of IAA – although we note that the IAA did not undertake a redundancy programme), this is an area that we assess that NERL could have gone further in the 2020-21 period.

2.4.20 Overall for 2020, NERL was in the middle of ANSPs in the % of staff cost reductions. However, compared to other European ANSPs, NERL has made significant reductions in staff levels and the net benefits of these job reductions on cost will only materialise in 2022 and is not reflected in the comparisons presented above.

Comparisons to other aviation industry participants in the UK

2.4.21 This section discusses the responses to COVID-19 by major aviation industry participants in the UK. Where relevant cost containment data has been made available (either directly to Steer or from public sources). The organisations reviewed were:

- Heathrow Airport;
- Gatwick Airport;
- Manchester Airport Group (MAG) including 3 airports: Manchester Airport, Stansted Airport and East Midlands Airport;
- British Airways;
- easyJet; and
- Ryanair.

2.4.22 The analysis of cost containment measures recognises these organisations do of course differ from NERL in their operational characteristics, all are major aviation participants which have suffered significant demand and revenue impacts from the COVID-19 pandemic to which they have had to respond. NERL stated that it does not consider these comparators to be appropriate due to different fixed-variable cost balances and traffic risk sharing arrangements.

2.4.23 While the proportions of very highly skilled staff differ from those of NERL, all the organisations do have significant numbers of highly trained employees, many of whom work in safety-critical environments (e.g. airline pilots). Some categories of costs, such as rents and external contracts, present similar opportunities for cost savings as available to NERL.

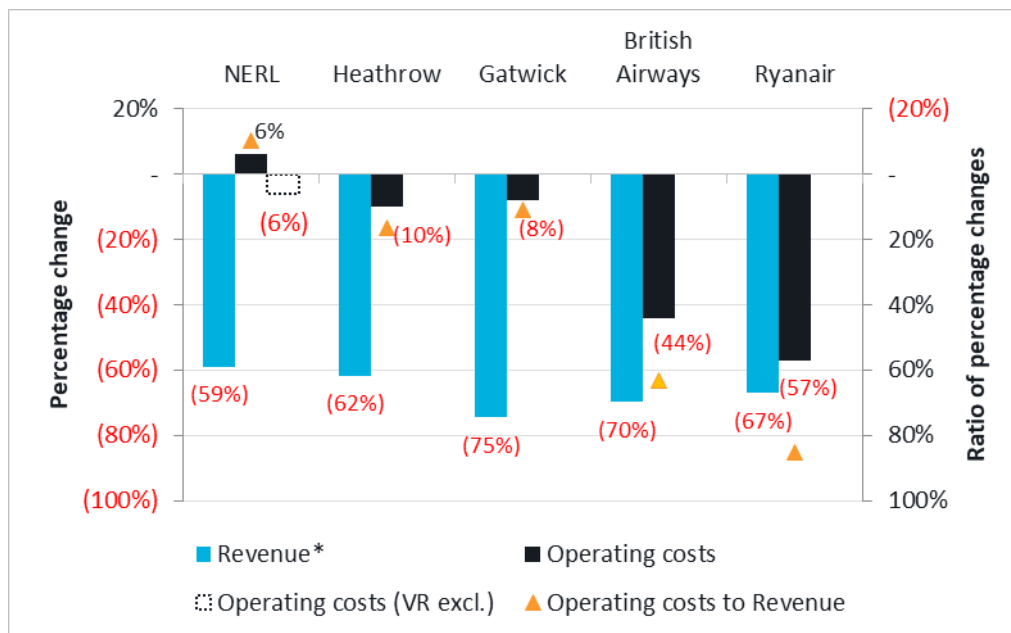
Therefore, while the cost containment measures undertaken by these organisations are not directly comparable in all categories, there are sufficient similarities for the comparisons to be informative.

2.4.24 The comparator organisations do differ from NERL in having more direct commercial pressures, as their revenues are not guaranteed against traffic (or volume) risk in the way that the UK regulatory arrangements and SES charging scheme does for NERL and other ANSPs in Europe. Therefore, it is helpful to see how they have responded to the challenges of the pandemic and to identify whether such commercial pressures have led them into responding more aggressively than NERL in finding operating cost savings. These provide an indication of the envelope of possibilities available to an organisation operating in the UK aviation industry.

Demand and total operating costs

2.4.25 The figure below shows the reduction in revenue experienced by the organisation in 2020 compared to 2019, as well as the corresponding reduction in operating expenditure. The diamonds show the ratio of the change in costs to the change in revenue. We note that easyJet did not report financial accounts in a time period that facilitated valid comparison with other organisations in the sample. Moreover, all the costs include the impacts of restructuring and redundancy costs and explain why NERL has a net increase in costs (the change in operating costs excluding these is also shown). We recognise the benefits from these programmes are mainly felt in 2021. However, financial accounts are generally not available for the full year 2021 for the comparator organisations.

Figure 2.19: Change in revenue and operating costs by organisation, 2020 versus 2019 (nominal)



Source: Steer analysis of 'NR23 opex template FINAL' received on 07/02/2022 & Annual reports 2020. Note: (*) Value for NERL based on Traffic Service Units (TSU).

2.4.26 The analysis shows that airlines were the most successful in reducing costs at a rate which more closely reflected reductions in revenues. Ryanair reduced its costs by 57% relative to a fall in revenue of 67% and British Airways reduced its costs by 44% relative to a fall in revenue of 70%. Airports having significant fixed costs, Heathrow and Gatwick Airports managed to reduce their costs by 14% and 8% respectively.

Staff costs of other UK aviation industry participants

Overview

2.4.27 We set out the staff cost reductions in 2020 versus 2019 achieved by each organisation below:

- Heathrow reduced staff costs by 6% (16% if UK furlough subsidies are included);
- Gatwick reduced staff costs by 18% (35% if UK furlough subsidies are included);
- British Airways reduced staff costs by 23% (33% if UK furlough subsidies are included); and
- Ryanair reduced staff costs by 53% in the last quarter of 2020 compared to the same period in 2019 (assuming that governments' payroll support subsidies are included).

Reduction of staff working hours/salaries

2.4.28 The table below showcases the actions taken by the comparator companies to staff salaries. Note that, for the purposes of effective comparison across companies, we include changes to variable pay and holiday allowances within this section. For Gatwick and EasyJet details are not available.

Table 2.12: Actions taken to reduce staff salaries by organisation, 2020

Organisation	Action	Reduction on 2019
Heathrow Airport	<ul style="list-style-type: none"> • Review of all salaries to ensure they aligned to market rates. As a result, frontline worker pay rolls were cut by reducing legacy terms and conditions to above markets levels and the London Living Wage. • Temporary pay cuts and bonus cancellations 	<ul style="list-style-type: none"> • Not available
MAG	<ul style="list-style-type: none"> • Reducing working hours • Temporarily reducing pay for all staff 	<ul style="list-style-type: none"> • Not available
British Airways	<ul style="list-style-type: none"> • Management pay cuts • Pilots unpaid leave 	<ul style="list-style-type: none"> • Not available
Ryanair	<ul style="list-style-type: none"> • CEO pay reduced by 50% for the full year to March 2021. • Pay cut for cabin crew (and cancellation of bonus) • Pay cut for pilots 	<ul style="list-style-type: none"> • -10% cabin crew pay • -20% pilot pay

Source: Airport and airline Annual reports, shareholder presentations and website information

Headcount rationalisation

2.4.29 The table below sets out the reductions to headcount (or staff agency fees) made by each of the comparator organisations in 2020 in response to the pandemic.

Table 2.13: Actions taken to reduce Headcount rationalisation by organisation, 2020

Organisation	Action	Reduction on 2019
Heathrow Airport	<ul style="list-style-type: none"> • Reduction of the management team and the frontline team choosing to leave under voluntary severance. • Recruitment freeze 	<ul style="list-style-type: none"> • -33% of management • -25% of frontline

Organisation	Action	Reduction on 2019
Gatwick Airport	<ul style="list-style-type: none"> The overall headcount was reduced through the termination of fixed term contracts and redundancy programmes 	<ul style="list-style-type: none"> -60% staff
MAG	<ul style="list-style-type: none"> Redundancy programme Recruitment freeze 	<ul style="list-style-type: none"> -33% staff
British Airways	<ul style="list-style-type: none"> Restructuring and redundancy programme 	<ul style="list-style-type: none"> -23% staff
easyJet	<ul style="list-style-type: none"> Reduction of headcount 	<ul style="list-style-type: none"> -30% staff
Ryanair	<ul style="list-style-type: none"> Temporary closure of bases with staff temporarily laid off Recruitment freeze 	<ul style="list-style-type: none"> Not available

Source: Airport and airline Annual reports, shareholder presentations and website information

Cost of redundancy programmes

2.4.30 While it is difficult to be precise about what terms were offered as part of voluntary or other redundancy programmes, based on the redundancy cost reported in their financial accounts.

- Gatwick: estimated 75% of average wages and salaries in 2019.
- BA: estimated 54% of average wages and salaries in 2019.
- easyJet: estimated 60% of average wages and salaries in 2019.

2.4.31 These are all significantly less than the 21 months or 175% reported by NERL for the costs of its voluntary redundancy scheme. This was echoed by stakeholders, who expressed concern that some of the actions on cost reduction did not go far enough compared to industry peers and the redundancy programme was very costly, requiring a long payback period. NERL explained that this was linked to existing agreements in place with unions and that it did not have the time to renegotiate these. This is an area where NERL could have taken potentially different actions.

Government support

2.4.32 During the pandemic, the UK government (and other governments) provided various forms of support to companies affected by the pandemic. The table below shows, where data is available, how the comparator companies availed themselves of this support. We understand that NERL fully topped-up salaries for staff on furlough.

Table 2.14: Actions taken to draw support from government by organisation, 2020

Organisation	Action	Support amount
Heathrow Airport	<ul style="list-style-type: none"> UK Furlough scheme 	<ul style="list-style-type: none"> £36m
Gatwick Airport	<ul style="list-style-type: none"> UK Furlough scheme 	<ul style="list-style-type: none"> £25.8m
MAG	<ul style="list-style-type: none"> UK Furlough scheme 	<ul style="list-style-type: none"> £58.9m (until 31/03/2021)
easyJet	<ul style="list-style-type: none"> Various European governments' payroll support schemes 	<ul style="list-style-type: none"> £116m (until 30/09/2020)
Ryanair	<ul style="list-style-type: none"> Various European governments' payroll support schemes 	<ul style="list-style-type: none"> Not available

Source: Airport and airline Annual reports, shareholder presentations and website information

Staff pensions costs

2.4.33 No data concerning any cost reductions relating to pension schemes have been identified.

Reasonableness of actions in area of staff

2.4.34 It is recognised that NERL took a range of actions on staff numbers and costs during the pandemic. This was driven by the reduction in activity and need to retain liquidity in the business. While net cost savings in 2020 were minimal due to the costs incurred from the voluntary redundancy programme, significant cost savings in 2021 and 2022 are reported by NERL (some 20% and 14% of 2019 staff costs respectively).

2.4.35 As can be seen from our analysis above in paragraphs 2.4.20 and 2.4.28 most European ANSPs and UK aviation industry participants have needed to take similar unplanned actions to mitigate the impacts of COVID-19. Some industry participants such as airlines have been more successful in reducing their costs closer to the level of reduction in revenues. Airports and ANSPs, have generally remained open to service and therefore avoiding fixed costs of more limited operations has been more challenging, nevertheless significant staff cost savings have been made at airports in the UK, reflecting the expectation that traffic will not return to 2019 levels for a number of years, and reflecting the commercial nature of the operations, with no formal traffic risk sharing arrangements in their charging arrangements. Actions across ANSPs in Europe have been mixed, generally not making as significant reductions in costs as other industry participants. However, even if the extent of change was not available for ANSPs the types of action were available.

2.4.36 Based on the review of the actions taken by NERL, we have identified the following two areas where we consider alternative actions might have been taken. We recognise the guidance issued by the CAA for the reconciliation review stated that actions would not be reviewed with the benefit of hindsight.

- Voluntary salary reductions: as discussed in paragraph 2.4.19 in many other organisations this was requested of both operational and management staff, especially if the individuals were on furlough, reduced activity working, etc. If like management grades, all other grades had been asked to take a 10% voluntary pay cut for three months and 50%, had agreed the savings in 2020 would have been approximately £2.5 million.
- Cost of Voluntary Redundancy scheme: NERL identified the £61 million, £185k average cost of the scheme, recognising a 21 months' pay back period. This was based on the arrangements that had been negotiated with Trade Unions ahead of the pandemic. Many organisations brought forwards exceptional redundancy arrangements in the context of the pandemic (see summaries above in UK aviation sector in 2.4.31, where less generous VR schemes are identified). Moreover, NERL might have anticipated that the Voluntary Redundancy scheme would be attractive, given the generous terms on offer and negotiated new arrangements. The impact of providing 12 months rather than 21 months of staff costs on average would have saved approximately £26 million.
 - However, NERL has pointed out that it was bound by the terms of its Redeployment & Redundancy Agreement (RRA) with staff. Notice to terminate this (12 months) was served in May 2020 to avoid any future redundancy programmes being bound by the same terms, but in the meantime – given the pressure to restructure costs – it went ahead with the VR programme under the existing terms after securing new bank facilities in August 2020.

- The impact of the VR programme being implemented in Q4 2020 with a 21-month pay back is understood to be equivalent to that of a programme that might have been implemented under new terms in Q2 2021 with a 12-month pay back. There could though have been a 1 to 3 month benefit had a VR programme been implemented at the time of a new RRA potentially being adopted in May 2021, which is equivalent to savings of between £3 million and £9 million. This assumes that the RRA in place was binding, a timely new RRA, a parallel consultation period in the run-up to it being adopted and the same take-up by staff. .

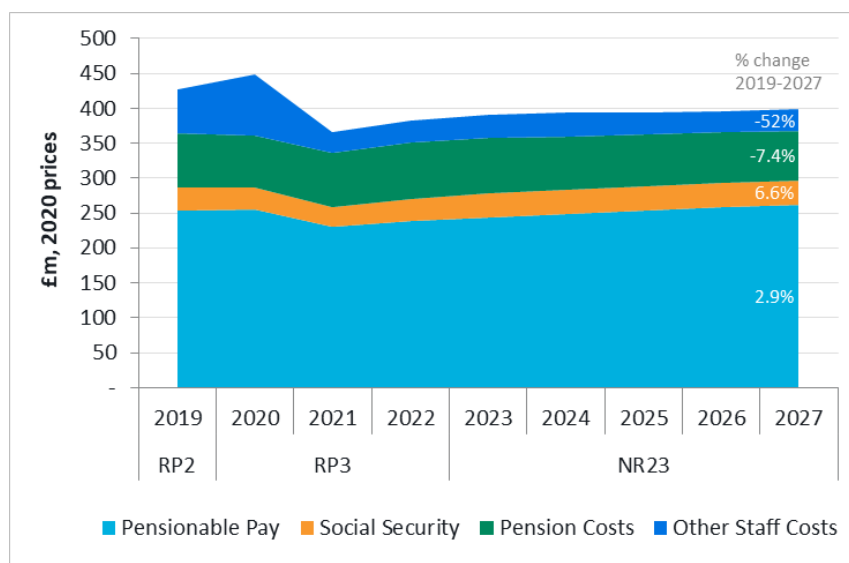
2.4.37 Steer recognises the context in which difficult decisions had to be taken during the pandemic, but considers that the alternative approaches could have formed a strategy for supporting further cost-savings during the crisis to help underpin liquidity. It also recognises the impact of historic Trade Union negotiations and reluctance to change conditions particularly for ATCOs at a time of uncertainty for the industry as well as the expectation that traffic levels will return to 2019 levels and therefore retaining capability for then is required.

2.4.38 In addition to the above areas, we note that a small cost disallowance relating to UTM development costs could be applied during the reconciliation period, to ensure consistency in the treatment of these costs across the reconciliation period and NR23 (see section 3.5.13). Mainly informed by the review of these costs in NR23, if the CAA assess that NERL may incur some costs to manage the operational impact of new airspace users on conventional airspace users, then the costs incurred over 2020-2022 could be allowed. On the other hand, if the CAA assesses that none of the UTM development costs satisfy the user pays principle and are disallowed, this would result in a saving of £0.7 million during the reconciliation period.

2.5. Staff costs in the NR23 business plan

2.5.1 In this section we review the key assumptions in NERL's BP for staff costs, identify stakeholders' views and assess the cost by category of staff, and type of staff costs identifying potential areas of cost improvement for the CAA's consideration.

2.5.2 Figure 2.20 shows NERL's staff costs (including pension and redundancy costs, as well as retaining labour costs which have been capitalised in NERL's accounts) for 2019, 2020 and 2021 actuals, latest forecasts for 2022, and its projections for NR23. Note that pension costs are included on a P&L basis, which are not charged through the price control (because cash pensions are used instead), so these costs do not directly correspond to prices.

Figure 2.20: NERL's historical and projected staff costs (2019-2027)

Source: 'NR23 opex template FINAL' received on 07/02/2022

- 2.5.3 Overall, staff costs are forecast to grow by +0.8% CAGR (2022-2027) over NR23, and are -6.7% lower in 2027 compared to 2019. The growth in staff costs is driven by additional staff FTEs (+1.5% CAGR over NR23) and changing total unit employment costs per FTE (+-1.0% CAGR over NR23).
- 2.5.4 Over the period shown, pensionable pay and pensions account for 83% of total staff costs (gross of capitalised labour). Pensionable pay accounts for 56%-66% of total staff costs throughout the period and increases from £254 million at the end of RP2 to £261 million at the end of NR23. Pension costs fall from £77 million at the end of RP2 to £71 million at the end of NR23.
- 2.5.5 Social security costs account for 7% to 9% over the period and increase from £33 million at the end of RP2 to £35 million at the end of NR23, while redundancy costs are relatively small and are generally between £1m and £2m in most years. Other costs (which include contractors, additional pay and redundancy) decrease from £63 million at the end of RP2 to £30 million at the end of NR23, following the measures adopted during the COVID-19 crisis. Redundancy costs spiked in 2020, following the implementation of the VR programme. Capitalised labour (not shown in the figure) is equivalent to 8% to 15% of staff costs over the period and fluctuates around £45 million during NR23 (around 11% of staff costs), down from £64 million at the end of RP2 (a peak year for capitalised labour costs).
- 2.5.6 The level of disaggregation within the analysis is based on the key issues that have been identified with the BP, as discussed with airlines and other stakeholders at the business plan workshop on 3 March 2022. We have analysed staff costs through the following approaches:
- Analysis of FTE requirements for ATCOs (operational, non-operational and trainees (TATCs));
 - Analysis of FTE requirements for central management and support staff (specifically Graduates);
 - Analysis of alternative salary growth profiles at a total staff level; and
 - Analysis of alternative DC pensions arrangements at a total staff level.

- 2.5.7 The assessment of staff cost projections in the business plan is to inform the CAA's assessment of the overall efficient cost allowance for NERL during NR23. The decisions on how many staff NERL should employ, how much they should be paid and what pension contributions NERL should offer are decisions for NERL to make.

Stakeholder views

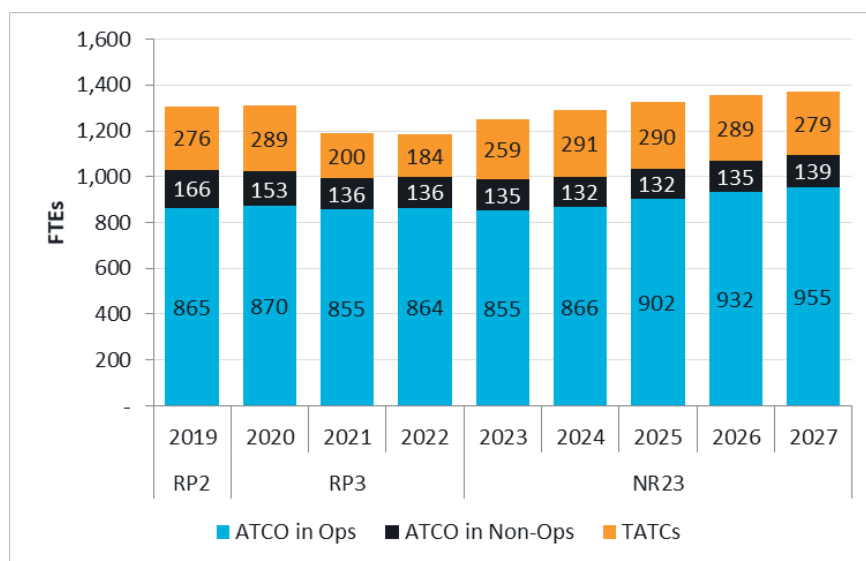
- 2.5.8 Stakeholders want to ensure there are enough ATCOs to cope with the traffic levels in the recovery period, recognising the uncertainty surrounding traffic forecasts – so some wanted to err on the side of overprovision. Nevertheless, airlines are keen that this is done with sufficient efficiency and flexibility, through upskilling the existing staff, realising the benefits of the investment in technology and increased standardisation, and through seeking to flexibly deliver ATCO resourcing requirements through managing the balance of overtime and potentially delaying some retirements.
- 2.5.9 Airlines remain concerned about pensions costs, suggesting that a different, less generous, defined contribution scheme for new joiners is considered, particularly in the context of a large recruitment drive in the coming years.
- 2.5.10 There was also some concern about the capability to implement the capital plan and deliver legacy escape, which is impacted by redundancy of ATCEs and contractors. There was acknowledgment that NERL is delivering a big programme of change and that it ought to have the skills and resources to support this.

Air traffic controllers and Trainees (ATCOs & TACTs)

- 2.5.11 ATCO staff are comprised of:
- Operational staff, who are responsible for controlling traffic;
 - Non-operational staff, who are responsible for auxiliary roles including safety management, supporting airspace and systems development, providing training and operational management; and
 - Trainees, who require a period of two to three years before they become a qualified ATCO.
- 2.5.12 Figure 2.21 shows actual operational ATCOs, non-operational ATCOs¹⁸ and trainee FTEs for 2019-2021 and projections for 2022 and NR23.

¹⁸ The operational/non-operational split is understood to be accurate for 2019 and 2027, but is interpolated for the intermediate years.

Figure 2.21: NERL ATCO FTEs (2019-2027)

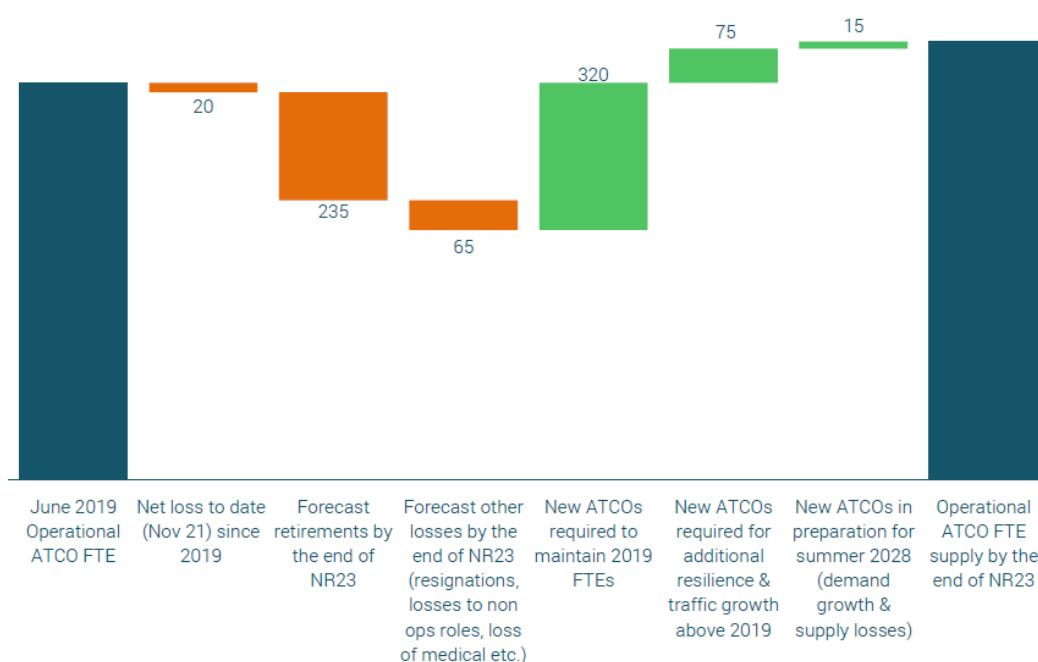


Source: 'NR23 opex template FINAL' received on 07/02/2022, BP Appendix G, responses to clarification questions received 01/03/2022

2.5.13 Each element of Figure 2.21 can be understood as follows:

- Operational ATCOs increase across the period from 865 in 2019 to 955 in 2027 (CAGR +1.2%), with some fluctuation through the RP3 and early NR23 period, following the pause in training during the COVID-19 crisis and some of the impact of the anticipated retirements;
- Non-operational ATCOs decrease across the period from 166 in 2019 to around 135 through NR23 (139 in 2027); and
- Following the pause in training during the COVID-19 crisis, trainees increase significantly following the restart of the training programme, exceeding 2019 levels in mid-NR23.

2.5.14 Figure 2.22 shows NERL's assumptions in relation to the growth of operational ATCO FTEs between 2019 and 2027, covering NR23. FTE increments are shown in green and decrements are shown in orange.

Figure 2.22: NERL BP “ATCO bridge” (2019-2027)

Change in controller supply by end of 2027 vs 2019

Source: BP Appendix G

- 2.5.15 NERL explains that the process for forecasting the operational requirement for ATCOs considers the number of airspace sectors that it expects to open and for how long, the number and validation (skills) mix of staff required to operate those sectors with the requisite service quality. The process is based on the traffic forecast, historic traffic presentation and outturn performance. NERL highlights that an emerging constraint in its resourcing plan is presented by the loss of experienced staff with multiple validations (through the forecast spike in retirements), which leads to a reduction in operational flexibility until newly trained ATCOs acquire similar skill levels (up to two years after initial validation). This is mitigated by including ATCOs for additional resilience, which results in maintaining the number of ATCOs slightly above the operational requirement.
- 2.5.16 One of the key assumptions made by NERL in developing its resourcing plan is that there will be no improvement in underlying ATCO-hour productivity over NR23. It states that productivity gains could be generated by improvements in controller tools and other technology, by increasing levels of controller skills and experience, by changes in airspace structures which reduce complexity, and by changes in the organisation and coordination of controllers with the available technology. NERL expects that none of these factors is likely to have a material positive impact on productivity in the NR23 period for the following reasons:
- Technology: new Common Platform controller tools are dependent upon the prior implementation of the technology transformation programme, and thus will not be available to controllers within the NR23 period.
 - Skills: it anticipates a significant outflow of experienced, multi-validated controllers in NR23, as they reach retirement age, and replacement by newly trained staff, initially holding only a single validation. This demographic shift and consequent reduction in the

average numbers of validations per controller will place a drag on overall ATCO productivity.

- Airspace change: it is planning to use the reduction in controller workload which would be enabled by those airspace changes to be implemented during NR23 to improve service outcomes for customers, in terms of better resilience, capacity and environment performance. This was the clear preference expressed by customers during consultation for the NR23 plan. As such, there is no unused benefit from airspace change in the NR23 period which could be spent on reducing ATCO numbers.
- Organisation: it continues to make incremental improvements to training and rostering practices to ensure that it makes best use of its controller workforce. In line with customer preferences and the Palamon investigation findings, it is focused on using these gains to improve operational resilience.

2.5.17 One of the other key assumptions made by NERL is that no overtime will be used within its long-term resource planning to deliver the operational service as a matter of course. An allowance for overtime has been included in the BP to support non-operational activities, such as the capital programme and training new controllers. According to NERL, some of this allowance will also be used tactically to mitigate temporary shortfalls in the operation, such as short-notice sickness, but that overtime is not used for the resourcing planning as it cannot commit to delivering a level of service quality that is reliant on voluntary overtime from ATCOs.

2.5.18 In our analysis, we have developed modelled projections of the number of ATCOs which may be required if a range of different assumptions were applied to the two key inputs highlighted above.

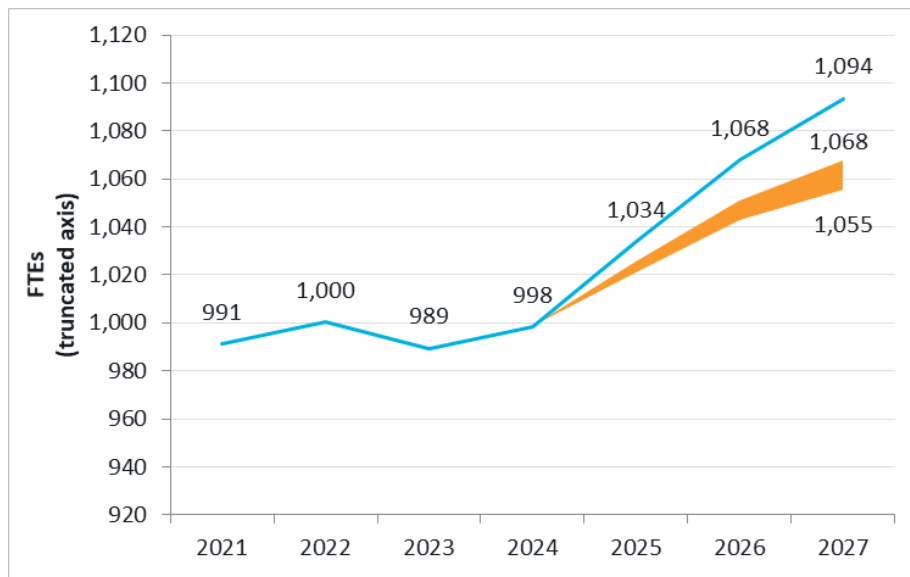
Allowing for increases in ATCO-hour productivity

2.5.19 For the factors named by NERL as influencing productivity, our understanding is as follows: given the losses since 2019 and accepting the forecast for the retirements and losses over NR23, we infer from our analysis of NERL's ATCO projections that 56 out of the +75 new ATCOs required for "traffic growth above 2019 levels and additional resilience" (see Figure 2.22), relate to the additional resilience – with a further +15 new ATCOs added in preparation for summer 2028.

2.5.20 Based on the above, acknowledging that NERL is delivering high levels of productivity compared to benchmarks and that productivity gains may be shared between service quality and cost efficiency. In the context of analysis of ACE benchmarking report data over RP2, NERL achieved improvements in ATCO-hour productivity of +3.0% CAGR over 2015-2019 and 1.75% over the longer period of 2009-2019. However for NR23, during traffic recovery to 2019 levels it is recognised as difficult to achieve productivity improvements. Therefore after 2025 we assume the ability to achieve productivity linked to improved processes and capital programme. Taking into account the expected level of traffic growth, the uncertainty of the timing of benefits of the capital programme of NR23 and the historic long term productivity growth, an improvement range of 1% per annum from 2025 (low) and 1.5% improvement from 2025 (high) is applied. This results in a need to train fewer TATCs in the early years of NR23 and reduces the ATCO headcount requirement in the final years of NR23.

2.5.21 Figure 2.23 shows the outcome of our modelling for total ATCOs compared to the projections in NERL's BP.

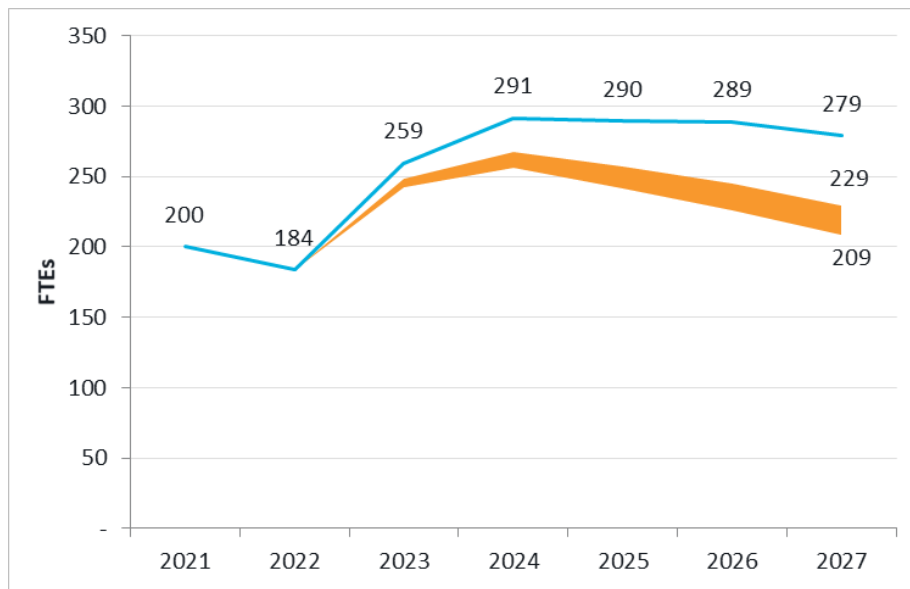
Figure 2.23: Steer and NERL ATCO projections (2021-2027)



Source: Source: 'NR23 opex template FINAL' received on 07/02/2022, BP Appendix G, Steer analysis

- 2.5.22 The figure shows that relative to NERL’s projections, our analysis has identified potential differences in total ATCO levels of between -1.0% and -1.5% over NR23. The lower ATCO requirement also generates a potentially lower ATSA requirement of a similar magnitude, also driven by improvements in workload and rostering.
- 2.5.23 Correspondingly, this flows through to the TATC requirements in the years preceding when the new ATCOs would be expected to be deployed, as shown in Figure 2.24. Here our analysis has identified potential differences in TATC level of between -11% and -17% over NR23.

Figure 2.24: Steer and NERL TATC projections (2021-2027)



Source: Source: 'NR23 opex template FINAL' received on 07/02/2022, BP Appendix G, Steer analysis

- 2.5.24 The combined effect of the above changes, resulting from the higher ATCO productivity (1% low, 1.5% high) post 2025, which reduces the ATCO and TATC requirement results in a real terms change in total costs of between -0.6% and -0.9% over NR23.

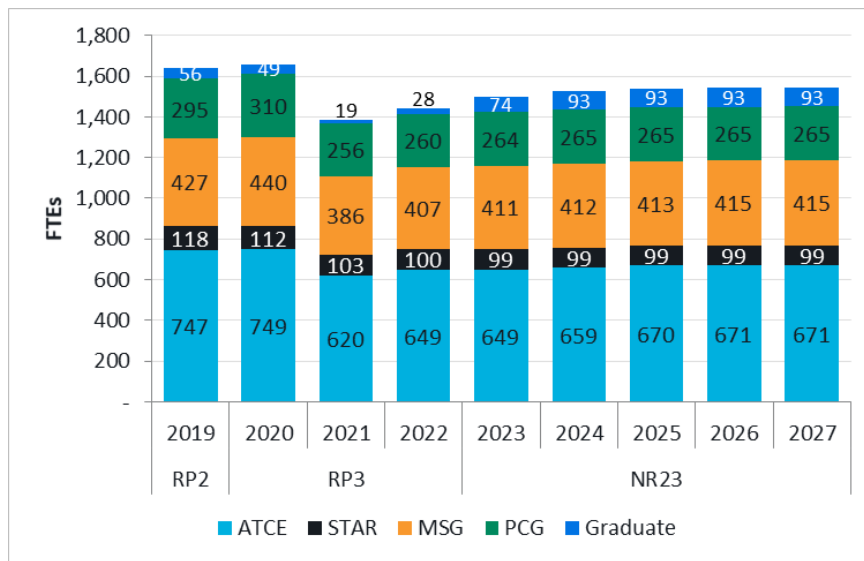
Allowing for tactical overtime as part of resource planning

- 2.5.25 Drawing on analysis from the RP3 assessment, we understand that in 2017 an equivalent of 23 FTEs' worth of operational overtime was required to manage outturn traffic, which corresponds to about 30 hours per operational ATCO. Using overtime is in practice more costly than deploying ATCOs on normal pay, however, allowing for some tactical overtime as part of resource planning – all else being equal – will provide for a lower overall ATCO requirement, which could be a suitable approach for achieving the balance of resilience and (particularly downside) flexibility by embedding less cost into the organisation over the long-term. It effectively allows for coping with higher traffic, while also potentially better-positioning NERL to deal with another downturn.
- 2.5.26 We have applied the impact of allowing 5 hours and 10 hours of tactical overtime from 2025 as part of resource planning, impacting the operational requirement for managing 2019 levels of traffic and any growth. The outcome of our modelling for total ATCOs compared to the projections in NERL's BP results in a small difference in the overall ATCO requirement. As above, the potentially lower ATCO requirement also generates a potentially lower ATSA requirement of a similar magnitude and flows through to the TATC requirements in the years preceding when the new ATCOs would be expected to be deployed.
- 2.5.27 Taken together with the impact on ATSAs and TATCs, which results in lower costs for these categories, the introduction of tactical overtime nets to approximately zero (between +0.02% and +0.04% change to total costs) in real terms over 2023-2027, but would result in a slightly lower cost base (c. -£1.5m in the high case) when resetting for NR28.
- 2.5.28 Given feedback from airlines has consistently focused on whether NERL will be sufficiently able to handle higher traffic over the recovery period and in the longer-term, this assumption is not included in the cumulative ranges provided by Steer to the CAA.

Central management and support staff

- 2.5.29 Central management and support staff are comprised of ATCEs, STARs PCGs, MSGs and Graduates. Figure 2.25 shows actual FTEs for these staff categories over 2019-2021 and projections for 2022 and NR23.

Figure 2.25: NERL Central management and support staff (2019-2027)



Source: 'NR23 opex template FINAL' received on 07/02/2022

2.5.30 Table 2.15 shows the evolution for each element of Figure 2.25 and for context includes the changes in RP2 (2015-2019) and across the 2015-2027 period:

Table 2.15: NERL Central management and support staff changes

Staff category	CAGR					
	2020-2021	2021-2022	2022-2027	2015-2019	2015-2027	2019-2027
ATCE	-17%	+4.6%	+0.7%	-0.8%	-1.1%	-1.3%
STAR	-7.7%	-3.6%	-0.1%	+4.4%	-	-2.2%
MSG	-12%	+5.5%	+0.4%	+6.1%	+1.7%	-0.4%
PCG	-17%	+1.5%	+0.3%	+10%	+2.3%	-1.4%
Graduate	-60%	+4.5%	+27%	+15%	+9.3%	+6.6%

Source: 'NR23 opex template FINAL' received on 07/02/2022

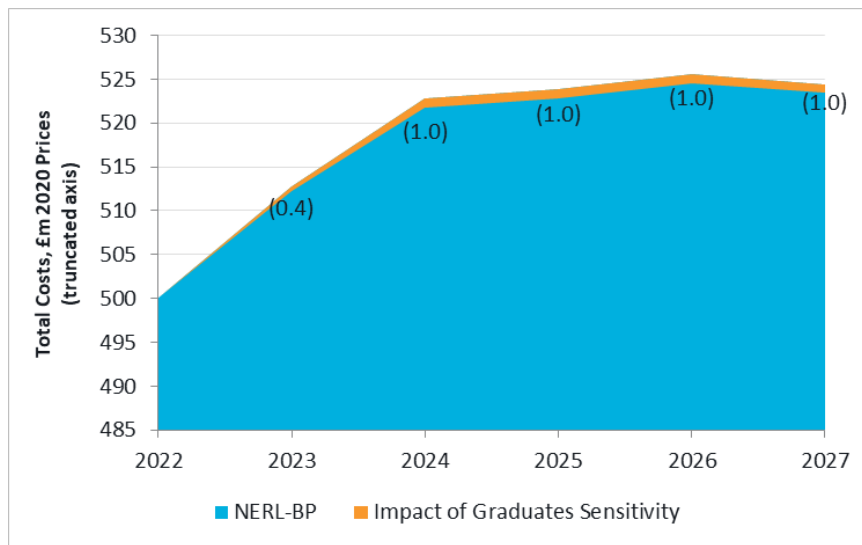
2.5.31 NERL explained that its plan assumes graduates undertake a two year placement, and then take up a vacancy created through retirement or attrition of existing employees, or leave the business. As part of this, the duration of the early career placements has been standardised to two years, where in RP2 the length of placements varied in duration, with some placements being just a few months. The majority of the increase in graduate FTEs is then attributed to the standardisation of the scheme duration, while the annual intake in terms of headcount remains consistent with previous requirements and no new roles have been created in the plan for graduates once they are assumed to have completed the programme.

2.5.32 NERL described that its early careers scheme is focused on generating cost-effective talent for the following four corporate and specialist areas, which broadly correspond to the staff categories outlined above:

- People and transformation;
- Finance and analytics;
- Engineering and technology; and
- Safety and cyber-security.

- 2.5.33 An intake of around 47 graduates a year into the above staff categories corresponds to 3.2% of FTEs across ATCEs, STARs, MSGs and PCGs at the end of NR23. Although not directly related, analysis of the staff turnover implied by the growth in DC pension scheme members, suggests that a retirement and attrition rate of 3.2% p.a. is higher than expected for these staff categories, particularly given the high number of retirements expected for operational staff over NR23. In the meantime, 93 FTEs across the combined cohorts are all fulfilling roles in the organisation (accepting that a fair proportion of their time might be spent on training), an increase which if directly observed in (or allocated to) the roles these graduates are supporting, would require more justification.
- 2.5.34 Assuming an existing staff attrition/turnover rate of c.1.6% would imply a low level of graduate retention (c.50%), which corresponds to 23 graduates a year taking up roles in the business. On this basis, we have applied the impact of reducing the size of each annual intake to 30 FTEs, with the assumption that NERL can achieve higher graduate retention rates (c. 75%) from its programme to realise the same outcome, while reducing the size of the combined cohort from over 90 FTEs to 60.
- 2.5.35 As shown in Figure 2.26, our modelling for total costs compared to the projections in NERL’s BP, results in a small saving (-0.17% of total costs) as a result of the lower Graduate FTEs assumed over 2023-2027.

Figure 2.26: Steer and NERL total cost projections (2022-2027)

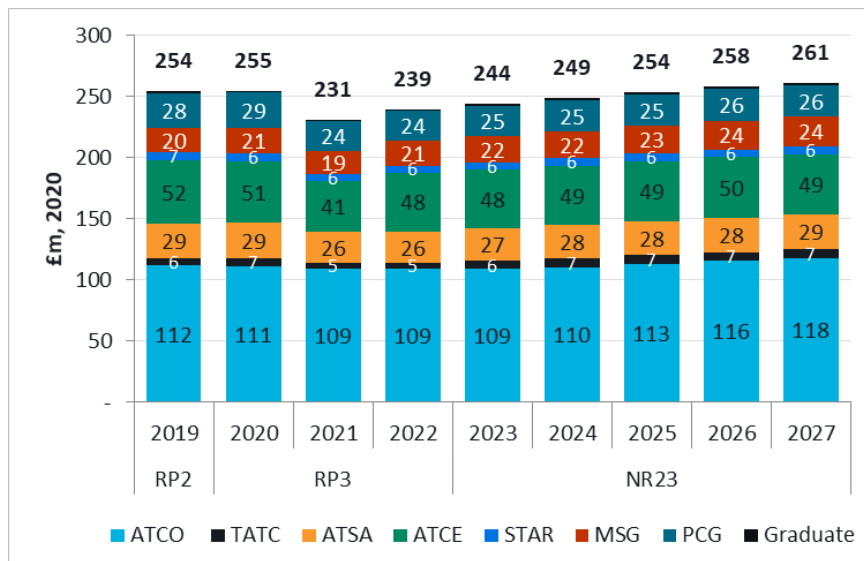


Source: Source: ‘NR23 opex template FINAL’ received on 07/02/2022, BP Appendix J, responses to clarification questions received 01/03/2022, Steer analysis

Staff pay

- 2.5.36 Pensionable pay accounts for 52% to 59% of total staff costs throughout the period and increases from £254 million at the end of RP2 to £261 million at the end of NR23, as shown in Figure 2.27.

Figure 2.27: NERL total pensionable pay by staff category (2019-2027)



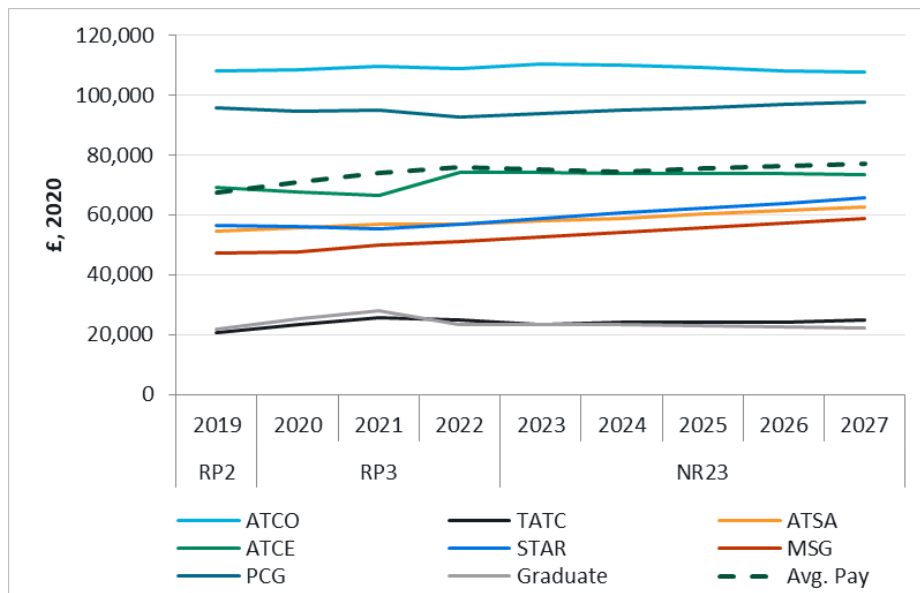
Source: Source: 'NR23 opex template FINAL' received on 07/02/2022

2.5.37 Pensionable pay is a function of the number of FTEs in each staff category and their average salary. The evolution of staff numbers is described in the previous sections, while Figure 2.28 below shows the average salaries for each category in real terms. As noted previously, the evolution of average salaries is driven by:

- Changes in the mix of staff within each category, reflecting a movement in the share of staff across different grades (i.e. pay scales);
- Pensionable pay award, reflecting annual increases in salaries;
- Incremental progression, reflecting contractual increases within pay scales linked to length of service and performance; and
- Attrition and retirements, reflecting the effect of experienced staff (often at the top of the pay scale) leaving and new staff joining (at the bottom or lower on the pay scale).

2.5.38 The first three of these drivers lead to increases in average salaries, while the fourth driver acts in the opposite direction, pushing average salaries down.

Figure 2.28: NERL average salaries by staff category (2019-2027)



Source: Source: 'NR23 opex template FINAL' received on 07/02/2022, BP Appendix J, responses to clarification questions received 01/03/2022

2.5.39 Each element of Figure 2.28 can be understood as follows:

- Overall average pensionable pay increases in real terms by +1.7% CAGR between 2019 and 2027. Much of this increase is observed over the 2019-2021 period, reflecting changes in the mix of staff driven by the VR programme which reduced the proportion of non-operational staff that have lower average salaries than operational staff. Average pensionable pay increases by +0.6% CAGR between 2021 and 2027.
- For ATCOs, average salaries decrease by -0.3% CAGR between 2021 and 2027, reflecting the impact of a high level of retirements expected over the period and the additional new ATCOs introduced to support improved resilience.
- For TATCs, average salaries decrease by -0.5% CAGR over the 2021-2027 period.
- For ATSAs, average salaries increase by +1.6% CAGR over the 2021-2027 period.
- For ATCEs, average salaries increase by +11% in 2022, following a scarce skills adjustment planned to support retention and recruitment for engineering staff with relevant skills. Average salaries remain stable in NR23 (-0.2% CAGR 2022-2027).
- For STARS, average salaries increase by +2.9% CAGR over the 2021-2027 period, mainly reflecting incremental progression for this category of staff, a high proportion of which is not at the top of the pay scale.
- For MSGs, average salaries increase by +2.7% CAGR over the 2021-2027 period, reflecting the same factors as those noted for STARS.
- For PCGs, average salaries increase by +0.4% CAGR over the 2021-2027 period.
- For Graduates, average salaries decrease by -17% in 2022, and continue to decrease by -1.1% CAGR (2022-2027) over NR23.

2.5.40 [Redacted – commercially sensitive].

2.5.41 [Redacted – commercially sensitive].

Figure 2.29: [Redacted]

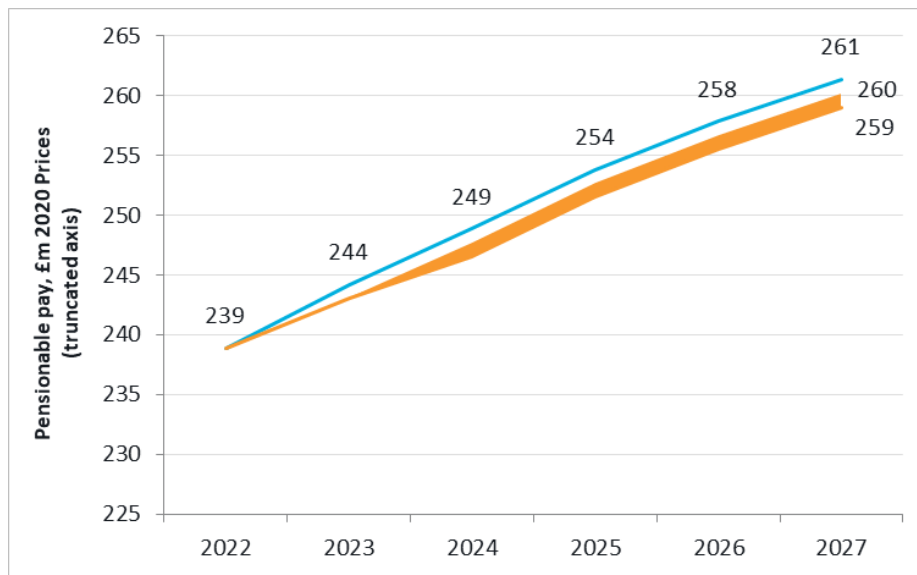
2.5.42 CPI forecasts have moved substantially since those used by NERL for developing its BP, and are expected to continue to remain volatile, with higher inflation generally expected over the short-term. Although inflation risks to the business plan more widely are mitigated by the inflation true-up mechanism in the regulatory framework, we consider that it is appropriate to review whether the [redacted] pay award is in line with approaches used by other large organisations, including those with unionised workforces¹⁹. Moreover, whether it is appropriate to provide [redacted] pay awards during the recovery period of the pandemic when productivity levels remain below 2019 historic levels – or whether [redacted] increases to the pay scale should be more closely linked to higher levels of activity (i.e. traffic) and improved productivity.

2.5.43 While we have not updated the CPI forecasts used in the business plan, we have tested the relative impact of delaying [redacted] pay awards by capping increases [redacted] for a period until traffic is expected to make more of a recovery towards 2019 levels:

- for 1 year (i.e. 2023) before resuming NERL’s planned [redacted] pay awards from 2024; and
- for 2 years (i.e. 2023 and 2024), before resuming NERL’s planned [redacted] pay awards from 2025.

2.5.44 As shown in Figure 2.30, our modelling for pensionable pay compared to the projections in NERL’s BP, results in a saving of between -0.3% and -0.5% of total costs over 2023-2027 as a result of delaying the [redacted] pay awards.

Figure 2.30: Steer and NERL pensionable pay cost projections (2022-2027)



Source: Source: ‘NR23 opex template FINAL’ received on 07/02/2022, responses to clarification questions received 01/03/2022, Steer analysis

¹⁹ For example, the RMT-negotiated pay offer (Feb 2022) for Heathrow Rail staff is based on CPI capped at 2.5%. <https://www.rmt.org.uk/news/publications/heathrow-rail-pay-offer100222/heathrow-rail-pay-offer.pdf>

2.5.45 In separate top-down analysis, the results of our staff cost benchmarking show that over the 2003 to 2019 period salary growth for all NERL staff has outperformed comparators for the Transport & Storage sector, which was -5.4% lower in 2019 (see the historical analysis in section 2.3). Meanwhile, the review of individual roles identified differences between the upper quartile of the benchmarks and NERL in the range of -9% for MSGs to -34% for ATSAs. Applying these top-down assumptions as a step change from the start of NR23 would result in a saving of between -3.2% of total costs (in the case of a -5.4% reduction in all salaries) and -10.7% of total costs (in the case of reductions in the benchmarked roles of -21% for ATCOs, -34% for ATSAs, -24% for ATCEs and -9% for MSGs). We acknowledge that such a step change would not be possible to be implemented in practice, so these ranges are illustrative only. Were such savings to be implemented gradually over a five year basis by the end of NR23, it would result in total costs being between -1.6% and -5.3% lower, if over a longer 10-year basis would result in between -0.7% and -2.5% lower.

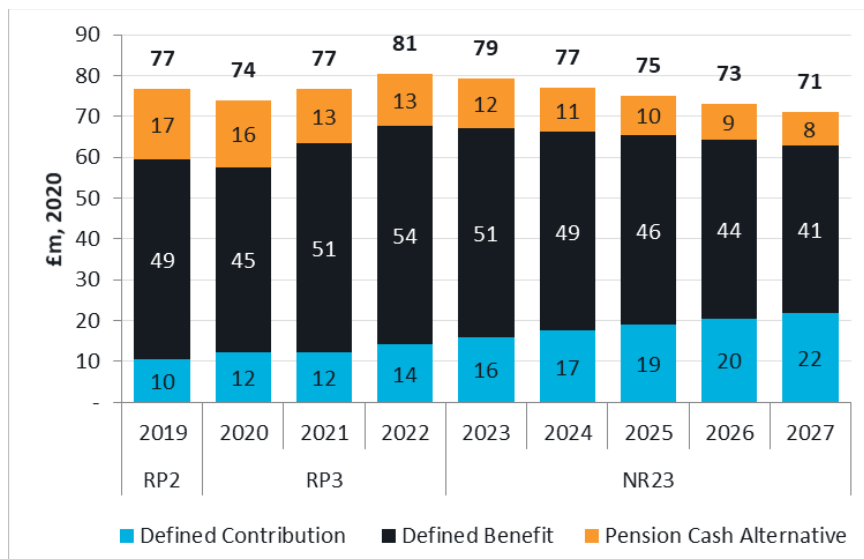
Defined Contribution pension costs

2.5.46 Total pension costs account for 17% of staff costs (incl. capitalised labour) over NR23 and fall from £77 million in 2019 to £71 million at the end of NR23, following an increase to £81 million in 2022. Pension costs are comprised of the costs for the defined contributions (DC) scheme, costs for the defined benefit (DB) scheme and pension cash alternative costs. As noted above, this analysis considers pensions on a P&L basis which are not charged through the price control (because cash pensions are used instead), so these costs do not directly correspond to prices.

2.5.47 Only DC pensions are in the scope of this study, which increase by +9.6% CAGR between 2019 and 2027, driven by a +5.3% increase in the number of members on the scheme, in combination with an increase in the pensionable pay of these members. NERL’s assumed average contribution rate in the BP is 16% and it bears the risk of contributions exceeding this rate in practice.

2.5.48 We undertook a benchmarking exercise of these contributions against comparable UK employers, which indicated that NERL’s contributions were higher than those made by other employers (see Figure 2.15 above), at up to 18%, depending on the employee’s own contributions.

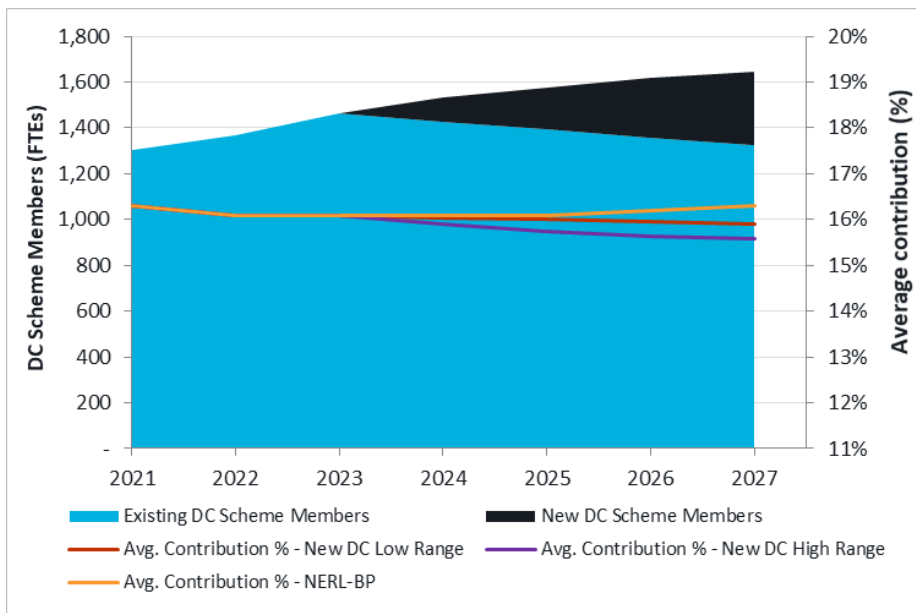
Figure 2.31: NERL pension costs (2019-2027)



Source: Source: 'NR23 opex template FINAL' received on 07/02/2022

- 2.5.49 Based on our benchmarking analysis, we consider that the current level of DC pension contributions by NERL is generous, given the wide discrepancy with contributions made by other comparable organisations. Airlines have also stated that they would like to see a new DC scheme with a lower maximum contribution introduced, particularly in the context of a large number of new employees being recruited by NERL to replace the high number of retirements expected over NR23.
- 2.5.50 NERL has previously stated that, within its legal constraints, it has taken all reasonable actions meaningfully available to mitigate the cost of its defined benefit scheme and provides a competitive defined contribution scheme necessary to attract and retain specialist trained operational staff. NERL believes that seeking to compare its fully funded pension arrangements with those of other European ANSPs which include pay as you go schemes, or schemes indirectly subsidised by the State, does not provide a fair comparison of such costs.
- 2.5.51 Further, NERL has stated that legal advice on the Memorandum of Understanding which was put in place at the closure of the DB scheme provides protections to current and future members of the DC scheme and its terms are enforceable until 31 December 2023. This means that it would not be possible to change the structure of the DC scheme (including implementing a new scheme) until 2024 at the earliest.
- 2.5.52 We have modelled the impact of new staff joining a DC scheme from 2024 with a maximum employer contribution of 12%, in line with the average of benchmarks (see Defined Contribution pension costs section). This has been done to illustrate the magnitude of the changes proposed by the airlines.
- 2.5.53 For the low range estimate (i.e. smaller saving), the contribution rate for members on the existing scheme is assumed to mature over time, moving up from an average of 16% towards 17%, as new members on a lower contribution rate are no longer joining the existing scheme to balance this average.
- 2.5.54 The high end estimate assumes that the contribution rate for members on the existing scheme evolves from 16.1% to 16.3% per NERL's response to a clarification question, which stated that contribution levels are consistent across all staff groups.
- 2.5.55 Figure 2.32 shows the number of members on the existing DC pension scheme and those which are assumed to join the new DC pension scheme, alongside the impact of introducing the new scheme on the average contribution rate for NERL. The resulting impact on DC contribution costs ranges from -£1.0m to -£1.8m lower than those assumed by NERL in NR23, corresponding to -0.04% to -0.07% saving on total costs during this period. However the impact of this change would be ongoing as more and more new staff join the organisation and existing members exit through normal attrition.

Figure 2.32: DC scheme members and average employer contribution (2022-2027)



Source: Source: 'NR23 opex template FINAL' received on 07/02/2022, responses to clarification questions received 01/03/2022, Steer analysis

3 Non-staff costs

3.1 Non-staff cost overview

Reconciliation review for 2020-2022

NERL took a range of actions on non-staff costs during the pandemic, driven by the reduction in demand and revenues, and the need to retain liquidity in the business. Most European ANSPs and UK aviation industry participants needed to take similar unplanned actions to mitigate the impacts of COVID-19.

Other European ANSPs undertook a range of non-staff cost reduction exercises similar to NERL, focussing on discretionary cost areas such as travel, training, contractors, consultants and external support. NERL's level of cost savings for non-staff costs was towards the top quartile of European ANSPs in percentage reduction over 2019 cost levels terms. Meanwhile, the level of reduction in non-staff operating costs from NERL is in a similar range to the UK airports investigated in our benchmarking. Airlines were able to reduce costs more significantly due to the variable nature of fuel and catering costs when planes were not operated.

Steer recognises the context in which difficult decisions had to be taken during the pandemic and based on this analysis Steer does not find any grounds for suggesting amendments to these values, with the exception of UTM development costs (see next section) for which if the CAA adopts a strict user pays approach for NR23, then it would be coherent for the costs during the reconciliation period to also be treated in the same way.

Non-staff costs in the NR23 business plan

Non-staff costs (including exceptional costs) represented just over 26% of total opex (before labour is capitalised) in 2019. In the long-term, like staff costs, non-staff costs will be driven by the volume of activity of operations. However, as many non-staff costs are associated with operating assets and providing auxiliary services, they should be less responsive to short-term fluctuations in traffic volume as these costs will be relatively constant in the short-term. Overall, non-staff costs (including exceptional items) grow by +0.9% CAGR (2022-2027) over NR23, and are +10.8% higher in 2027 compared to 2019, driven by growth in asset management costs.

Asset management accounts for 26% of non-staff costs. The growth in "other asset management costs" relating to UKATS is driven by the implementation of DP En Route & Voice for upper airspace, while at the same time legacy systems remain in operation for lower airspace. This results in "dual running" and additional support costs being incurred until the Common Platform is implemented (assumed in NR28), allowing for "legacy escape" from the cost of supporting the existing systems. Although more apparent in the context of these non-staff costs, relevant costs are also incurred for technical staff (and their staff costs) that are required for providing this support. Based on NERL's analysis of the impact of this part of its capital plan on opex (Appendix H to the BP), legacy escape would enable savings of approximately £10 million per year. Given the materiality of these costs, an alternative capex profile for the investments relating to legacy escape is proposed as part of the

capex review. This is presented separately as it would require NERL to adopt a different strategy over NR23, rather than exploring ways of realising efficiencies within its proposed plan.

For the remaining non-staff costs, we have reviewed all cost items included in the opex template provided by NERL, but we have not carried out a detailed assessment on each of these due to either unavailability of benchmarks, the small size of some costs or the unique nature of some of NERL's costs. In general, costs increase in NR23 following the cost mitigation measures adopted during the COVID crisis, but do not grow above levels seen in RP2. However, we consider that sufficient justification for the evolution of UTM Development costs and DB pension management costs over NR23 has not been provided by NERL.

Steer notes that it is not clear why the activities for integrating new airspace users that are captured under UTM Development costs (particularly in relation to trials and new services) are attributed to commercial aviation customers and why these costs cannot also be recovered under the alternative mechanism proposed by NERL in line with the "user pays" principle. Adhering to the user pays principle would result in all UTM development costs being excluded during NR23, resulting in a saving of -0.2% of total costs. On the other hand, if we recognise that NERL may need to incur some costs as part of the NR23 cost base to manage the operational impact of new airspace users on conventional airspace users, the 2022 level of costs could be maintained, resulting in a -0.1% saving.

DB pension management costs represent the investment management costs for the DB scheme that up to and including 2021 were incurred and paid for directly by the Civil Aviation Authority Pension Scheme (CAAPS), and reimbursed via cash pension contributions. From 2022 onwards, NERL is expecting a change in how these costs are incurred, and assumes that these will be paid directly to the investment managers. These costs therefore form part of opex rather than the cash pensions building block. Steer notes that these costs increase despite a reduction in membership over the period, while the Government Actuary's Department (GAD) has found the cost per member to be significantly higher than other typical UK DB schemes of a similar size. Accepting that the increase in DB pension management costs between 2022 and 2023 may be driven by the same factors as the increase explained by NERL for DC pension management costs, namely higher life assurance and income protection premiums which have increased as a result of market conditions, but then maintaining costs at 2023 levels would result in a saving of -0.05% in total costs. Maintaining costs at 2022 levels would deliver a -0.13% saving.

Additionally, we have excluded CAA CMG Fees from the NR23 BP, based on CAP 2282, from which Steer understands that these fees will be levied directly by the CAA on airspace users from 2023, and will not be charged through NERL. The removal of CAA Fees from NERL's cost base amounts to -£5.2m over NR23, which is equivalent to 0.2% of total costs over 2023-2027 – although from the perspective of airspace users, this is just an allocation point, with these costs still being incurred as the fees will be levied directly by the CAA.

Further to the detailed bottom-up analysis of the different cost items, we have reviewed costs from a top-down perspective, covering both staff and non-staff costs, using a total factor productivity (TFP) approach and an approach that considers the trend in historical unit cost. Regulators over recent price controls in the aviation, energy and water sectors have applied a +1% p.a. assumed improvement in total factor productivity, reflecting ongoing productivity gains. The application of a +0.75% to +1.0% p.a. TFP gain on NERL's costs would result in savings of between -2.0% and -2.7% over NR23. Looking at the trend in historical unit costs, over RP2 real unit operating costs per en-route service unit reduced on average by -3.6% p.a. Applying an equivalent average unit cost

reduction for 2026 and 2027, following the forecast recovery of service units to 2019 levels in 2025, results in a saving of -1.3% in total costs compared to the NR23 BP.

Summary

Overall, the bottom-up analysis results in a small saving compared to the projections in NERL's BP, which combined total between -0.2% and -0.4% of total costs over 2023-2027, or -0.4% and -0.6% if the CAA CMG Fees are also excluded.

A top-down approach covering both staff and non-staff costs, and considering total factor productivity improvements and historical unit cost trends results in savings between -0.7% and -2.7% of total costs for NR23 (before the reallocation of CAA Fees).

These ranges are considered alongside those for the staff costs, with a combined view on operating costs provided in the Executive Summary.

3.2 Introduction

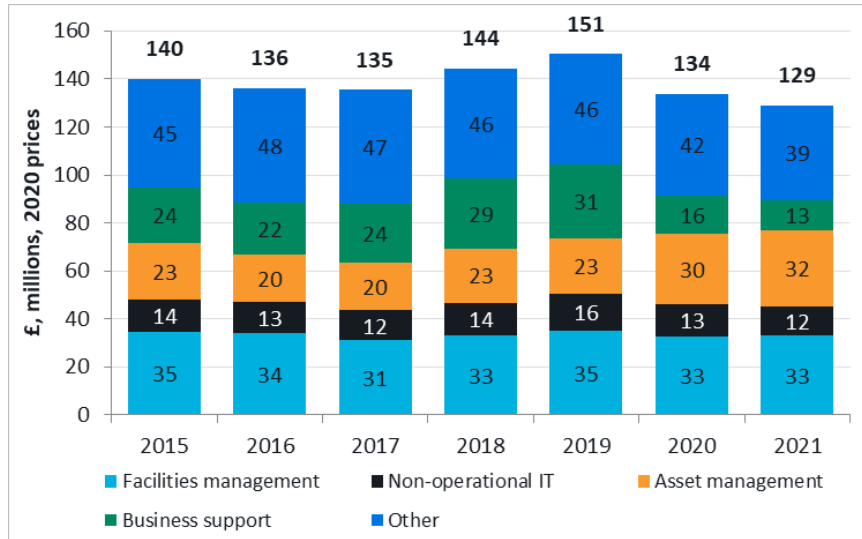
- 3.2.1 Non-staff costs (including exceptional costs) represented just over 26% of total opex (before labour is capitalised) in 2019. In the long-term, like staff costs, non-staff costs will be driven by the volume of activity of operations. However, as many non-staff costs are associated with operating assets and providing auxiliary services, they should be less responsive to short-term fluctuations in traffic volume as these costs will be relatively constant in the short-term. In this chapter we consider historical non-staff costs, non-staff costs over the reconciliation period (2020-2022) and non-staff costs in the NR23 BP.
- 3.2.2 As with staff costs, the assessment of non-staff costs is to inform the CAA's assessment of the overall efficient cost allowance for NERL during NR23. The CAA's assessment is not to determine the arrangements that NERL should make for facilities management, asset management or any other aspect of its business. Those arrangements are for NERL to determine.

3.3 Historical analysis

- 3.3.1 In this section we analyse the evolution of NERL's non-staff operating costs over 2015-2019 (RP2), 2020 and 2021, based on the data provided by NERL in its BP submission. The level of disaggregation within the analysis is based on what was provided within the submission; we have therefore analysed non-staff costs based on the following five categories:
- Facilities management;
 - Non-operational IT;
 - Asset management;
 - Business support; and
 - Other.
- 3.3.2 Figure 3.1 below shows NERL's non-staff operating costs in real terms between 2015 and 2019, split into the five cost categories listed above. Non-staff operating costs fell between 2015 and 2017 by -1.7% CAGR from £140 million to £135 million, before growing rapidly in the last two years of RP2 (+5.5% CAGR 2017-2019) to £151 million in 2019. Non-staff costs were reduced by -11% in 2020 and a further -3% in 2021 as a result of cost-mitigation measures taken by NERL in the context of the COVID-19 crisis.
- 3.3.3 Over RP2, 'Other' costs accounted for approximately 33% of total non-staff costs. The remaining costs were made up of facilities management (approx. 24%), asset management

(approx. 15%), business support (approx. 18%), and non-operational IT (approx. 10%). The composition of non-staff costs changed over 2020 and 2021, with asset management costs growing to represent 25% of non-staff costs in 2021, while business support costs fell and represented 10% of non-staff costs – the remaining cost categories saw smaller shifts. These changes are analysed in more detail in the sections that follow. Changes over 2020 and 2021 are described in further detail in the section on the reconciliation period below.

Figure 3.1: NERL total non-staff operating costs (2015-2021)

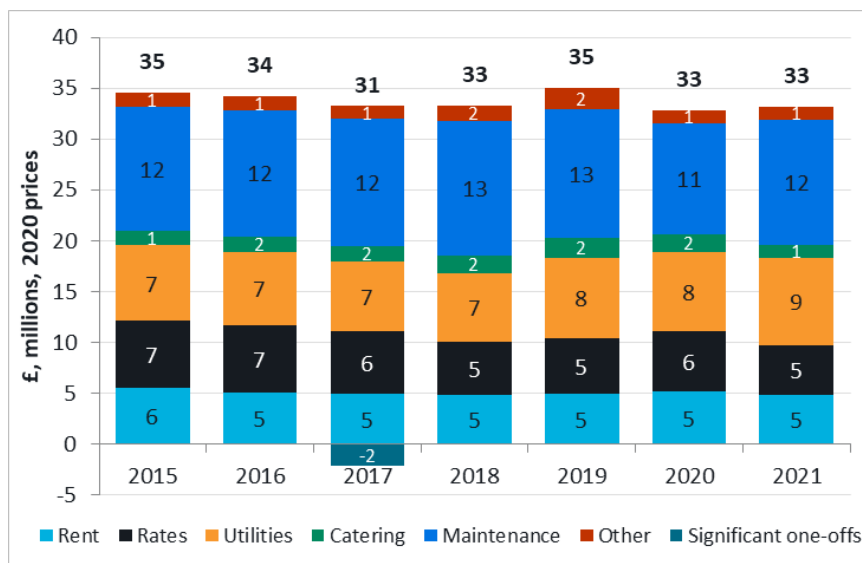


Source: 'NR23 opex template FINAL' received on 07/02/2022

Facilities management

3.3.4 Figure 3.2 shows NERL’s facilities management costs between 2015 and 2021, disaggregated into six sub-categories. In 2017, NERL received a £2 million one-off rate rebate in relation to the Swanwick Centre; therefore in 2017 total facilities management costs are £2 million lower than the sum of the six sub-categories shown.

Figure 3.2: NERL facilities management costs (2015-2021)



Source: 'NR23 opex template FINAL' received on 07/02/2022

3.3.5 Facilities management costs (accounting for the -£2.0m rebate) decreased by -5.1% CAGR between 2015 and 2017, before increasing by +6.1% CAGR over 2018 and 2019. Facilities management costs fell to 2018 levels in 2020 and 2021. Each of the sub-categories evolved as follows:

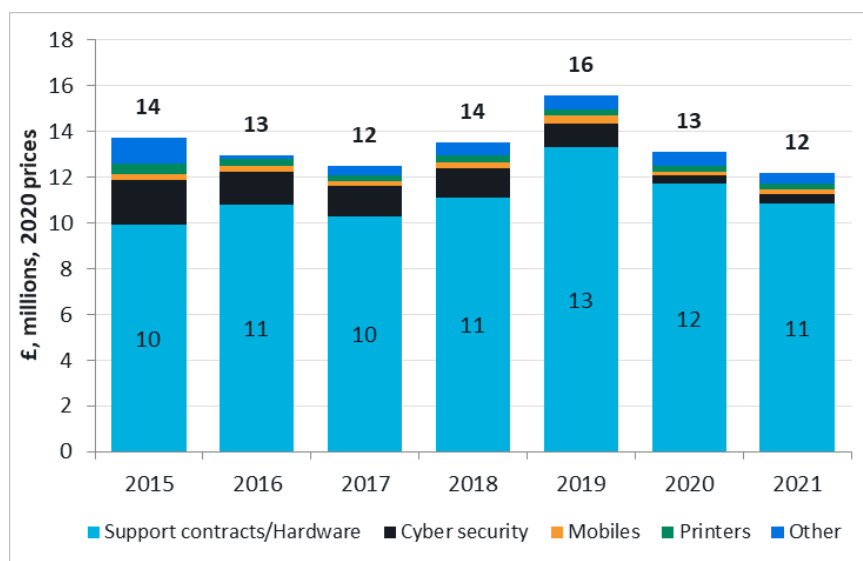
- Rent costs decreased by -5.2% CAGR between 2015 and 2017 and remained relatively stable for the remainder of RP2. They increased by +4.6% in 2020, but were then reduced by -6.4% in 2021.
- Rates, which represent business rate charges for NERL's corporate and remote sites, decreased by -5.1% CAGR over 2015-2019. They increased in +9.0% in 2020 before reducing by -16.9% in 2021.
- Utilities costs decreased by -3.4% CAGR between 2015 and 2018, before then increasing +19% in 2019. They fell slightly in 2020 (-2.4%) before increasing strongly in 2021 (+11%). NERL had previously stated that the increased costs were due to dual running of legacy and new assets, however the energy usage (kWh) drivers submitted as part of the NR23 business plan do not indicate a significant change in energy consumption.
- Catering costs increased by +8.2% CAGR between 2015 and 2019. NERL had previously stated that that this increase is driven by increased labour costs arising from increased to the national minimum wage, increased commodity costs arising from Brexit and increased usage of food catering facilities. Catering costs reduced by -7.7% in 2020 and by a further -29.9% in 2021.
- Maintenance costs increased by +1.0 CAGR over RP2. They fell by -14% in 2020 before growing back by +13% in 2021.
- Other costs (including, for example, security vetting, legal fees and management consultancy) decreased by -4.7% between 2015 and 2017 before increasing strongly over the next two years (+26% CAGR 2017-2019). They reduced by -33% in 2020 and a further -7.0% in 2021.

3.3.6 Based on the analysis of each of the facilities management sub-categories, the reduction in total costs between 2015 and 2019 was driven primarily by reductions in rent and rates costs. While cost mitigation actions over 2020 and 2021 saw reductions in all sub-categories except utilities.

Non-operational IT

3.3.7 Figure 3.3 shows NERL's non-operational IT costs between 2015 and 2021, disaggregated into five sub-categories.

Figure 3.3: NERL non-operational IT costs (2015-2021)



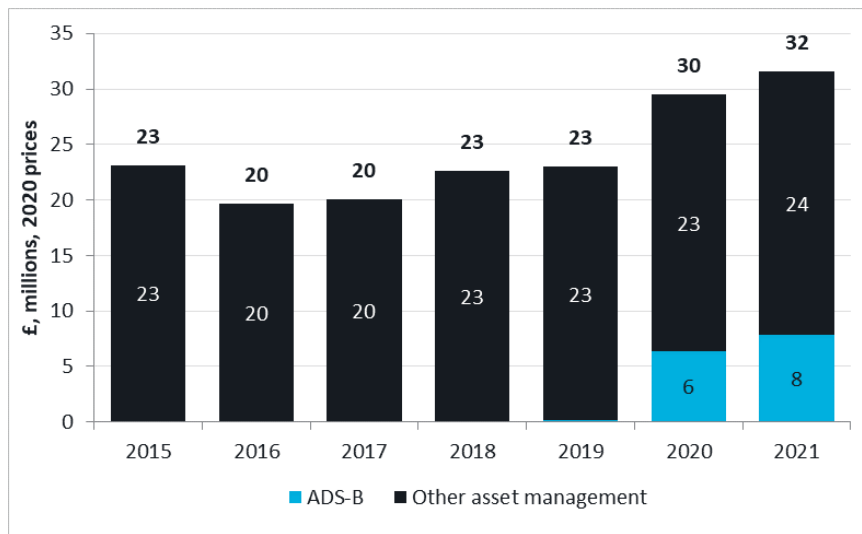
Source: 'NR23 opex template FINAL' received on 07/02/2022

- 3.3.8 Non-operational IT costs decreased by -4.6% CAGR between 2015 and 2017, before growing strongly in over the next two years (+12% CAGR 2017-2019). They reduced by -16% in 2020 and a further -7.0 in 2021.
- 3.3.9 Support contracts/Hardware costs accounted for 72% of non-operating IT costs in 2015 and drove for most of the growth in total costs over the period, accounting for 86% of costs by 2019. They were reduced by -9.9% CAGR over 2020 and 2021, but comparatively less than other subcategories (except Printers), meaning that they represented nearly 90% of non-operating IT costs in 2021.
- 3.3.10 NERL previously stated that these costs reflect new application support costs (Rostering, ADQ & PowerBI) and an industry shift from asset based on-premises IT to consumption of technology and Software as a Service (SaaS) with incremental technology/security refresh cycles. We note that SaaS costs are included under Business Support Technical Services in the NR23 plan following a change in accounting treatment.
- 3.3.11 We note that cyber security costs decreased from nearly £2 million in 2015 to just over £1 million in 2019 (-15% CAGR 2015-2019), during normal operations. These costs were then reduced very significantly over 2020 (£0.39m) and 2021 (£0.45m), however are forecast to return to RP2 levels in 2022 and grow strongly over NR23.

Asset management

- 3.3.12 Figure 3.4 shows NERL's asset management costs between 2015 and 2021, disaggregated into the ADS-B costs and other asset management costs.

Figure 3.4: NERL asset management costs (2015-2021)



Source: 'NR23 opex template FINAL' received on 07/02/2022

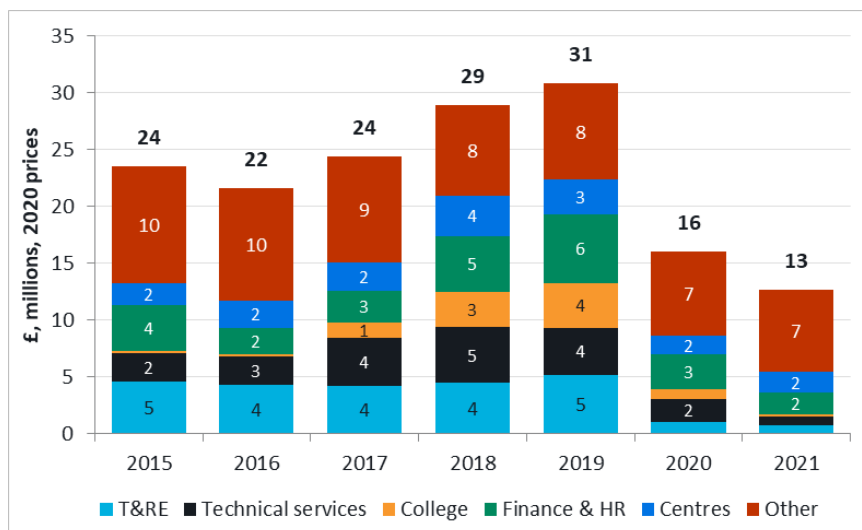
3.3.13 Other asset management costs (which represented all asset management costs until material ADS-B related costs started being incurred from 2020) fell by -15% in 2016, before growing by +5.2% CAGR over the 2016 to 2019 period, and continued to grow with a CAGR of +2.0% over 2020 and 2021.

3.3.14 ADS-B was introduced in 2019 with material costs incurred from 2020. NERL has indicated that these costs are driven by the number of oceanic flights using the technology. ADS-B costs grew by +22% between 2020 and 2021.

Business support

3.3.15 Figure 3.5 shows NERL’s business support costs between 2015 and 2021, disaggregated into six sub-categories.

Figure 3.5: NERL business support costs (2015-2021)



Source: 'NR23 opex template FINAL' received on 07/02/2022

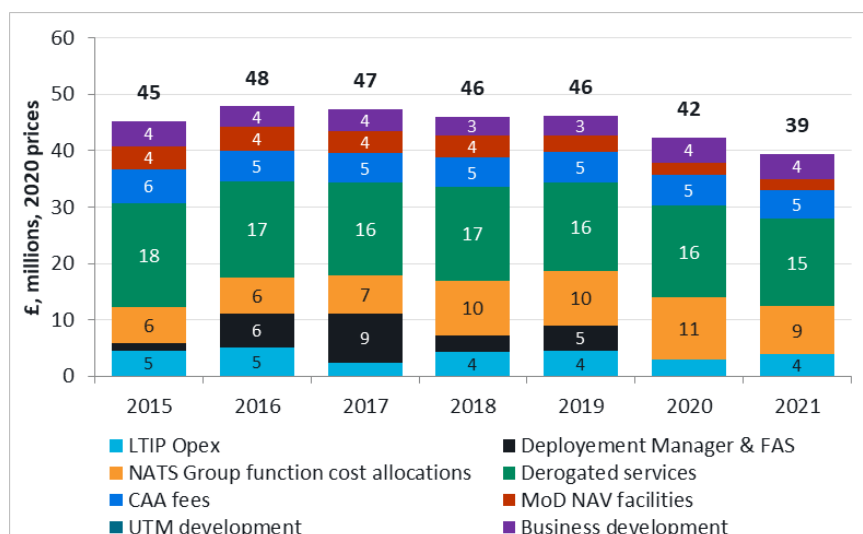
3.3.16 Business support costs decreased by -8.3% in 2016, after which they grew by +13% CAGR over the 2016 to 2019 period. They were reduced by -48% in 2020 and a further -21% in 2021. Each of the sub-categories evolved as follows:

- Travel and related expenses (T&RE) decreased by -6.8% in 2016 and a further -1.8% in 2017 before growing by +11% CAGR between 2017 and 2019 to £5.2 million. They were reduced to £0.7m by 2021.
- Technical services costs include third party support contracts related to the ongoing running and maintenance of DP En Route infrastructure and grew by +13.5% between 2015-2019, before being halved in 2020 and reduced by a further -69% in 2021 to £0.7m. Following a change in accounting treatment, Software as a Service (SaaS) costs are included in this line item for NR23, instead of under Non-operational IT “Support contracts/Hardware”. This line item also includes Engineering cyber support costs in NR23.
- College costs, which represent the outsourcing of ATCO training, increased significantly over RP2 from £0.2m in 2015 to £4.0m in 2019, as the training programme was ramped up in the face of higher than planned traffic. College costs were reduced to £0.2m by 2021, as training was paused in the context of the COVID-19 crisis.
- Finance & HR costs were reduced by -44% in 2016, before growing strongly for the remainder of RP2 (+38% CAGR 2016-2019), driven by increased recruitment activity and, as previously stated by NERL, some of the increased finance costs towards the end of the reference period associated with the CAA’s regulatory review. Finance & HR costs were halved in 2020 and reduced by a further -38% in 2021 to £1.9m.
- Centres costs, which represent non-staff costs within operational centres, increased by +13.5% CAGR between 2015 and 2019. They were reduced by -46% in 2020, before growing by +6.1% in 2021.
- The remaining business support costs reduced by -4.9% CAGR between 2015 and 2019. They were reduced by -12.4% in 2020 and a further -1.8% in 2021. They are comprised of:
 - Other support and corporate services (such as legal, safety, supply chain, corporate comms, etc.) which remained relatively stable over RP2 (+0.6% CAGR 2015-2019).
 - Future ATM capability costs associated with investments to mitigate the loss of funding as a result of Brexit. Future ATM capability grants are included as a negative cost in 2017, which accounts for some of the large increase in costs in 2018.
 - Other business support costs which include costs that are incurred by the company that are not business area specific such as bank charges, irrecoverable VAT and exchange gains/losses, as well as some balancing items and calendarization adjustments. In the NR23 plan they also include DC and DB pension management costs, as well as ACOG non-staff costs.

Other non-staff operating costs

3.3.17 Figure 3.6 shows NERL’s other non-staff costs between, 2014 and 2019, disaggregated into eight sub-categories.

Figure 3.6: NERL historical other non-staff operating costs (2015-2021)



Source: 'NR23 opex template FINAL' received on 07/02/2022

3.3.18 Other non-staff operating costs grew +5.7% in 2016 before going down by -1.1% CAGR over the rest of RP2. They decreased by -7.7% CAGR over 2020 and 2021. Each of the sub-categories evolved as follows:

- LTIP opex, which represents long-term investment plan support costs grew by +10% in 2016 and then fell significantly in 2017 before growing back to 2015 levels in 2019. They were reduced by -35% in 2020 and grew by +32% in 2021 as investments resumed.
- Deployment manager and Future Airspace Strategy (FAS) costs are capex-related costs associated with introducing new technologies and airspace design; 2015 is the first year in which NERL recorded costs associated with these initiatives. These costs increased by over +170% CAGR in 2016 and 2017, but decreased by -28% CAGR in the following two years. The FAS facilitation fund used in RP2 was phased out and replaced with an opex flexibility fund in RP3, which is not expected to continue in NR23.
- NATS Group function cost allocations, which we understand represent payments from NERL to NSL, increased with a CAGR of +1.8% between 2015 and 2017, before growing more rapidly in the following two years (+19% CAGR 2017-2019). These costs continued to grow in 2020 (+15%) before decreasing by -22% in 2021.
- Derogated services, which account for a significant proportion of other non-staff costs, represent licensed services that NERL has derogated to another ANSP (usually NSL), such as en route services in the vicinity of an airport to a TANS provider. These costs decreased by -3.9% CAGR between 2015 and 2019, and after an increase in 2020 (+3.5%) they fell by -5.6% in 2021.
- CAA fees (comprising CMG and SARG fees) fell by -6.1% CAGR between 2015 and 2017 before increasing by +1.8% CAGR in the last two years of RP2. CAA fee costs remained relatively stable in 2020 (+0.4%) and decreased by -5.3% in 2021.
- MOD navigation facilities costs decreased by -9.4% CAGR over 2015-2019 and continued to be reduced over 2020 and 2021 by -18% CAGR.
- UTM development costs are understood to relate to Uncrewed Aircraft Systems and were very small (c. £0.1m) over 2019 to 2021. The costs are projected to become more material over NR23. The extent to which these are to be attributed to the en route cost base is analysed below.

- Business development costs fluctuated over RP2, but overall fell by -6.0% CAGR between 2015 and 2019. These costs increased strongly in 2020 (+29%) and remained stable in 2021 (-0.6%).

3.4 Reconciliation review for 2020-2022 on non-staff costs

3.4.1 In a similar way as for staff numbers and staff costs, NERL took actions on non-staff costs in response to the exceptional circumstances of the pandemic. In this section we provide a review of the actions taken by NERL to reduce non-staff costs, we then go on to compare to the actions of other ANSPs across Europe and other UK aviation companies, before assessing suggestions for cost disallowances over the period.

Actions taken by NERL

3.4.2 Over the 2020 and 2021 period NERL took a number of actions listed below on non-staff costs.

Table 3.1: 2020-2022: NERL actions on non-staff costs

Actions
Business rate reductions: NERL benefited from business rate reductions as part of the government support scheme to companies.
Rationalisation of estates: With office staff working from home, the overall estate footprint was temporarily rationalised, and the usage of remaining facilities was reduced.
Austerity measures: various expenses were challenged and rationalised across the company. For example, business travel was reduced, and R&D expenditure were cut.
Re-planning of capital expenditures: NERL capital investment portfolio was paused and then re-planned through the engagement with customers (see the capex section for more detail).

Outcomes

3.4.3 Across the non-staff cost initiatives, NERL estimate the saving by year in their BP as presented in the table below. These represent significant reductions in non-staff costs and capital expenditure programme.

Table 3.2: NERL estimate of cost savings by non-staff initiative (costs 2020 prices)

Action	2020	2021	2022	Total
Reduce discretionary spend	£34m	£43m	£25m	£101m
Total non-staff costs 2019	£151m			
% of 2019 staff costs	23%	28%	17%	
Capital cost reduction	£113m	£76m	£4m	£193m
Capital spend 2019	£157m			
% of 2019 capital spend	72%	48%	3%	

Source: NERL business plan, Steer presentation

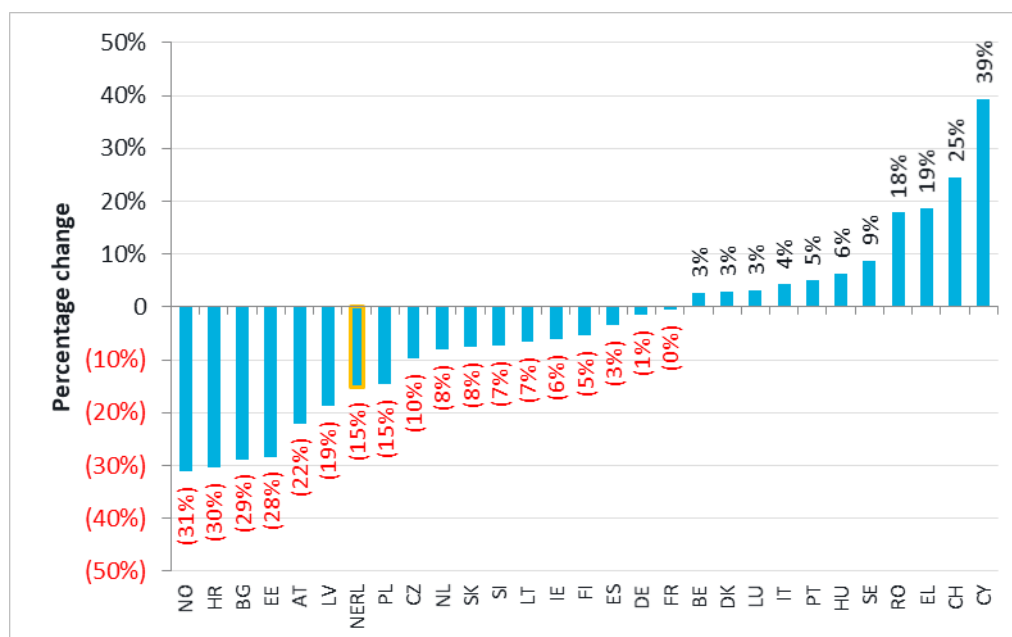
Comparisons to other ANSPs in Europe

3.4.4 Using the same PRB collected data sources, in this section we summarise the actions taken by other ANSPs in the area of non-staff costs.

3.4.5 Figure 3.7 below presents the change in ANSP non-staff operating costs between 2019 and 2020 and between 2019 and 2021 as submitted to the PRB in November 2020.

3.4.6 It should be noted that exceptional costs have been excluded from the other non-operating costs. However, these can potentially have a material impact on the savings at the total operating costs level.

Figure 3.7: Change in ANSP en-route other non-staff operating costs, 2020 versus 2019 (real)



Source: Steer analysis of PRB data & 'NR23 opex template FINAL' received on 07/02/2022.

3.4.7 There is significant variability in the level of non-staff operating cost changes expected by ANSPs in 2020 and 2021 versus 2019.

3.4.8 Of the 29 ANSPs, 11 expected costs to increase in 2020. In the cases of Romania (RO), Greece (EL), Switzerland (CH) and Cyprus (CY), these increases are significant and range between +18% to +39%. All of these ANSPs (excluding Greece) describe ways in which other operating costs had been reduced in their submissions, thus the nature of cost increases is unclear (but are assumed to have been in the respective ANSPs' original plans for 2020, with the decreases described being against these plans rather than versus 2019).

3.4.9 The NERL received data indicated a -15% saving in other non-staff operating costs in 2020 versus 2019. This compares with an overall average saving achieved by ANSPs of -3.5%. In 2020, the NERL non-staff costs saving ranks it 7th out of 28 ANSPs and it compares favourably with comparator group changes expected by Spain (-3%), Germany (-1%), France (0%) and Italy (4%) in 2020. Nevertheless, the bad debt costs of NERL (£25m) included in the exceptional costs offset this saving at the total operating costs level.

3.4.10 Significant non-staff operating cost decreases were expected by Austria, Estonia, Latvia and Norway in 2020.

Structure of other non-staff operating cost reductions

3.4.11 Disaggregated other non-staff operating cost data was not available from the PRB submissions, thus it was not possible to compare savings made across individual line items by European ANSPs. Descriptions of how savings were expected to be realised in 2020 were however included and have been summarised in Table 3.3 below. These have been taken at

face value and not further verified. Further information has been provided in the subsequent subsections and has been quantified where possible.

Table 3.3: Structure of reductions to other non-staff operating costs by ANSP, 2020

Note ticks represent where actions on these cost lines were taken by ANSPs to contribute to the overall 2020vs2019 non-staff cost savings

	2020 vs 2019	Rent	Training	Supplier contracts/ Data	External support	Utilities	Maintenace	Building	ATM	Projects	Others
NERL	-15%		✓					✓		✓	Austerity measures (Business travel, CAA fees, R&D, etc.)
EE	-28%		✓	✓							
NO	-31%		✓			✓					
AT	-22%		✓		✓						
LV	-19%				✓						Reduction of 'non-critical costs'
HR	-30%		✓	✓	✓			✓	✓	✓	
NL	-8%		✓	✓	✓	✓				✓	
SK	-8%		✓		✓	✓			✓		
CZ	-10%		✓		✓			✓	✓		
BG	-29%		✓			✓	✓		✓		
SI	-7%		✓	✓							
FI	-5%		✓								'Most costs'
HU	6%	✓	✓	✓	✓					✓	
LT	-7%		✓	✓				✓			
ES	-3%										not compromising safety and quality'
FR	0%										None specified
PL	-15%	✓	✓	✓	✓	✓	✓	✓	✓	✓	

	2020 vs 2019	Rent	Training	Supplier contracts/ Data	External support	Utilities	Maintenance	Building	ATM	Projects	Others
DK	3%		✓								
LU	3%		✓	✓	✓	✓					
IT	4%						✓	✓	✓		
IE	-6%		✓	✓	(✓)	(✓)	(✓)	(✓)	(✓)	✓	Reductions across all categories
DE	-1%		(✓)	(✓)	(✓)	(✓)	(✓)	(✓)	(✓)	(✓)	Reductions across all categories
PT	5%		✓								
SE	9%		✓	✓		✓					Retirement of MSSR-radars
RO	18%		✓	✓		✓			✓		
EL	19%										None specified
BE	3%		✓		✓	✓			✓	✓	
CH	25%					✓		✓	✓		MET reimbursement
CY	39%			✓	✓						

Source: Steer analysis of PRB data & NR23 business plan

Rent

- 3.4.12 Reductions in rental costs were cited by two ANSPs in their submissions.
- 3.4.13 The Hungarian ANSP was able to negotiate a temporary reduction in rent for the use of state-owned properties. This amounts to HUF342m (£856,000) for 2021; no saving was achieved in 2020. Total expected property expenditure was not available, and the percentage reduction achieved cannot be deduced.
- 3.4.14 The Polish ANSP noted that lower rental and lease costs were achievable due to the revision of their investment plan and that the cancellation of new ATCOs recruitment had also reduced the requirement for additional space. The individual cost saving associated with this measure cannot be presented it was presented as part of a larger amalgamated saving.

Travel

- 3.4.15 21 ANSPs explicitly cited reductions in travel costs. Operating costs savings expected from reduced travel were stated by 10 ANSPs and are presented in Table 3.4 below.

Table 3.4: ANSP travel costs reductions, 2020

ANSP	Total Saving specified (2020)
CZ	£ 1.0m
DK	£ 0.7m
HR	£ 1.2m
HU	£ 0.9m
IE	£ 0.5m
LU	£ 0.2m
PL	£ 2.4m
PT	£ 0.5m
RO	£ 0.5m
SE	£ 1.3m

Source: Steer analysis of PRB data

Training

- 3.4.16 15 ANSPs explicitly cited reductions in training costs as a component of other operating cost reductions and associated costs reductions were provided by eight. These are presented in Table 3.5 below.

Table 3.5: ANSP training costs reductions, 2020

ANSP	Total Saving specified (2020-2021)
DK	£ 0.7m
HR	£ 2.0m
HU	£ 0.3m
IE	£ 1.8m
LU	£ 0.1m
PL	£ 3.1m

ANSP	Total Saving specified (2020-2021)
RO	£ 2.0m
SE	£ 0.9m

Source: Steer analysis of PRB data

Supplier contracts/Data subscriptions

- 3.4.17 11 ANSPs cited reductions in supplier contract costs as a component of other operating cost reductions. Information submitted by ANSPs was not provided at a level allowing supplier contract and data subscription cost savings to be quantified.

External support/consultants

- 3.4.18 10 ANSPs cited reductions in external support/consultant costs as a component of other operating cost reductions. Information submitted by ANSPs was not provided at a level allowing external support and consultant cost savings to be quantified.

Utilities

- 3.4.19 Three ANSPs cited reductions in utility costs as a component of other operating cost reductions. Some ANSPs noted that utility costs had increased. Information submitted by ANSPs was not provided at a level allowing utility cost savings to be quantified.

Maintenance

- 3.4.20 Nine ANSPs cited reductions in maintenance costs as a component of other operating cost reductions. Information submitted by ANSPs was not provided at a level allowing supplier maintenance cost savings to be quantified and differentiating between property and system maintenance was not possible.

Projects

- 3.4.21 Five ANSPs cited reductions in project costs as a component of other operating cost reductions. Information submitted by ANSPs was not provided at a level allowing project cost savings to be quantified.

Comparisons to other aviation industry participants in the UK

- 3.4.22 For the same sample of aviation industry participants as reported in the staff costs section, we set out the non-staff operating cost reductions in 2020 versus 2019 achieved by each organisation below:
- Heathrow reduced non-staff operating costs by 21.3% in 2020 (excluded depreciation, amortisation, exceptional items and waivers);
 - Gatwick increased non-staff operating costs by 2.4% in 2020 (excluded depreciation, amortisation, exceptional items and waivers);
 - British Airways reduced other non-staff operating costs by 54% in 2020 (excludes depreciation, amortisation and exceptional items but includes variable costs such as fuel and charges); and
 - Ryanair reduced other non-staff operating costs by 67% in 2020 (excludes depreciation and amortisation but includes variable costs such as fuel and charges).

Action taken

- 3.4.23 The table below sets out the actions taken to reduce other non-staff costs in 2020 versus 2019 by each of the comparator organisations.

Table 3.6: Actions taken to reduce other non-staff costs by organisation, 2020

Organisation	Action	Reduction on 2019
Heathrow Airport	<ul style="list-style-type: none"> Operations in Terminals 3 and 4 were closed and mothballed in April 2020 Non-essential retailers were closed in late March 2020 One of the two runways was closed in April 2020 Most of the suppliers' contracts have been renegotiated to find opportunities for cost reduction 	<ul style="list-style-type: none"> Cost reductions cannot be mapped to specific actions just general cost savings as described in previous section
Gatwick Airport	<ul style="list-style-type: none"> Contractual and resourcing adjustments have been agreed with suppliers Discretionary expenditure has been halted Closing and mothballing of the South Terminal 	<ul style="list-style-type: none"> See above
MAG	<ul style="list-style-type: none"> Review of all expenditure 	<ul style="list-style-type: none"> Not available
British Airways	<ul style="list-style-type: none"> Outsourcing of Gatwick handling operation Consolidation of the three engineering sites in Wales in to one base Consolidation of the operation into London Heathrow Terminal 5 Temporary suspension of operations from London Gatwick and London City Permanent retirement of the B747 fleet Robust financial controls to ensure only business critical spend was made. 	<ul style="list-style-type: none"> See above

Source: Annual reports

Reasonableness of actions in area of non-staff costs

- 3.4.24 It is recognised that NERL took a range of actions on non-staff costs during the pandemic. This was driven by the reduction in demand and revenues, and the need to retain liquidity in the business.
- 3.4.25 Most European ANSPs and UK aviation industry participants needed to take similar unplanned actions to mitigate the impacts of COVID-19. Other European ANSPs undertook a range of cost reduction exercises similar to NERL, focussing on discretionary cost areas such as travel, training, contractors, consultants and external support. NERL's level of cost savings for non-staff costs was towards the top quartile of European ANSPs in percentage reduction over 2019 cost levels terms.
- 3.4.26 The level of reduction in non-staff operating costs from NERL is in a similar range to the UK airports investigated in our benchmarking. Airlines were able to reduce costs more significantly due to the variable nature of fuel and catering costs when planes were not operated.
- 3.4.27 Steer recognises the context in which difficult decisions had to be taken during the pandemic and based on this analysis Steer does not find any grounds for suggesting amendments to

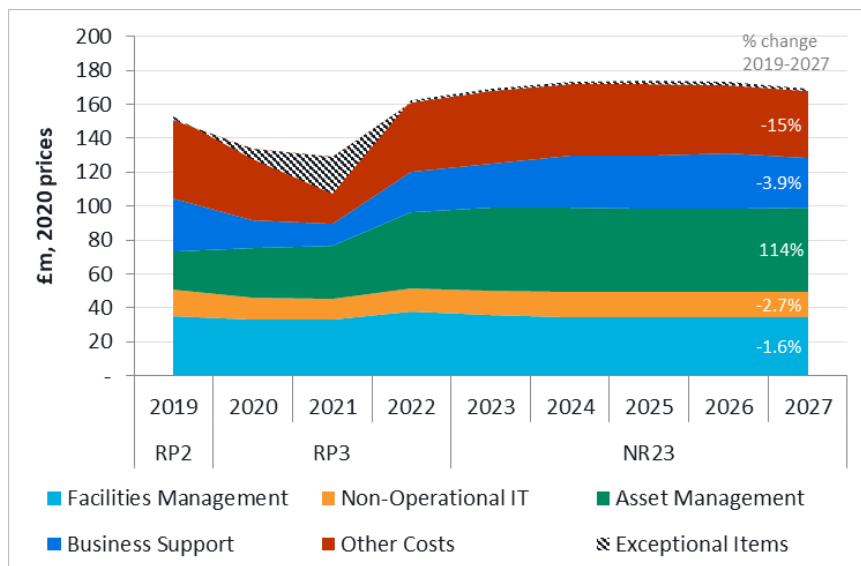
these values, with the exception of UTM development costs (see next section) for which if the CAA adopts a strict user pays approach for NR23, then it would be coherent for the costs during the reconciliation period to also be treated in the same way.

3.5 Non-staff costs in the NR23 business plan

3.5.1 This section provides an overview of trends in non-staff costs over the 2019-2027 period before analysing the key assumptions used in NERL’s NR23 BP and undertaking bottom-up and top-down analysis to identify potential cost efficiency improvements.

3.5.2 Figure 3.8 shows NERL’s non-staff costs (including exceptional items, but excluding redundancy costs) for 2019, 2020 and 2021 actuals, latest forecasts for 2022, and its projections for NR23.

Figure 3.8: NERL’s historical and projected non-staff costs (2019-2027) – proportion indicates change in 2027 compared to 2019



Source: ‘NR23 opex template FINAL’ received on 07/02/2022

3.5.3 Overall, non-staff costs (including exceptional items) grow by +0.9% CAGR (2022-2027) over NR23, and are +10.8% higher in 2027 compared to 2019.

3.5.4 Excluding exceptional items, over the period shown:

- Facilities management costs account for 22% of non-staff costs, remaining at around £35 million over NR23.
- Non-operational IT costs account for 9% of non-staff costs, remaining at around £15 million over NR23.
- Asset management costs account for 26% of non-staff costs, growing from £23 million at the end of RP2 to £49 million at the end of NR23.
- Business support costs account for 16% of non-staff costs. After a reduction in 2020 and 2021, these costs grow from £25 million in 2023 (equivalent to the average over RP2) to £30 million at the end of NR23 (equivalent to the level in 2019).
- Other costs account for 26% of non-staff costs, falling from £43 million in 2023 to 39 million at the end of NR23.

3.5.5 Exceptional items costs remain around £1.5 million over NR23.

3.5.6 The assessment of non-staff costs in the BP is to inform the CAA’s assessment of the overall efficient cost allowance for NERL during NR23. The CAA’s assessment is not to determine the arrangements that NERL should make for facilities management, asset management or any other aspect of its business in BP. Those arrangements are for NERL to determine.

3.5.7 We have reviewed all cost items included in the opex template provided by NERL, but we have not carried out a detailed assessment on each of these due to either unavailability of benchmarks, the small size of some costs or the unique nature of some of NERL’s costs.

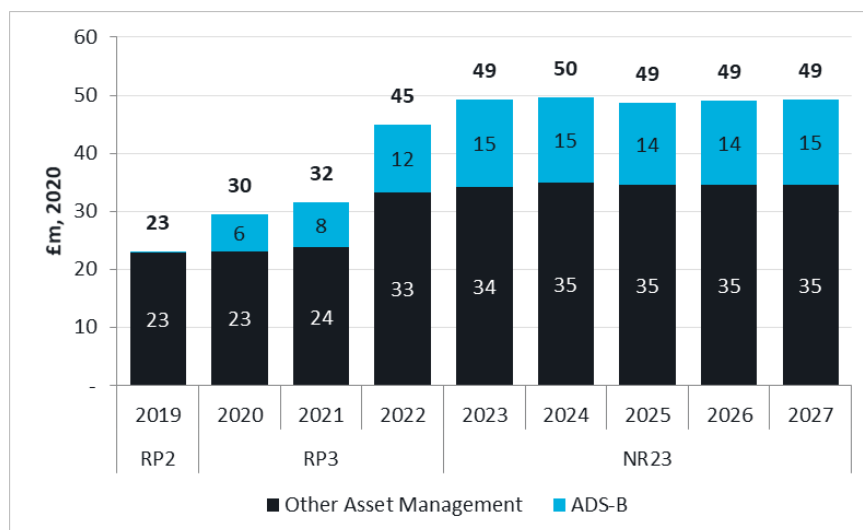
Asset management

3.5.8 One of the major and growing non-staff costs is asset management, which increases by a CAGR of +10% between 2019 and 2027. As shown in Figure 3.9, these costs are comprised of:

- “Other asset management costs” relating to UKATS and which increase by +40% in 2022 and remain at around £35 million through NR23.
- ADS-B costs relating to Oceanic, which grow as Oceanic traffic recovers in the North Atlantic and Tango sectors to around £15 million through NR23.

3.5.9 The growth in other asset management costs is driven by the implementation of DP En Route & Voice for upper airspace, while at the same time legacy systems remain in operation for lower airspace. This results in “dual running” and additional support costs being incurred until the Common Platform is implemented (assumed in NR28), allowing for “legacy escape” from the cost of supporting the existing systems. Although more apparent in the context of these non-staff costs, relevant costs are also incurred for technical staff that are required for providing this support. Based on NERL’s analysis of the impact of this part of its capital plan on opex (Appendix H to the BP), legacy escape would enable savings of approximately £10 million per year. Given the materiality of these costs, an alternative capex profile for the investments relating to legacy escape is proposed in Chapter 4.

Figure 3.9: NERL asset management costs (2019-2027)



Source: ‘NR23 opex template FINAL’ received on 07/02/2022

3.5.10 Stakeholders consider that insufficient information and explanation has been provided for the approach chosen and that as a result they do not fully understand the strategy leading to significantly higher sustainment operating and capital costs and delay in the delivery of the capital programme and benefits for DP En-route/Common Platform. While Steer understands

the strategy, the justification for the cost levels is less clear, moreover as addressed in our alternative legacy escape profile suggested in the capex chapter, we recognise there is more than one strategy that could be followed. The review of legacy escape and its potential impact on non-staff costs is provided in section 4.5.93 to 4.5.115.

Other non-staff costs

- 3.5.11 In the analysis below we highlight line items for which we consider sufficient justification for their evolution over NR23 has not been provided. Additionally, we have excluded CAA-CMG Fees from the NR23 BP, based on CAP 2282, from which Steer understands that these fees will be levied directly by the CAA on airspace users from 2023, and will not be charged through NERL.

Table 3.7: Cost items for which justification is not considered sufficient (£m, 2020 prices)

£m, 2020	2022	2023	2024	2025	2026	2027	Total NR23	CAGR 2022-2027
UTM development	0.5	0.5	1.0	1.3	1.5	1.7	6.0	+27.7%
DB pension management costs	2.4	2.7	2.7	2.8	3.0	3.2	14.4	+5.9%

Source: 'NR23 opex template FINAL' received on 07/02/2022

- 3.5.12 For the items identified in Table 3.7:

- UTM development costs grow from £0.5m in 2022 to £1.7m in 2027, a total of £6.0m in NR23. NERL explained that these costs consist of additional resources and outsourced software services that enable NERL to continue to:
 - manage the safety risk and operational impact on conventional aircraft from the range of new airspace users outlined above;
 - manage access to restricted airspace in accordance with legislation, deploying automated procedures where necessary to reduce increases in staff costs;
 - support an increased volume of trials of new airspace users' operational concepts both inside and outside controlled airspace. This supports activities such as the government's Future Flight programme and the CAA Innovation Sandbox; and
 - undertake early activities in the definition of new services, standards and operating procedures. These are in direct support of the CAA's Airspace Modernisation Strategy and stated ambitions towards greater airspace integration.

- 3.5.13 NERL has proposed to protect commercial aviation customers from the potential cost impacts arising from new users by excluding additional investment options presented for the integration of new airspace users (at an estimated cost of around £34m) from its NR23 business plan, and instead recover these costs through an alternative mechanism in line with the "user pays" principle. Steer notes that it is not clear why the activities above (particularly the third and fourth bullet points on trials and new services etc.) are attributed to commercial aviation customers and why these costs can not also be recovered under the alternative mechanism proposed by NERL, a recommendation to make these costs recovered through alternative mechanism as a possible amendment to allowable costs is provided in Table 3.8.

- **DB pension management costs** increase from £2.4m in 2022 to £3.2m in 2027, a total of 14.4m over NR23. They represent the investment management costs for the DB scheme that up to and including 2021 were incurred and paid for directly by the Civil Aviation

Authority Pension Scheme (CAAPS), and reimbursed via cash pension contributions. From 2022 onwards, NERL is expecting a change in how these costs are incurred, and assumes that these will be paid directly to the investment managers. These costs therefore form part of opex rather than the cash pensions building block. This will allow NERL to fully recover the VAT costs associated, which is not the case under the current set up, and will therefore deliver a benefit to customers. Steer notes that DB pension management costs increase despite a reduction in membership over the period, while the Government Actuary's Department (GAD) has found the cost per member to be significantly higher than other typical UK DB schemes of a similar size. Alternative assumptions to amend the cost allowance is provided in Table 3.8.

Sensitivities

- 3.5.14 We have applied sensitivities on the items identified above, in order to quantify the impact of different assumptions, as shown in Table 3.8.

Table 3.8: Steer non-staff cost sensitivities (£m, 2020 prices)

£m, 2020	Assumption	NERL BP Total 2023-2027	Steer sensitivity Total 2023-2027	Delta	% of total costs 2022-2027
UTM development	Low range saving: Recognising that NERL may need to incur some costs as part of the NR23 cost base to manage the operational impact of new airspace users on conventional airspace users, the 2022 level of costs could be maintained.	£6.0	2.9	(3.5)	(0.13%)
	High range saving: Adhering to the user pays principle would result in all UTM development costs being excluded during NR23.	6.0	-	(6.0)	(0.23%)
DB pension management costs	Low range saving: Maintain costs at 2023 levels, accepting that the increase in DB pension management costs between 2022 and 2023 may be driven by the same factors as the increase explained by NERL for DC pension management costs, namely higher life assurance and income protection premiums which have increased as a result of market conditions.	14.4	13.1	(1.3)	(0.05%)
	High range saving: Maintain costs at 2022 levels.	14.4	10.9	(3.5)	(0.13%)

Source: 'NR23 opex template FINAL' received on 07/02/2022, Steer analysis

- 3.5.15 Each of the sensitivities results in a small saving compared to the projections in NERL's BP, which together total between -0.2% and -0.4% of total costs over 2023-2027.
- 3.5.16 The removal of CAA CMG Fees from NERL's cost base amounts to -£5.2m over NR23, which is equivalent to 0.2% of total costs over 2023-2027 – although from the perspective of airspace users, this is just an allocation point, with these costs still being incurred as the fees will be levied directly by the CAA.

Top-down benchmarks

Total factor productivity improvements

- 3.5.17 Regulators over recent price controls in the aviation, energy and water sectors have applied a +1% p.a. assumed improvement in total factor productivity (TFP), reflecting ongoing productivity gains and covering staff and non-staff costs, as shown in Table 3.9.

Table 3.9: Total factor productivity applied in other price controls

Price control	Overall opex frontier shift
Ofgem, RIIO-GD1/T1, 2012	1.0%
CAA, Heathrow Airport, 2014	1.0%
Competition Commission, Northern Ireland Electricity, 2014	1.0%
Ofgem, RIIO-ED1, 2014	1.0%
Utility Regulator, NI Water, 2014	0.9%
CMA, Bristol Water, 2015	1.0%
Utility Regulator, GD17, 2016	1.0%
Ofwat, PR19, 2019 (draft determination range)	~1.0%
CAA, H7, 2021 (initial proposals)	1.0%

Source: CAP2266A

- 3.5.18 Using a similar approach, and applying this level of improvement to NERL's overall N23 operating cost base with the exception of Rates, Utilities and Cyber Security costs would imply savings in total costs of around -2.7% over the NR23 period. Rates and Utilities are excluded as, for a given size/location of facilities, their unit costs are not in direct control of the NERL. Cyber security costs are excluded because it would not be consistent to assume productivity gains at the same time as increased needs resulting from the implementation of new technology and the wider security context. The cyber security cost profile in NERL's NR23 BP is also understood and supported by stakeholders. A low case, assuming a +0.75% p.a. TFP improvement would lead to a -2.0% saving in total costs.

Historical unit cost trends

- 3.5.19 Over RP2, real unit operating costs per en-route service unit²⁰ reduced on average by -3.6% p.a. It is not reasonable to assume that this might be achieved during a period of low or recovering traffic, but applying these average unit cost reductions for 2026 and 2027, following the forecast recovery of service units to 2019 levels in 2025, results in a saving of -1.3% in total costs compared to the NR23 BP.

²⁰ Total costs include pensions on a P&L basis, which are not charged through the price control (because cash pensions are used instead), so these costs do not directly correspond to prices. Total costs per en-route service unit used to illustrate the broad relationship of costs and traffic (these values do not include other unit rate adjustments (inflation, traffic risk sharing etc.) and do not correspond to prices).

4 Capital expenditure

4.1 Capital expenditure overview

Reconciliation review for 2020-2022

As a result of the drop in traffic due to the COVID-19 pandemic, and the subsequent financial and liquidity difficulties experienced by NERL, certain elements of the capital programme have been stopped, and the entire programme has been re-planned for the 2020-2022 (i.e. the reconciliation) period.

The actions taken by NERL have been presented to and consulted with customers, as part of the TCAB and interim SIP21 processes. As part of the response, NERL has taken the following actions:

- Pausing the capital programme (apart from essential services and sustainment) for six months in 2020;
- Releasing 149 contractors (covered in chapter 2);
- Voluntary redundancy of 200 technical staff (covered in chapter 2); and
- Moving to a “fix on fail” approach in the sustainment of the systems.

These actions enabled capital expenditure savings and contributed to the resolution of the financial and liquidity crisis, however, they also resulted in a significantly reduced capacity to change and implement major system transitions. This capacity to change was further reduced by the difficulties stemming from COVID-19 related restrictions, which hindered on-site work and the use of international contractors and suppliers.

The strategy followed by NERL did result in a prolonged period during which legacy systems and the new iTEC platform will run in parallel, and requiring increased investment into sustainment, and also resulting in higher operational costs (asset management costs) than originally planned.

As to whether or not such decisions were reasonable, this will have to be assessed in the context of the NR23 capital programme, as there still remain uncertainties as regards the profile of legacy escape and the timeline against which its benefits may be realised, given (as mentioned above) the exact functionality nor a robust timeline for the development of iTEC v3 is available.

Under ordinary circumstances, the capex portfolio and its efficiency would be assessed against their impact on operational efficiency and service quality. We note here, that due to the global pandemic and its effect on traffic volumes, the outcomes of the KPIs and service quality measurements are not representative of the actual impacts of the capex portfolio and cannot be compared with pre-pandemic performance. The impact of the implemented capex programmes will have to be assessed once they have been commissioned (e.g. DP En Route) and the traffic volumes recover and allow for a reasonable comparison with pre-pandemic figures.

Based on the above, and that alternative capex portfolios cannot be proposed without applying hindsight, no alternative capex baseline is proposed for the 2020-2022 period. It must be noted though, that the reduction in the capacity of the organisation to implement change is not entirely an

exogenous factor for the business plan, even though it is acknowledged, that labour market trends and changes in the supplier capacities are external factors and are outside the control of the ANSP. Nonetheless, measures to mitigate these effects can be taken, thus a permanent reduction in the capacity to implement change should not be used as a fundamental assumption when planning for NR23. Indeed, during the discussions, NERL presented a set of measures to counter this reduction, such as:

- Devising alternative sourcing strategies;
- Transformation of job families and descriptions in the critical domains towards ITIL (Information Technology Infrastructure Library) based structures rather than ATC oriented ones;
- Outsourcing some of the challenging/problematic areas; and
- Defining new ways of working.

Despite the definition of these measures, the business plan contains no assumptions on the recovery of the capacity to implement change.

Capital expenditure in the NR23 business plan

The capital programme is largely driven by the headline programmes:

- Airspace and Ops enhancements;
- DP En-route & Voice and Common Platform; and
- Sustainment and Surveillance.

These programmes represent almost 78% of the total capex planned for NR23, although it is noted, that the Sustainment and Surveillance programme is more of a collection of smaller investment programmes, than a coherent investment programme, and is also largely dependent on DP En route & Voice and the Common Platform.

During the assessment of the individual investment programmes, we have found a lack of foundational business plans and identified benefits of the projects and issues which would require adjustments to the proposed profiles for the Common Platform, the Sustainment and Surveillance and the Risk and Contingency lines.

The quality and detail in business plans supporting the projects put forward by NERL, including their identified benefits to users, has not been provided to CAA as part of the BP submission. This makes it difficult to assess the appropriateness of the capital plan put forward, both in terms of the level of costs and in terms of whether the solutions chosen are the right ones. Stakeholders have also expressed concern about the relatively smaller size of the programme compared to RP2 and RP3 and the reduced capability of NERL to deliver a capital programme following the VR programme of 2020 and 2021.

Based on the comparison to the risk and contingency allowances in previous regulatory periods, we assess that the risk and contingency allowance for NR23 should be adjusted both in its total value and profile. We suggest using a risk and contingency allowance of 5% reflecting the RP3 approach. On this basis, the risk and contingency allowance would be a total of £28m over NR23, a -2.8% reduction in total planned capital expenditure, with the allowance distributed evenly across the 2024-2027 period, given the overall capex programme is of a similar magnitude in each year.

In addition to assessing the programmes separately, we undertook a more holistic approach, and highlighted two more complex issues: the profile for legacy escape and the risk and contingency allowance, together with the '2+5' approach. Based on our findings, we propose an alternative capex profile for NR23 that involves a 'step-wise' scenario for legacy escape and is of the same value as that

plan proposed by NERL (£574 million), but is restructured/reprioritised to deliver the most benefits to customers through the investments, particularly by bringing legacy escape forward in time and reducing the period during which new and legacy systems are maintained in parallel. The alternative profile is a combination of three main components:

- The 'step-wise' legacy escape scenario, which foresees the transition of lower airspace operations onto iTEC v2, followed by a more organic upgrade to iTEC v3 in NR28, once iTEC v3 becomes available;
- An adjusted sustainment profile, driven by realisation of legacy escape with transitioning lower airspace operations to the new platform; and
- a reduced risk and contingency allowance.

The suggested alternative legacy escape profile, if implemented, should also enable a £10m p.a. reduction in operating costs, from 2026 onwards (i.e. a total of -£20m over 2026 and 2027, equivalent to -0.8% of total NR23 opex).

4.2 Introduction

4.2.1 The context for the capital expenditure programme submitted by NERL for NR23 is largely driven by the consequences of the COVID-19 pandemic, and the choices made by NERL during RP3. As discussed during previous SIP and TCAB meetings, and during the CCWG dedicated session, NERL has fundamentally revised its investment portfolio compared to the original RP3 plans.

4.2.2 In the following sections, we provide an overview of the RP3 business plan and the reconciliation review for 2020-2022 to provide a baseline against which the NR23 plans may be evaluated.

4.2.3 The capital programme of the NR23 BP is then analysed, both at the portfolio level and the level of each programme contained in the portfolio. The review focuses on:

- the key assumptions presented by NERL;
- the justifications behind the planned expenditure;
- any supporting evidence provided by NERL;
- the consistency with plans from RP3 and the reconciliation review;
- key risks identified; and
- distribution and materiality of the planned expenditure.

4.2.4 Wherever possible, the review is supported by benchmarking with relevant ANSPs or other organisations.

4.2.5 For the purpose of this review, 'capital programme' refers to the entire investment portfolio, as presented by NERL in its business plan submission and 'investment programme' refers to a group of investment projects (e.g.: DP en route & Voice, Common Platform, etc.).

4.3 RP3 business plan

Overview

4.3.1 The cornerstone of the baseline RP3 capital programme of NERL has been the DSESAR programme, aimed at replacing aging or obsolete flight data processing systems and surveillance data processing systems and also a transition towards a cloud base, more resilient and flexible common platform for all NATS operations. The RP3 capital programme also

included investments into airspace restructuring, sustainment of various infrastructure elements and systems, and investments related to oceanic and military operations.

- 4.3.2 The overview of the RP3 investment plan (determined costs) is provided in Table 4.1 below. The business plan uses different CPI indices to convert the different cost items to 2020 prices, therefore in order to avoid confusion, 2017 prices have been retained here, also considering, that for the calculation of the percentage of the original plan, the price basis is not relevant.

Table 4.1: Baseline RP3 investment programme overview

Programmes in RP3 rBP	Sub-programmes	Capex Costs 2020-2024 (2017 prices) £m	Capex Costs 2020-2022 (2017 prices) £m	Percentage of 2020-2024 figures
DSESAR	DP En route	28	28	100%
	DP Lower	191	190	99.5%
	RP4 iTEC & Foursight	80	-	0%
Airspace	Free Route Airspace (FRA)	26	25	96.2%
	Queue & Capacity management (QCM)	18	15	83.3%
	Systemised Airspace	71	42	59.2%
Domestic en-route	Operational airspace enhancements	9	5	55.5%
	Operational system enhancements	28	18	64.3%
Technical resilience	Centres & builds sustainment	78	45	57.7%
	Remote sites & CNS sustainment	66	42	63.6%
Business Resilience	Facilities Management	52	32	61.5%
	Information Solutions	36	25	69.4%
Oceanic	Oceanic	15	11	73.3%
	Military	8	6	75%
	Contingency	34	13	38.2%
	Accelerated from RP2	23	-	0%
Total		763	497	65.1%

Source: Interim SIP21 Final to the CAA. Note: Costs for the period of 2020-2022 are a subset of planned costs, not actuals.

4.4 Reconciliation review for 2020-2022 on capital expenditure

Actions taken by NERL

- 4.4.1 As a result of the drop in traffic due to the COVID-19 pandemic, and the subsequent financial and liquidity difficulties experienced by NERL, certain elements of the capital programme have been stopped, and the entire programme has been re-planned for the 2020-2022 (i.e. the reconciliation) period.
- 4.4.2 The actions taken by NERL have been presented to and consulted with customers, as part of the TCAB and interim SIP21 processes. As part of the response, NERL has taken the following actions:
- Pausing the capital programme (apart from essential services and sustainment) for six months in 2020;

- Releasing 149 contractors;
- Voluntary redundancy of 200 technical staff; and
- Moving to a “fix on fail” approach in the sustainment of the systems.

- 4.4.3 These actions enabled capital expenditure savings and contributed to the resolution of the financial and liquidity crisis, however, they also resulted in a significantly reduced capacity to change and implement major system transitions. This capacity to change was further reduced by the difficulties stemming from COVID-19 related restrictions, which hindered on-site work and the use of international contractors and suppliers.
- 4.4.4 When assessing the actions taken by NERL in relation to the COVID-19 pandemic and its impacts, there is a caveat that all the actions and decisions have been situational at the time, affected by factors some of which are not reconcilable ex-post (such as the perceived risk of an outbreak in a centre). There may also have been factors (financing and liquidity of the company), which fall outside the scope of this review, but which have had a driving influence on how and what decisions were taken by NERL at the time.
- 4.4.5 It is nevertheless useful to consider how other European ANSPs reacted to the pandemic, as context. European ANSPs took different approaches to handling COVID-19 impacts. Based on the information provided by ANSPs through the Eurocontrol Network Manager’s Network Operations Plan Recovery Plans (now called Rolling Seasonal NOP), the following three main approaches can be outlined:
- Firstly, most ANSPs decided to temporarily pause or postpone their major projects, as a consequence of the COVID-19 related restrictions hindering work in simulation facilities (due to social distancing requirements). Following the lifting of restrictions, ANSPs continued carrying out their investments and running their transition programmes, although the exact timing of course depended on decisions imposed by local governments on the restrictions (‘Stop-and-go strategy’).
 - Secondly, there were a handful of ANSPs which focused their reactions on scaling their businesses down as much as possible, in order to respond to the drop in traffic demand, and to provide at least some cost efficiency benefits to their customers (most notable example is LPS Slovakia). These ANSPs tried to reshape and re-plan their operations, including investments and airspace redesign projects as well (‘Scale down strategy’).
 - Thirdly, there were also a handful of ANSPs (MUAC, HCAA, ROMATSA, LFV, etc.) which undertook to carry on with their investment programmes, and even considered speeding them up, as normally scarce ATCO resources become available during the traffic downturn. These ANSPs might also have experienced shorter pauses in their investment projects, but worked continuously against their existing plans, and took no decisive actions as regards postponing major projects (‘Fly forward strategy’).
- 4.4.6 Most ANSPs decided to postpone and/or indefinitely suspend the recruitment and training of ATCOs (out of the 31 ACCs, only 10 reported more ATCO FTEs than in 2019), which resulted in an overall drop in ATCO FTEs of -2.6% on average in the SES Member States.
- 4.4.7 The actions and decisions taken by NERL fall within the ‘Scale down strategy’ group, being driven by financial and liquidity issues, as well as health and safety considerations. Even though judging the appropriateness and efficiency of these decisions is impossible without hindsight, it is still important to explore the longer-term implications of the actions taken, and how these could have been different, if a different strategy had been followed by NERL.

- 4.4.8 Following the short-term reactions to the situation, and once it became apparent that the recovery from the pandemic will be prolonged, NERL revised and re-planned its capital programme. This revision has been driven by the following drivers:
- To ensure that the long-term capital programme is financeable under the forecast traffic conditions;
 - To ensure that service quality is not compromised, and essential systems remain operational; and
 - To ensure that the key changes originally planned in the RP3 business plan are still implemented and benefit customers.
- 4.4.9 This revision of the capital programme was consulted with customers through the TCAB and SIP processes, and resulted in the capital programme included in the SIP21 addendum RP3 baseline. Table 4.2 summarises the mapping between the RP3 business plan capital programme and the SIP21 addendum RP3 baseline.
- 4.4.10 The SIP21 addendum RP3 baseline capital programme had four major changes compared to the RP3 baseline programme:
- NERL stopped DP Lower and RP4 iTEC & Foursight programmes, but carried on the implementation of DP En-route, together with the investments targeting the main voice system (DP En-route & Voice).
 - Airspace and operational enhancements related projects have been reorganised into a single programme, while also stopping the Queue & Capacity Management and the Systemised Airspace projects, also partially stopping Free Route Airspace as well.
 - Sustainment related investment was moved to a fix on fail approach until the end of 2020, instead of carrying on with the planned sustainment related investments.
 - Investments into the new common platform for all NATS operations have been revised and reorganised into the iTEC Collaboration project, focusing on progressing the development of the new common platform in cooperation with six other ANSPs from Europe.
- 4.4.11 Apart from these actions, military related investments have been paused, and a programme aimed at transforming and sustaining the simulation and training environments have been launched. A new line item for 'Other' investments has also been added to the SIP21 addendum baseline.

Table 4.2: Mapping of RP3 investment programmes and SIP21 addendum RP3 baseline programmes

Programmes in RP3 rBP	Sub-programmes	Status in SIP21 addendum RP3 baseline	Programmes in SIP21 addendum RP3 baseline
DSESAR	DP Enroute	Continued	DP En-route & Voice
	DP Lower	Stopped	
	RP4 iTEC & Foursight	Stopped	
Airspace	Free Route Airspace (FRA)	Partially stopped	Airspace & Ops enhancements
	Queue & Capacity management (QCM)	Stopped	
	Systemised Airspace	Stopped	
Domestic en-route	Operational airspace enhancements	Continued and merged with Airspace & Ops enhancements programme	
	Operational system enhancements	Continued	
Technical resilience	Centres & builds sustainment	Continued	Sustainment & Surveillance
	Remote sites & CNS sustainment	Continued	
Business Resilience	Facilities Management	Continued	Facilities management
	Information Solutions	Continued	Information Solutions
Oceanic	Oceanic	Continued	Oceanic
	Military	Paused	-
	Contingency	n/a	-
	Accelerated from RP2	n/a	-
	-	-	iTEC Collaboration
-	-	-	Simulation transformation & sustainment
	-	-	Other

Source: SIP21 Interim Final to the CAA. The 'Stopped' status indicates a project has been permanently stopped.

- 4.4.12 The replanning of the capital programme also affected some of the key implementation timelines. The full implementation of DP En route & Voice has been shifted from 2020-2021 to 2024-2025. The cancellation of DP Lower and RP4 iTEC & Foursight also meant, that the transition of lower airspace operations onto the new common platform will not be possible in 2024, as originally foreseen.
- 4.4.13 Options have been discussed with customers to introduce an intermediate transition of lower airspace operations in mid-NR23, followed by a full transition of both upper and lower airspace operations onto the new platform. This option has been turned down in favour of reducing the number of transitions, and moving lower airspace operations onto the new

platform only when the new iTEC v3 (formerly also known as OneSky) platform is implemented. This introduces uncertainty in the implementation dates, as neither the exact functionality nor a robust timeline for the development of iTEC v3 is available.

- 4.4.14 In terms of re-planning the airspace changes and the related investments, NERL reprioritised the previously planned changes in line with customer views expressed in the TCAB and SIP processes, as well as the ACOG discussions.

Outcomes

- 4.4.15 The actions taken by NERL during the pandemic resulted in significant savings compared to the capital expenditure profile included in the CMA Final determination. As it can be seen in Table 4.3, capex spend has been £231 lower than the CMA determination, which translates into a reduction of 44%. This has been achieved despite the major increase in DP En route and Voice capex resulting from changes in costs and the implementation schedule.

Table 4.3: Comparison of 2020-2022 actual / forecasted capex spend versus the CMA final determination profile

£m, 2020 CPI prices	CMA Final determination 2020-2022	Actuals / Forecasts, 2020-2022	Difference in £m	Difference in %
Airspace & Ops Service Enh	112	31	-80	-72%
DP En Route (inc Voice)	29	168	139	479%
Sustainment and Surveillance	92	58	-33	-37%
Common Platform	200	12	-189	-94%
Business Resilience - IS	27	13	-14	-52%
Business Resilience - Property & FM	34	3	-31	-91%
Oceanic	11	5	-6	-55%
Risk & Contingency	14	0	-14	-100%
Military	5	2	-3	-60%
Total	523	293	-231	-44%

Source: NERL response to CAA's request for information relating to the reconciliation review for NR23 (CAP2291).

- 4.4.16 In order to better illustrate the evolution of NERL's capex plans during and after the pandemic, a comparison of the different profiles included in the business plans submitted by NERL over the period has also been carried out.

Table 4.4: Overview of the SIP21 addendum RP3 baseline

£m CY, 2020 CPI prices	2020	2021	2022	RP3 total
DP-ER & Voice	54	62	59	175
Airspace and Ops enhancements	6	12	13	31
Sustainment and surveillance	7	16	24	47
Facility management	3	8	12	23
Information solutions	3	7	8	18
Simulation Transformation and sustainment	0	0	1	1
Oceanic	2	2	2	6
iTEC collaboration	0	7	4	11

£m CY, 2020 CPI prices	2020	2021	2022	RP3 total
Military	0	0	0	0
Other	3	0	0	3
Risk & Contingency	0	0	0	0
Total:	78	114	123	315

4.4.17 As an outcome of the re-planning of the capital programme, the new SIP21 addendum RP3 baseline capital portfolio resulted in a total capex spend of £295m (2017 CPI prices), a significantly reduced programme compared to the original RP3 baseline plans, which were planned at £497m (in 2017 prices). The differences in the planned capex spends as well as the mapping of the projects across the plans are shown in Table 4.5.

Table 4.5: Comparison of rBP RP3 baseline and SIP21 Addendum RP3 baseline capital programmes

Programmes in RP3 rBP	Programmes in SIP21 addendum RP3 baseline	rBP baseline 2020-2022 capex costs (2017 prices) £m	SIP21 addendum RP3 baseline 2020-2022 capex costs (2017 prices) £m	% change between rBP and SIP21 addendum RP3 baseline	SIP21 addendum RP3 baseline 2020-2022 capex costs (2020 prices) £m
DSESAR	DP En-route & Voice	218	164	-25%	175
Airspace	Airspace & Ops enhancements	105	29	-72%	31
Domestic en-route					
Technical resilience	Sustainment & Surveillance	87	44	-49%	47
Business Resilience	Facilities management	32	22	-31%	23
	Information Solutions	25	17	-32%	18
Oceanic	Oceanic	11	5	-55%	6
	Military	6	-		-
	Contingency	13	-		-
	Accelerated from RP2	-	-		-
	iTEC Collaboration	-	11		11
	Simulation transformation & sustainment	-	1		1
	Other	-	2		3
	Total	497	295	-41%	315

Source: SIP21 Final

4.4.18 The strategy followed by NERL in reacting to the pandemic had three major consequences as regards capital expenditure, which are carried over to NR23 and possibly to NR28 as well:

- A shift in the planned date of legacy escape, from the originally foreseen 2023-2024 to mid-NR28. This is analysed in detail in the dedicated section below.

- A move to a fix-on-fail approach in sustainment related investments for 2020, followed by a revised overall sustainment strategy, largely driven by the shift in legacy escape.
- The reduced capacity of the organisation to carry out change and implement new developments, leading to a reduced capital programme. This consequence is carried over to NR23 as one of the basic assumptions by NERL underpinning the capital programme.

- 4.4.19 We note that two out of these three major consequences might have happened even if NERL had followed the ‘Stop-and-go strategy’ when reacting to the pandemic. Since COVID-19 related restrictions have disrupted the deployment process anyway, it is reasonable to assume, that the originally planned implementation dates would have been postponed, and this would have resulted in the need to revise the sustainment related expenditure, given the strong dependencies.
- 4.4.20 It is the reduced capacity to change where a different strategy could have yielded significantly different outcomes. By reducing the number of contractors and technical staff through the VR programme (which is an essential part of the ‘Scale down strategy’), NERL prioritised immediate cash savings over the mid-term capabilities of the organisation to implement investment projects.
- 4.4.21 In the ‘Fly forward strategy’ this would have been reversed, as this strategy would have leveraged the temporary increase of ATCO availability, even increasing the capacity to carry out changes in the short-term, without prejudice to the mid- to longer-term capabilities. It must be noted, that in this case, the cash savings would have been lower. NERL also noted, that major investment programmes at the time of these decisions were more dependent on engineering capabilities, than on ATCO resources.
- 4.4.22 As regards the ‘Stop-and-go strategy’, a minor reduction in the capacity to change might have occurred, simply as a result of pausing projects and sending personnel on furlough. Re-starting the projects and bringing the organisation up to speed would have resulted in reduced change capacity, but only for the very short term, with little to no effect on the NR23 period. It is acknowledged, that the ‘Stop-and-go strategy’ could have transitioned into a ‘Scale down strategy’ as uncertainty about the recovery of traffic grew over time.
- 4.4.23 The actions taken by NERL on its capital programme in response to the COVID-19 pandemic are within the range of actions taken by other ANSPs and as a result are seen as reasonable and proportionate. Based on experience with other European ANSPs, it must be highlighted, that the level of engagement with customers, the level of detail offered and the overall quality of information provided to airspace users about the actions taken were of high quality (noting however that some room for improvement may nevertheless exist from the perspective of airlines).
- 4.4.24 Looking at the UK aviation sector, we set out the actions taken to reduce capital costs in 2020 versus 2019 in the table below for the same sample of aviation industry participants as reported in the staff and non-staff costs sections. The scale of the reduction in NERL’s capital programme comparing to original plans is of a similar magnitude (-41%) as those seen at Heathrow and British Airways.

Table 4.6: Reduction in capital costs by other UK aviation industry participants

Organisation	Action	Reduction on 2019
Heathrow Airport	<ul style="list-style-type: none"> • Capital investments were reduced and focused mainly on safety and resilience. 	<ul style="list-style-type: none"> • £335m (-39.1%)

Organisation	Action	Reduction on 2019
Gatwick Airport	<ul style="list-style-type: none"> Key capital investment projects and programmes which were paused during the year. 	<ul style="list-style-type: none"> £167m (-66.0%)
MAG	<ul style="list-style-type: none"> Pausing non-essential capital projects 	<ul style="list-style-type: none"> Not available
British Airways	<ul style="list-style-type: none"> Deferral of a number of aircraft scheduled for delivery between 2020 and 2022 	<ul style="list-style-type: none"> £621m (-39.5%)
easyJet	<ul style="list-style-type: none"> Sale and leaseback of 33 aircraft 	<ul style="list-style-type: none"> £36m

Source: Annual reports

Reasonableness of actions in area of capital expenditure

- 4.4.25 Given the decisions and actions taken by NERL in response to COVID-19, the original investment plan for RP3 has been significantly reduced. At the time of the crisis, NERL was taking actions to maintain its liquidity and remain financeable, which are strong economic drivers, not faced by all entities operating under economic regulation.
- 4.4.26 On the other hand, the strategy followed by NERL in response to COVID-19 did result in a prolonged period during which legacy systems and the new iTEC platform will run in parallel, and requiring increased investment into sustainment, and also resulting in higher operational costs (asset management costs) than originally planned.
- 4.4.27 As to whether or not such decisions were reasonable, this will have to be assessed in the context of the NR23 capital programme, as there still remain uncertainties as regards the profile of legacy escape and the timeline against which its benefits may be realised, given (as mentioned above) neither the exact functionality nor a robust timeline for the development of iTEC v3 is available.
- 4.4.28 Under ordinary circumstances, the capex portfolio and its efficiency would be assessed against their impact on operational efficiency and service quality. We note here, that due to the global pandemic and its effect on traffic volumes, the outcomes of the KPIs and service quality measurements are not representative of the actual impacts of the capex portfolio and cannot be compared with pre-pandemic performance. The impact of the implemented capex programmes will have to be assessed once they have been commissioned (e.g. DP En Route) and the traffic volumes recover and allow for a reasonable comparison with pre-pandemic figures.
- 4.4.29 Based on the above, and that alternative capex portfolios cannot be proposed without applying hindsight, no alternative capex baseline is proposed for the 2020-2022 period. It must be noted though, that the reduction in the capacity of the organisation to implement change is not entirely an exogenous factor for the business plan, even though it is acknowledged, that labour market trends and changes in the supplier capacities are external factors and are outside the control of the ANSP. Nonetheless, measures to mitigate these effects can be taken, thus a permanent reduction in the capacity to implement change should not be used as a fundamental assumption when planning for NR23. Indeed, during the discussions, NERL presented a set of measures to counter this reduction, such as:
- Devising alternative sourcing strategies;

- Transformation of job families and descriptions in the critical domains towards ITIL (Information Technology Infrastructure Library) based structures rather than ATC oriented ones;
- Outsourcing some of the challenging/problematic areas; and
- Defining new ways of working.

4.4.30 Despite the definition of these measures, the business plan contains no assumptions on the recovery of the capacity to implement change.

4.5 Capital expenditure in NR23 business plan

Overview and evidence provided

- 4.5.1 NERL provided information on its capital programme as part of the NR23 business plan submission. Prior to the submission, the capital programme has been consulted during the CCWG process and certain elements of the programme have also been subject to consultation during the TCAB and SIP processes.
- 4.5.2 The business plan submission does refer to these processes and the materials presented during the various consultations. However, the submitted evidence is fragmented: with the evaluation and assessment of the capital programme not fully possible without considering the documentation previously submitted by NERL as regards its investment plans for the TCAB and SIP discussions in 2021.
- 4.5.3 In general, the level of detail provided through supporting business cases and identified benefits for each project/ capital programme is very limited, despite the CAA requesting further information during the clarification and question and answer process. This has made it difficult to verify the choice of capital programme compared to feasible alternatives.
- 4.5.4 NERL defined a set of three main objectives for its capital programme:
- Sustainment:
 - Sustaining existing services.
 - Ensuring resilient ATM services.
 - Airspace:
 - Delivering Increased Network Capacity, Enhanced Safety, Improved Environmental Performance & Reduced Fuel Burn for Customers.
 - Deploying SESAR:
 - Replacing ageing infrastructure.
 - Consolidating to a single platform, with improved tools and standardising operations.
- 4.5.5 NERL proposes what it characterises as a balanced investment portfolio: the planned investments are to “strike a balance between priorities and benefits, costs, deliverability and service risk”. NERL also provided information on the strategies considered during the planning of the programme. These strategies were characterised by the level of effort and capex spending, as well as the benefits and the corresponding outcomes. NERL defined a “low effort – low benefit” strategy, a “higher effort – higher benefit” strategy, and a middle strategy where the efforts and the benefits would fall in between of those of the two options.
- 4.5.6 NERL concluded that the two extreme strategies are not desirable, as the low effort strategy would induce operational and performance risks, whereas the high effort strategy would have a significantly higher deliverability risk. NERL proposes to follow a strategy, which balances these risks.

4.5.7 NERL also identified the key external drivers and internal constraints of the capital programme:

- External drivers,
 - Maintaining Safety.
 - Delivering customer priorities.
 - Maintaining availability of Critical National Infrastructure.
 - Providing a level of service in line with our legal obligations.
 - Ensuring we are not a constraint on recovery of traffic.
 - Delivering legislative and compliance requirements to Europe.
- Internal constraints
 - Prior investments made and technology work agreed and completed to date.
 - Operational systems reaching end of life.
 - To remain financeable within a cost-constrained environment.
 - Impact of Covid-19 on suppliers and wider supply chain.
 - Impact of Covid-19 on our plans for RP3 and pause of capex.
 - Our capacity to deliver change.

4.5.8 The resulting capital programme is summarised in Table 4.7. In addition to the point estimates of costs included in the detailed, programme level descriptions, NERL also provided range estimates for the major investment headline items. It must be noted here though, that the headline titles do not correspond entirely with the titles of the investment programmes, thus creating some ambiguity in the business plan.

Table 4.7: NR23 capital programme overview and ranges

£m 2020 prices	low	base	high
Airspace	70	83	100
DP En Route	38	38	40
Technical resilience	195	206	235
Lower technical operation	120	120	170
Other	124	127	135
Total	547	574	680

Source: NERL NR23 business plan

4.5.9 There are differences in the size of the ranges provided across the headline items. The smallest range applied is £2m (or c. 5% of the base value) for DP En Route, whereas the largest range is £50m (or c. 42% of the base value) for Lower technical. This is justified by the different level of maturity and the information available to NERL regarding the foreseen costs (e.g. the DP En Route programme is reported to be 80% ready, thus the uncertainty of the costs still to be incurred is significantly lower, than in other programmes, hence the range is only £2m).

4.5.10 The business plan submission provides an overview of the expected benefits of the capital programme as a whole, rather than at a project level as requested by CAA. NERL expects safety and environment related benefits from early on in NR23, and capacity improvements in the second half of the period. The benefits of the portfolio are summarised in Table 4.8.

Table 4.8: Overview of portfolio level benefits of the NR23 capital programme

Area	2023	2024	2025-27	Overall contribution
Safety (RAT) % reduction / 100k movements	3 - 6%	10 - 12%	6-12%	18-27%
Service impact C2 (seconds per flight)	0	0	0.7-1.2	0.7-1.2
3Di (score)	0-0.3	0.9-1.5	1.1-1.5	2-3.3
Technical resilience risk	Maintain exposure at a tolerable level (below £90m NWV)			
Cost efficiency	Minimise impact to medium term costs, drive long term efficiency in cost base			
Compliance	Targeting compliance across period			

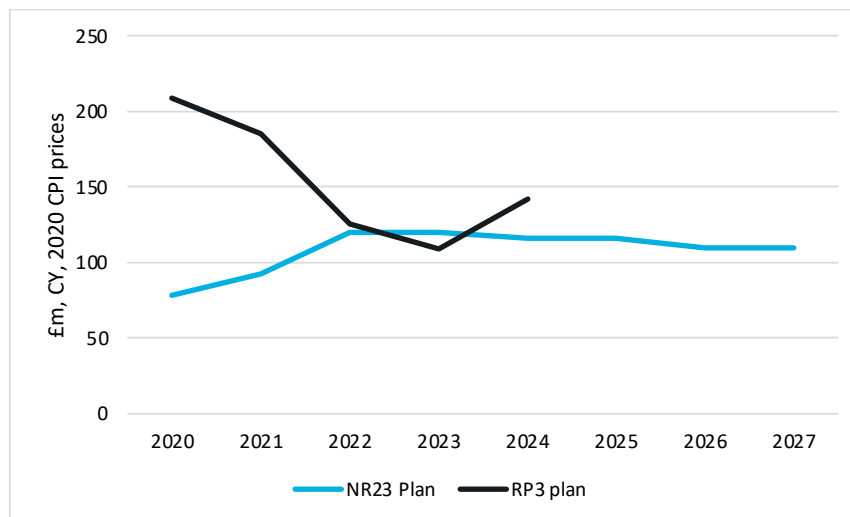
Source: NERL NR23 business plan

4.5.11 As regards cost efficiency, NERL expects to minimise the impact on medium-term costs, while driving long-term efficiency, which has to be viewed in the context of the impact of the capital programme on opex figures, which is also described by the business plan submission (in Appendix H).

Comparison to the RP3 baseline capital programme

4.5.12 When compared to the RP3 plans, the capital programme proposed for NR23 is substantially smaller, which is a result of the actions taken during 2020 and 2021, and the re-planning of the original RP3 baseline investment plan. Most importantly, the investments related to DP Lower and a significant part of airspace changes related investments are now shifted to NR28. The RP3 and NR23 capex profiles are shown on Figure 4.1.

Figure 4.1: Comparison of RP3 and NR23 capex profiles

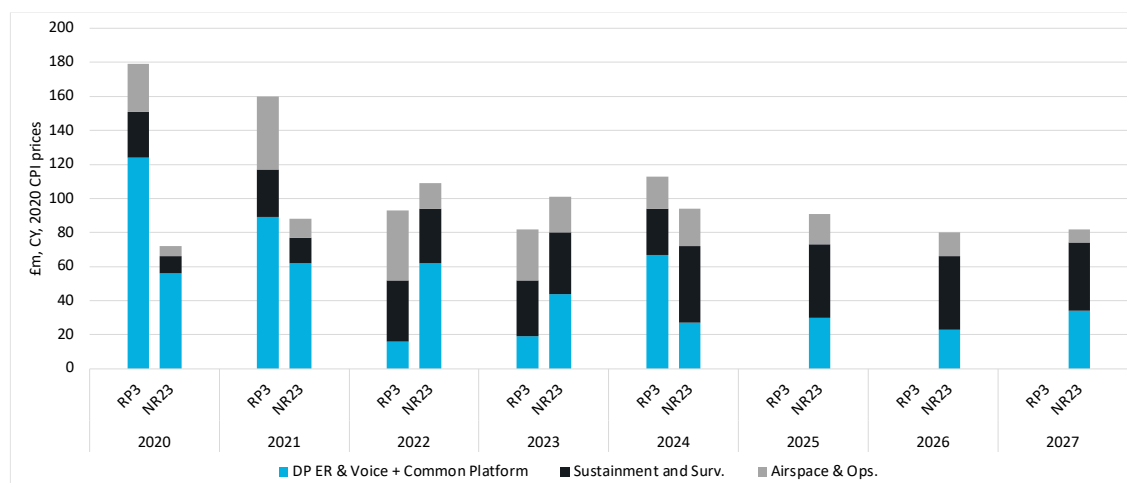


Source: NERL NR23 business plan

4.5.13 This also translates into a total value of £864m over the period of 2020-2027 for the NR23 capital program. Looking at the 2020-2022 timeframe, the NR23 profile (£290m) is £ 229m lower than the RP3 profile (£519m), while on the 2020-2024 timeframe the NR23 profile (£528m) is £ 241m lower than the RP3 profile (£769m).

4.5.14 The comparison of the three major headline items – DP En Route & Voice and Common Platform, Sustainment & Surveillance, and Airspace & Ops Enhancements – over RP3 and NR23 are shown on Figure 4.2. It is to be noted, that once DP En route phases out in 2024 and 2025, the Sustainment and Surveillance programme becomes the key headline part of the programme.

Figure 4.2: Comparison of the headline investments over RP3 and NR23



Source: NERL NR23 business plan

Methodology behind planning the capital programme

4.5.15 NERL introduced two changes in the methodology applied for capital programme planning:

- NERL has adopted a portfolio planning and management process, consisting of annual cycles of iterative steps, but still based on an overall technology strategy for the regulatory period; and
- As proposed during the CCWG discussions, NERL used the ‘2+5’ approach in its capital programme planning. The essence of this approach is to establish a rolling planning process, in which the next two years are elaborated in detail, whereas the five year horizon is only planned in strategic detail.

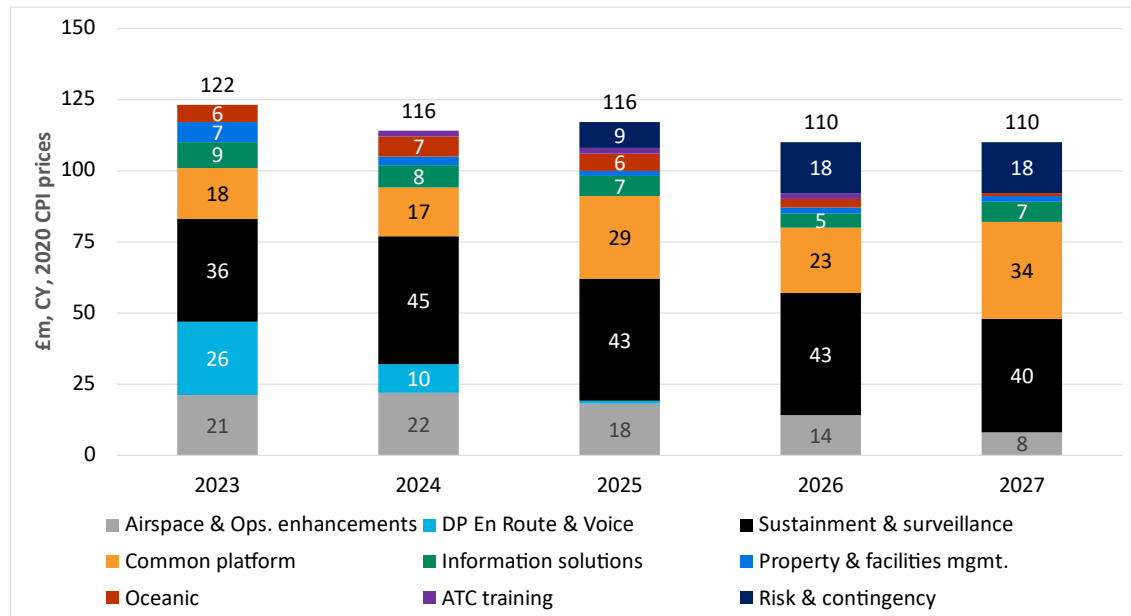
4.5.16 Both new methodologies are intended to increase customer engagement through better quality information for the shorter-term, however, it is not yet fully clear how they fit into the five-year price control cycles, and how the programme revisions resulting from the annual management cycle would be reconciled with the capex profile set out for the regulatory period. NERL proposed, that any changes to capex spend resulting from the annual review cycles would happen within the overall capex allowance for the period, although it is for the CAA to decide its approach. While this notion does limit the impact of such reviews on customers, it also reduces greatly the flexibility brought about by the concept of the ‘2+5’ approach. A dedicated section on the implications of the ‘2+5’ approach also in conjunction with risk and contingency is included under Highlighted topics and findings.

Structure of the portfolio

4.5.17 NERL provides an annual structural overview of the capital programme, detailing the planned capex for each year and each investment programme over NR23. The overview reveals that at least 75% of capex in each year is planned to be generated by the three areas which may be the most important enablers and drivers of customer benefits:

- Sustainment and surveillance;
- Airspace and operational enhancements; and
- DP En Route & Voice and Common Platform.

Figure 4.3: Structural overview of the NR23 capital programme



Source: NERL NR23 business plan

4.5.18 The structural overview also highlights the emergence of the risk and contingency related capex from 2025 onwards. This is explained by NERL as being less than 8% of the total investment spend and should cover the emergence of unforeseen investments and changes in the scope of projects. It must be highlighted, that when compared to the overall capex over the entire NR23 period, the proposed £44m risk and contingency allowance is less than 8%, but when comparing the yearly allowances in 2026 and 2027, the allowance of £18m corresponds to more than 16%. We assess that the level of risk and contingency is higher than in previous RPs and investigate this further in this chapter.

Stakeholders' views

4.5.19 Stakeholders raised a number of issues with the capital programme:

- NR23 Legacy escape: stakeholders do not fully understand the strategy leading to significantly higher sustainment capital costs and asset management operating costs and delay in the delivery of the capital programme and benefits for DP En-route/Common Platform. Airlines consider that insufficient information and explanation has been provided for the approach proposed by NERL and are concerned about the capability to implement legacy escape to the original timeframe being impacted by redundancy of engineers and capital project contractors.
- NR23 Cyber costs: stakeholders generally support increased cyber-security costs, but welcome clarity around any transfer in costs in relation to the shift towards the use of software as a service.
- NR23 Capital expenditure programme: airlines support a programme of expenditure of the approximate size proposed, and specific parts of the programme especially e.g. airspace change, but do not see that the benefits and consequences of the programme in

total have been demonstrated (both in terms of benefits in terms of cost efficiency and/or quality of service to NERL and other industry participants). The interaction between capital expenditure and any operating cost savings has not been explained clearly by NERL.

- NR23 2+5 approach: airlines expressed some concern about how this will work in the context of the five-yearly price control, and wanted further clarification from the CAA as to how it would work in practice (given existing SIP and TCAB processes).

Suitability of the capex programme

- 4.5.20 The evidence presented demonstrates that the planning process resulting in the capex programme is well established, the planning methodology and the logic is clear and transparent.
- 4.5.21 The capex programme is an organic continuation of the investments in RP3: the programme takes due account of what transpired during 2020-2022 and defines the plan on that basis. However, NERL proposes some key changes in both the general approach and the elements of the programme (see Sustainment and Surveillance, Legacy escape profile, and the 2+5 approach).
- 4.5.22 In terms of enabling service quality improvements, the main benefits come from the airspace changes foreseen by the programme. Based on the submitted evidence, these projects and their prioritisation have been subject to detailed consultation with airspace users and other stakeholders and are also in line with the related higher-level national plans and strategies. The technical changes and the deployment of SESAR functionalities, together with the transition towards a more robust and resilient infrastructure also enables improvements in service quality.
- 4.5.23 The business plan submission does not contain a complete set of detailed business cases to support each investment programme / project. NERL provided information on the benefit calculation mechanisms applied, and also submitted a set of example business cases for illustration purposes, but not directly linked to the business plan. NERL justifies the lack of comprehensive business plans with its benefit calculation methodology, in which the level of detail of the benefit calculations is dependent on the maturity of the projects. As a result of the replanning of the capital portfolio and the changes applied to the investment strategy in some areas (e.g. sustainment and surveillance), investment programmes are not yet at the maturity levels where NERL would assign validated, quantified benefits to them.
- 4.5.24 Despite this lack of comprehensive business cases, customer feedback during the consultations has been positive about the overall size of the investment programme with the caveat, that actual investment decisions should only be taken if solid business cases have been developed previously. NERL also stated, that further developments as regards the calculation of benefits will be shared as part of the coming TCAB and SIP processes.
- 4.5.25 The proposed technical changes and the overall vision about the target infrastructure is in line with that of the major European strategies and the European ATM Masterplan. NERL's proposed new architecture and the foreseen modus operandi is built on the key concepts of the Airspace Architecture Study, and if successfully delivered, it should ensure interoperability with neighbouring European ANSPs.
- 4.5.26 As regards maintaining and operating the elements of the critical national infrastructure, the capex programme contains the necessary elements of sustainment related investments. Based

on the evidence provided, it can be established, that NERL has assessed the status of its infrastructure and planned for investments to ensure that major failures can be avoided, and service delivery is not compromised.

- 4.5.27 The capital programme contains targeted investments into improving cyber-security and resilience, which is widely supported by the customers, and is considered an important and necessary action, when transitioning towards the new architecture and data-driven operations.
- 4.5.28 In general the evidence submitted shows that the capital programme contains the necessary elements to ensure service delivery and that it targets the appropriate areas of investment.
- 4.5.29 The questions and issues emerging from the assessment of the capex programme are related to how it supports cost efficiency, and whether the timing and combination of the investment programmes deliver the optimum solution. These issues and questions are assessed further in the following sections.

Deliverability of the capex portfolio

- 4.5.30 NERL provides a set of internal constraints, which have been considered when designing the capital programme. These are:
- Prior investments made and technology work agreed and completed to date.
 - Operational systems reaching end of life.
 - To remain financeable within a cost-constrained environment.
 - Impact of COVID-19 on suppliers and wider supply chain.
 - Impact of COVID-19 on our plans for RP3 and pause of capex.
 - The capacity to deliver change.
- 4.5.31 The issue of prior investments and technology work agreed and completed, together with the actions taken during the COVID-19 pandemic are reasonable considerations and define the starting point of the capital programme for 2020-2022, however, they are not necessarily constraints to what may be achieved during NR23 and beyond, even if certain impacts continue to be felt during NR23.
- 4.5.32 The question of remaining financeable is more complicated, and may act as an active constraint, limiting the amount of capital expenditure that can be delivered over the period, without incurring increased financial risks. This, however, is also dependent on how the capital programme is designed, how strong the business cases are behind the investments, and what returns are expected on the investments. The business plan does not offer detailed information on where the financial constraint would be in terms of capital expenditure, but implicitly assumes, that the proposed capital programme is financially deliverable.
- 4.5.33 From a deliverability perspective, arguably the most important constraint is NERL's capacity to deliver change. The business plan – and the previous materials presented and discussed during the SIP, TCAB and CCWG processes – describes what measures have been taken to cope with the COVID-19 impact, in particular the release of contractors and technical staff during 2020.
- 4.5.34 The capital programme considers this reduced capacity to change, and offers no explicit assumptions on increasing this capacity during NR23. We assess, that in the short-term, it is not possible to rebuild the capacity, as it takes considerable time and effort to recruit, train, and integrate new technical staff, and introduce them to the often complex transition

projects. On the other hand, over a five-year regulatory period, such constraints should at least be partially overcome, as these problems can be addressed in such a timeframe.

- 4.5.35 Indeed, in our engagement with NERL, it described a range of measures which are planned/already underway to counter the shortage of available technical staff, such as:
- Devising alternative sourcing strategies;
 - Transformation of job families and descriptions in the critical domains towards ITIL (Information Technology Infrastructure Library) based structures rather than ATC oriented ones;
 - Outsourcing some of the challenging/problematic areas; and
 - Defining new ways of working.
- 4.5.36 These measures fall outside the scope of the capex review, but are reasonable and are deemed an effective means to overcome the constraints faced, thus a significant rebuilding of the reduced capacity to implement changes can be considered when devising alternative capex profiles.
- 4.5.37 This aspect of the capital programme is important, as it is used as a key assumption behind the plans related to the implementation of the Common Platform, and at the core of the NERL NR23 capital programme. It is not entirely clear, and no detailed options have been presented on this issue by NERL, if the proposed investment plan requires a gradual increase of the capacity to change, or if it is assumed to stay flat during the period. This not only affects the deliverability of the portfolio, but also defines the profile of legacy escape, which in turn is driving a large part of the planned sustainment efforts, and enables some of the airspace changes as well.
- 4.5.38 The deliverability of each of the investment programmes in the portfolio is discussed in the respective sections below. As a general assessment, with the caveat of the aforementioned issue, the capital programme raises no major deliverability problems. The timeline and contents of the programme are reasonable, and seem to provide ample time to implement the necessary changes.

Overall capital expenditure assessment

- 4.5.39 This section provides a detailed assessment of the capital programme proposed by NERL by evaluating each of the investment programmes separately.

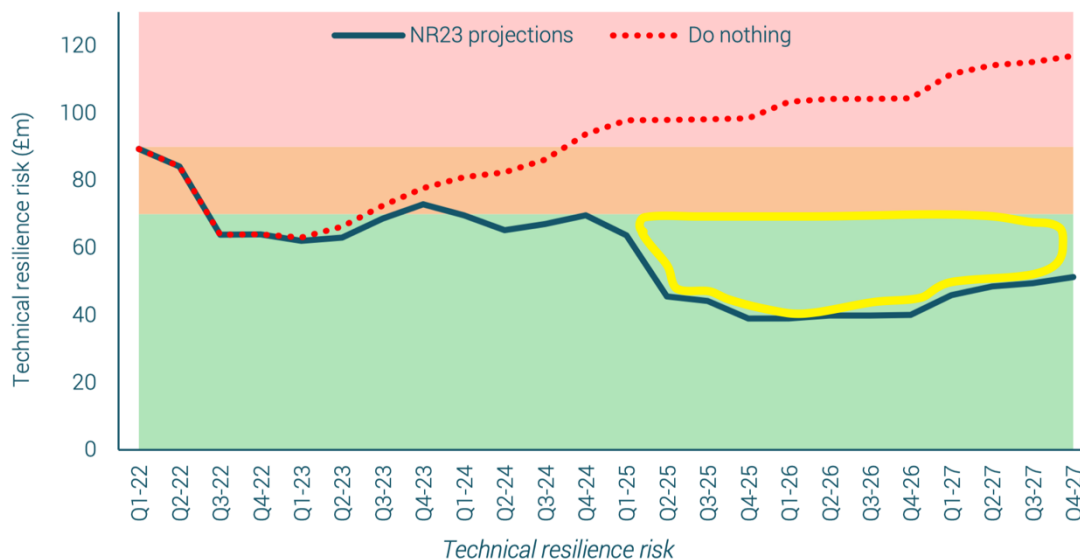
Sustainment and Surveillance

- 4.5.40 This programme is a collection of smaller investments, which are aimed at renewing, refurbishing or replacing systems and infrastructure elements or otherwise extending their lifecycles and the capabilities which they provide.
- 4.5.41 Following the major outbreak of COVID-19, NERL moved its sustainment activities to a “fix-on-fail” approach until the end of 2020, reducing the original capex for sustainment from £91m to £57m in the RP3 period. With more stable forecasts and the foreseen traffic recovery, NERL now plans to return its sustainment approach to a risk-based approach, which was used before the pandemic. This change is justified by the requirement to improve technical resilience, and to optimise sustainment investment by directing capex spending towards systems that would have a material impact on service delivery or service quality if they failed.
- 4.5.42 We assess, that even though the risk-based approach is reasonable in principle, it is not demonstrated, what the costs of a schedule-based approach would be. Nor is it clear, how the

risk-based approach differs from a schedule-based approach, when large parts of the sustainment plan are defined by the end of life of current systems.

- 4.5.43 The Sustainment and Surveillance programme foresees a larger budget for the complete renewal of NERL's surveillance service with a planned budget of £30m over the period.
- 4.5.44 Surveillance is part of the key infrastructure, and is fundamental to the provision of ATS services, ensuring the proper operation of surveillance system is a priority. The portfolio of primary and secondary radars has been deployed during 2007 and 2013, with an expected lifespan of 15 years, which would result in radars reaching their end of life between 2022 and 2028. However, the business plan provides, that a mid-life upgrade programme has extended the life of all radars until 2027. NERL also noted, that legislative changes regarding the manufacturing of spare parts, and the decisions of the single supplier of the current fleet to end support for these radars as of 2028 as the main drivers behind the situation and for the early commencement of a replacement project being undertaken to mitigate the associated risks.
- 4.5.45 The business plan does not contain detailed information on the content of the surveillance programme, however, the development of the future surveillance service has been part of the TCAB process. The business plan shows that ADS-B is considered as a substitute for other cooperative surveillance technologies, and that the sustainment of primary radars is also foreseen to be part of the programme. The exact combination of the surveillance portfolio, the technology implementations, and a detailed time plan is not included in the business plan, making further assessment not possible. The business plan foresees that the surveillance programme and its details will be further consulted annually in the SIP and TCAB procedures.
- 4.5.46 We find it important to highlight, that the implementation of different surveillance technologies may have significantly different capex and opex profiles, with some technologies being available on a "surveillance as a service" basis, which would eliminate the need for investments (at least partially).
- 4.5.47 Another material part of the sustainment programme focuses on the maintenance and renewal of core system elements, which were foreseen to be retired with the transition to DP En Route and DP Lower. While the business plan foresees that 33 systems will be retired from 2024 when DP En Route is implemented, major parts of the old architecture will also have to be sustained, until the full transition to the Common Platform, which is foreseen to happen in mid-NR28 (Legacy escape). This generates an increased sustainment spend during NR23. Legacy escape, and the dependencies between sustainment, DP En Route and Common Platform are also discussed further in a section below.
- 4.5.48 NERL uses technical resilience risk (measured as net weighted value of risk, NWV) as a proxy measure to ensure investments are targeted in line with the risk-based approach to sustainment. The changes in the technical resilience risk level are used to capture the benefits of sustainment spend. NERL noted, that the risk bands are the result of past operational experience and expert judgement, and have been used in previous regulatory periods. The business plan compares the NR23 sustainment plan to a 'do-nothing' scenario, in which NWV levels quickly escalate into the amber band in 2023 Q3, then reach the red band at the end of 2024. The projected NR23 profile keeps NWV around boundary of the green and amber bands until the implementation of DP En route & Voice, by the end of 2024, followed by a sharp decrease, and a period in which NWV is rather stable and well below the upper boundary of the green band.

Figure 4.4: Technical resilience risk as presented by NERL, highlighting the area where technical resilience risk is below the theoretical optimum



Source: NERL NR23 business plan, Appendix H page 15. Highlight by Steer/Integra.

- 4.5.49 Figure 4.4 shows the technical resilience risk profiles defined by NERL. The area highlighted in bright yellow indicates the reduction of NWV, below the theoretical optimum for NWV which is somewhere immediately below the upper boundary of the green band. NERL also noted, that there remains a very significant risk related to surveillance which (if not mitigated) would result in NERL exceeding the tolerable level of risk (i.e. the amber band) by some margin. NERL also stated in its business plan, that it is in the process of investigating alternative measures of risk management away from the use of NWV to a best practice methodology endorsed by the Institute of Risk Management (and consistent with ISO 31000) that focuses on the identification of risk and its subsequent control, rather than the overall potential cost of its impact.
- 4.5.50 According to our assessment, the business plan is lacking the comparison of the proposed NR23 technical resilience risk profile and any realistic alternative profiles (such as a schedule-based approach to sustainment), as only the ‘do-nothing’ scenario is considered. Without such comparison, and further supporting evidence, the proposed technical resilience risk profile cannot be justified.
- 4.5.51 Further to lowering the technical resilience risk levels, the business plan also describes how sustainment contributes to increasing energy-efficiency and CO₂ emissions. An example from 2020 is given for the Great Dun Fell radar site where electricity consumption has been reduced by 60%, however it is not clear, if the proposed sustainment projects will have a similar impact.
- 4.5.52 The business plan provides the planned overview of capex for the programme (Table 4.9). The headlines used to show the breakdown of costs do not exactly match the structure of the description of the programme, making the assessment ambiguous: it is not clear, if the sustainment actions related to NAS and NODE core are included under Flight (controller applications) or Platform or any other row. Similarly, it is unclear which row contains the sustainment spend planned for the core infrastructure and navigation. The capex values

included in the table do not add up to the total values provided, but the difference is marginal, and it is assumed to be due to rounding issues.

Table 4.9: Planned costs of the Sustainment and Surveillance programme

£m CY, 2020 CPI prices	2023	2024	2025	2026	2027	NR23
Platform (cyber, AIRACs, annual sustainment)	8	9	8	8	8	42
FM (centres infrastructure) and sims sustainment	5	7	7	9	8	37
FM (remote sites infrastructure)	6	4	7	5	5	27
Communications	0	6	5	6	7	23
Surveillance	2	7	7	8	6	30
Cross functional (e.g. networks) and info management	10	6	3	6	4	29
Flight (controller applications)	3	7	5	2	2	19
Total	36	45	43	43	40	206

Source: NERL NR23 business plan

- 4.5.53 Sustainment of NODE, NAS, EFD and other system elements are dependent on how the transition towards the new common platform is realised, and once the transition is fully realised and the existing systems are decommissioned, NERL foresees a £10m saving per annum in operational expenditure. This reduction is only foreseen as of mid-NR28, though.
- 4.5.54 We assess that there is considerable uncertainty in this programme with respect to the surveillance project. Also, sustainment investments are largely driven by the fact, that the transition to the Common Platform is only planned by mid-NR28, and therefore legacy systems must be sustained until then. Due to this interdependency, alternative profiles for sustainment are further explored under the section on alternative legacy escape below.
- DP En Route and Voice*
- 4.5.55 DP en route and Voice is a continuation of the first element from the DSESAR programme, started in RP2. NERL says that the programme is 80% complete, with the final testing and validation exercises remaining before the full implementation is realised in 2024 (although some last related activities are planned for 2025).
- 4.5.56 This programme will deploy iTEC v2 for the upper airspace operations, which replaces the outdated flight data processing system, along with several other legacy systems. iTEC v2 will serve as a basis for further software changes, which will be required to extend the platform for lower airspace operations as well.
- 4.5.57 Apart from being the driver of some of the sustainment-related capex elements, DP En Route also enables further airspace changes (such as cross-border free route airspace and the extension of AMAN/XMAN into the en route sectors).
- 4.5.58 The business plan provides an overview of the expected benefits. These are related to improving safety of operations by reducing controller workload, delivering a reduction of CO₂ emissions, increasing resilience by replacing outdated technology, and improving cyber-resilience.

- 4.5.59 It is important to note, that the expected reduction in ATCO workload is not reflected elsewhere in the business plan as an increase of ATCO productivity, although the description of the benefits for this programme highlights this relationship. NERL noted, that such benefits are only planned to be realised once the more advanced functionalities of the ATM system and the foreseen airspace changes are all delivered. Although this does not have a direct impact on the capital programme, changes in ATCO productivity are important inputs for operational cost scenario building.
- 4.5.60 In terms of cost efficiency improvements, the business plan expects further productivity gains through automation of manually intensive activities (an example of introducing an airspace change into the current system is given). NERL expects to improve its flexibility and speed of change as a result of the transition.
- 4.5.61 NERL also provides high-level information about how joining the iTEC collaboration reduces development costs: according to the business plan, £50m in development costs have been avoided so far, and NERL only contributes 25% of future development costs, compared to developing the system on its own.
- 4.5.62 Even though these cost efficiency benefits are presented under the DP En Route & Voice programme, arguably the benefits will only be realised entirely once the implementation of the Common Platform is completed, and all legacy systems are decommissioned (legacy escape is discussed further in a dedicated section below).

Table 4.10: Capex related to DP En route & Voice

CY, 2020 CPI prices, £m	2023	2024	2025	2026	2027	NR23
DP En Route & Voice	26	10	1	0	0	38

Source: NERL NR23 business plan

- 4.5.63 Since most of the work in DP En Route has already been carried out, capex is planned to phase out following 2024 (Table 4.10).

Common Platform

- 4.5.64 The Common Platform is arguably the most important investment programme in the NR23 capital plan, as it constitutes the full transition to the new, single platform serving both upper and lower airspace operations. This transition was previously foreseen by 2027, but due to the pause of capex in 2020 and the decisions taken on replanning the capital programme, this transition has now been shifted to mid-NR28 (2030).
- 4.5.65 NERL stated that a direct mapping between the contents of the Common Platform and the former projects of DP Lower and RP4 iTEC & Foursight cannot be established, as the Common Platform programme is based on a different strategy towards legacy escape (see also paragraph 4.5.67).
- 4.5.66 The programme must be evaluated in conjunction with DP En Route and Voice: the implementation of iTEC v2 for the upper airspace operations is planned for 2024-2025, followed by the implementation of iTEC v3 for lower airspace operations around 2028-2029, which is then followed by transitioning upper airspace operations onto iTEC v3. This means three major system transitions over a period of six years, and capex of £158m in NR23.

- 4.5.67 The original plans for RP3 foresaw a midway transition for lower operations to a version called iTEC v2.5 during the NR23 period. This intermediate transition step has been removed from the plans, in an effort to adapt to the reduced change capacity, and to limit the number of transitions. According to our assessment, limiting the number of transitions may eliminate the need for some project management efforts, on the other hand, this comes at the expense of having to run significantly larger transition projects at later stages, and having to deal with increased uncertainty during the longer development periods. We assess that more agile transition steps would be beneficial.
- 4.5.68 The business plan transparently provides that the contents of the investments within the Common Platform programme are not finalised, and will probably be subject to changes, as the specifications and requirements are still under definition, and the implementation of DP En Route may also affect the plans. We assess that this is a critical point, as it illustrates the level of uncertainty still included in the capex portfolio.
- 4.5.69 The business plan also provides an overview of the key benefits expected from the Common Platform. These benefits are largely the same as those presented under the DP En Route & Voice programme, and are not quantified.

Table 4.11: Capex planned under the Common Platform project

CY, 2020 CPI prices, £m	2023	2024	2025	2026	2027	NR23
iTEC collaboration	4	4	4	3	3	18
Lower platform (incl. FMARS)	14	14	16	10	22	76
Upper airspace builds	0	0	9	9	9	27
Total	18	17	29	23	34	120

Source: NERL NR23 business plan

- 4.5.70 The information on the planned capex values (Table 4.11) is provided broken down into three categories: iTEC collaboration, Lower platform (incl. FMARS) and Upper airspace builds. This again raises the question of how these projects relate to those included in the original RP3 plans.
- 4.5.71 According to our assessment, the most important question about the Common Platform and DP En Route is if it was possible to devise an alternative capex profile which would reduce the period during which legacy and new systems are operated and sustained, and/or which would unlock the benefits of the new system for lower airspace operations sooner than mid-NR28. This issue is further examined under the legacy escape section below.

Airspace and operational enhancements

- 4.5.72 Apart from the foreseen FASI changes, most of the airspace changes under the programme depend on the replacement of the NODE core, the implementation of DP En Route & Voice, and certain sustainment actions. As a result, these changes are planned to be implemented in 2025 and 2026, and benefits from these will not be realised in the first half of NR23.
- 4.5.73 Airspace capacity management enhancement foresees ATCO productivity and efficiency improvements. These improvements are however not considered as inputs in other parts of the business plan (i.e. when planning operational costs).

Table 4.12: Capex planned under the Airspace and Ops enhancement programme

CY, 2020 CPI prices, £m	2023	2024	2025	2026	2027	NR23
Airspace management enhancement / OSEP / iACM	4	4	3	3	2	15
Airspace modernisation	6	7	7	7	5	32
ExCDS enhancements	3	3	3	0	0	9
Free route	2	5	2	0	1	9
Queue and capacity management	6	4	4	3	0	18
Total	21	22	18	14	8	83

Source: NERL NR23 business plan

4.5.74 Airspace and operational management related projects are discussed and consulted with stakeholders through a number of processes and are also aligned with the Eurocontrol Network Manager. We assess that the planned changes are all reasonable and effective to improve the efficiency of the airspace.

Information solutions

4.5.75 The business plan provides that the focus of this programme is:

- to maintain and develop the underlying IT infrastructure;
- to sustain and maintain end user devices;
- to maintain the performance and regulatory compliance of business IT systems; and
- to improve the security and cyber resilience of the systems.

4.5.76 Even though the programme is not described in detail, we assess that all organisations, irrespective of the nature of their operations, must invest continuously to improve their IT infrastructure, and in particular to enhance cyber-security. The capex planned for the NR23 period in this regard is reasonable, and no major issues or questions have been identified within this programme.

4.5.77 During the CCWG process and in subsequent discussions, customers also welcomed the investments into cyber resilience.

Table 4.13: Capex planned under the Information solutions programme

CY, 2020 CPI prices, £m	2023	2024	2025	2026	2027	NR23
Information systems	9	8	7	5	7	36

Source: NERL NR23 business plan

Property and facilities management

4.5.78 There is a significant reduction in capex in the programme from 2024 onwards. The business plan does not provide an explanation as regards the drivers of this decrease.

4.5.79 There is a general caveat under the risks which notes that net zero technologies cost more than traditional ones. This should not be used as a general waiver and should be subject to case-by-case analysis.

- 4.5.80 Another general statement under risks mentions the changed workplace attendance environment as a risk on productivity and efficiency and foresees higher costs and delays in implementations due to this. We assess that this issue should be resolved prior to any related investment and is regarded as a general HR issue, thus this should not be used a justification for delays in implementation and/or increased investment costs
- 4.5.81 According to our benchmark of European ANSPs, the expenditure planned by NERL on property and facilities management is reasonable, and apart from the aforementioned two statements, we have found no issues with this programme.

Table 4.14: Capex planned under the Property and facilities management programme

CY, 2020 CPI prices, £m	2023	2024	2025	2026	2027	NR23
Property and facilities management	7	3	2	2	2	18

Source: NERL NR23 business plan

Oceanic

- 4.5.82 The oceanic programme foresees the modernisation of the core GAATS+ 18 system elements. GAATS+ is the main system supporting oceanic operations. The modernisation of the system is driven by the coordination with North-Atlantic partners and is required to ensure interoperability.
- 4.5.83 However, it is not clear how this modernisation is related to DP En Route and Common Platform, especially how the interfaces between operations and systems are going to be managed. NERL noted, that due to interoperability issues, linking these systems is not currently foreseen.
- 4.5.84 The business plan also caveats that the cooperation with NavCanada is still under definition in its early stages, and that the emerging investment requirements are not yet foreseen, thus NERL plans to confirm these in the SIP processes.
- 4.5.85 Capex values are decreasing for Oceanic between 2024-2027. It is not clear, how this is reconciled with the statement, that most of the investment will come in later stages of the cooperation with NavCanada.
- 4.5.86 Our overall assessment is, that there is still a significant uncertainty in Oceanic investments, but the planned range for expenditure is reasonable.

Table 4.15: Capex planned under the Oceanic programme

CY, 2020 CPI prices, £m	2023	2024	2025	2026	2027	NR23
Oceanic	6	7	6	3	1	23

Source: NERL NR23 business plan

ATC training transformation

- 4.5.87 The information presented in the business plan foresees an overall £7m in investment over the NR23 period for the transformation of ATCO training and related infrastructure. As a result of the programme, the business plan anticipates outcomes and benefits in improved responsiveness to variations in ATCO demand, reduced lead time and increased success rate of ATC training, and more cost-efficient training processes.

- 4.5.88 In addition to the above benefits, the business plan also foresees a more efficient use of ATCO resources, which would enable the use of ATCOs in training and in the development and validation of new technologies while not having to compromise service quality levels.
- 4.5.89 The benefits described in detail in Appendix G would clearly justify the investment, if NERL managed to realise them. Appendix G also provides, that the improvements foreseen for success rates and training efficiency are already factored in the ATCO recruitment and training plans for NR23. It is unclear though, whether the improvements in the more efficient use of controllers, especially as regards their use in validation exercises and during transition periods are also factored into the current plan.
- 4.5.90 Appreciating the benefits the investment may bring about, it is unclear why NERL only plans to initiate the programme in 2024. A key assumption used by NERL in its business plan is the reduced capacity to change, which is partly driven by the scarcity of ATCO resources, therefore bringing the investment forward may help accelerate other investment programmes, most notably those related to new ATM systems and controller tools. Ultimately, this could also help reduce the time required to achieve legacy escape.
- 4.5.91 During the CCWG process, this project was initially presented by NERL as an option. Customers expressed unanimous support for the project, provided that the business would be justified by the benefits, hence the project has been included in the business plan submission by NERL.
- 4.5.92 We assess that this investment is actually a key feature of the portfolio, as any significant gains in ATCO recruitment and training efficiency has a positive impact on operating costs and ATCO productivity as well.

Table 4.16: Capex planned for the ATC training transformation programme

CY, 2020 CPI prices, £m	2023	2024	2025	2026	2027	NR23
ATC training transformation	0	2	2	2	0	7

Source: NERL NR23 business plan

Highlighted topics and findings

- 4.5.93 This section provides the more detailed review and assessment of two major headline issues included in the business plan:
- The planned profile of the legacy escape, and its implications on the overall capex profile,
 - And the risk and contingency allowance and its relationship with the '2+5' approach proposed by NERL.
- 4.5.94 Both of these issues have implications beyond a single investment programme, thus a more holistic approach is required in their assessment. Findings included in the following sub-sections are additional to those listed under each individual investment programme.

Legacy escape profile

- 4.5.95 Arguably the most important aspect of NERL's capital programme is how the transition onto the new, common operational platform is planned and carried out. The investments directly related to the legacy escape amount to £158m over NR23, not counting the sustainment spend that is required due to maintaining the new platform and legacy systems in parallel.

- 4.5.96 During the CCWG process, NERL provided customers with the option to accelerate iTEC v3 development and implementation. The option did not contain a detailed description of capex profiles or expected benefits, only an estimated value of £20m in additional planned capex was provided. With the lack of sufficient information and without a clear understanding the benefits this option could bring, customers did not express their support, and it has not been incorporated into the business plan. The business plan does mention however, that this option will be subject to further discussions during the upcoming TCAB and SIP procedures.
- 4.5.97 Besides the apparent materiality of the capex related to legacy escape, the impact on operating costs is also significant. The business plan provides slightly diverging figures as to what the impact of the proposed legacy escape profile is, but even the lowest estimates included in the plan refer to a £10m saving p.a., once the transition to the Common Platform is realised, and legacy systems are decommissioned.
- 4.5.98 Beyond the impact on capex and operating costs, the operational impact of moving to the new platform is also expected by NERL to be significant: there are improvements foreseen in nearly all aspects of service quality, as well as a step change towards lower complexity of the architecture, and notable improvements in resilience, flexibility, and scalability.
- 4.5.99 Based on the above points, we suggest that the legacy escape profile should be further discussed within the NR23 price control procedure, rather than left to the SIP and TCAB procedures of the coming years. To facilitate this, we are proposing alternative capex profiles that could be considered for the legacy escape.
- 4.5.100 The proposed alternative profiles are logical scenarios, their technical feasibility is not assessed in detail, although common sense is applied to avoid fully unrealistic extremes. The purpose of this exercise is to support the discussions around legacy escape, and to feed into the profiling of operating costs.
- 4.5.101 For the scenario building, we use the DP En Route & Voice, Common Platform and the Sustainment and Surveillance programmes. The baseline scenario is the one proposed by the business plan, as shown in Table 4.17. As discussed under the respective sections, this profile foresees the full implementation of iTEC v2 in the en route environment, followed by a prolonged period of parallel operations, where lower airspace operations are still based on legacy systems, until the iTEC v3 common platform is implemented (in mid-NR28). Once the common platform is in place, en route operations are then transitioned to iTEC v3 as well, and legacy escape is realised.

Table 4.17: Baseline legacy escape capex profile

CY, 2020 CPI prices, £m	2023	2024	2025	2026	2027	NR23
<i>DP En Route and Voice</i>	26	10	1	0	0	38
<i>Common platform</i>	18	17	29	23	34	120
-iTEC collaboration	4	4	4	3	3	18
-Lower platform (incl. FMARS)	14	14	16	10	22	76
-Upper airspace builds	0	0	9	9	9	27
Total	44	27	30	23	34	158

Source: NERL NR23 business plan

- 4.5.102 Our first alternative scenario suggests the acceleration of investments into the Common Platform and iTEC v3 ('Accelerated' scenario), based on the option provided by NERL during the CCWG consultations. This scenario is based on the following assumptions:
- It is possible to increase NERL's capacity to change, and to restore this capacity at least to pre-COVID-19 levels; and
 - iTEC v3 implementation can be moved forward if investments are accelerated.
- 4.5.103 In this scenario, investments into iTEC collaboration and Lower platform are brought forward to the 2023-2025 period, and are lowered in the last two years of NR23. The total values for each project are also increased, as we assume that investments from NR28 are also brought forward into the NR23 timeframe. The overall capex spend is below the maximum foreseen expenditure per year in the original RP3 baseline capital programme.
- 4.5.104 Investments into the upper airspace builds are offset by one year, reflecting a minor shift in priorities, resulting in £9m being carried over to NR28. The overall difference for the NR23 period between the baseline and the accelerated profile is £19m, however, this increase should not translate into an increase of the total capex foreseen for the investment programmes (i.e., capex is shifted in time, but not increased overall).

Table 4.18: Capex profile of the accelerated legacy escape scenario

CY, 2020 CPI prices, £m	2023	2024	2025	2026	2027	NR23
<i>DP En Route and Voice</i>	26	10	1	0	0	38
<i>Common platform</i>	38	38	26	22	15	139
-iTEC collaboration	8	8	6	3	1	26
-Lower platform (incl. FMARS)	30	30	20	10	5	95
-Upper airspace builds	0	0	0	9	9	18
Total	64	48	27	22	15	177

Source: own calculations and NERL NR23 business plan

- 4.5.105 We assume that by accelerating the investments, the implementation of iTEC v3 could be brought earlier at least by approx. two years, to 2027, significantly shortening the period of dual running the systems. We acknowledge that bringing the implementation of iTEC v3 forward may not be possible, as part of the development is done in collaboration with other ANSPs, and thus may not be accelerated further unilaterally.
- 4.5.106 This accelerated implementation would likely result in a reduced need for sustainment related investments. When trying to assess the magnitude of this impact, the following items of the sustainment programme have been considered:
- NODE CORE replacement;
 - General support and sustainment;
 - ExCDS Resilience; and
 - NAS sustainment.

- 4.5.107 These items represent a yearly spend of £20m to £28m, based on the information provided by NERL in the context of customer engagement technical meetings in 2020²¹. This is a rather indirect indication however, and this impact is not factored into the alternative profile.
- 4.5.108 As a result of stakeholder discussions and assessing further information provided by NERL, the accelerated legacy escape scenario is now seen as overly ambitious, mainly due to the fact that the acceleration of investments and the development of iTEC v3 is very much dependent on the iTEC collaboration partners, and thus such a significant shift in the timing of the development is not realistic.
- 4.5.109 The second alternative scenario suggests a reprioritisation of investments, and a different path towards legacy escape ('Stepwise' legacy escape). This scenario is based on the logic of the baseline RP3 plans of NERL, which foresaw a transition of lower operations to iTEC in 2023-2024. This scenario uses the following assumptions:
- It is possible to increase NERL's capacity to change over time, and to gradually restore this capacity at least to pre-COVID-19 levels.
 - Development and implementation of iTEC v3 is highly uncertain, and also dependent on the decisions of iTEC collaboration partners, thus it is not reasonable to bring the iTEC v3 implementation earlier.
 - Lower airspace operations can be transitioned to iTEC v2, as deployed for en route operations.
- 4.5.110 The first assumption is based on the information provided by NERL, already discussed under the section on the Deliverability of the capex portfolio, the second assumption is based on the understanding from the assessment of the accelerated legacy escape scenario. The third assumption has been devised from previous investment plans by NERL. We assess that all three assumptions are reasonable and realistic.
- 4.5.111 In this scenario, investments into the iTEC collaboration are reduced in 2023-2025, reflecting a change in priorities, as iTEC v2 is already deployed in 2023-2024 for en route. The investments in Lower platform are on the other hand increased, as more development is required to enable the transition of lower airspace operations to the iTEC v2 platform, which is suggested here in 2025-2026. Upper airspace related investments are postponed by two years, initiating only in 2027, in anticipation of the iTEC v3 transition. Likewise, there are investments into lower operations in 2026-2027 as well, to prepare for full transition to iTEC v3.
- 4.5.112 This scenario also considers, that in order to accelerate the investments and transition lower airspace operations onto the new iTEC v2, NERL needs to invest into ramping up its capacity to deliver change, and this increases the costs of the development significantly. This increase is captured in the inflated capex for the Lower platform: the total spend for Lower platform in the NR23 period is more than double compared to the business plan figures (business plan figures are shown in brackets in the below table, wherever different from the alternative profile).

Table 4.19: Capex profile of the stepwise legacy escape scenario

CY, 2020 CPI prices, £m	2023	2024	2025	2026	2027	NR23
<i>DP En Route and Voice</i>	26	10	1	0	0	38

²¹ Customer Engagement – Technical Delivery November 2020 slide pack by NERL.

CY, 2020 CPI prices, £m	2023	2024	2025	2026	2027	NR23
<i>Common platform</i>	44 (18)	44 (17)	37 (29)	24 (23)	25 (34)	174 (120)
-iTEC collaboration	2 (4)	2 (4)	2 (4)	3	3	12 (18)
-Lower platform (incl. FMARS)	42 (14)	42 (14)	34 (16)	21 (10)	13 (22)	163 (76)
-Upper airspace builds	0	0	0 (9)	0 (9)	9	9 (27)
Total	70 (44)	54 (27)	38 (30)	24 (23)	25 (34)	212 (158)

Source: own calculations and NERL NR23 business plan

- 4.5.113 As a result of the increase in development costs, the total capex considered for this scenario is +£54m higher compared to the business plan. This increase, however, is not translated into a net increase in the capex portfolio, as once the transition of lower airspace operations has been achieved, legacy systems which were kept operational to support lower operations can be decommissioned, which enables significant savings in sustainment-related spend. Therefore, a reduction of -£36m over the period is included in this scenario, resulting in a total of £170m for Sustainment and Surveillance (vs. the £206m in the BP). Business plan figures are shown in brackets wherever different from the alternative profile.

Table 4.20: Sustainment profile in the 'step-wise' legacy escape scenario

CY, 2020 CPI prices, £m	2023	2024	2025	2026	2027	NR23
Platform (cyber, AIRACs, annual sustainment)	8	9	8	8	8	41
FM (centres infrastructure) and sims sustainment	5	7	7	9	8	36
FM (remote sites infrastructure)	6	4	7	5	5	27
Communications	0	6	4 (6)	3 (6)	4 (7)	17 (24)
Surveillance	2	6 (7)	5 (7)	6 (8)	4 (6)	23 (30)
Cross functional (e.g. networks) and info management	7	4 (6)	2 (3)	3 (6)	2 (4)	18 (29)
Flight (controller applications)	3	5 (7)	0 (5)	0 (2)	0 (2)	8 (19)
Total	31	41 (46)	33 (42)	34 (44)	31 (40)	170 (206)

Source: own calculations and NERL business plan.

- 4.5.114 Adjustments to the surveillance capex are based on the mapping provided by NERL across various responses to clarification questions and are not to be considered the result of a detailed operational and technical analysis, but rather as an estimate of what the impact of decommissioning legacy systems could be. The lines affected by the adjustments within the programme are:

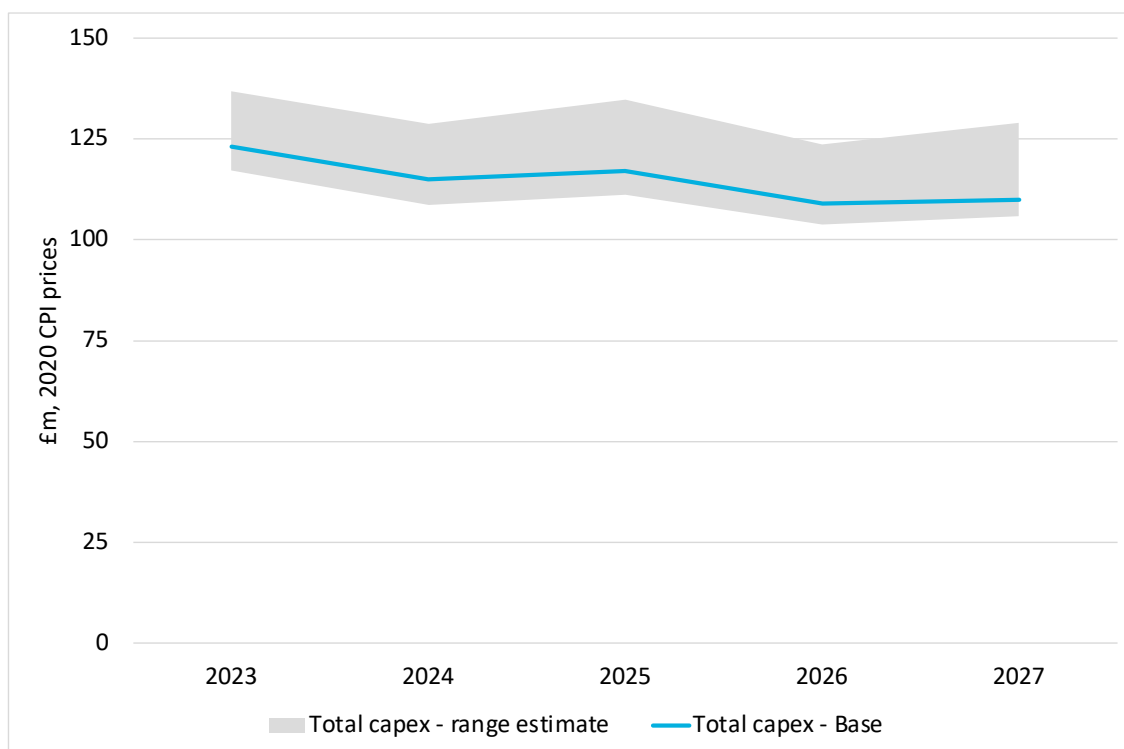
- Communications;
- Surveillance;
- Cross functional and information management; and
- Flight (controller applications).

- 4.5.115 These adjustments, together with the increase in investments related to the Lower platform result in a net increase of +£31m in capex compared to the business plan. On the other hand, the transition of lower airspace operations and the subsequent decommissioning of legacy systems enable a yearly saving of -£10m in operating costs, which must also be considered when further exploring this scenario.
- 4.5.116 This scenario would postpone the transition to iTEC v3 further into NR28. This would partially eliminate the risks and uncertainties around iTEC collaboration and the development of iTEC v3, while at the same time still allowing for a legacy escape. This legacy escape, however, would happen by transitioning lower operations to iTEC v2, instead of iTEC v3, but this is still assumed to enable discontinuing the existing systems. The transition towards iTEC v3 would then be a more organic upgrade in NR28.

Risk and contingency allowance and the '2+5' approach

- 4.5.117 The business plan provides the range estimates for the headline investment programmes. These ranges reflect the uncertainty in the costs and prices incurred during the various investment programmes, as well as the general variability of the contents of those (see Table 4.7). These ranges are however for illustrative purposes only, the business plan does not rely on these ranges when defining contingency or risk allowances. The capex portfolio is planned based on the point estimates given for each programme.
- 4.5.118 Figure 4.5 shows the estimated yearly breakdown of the range estimates for the capital programme. The range shown is a sum of the estimated ranges for each specified programme. The range estimates are distributed proportionately to the planned base capex spend per programme per year.

Figure 4.5: Yearly breakdown of capex range estimates



Source: NERL NR23 business plan and own calculations

- 4.5.119 NERL also introduces the '2+5' approach as a proposed governance mechanism for capex-related decisions. The key concept of the approach is a rolling investment planning cycle, which is iterated in each year. Each iteration evaluates the capital portfolio, defines the capex planned for the subsequent two years in detail, and sets out a 5-year strategic plan on capex, without trying to build each year beyond the 2-year threshold from a bottom-up, technical approach.
- 4.5.120 NERL proposes to embed the '2+5' approach into the existing SIP and TCAB processes. The business plan assumes that the capex figures coming out of the '2+5' iterations should be within the overall capex allowance for the period (that is, the sum of all the point estimates for each line item, totalling at £574m for NR23).
- 4.5.121 Despite this, the base estimate for the portfolio is significantly closer to the lower boundary of the range, which would imply that during the '2+5' iterations the capex spend is more likely to increase compared to the base plan.
- 4.5.122 It is important to note, that the overall capex point estimate does include the risk and contingency allowance as well. According to the business plan, this serves as a buffer for unforeseen investment needs and emerging opportunities that could generate benefits for the customers. The use of the risk and contingency allowance in the context of the '2+5' approach is not elaborated in the business plan, however the information provided by NERL provides, that all changes in the capex profile should fit in the overall allowance and this should apply to risk and contingency as well. However it is for the CAA to determine the approach for NR23.
- 4.5.123 The risk and contingency allowance is set at £44m over the period, but expenditure is only planned as from 2025 onwards, ramping up towards the end of NR23. This is justified by NERL with the increasing uncertainty inherent in the longer-term plans. We assess however, that unforeseen events or complications can affect earlier years as well, regardless of how detailed those years are planned, and thus we recognise a uniform distribution of risk and contingency would be more logical, even more so, as capital expenditure is almost evenly distributed across the years of the period as well.
- 4.5.124 During the CCWG and subsequent discussions, customers expressed their support of such a central buffer for risk and contingency, as opposed to having a risk allowance in each of the line items of the capital portfolio.

Table 4.21: Risk and contingency profile

Risk and Contingency						
CY, 2020 CPI prices, £m	2023	2024	2025	2026	2027	NR23
Risk & contingency	0	0	9	18	18	44

Source: NERL NR23 business plan

- 4.5.125 In the materials distributed for the CCWG process, NERL proposed to include in its business plan a £9m contingency allowance for DP En route for each year during the period of 2025-2027. This allowance was also combined with an 'emerging opportunities' buffer of £9m for 2026 and 2027. The business plan, however, does not refer to this distinction: the risk and contingency allowance is provided without any reference to specific programmes.
- 4.5.126 We note that the 7.7% (£44m/£574m) risk & contingency allowance for NR23 is substantially higher than that of RP2, when the risk & contingency allowance at the portfolio level was

around 4% (at £30m), and that of RP3, when the risk & contingency allowance was 5% (at £31m). These allowance figures include the portfolio, programme and project level risks, as no project specific allowance have been included in the final plans for RP2 and RP3, similarly to the NR23 business plan. It must also be noted that the business plan only considers risk and contingency related spending from 2025 onwards, and in 2026 and 2027, the allowance accounts for 16.4% of the annual spend.

- 4.5.127 Further to this, we understand that the ‘2+5’ approach should help reduce uncertainty and risk in the capital portfolio, and not result in increased risk and contingency allowances compared to previous periods.
- 4.5.128 Based on the above observations related to the distribution of the allowance, and the comparison to the risk and contingency allowances in previous regulatory periods, we assess that the risk and contingency allowance should be adjusted both in its total value, and in its distribution over the period. We suggest using a risk & contingency allowance of 5%, following the RP3 approach.
- 4.5.129 On this basis, the risk and contingency allowance would be £7m in each year over 2024-2027, resulting in a total of £28m over NR23 (assuming that the capex programme for 2023 has been fixed).

Table 4.22: Alternative risk and contingency profile

CY, 2020 CPI prices, £m	2023	2024	2025	2026	2027	NR23
Risk & contingency	0	7	7	7	7	28

Source: Steer-Integra analysis.

4.6 Summary

- 4.6.1 The capital programme is largely driven by the headline programmes:
- Airspace and Ops enhancements;
 - DP En-route & Voice and Common Platform; and
 - Sustainment and Surveillance.
- 4.6.2 These programmes represent almost 78% of the total capex planned for NR23, although it is noted, that the Sustainment and Surveillance programme is more of a collection of smaller investment programmes, than a coherent investment programme, and is also largely dependent on DP En route & Voice and the Common Platform.
- 4.6.3 During the assessment of the individual investment programmes, we have not found major issues, which would require adjustments to the proposed profiles (apart from the Common Platform, the Sustainment and Surveillance and the Risk and Contingency lines).
- 4.6.4 In addition to assessing the programmes separately, we undertook a more holistic approach, and highlighted the two more complex issues: the profile for legacy escape and the risk and contingency allowance, together with the ‘2+5’ approach. The assessment of these issues resulted in proposed adjustments to the capex profiles of the projects involved.
- 4.6.5 Based on our review of the business plan, and in particular the findings established about the risk and contingency allowance, and the alternative, ‘step-wise’ scenario for legacy escape, we propose the following alternative capex profile for NR23. The alternative profile is a combination of three main components:

- The ‘step-wise’ legacy escape scenario, which foresees the transition of lower airspace operations onto iTEC v2, followed by a more organic upgrade to iTEC v3 in NR28, once iTEC v3 becomes available;
- An adjusted sustainment profile, driven by realisation of legacy escape with transitioning lower airspace operations to the new platform; and
- a reduced risk and contingency allowance.

4.6.6 When defining our proposed alternative capex profile, we also considered, that the business plan submitted by NERL included an already much reduced capex plan, compared to the original RP3 profile. Our understanding is, that rather than reducing the capex profile further, the emphasis for NR23 should be on how to deliver the most benefits to customers through investments, and from this perspective, bringing legacy escape forward in time and reducing the period during which new and legacy systems are maintained in parallel should be the main priority. This approach has largely been supported by customers during the CCWG process.

4.6.7 Table 4.23 provides an overview of the alternative capex over the NR23 period (NERL business plan figures are in brackets, wherever different from alternative profile proposed by us).

Table 4.23: Alternative capex profile for NR23

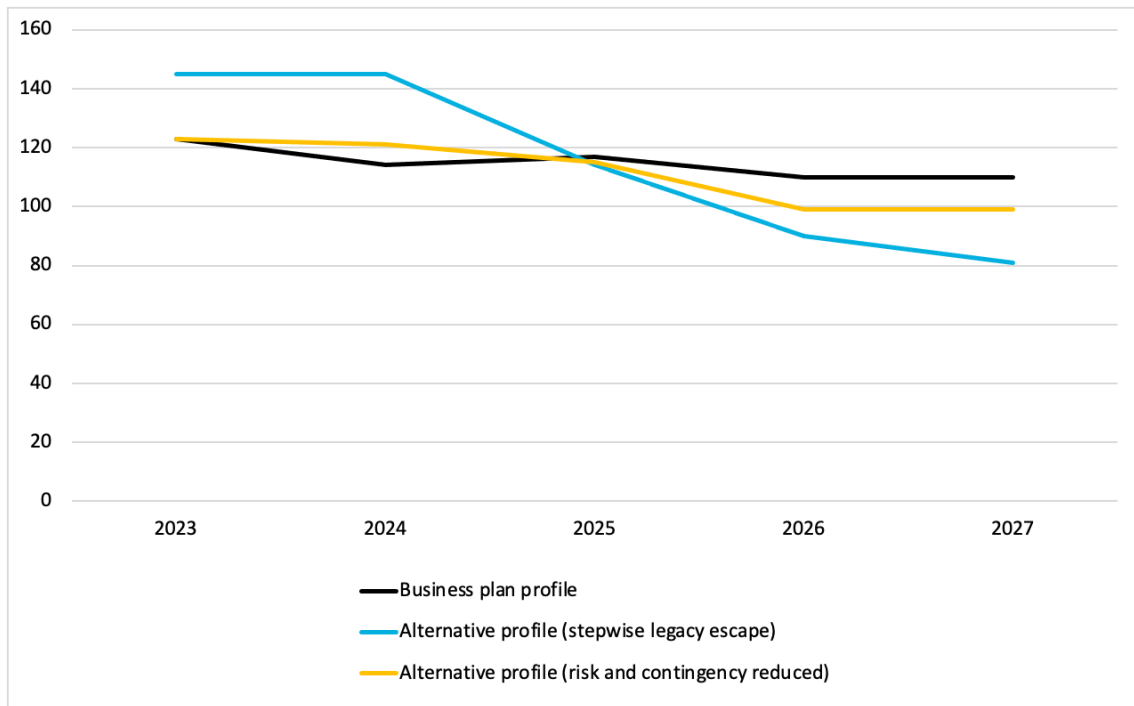
CY, 2020 CPI prices, £m	2023	2024	2025	2026	2027	NR23
Airspace and operational enhancements	21	22	18	14	8	84
DP En Route and Voice	26	10	1	0	0	38
Sustainment and surveillance	31 (36)	41 (45)	33 (43)	34 (43)	31 (40)	170 (206)
Common platform	44 (18)	44 (17)	37 (29)	24 (23)	25 (34)	174 (120)
Business resilience (information solutions)	9	8	7	5	7	36
Business resilience (property and facilities management)	7	3	2	2	2	16
Oceanic	6	7	6	3	1	23
ATC training	0	2	2	2	0	6
Risk & contingency	0	7 (0)	7 (9)	7 (18)	7 (18)	28 (44)
Total	145 (123)	145 (114)	114 (117)	90 (110)	81 (110)	575 (574)

Source: NERL NR23 business plan and own input.

4.6.8 This alternative profile is proposed to account for almost the same overall capex allowance over NR23, however, the distribution of expenditure and the prioritisation within the portfolio is different. It must also be noted that there may be investments in relation to legacy escape which were only planned for NR28 but are now brought forward to NR23, and likewise, investments into upper airspace related builds that are partially deferred until NR28. We also note that due to rounding issues when adding together the line items from the portfolio, these may result in +/- £5m overall. The suggested alternative legacy escape profile should also enable a £10m p.a. reduction in operating costs, from 2026 onwards.

4.6.9 Given the high levels of uncertainty around iTEC v3 developments, and the dependency on the iTEC collaboration partners, the ‘accelerated’ legacy escape scenario has not been pursued further and is not used to create an alternative capex profile.

Figure 4.6: Alternative capex profile comparison



Source: NERL NR23 business plan and own calculations.

4.6.10 It must be noted that depending on how the legacy escape scenarios are explored in later stages, and in particular their implications on sustainment spend, the alternative capital expenditure profile may vary.

Appendices

A Summary of operating cost efficiency ranges for total costs on a cash pension cost basis

Table A.1: Overview of Steer top down analysis of potential efficiency savings relative to total costs in NERL's NR23 BP (£m 2020 prices) – total NR23 costs on a cash pension cost basis

Item	Steer Analysis	Range Low % change to NERL 2023-2027	Range High % change to NERL 2023-2027
Staff cost, salary benchmarking	<p>The results of our top-down staff cost benchmarking show that over the 2003 to 2019 period salary growth for all NERL staff has outperformed comparators for the Transport & Storage sector, which was -5.4% lower in 2019. Meanwhile, the review of individual roles identified differences between the upper quartile of the benchmarks and NERL in the range of -9% for MSGs to -34% for ATSAs. Applying these top-down assumptions as a step change from the start of NR23 would result in a saving of between -3.2% of total costs (in the case of a -5.4% reduction in all salaries) and -10.7% of total costs (in the case of reductions in the benchmarked roles of -21% for ATCOs, -34% for ATSAs, -24% for ATCEs and -9% for MSGs). We acknowledge that a step change in a single year would not be practical, so have considered a glide path to these benchmarks. Were such savings to be implemented gradually over a five-year period by the end of NR23, it would result in total costs being between -1.6% and -5.4% lower. If it was to take longer, say a 10 year period, the range would be -0.7% to -2.5% lower.</p> <p>It would be for the CAA to consider the timing of any transition and broader implications of adopting cost savings towards the top end of this range, e.g. for industrial relations.</p>	(£18.8m) (0.7%)	(£64.5m) (2.3%)
Total factor productivity improvements	Regulators over recent price controls in the aviation, energy and water sectors have applied a +1% p.a. assumed improvement in total factor productivity (TFP) ²² . Applying this level of improvement to NERL's NR23 cost base with the exception of Rates, Utilities (which are assumed to be costs outside the control of NERL) and Cyber Security costs (for which the planned growth is supported by airline	(£52.3m) (1.9%)	(£71.3m) (2.5%)

²² see CAP2266A for H7 p.119.

Item	Steer Analysis	Range Low % change to NERL 2023-2027	Range High % change to NERL 2023-2027
	stakeholders) would imply savings in total costs of around -2.7% over the NR23 period. A low case, assuming a +0.75% p.a. TFP improvement would lead to a -2.0% saving in total costs.		
Historical unit cost trends	Over RP2, real unit operating costs per en-route service unit ²³ reduced on average by -3.6% p.a. Applying these average unit cost reductions for 2026 and 2027, following the forecast recovery of service units to 2019 levels in 2025, results in a saving of -1.3% compared to the NR23 BP.	(£33.0m) (1.2%)	(£33.0m) (1.2%)
Top down range	Note this range represents Steer’s estimate of the savings from each of the individual top-down analyses. In principle the staff cost savings could be combined with the total factor productivity improvements but Steer has sought to avoid any potential for double counting. This could be reconsidered by the CAA. Steer has also applied the staff cost savings assuming a 10-year transition period, the CAA could consider a different time period is appropriate.	(£18.8m) (0.7%)	(£71.3m) (2.5%)
Bottom up range	See Table A.2 for detailed assumptions (including CAA CMG fees in NERL cost base (i.e. the denominator), but disallowing them (i.e. removing them from the nominator))	(£37.5m) (1.3%)	(£55.8m) (2.0%)
Steer range	Top down and bottom up are used as alternatives to produce the range across all techniques. The bottom up range is within that of the top down approaches.	(£18.8m) (0.7%)	(£71.3m) (2.5%)
Steer range (excluding CAA CMG fees from NERL cost base)		(£13.6m) (0.5%)	(£66.1m) (2.4%)

²³ Total costs include pensions on a P&L basis, which are not charged through the price control (because cash pensions are used instead), so these costs do not directly correspond to prices. Total costs per en-route service unit used to illustrate the broad relationship of costs and traffic (these values do not include other unit rate adjustments (inflation, traffic risk sharing etc.) and do not correspond to prices).

Table A.2: Overview of alternative assumptions for NR23 for operating costs and resulting efficiency ranges (£m 2020 prices) – total NR23 costs on cash pension cost basis

Item	NERL assumptions	Steer observations	Steer assumption	Range Low £m change to NERL 2023-2027	Range High £m change to NERL 2023-2027
Operating costs					
ATCO productivity	NERL assumes no improvements in ATCO productivity during NR23. NERL states that productivity gains could be generated by improvements in controller tools and other technology, by increasing levels of controller skills and experience, by changes in airspace structures which reduce complexity, and by changes in the organisation and coordination of controllers with the available technology. None of these factors is likely to have a material positive impact on productivity in the NR23 period.	Historically NERL has improved ATCO productivity on average 1.75% per annum over the 2009-2019 period, linked to growth in traffic and improved processes and systems. The implementation of DPER in 2025 would be expected to deliver some productivity improvements, while the reduction in controller workload enabled by airspace changes could be shared between productivity improvements and improved service performance outcomes, particularly given the added resilience that is separately being built into the operational resourcing plan.	During traffic recovery it is recognised as difficult to achieve productivity improvements. Therefore after 2025 assume ability to achieve productivity linked to improved processes and capital programme. Taking into account the expected level of traffic growth and capital programme, an improvement range 1% per annum from 2025 (low) and 1.5% improvement from 2025 (high) is applied. This results in a need to train fewer TATCs in the early years of NR23 and reduces the ATCO headcount requirement in the final years of NR23.	(£15.2m) (0.5%)	(£22.4m) (0.8%)
Salary increments for all staff	[Redacted – commercially sensitive]	[Redacted] salary increments often associated with productivity improvements. We remain in a recovery period for the industry in 2022-2024 at least.	Low range: [Redacted – commercially sensitive] High range: [Redacted – commercially sensitive]	(£7.0m) (0.2%)	(£12.7m) (0.5%)

Item	NERL assumptions	Steer observations	Steer assumption	Range Low £m change to NERL 2023-2027	Range High £m change to NERL 2023-2027
		High inflation (2022 CPI estimate of 6% to 7% (March 2022)), calls into question the affordability of [redacted] pay awards over the next years.	Leads to lower wage escalation across all staff grades.		
Graduate scheme	Graduates grow across the period from 56 in 2019 to 93 in 2027. Following a reduction of -60% in 2021, Graduates grow by +45 in 2022 and then approximately triple in number by 2024 to 93 FTEs and remain at this level for the rest of NR23, in part driven by the formalisation of a two-year early careers programme.	<p>The Graduate scheme provides extra capacity to support the management and other NERL HQ grades. There is a significant increase in the number of graduates over the NR23 period, which if directly observed in (or allocated to) the roles these graduates are supporting, would require more justification.</p> <p>An intake of around 47 graduates a year into the staff categories corresponds to 3.2% of FTEs across ATCEs, STARS, MSGs and PCGs at the end of NR23, which implies a high rate of staff attrition/turnover.</p>	<p>Assuming an existing staff attrition/turnover rate of c.1.6% would imply a low level of graduate retention (c.50%).</p> <p>Steer assumes a higher retention rate of 75% which consequently leads to a need for 60 graduates rather than the 93 assumed in the NERL plan to fill the same number of positions at the end of the programme, whilst increasing the overall number of roles by a smaller amount.</p>	(£4.5m) (0.2%)	(£4.5m) (0.2%)
DC scheme	NERL assumes no change to the current scheme with a maximum contribution of 18% and assumed average over NR23 of 16%	Airlines have raised concerns that the scheme is overly generous and have suggested a new scheme for new joiners in NR23 could be introduced.	<p>DC Contribution rate for new joiners from 2024 assumed to be 12% rather than 16% assumed by NERL.</p> <p>The low range estimate assumes the contribution rate for members on</p>	(£1.0m) (0.04%)	(£1.8m) (0.06%)

Item	NERL assumptions	Steer observations	Steer assumption	Range Low £m change to NERL 2023-2027	Range High £m change to NERL 2023-2027
		Steer has benchmarked the DC scheme to comparable former public entities in the UK the average level of contribution is 12%.	<p>the existing scheme matures over time, moving up from an average of 16% towards 17%, as new members on a lower contribution rate are no longer joining the existing scheme to balance this average.</p> <p>The high end estimate assumes that the contribution rate for members on the existing scheme evolves from 16.1% to 16.3% per NERL's response to a clarification question, which stated that contribution levels are consistent across all staff groups.</p>		
UTM development costs	UTM development costs grow to an average of £1.2m in NR23.	The rationale for the allocation of costs relating to Uncrewed Aircraft Systems to NERL's cost base is not clear, given airlines' feedback through the consultation on the "user pays" principle.	<p>The inclusion of these costs in the NR23 cost base may not be in line with the "user pays" principle.</p> <p>For the low range, recognising that NERL may need to incur some costs as part of the NR23 cost base to manage the operational impact of new airspace users on conventional airspace users, the 2022 level of costs could be maintained.</p> <p>In the high case, adhering to the user pays principle would result in all UTM development costs being excluded during NR23.</p>	(£3.5m) (0.1%)	(£6.0m) (0.2%)

Item	NERL assumptions	Steer observations	Steer assumption	Range Low £m change to NERL 2023-2027	Range High £m change to NERL 2023-2027
CAA fees	NERL includes CAA CMG fees in its NR23 cost base.	Based on CAP 2282, Steer understands that CAA CMG fees will be levied directly by the CAA on airspace users from 2023, and will not be charged through NERL.	Removal of CAA CMG fees from NR23 cost base.	(£5.2m) (0.2%)	(£5.2m) (0.2%)
DB pension management costs	DB pension management costs increase from £2.4M in 2022 to £3.2M in 2027.	DB pension management costs increase despite a reduction in membership over the period, while the Government Actuary's Department (GAD) has found the cost per member to be significantly higher than other typical UK DB schemes of a similar size.	For the low range maintain costs at 2023 levels, accepting that of the increase in DB pension management costs between 2022 and 2023 may be driven by the same factors as the increase explained by NERL for DC pension management costs, namely higher life assurance and income protection premiums which have increased as a result of market conditions. For the high range, maintain costs at 2022 levels.	(£1.3m) (0.05%)	(£3.5m) (0.12%)
NERL assumed level of operating costs 2023-2027				£2,805m	£2,805m
Cumulative estimated range low				(£37.5m)	
Cumulative estimated range high					(£55.8m)
Range of operating costs				£2,768m	£2,750m
% change to NERL plan				(1.3%)	(2.0%)
W x U -	NERL assumed level of operating costs 2023-2027			£2,800m	£2,800m

Item	NERL assumptions	Steer observations	Steer assumption	Range Low £m change to NERL 2023-2027	Range High £m change to NERL 2023-2027
	Cumulative estimated range low			(£32.3m)	
	Cumulative estimated range high				(£50.5m)
	Range of operating costs			£2,798m	£2,750m
	% change to NERL plan			(1.2%)	(1.8%)

Control Information

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