Final Report
February 2019

NERL's forward-looking capital programme and expenditure efficiency

Civil Aviation Authority
Our ref: 23272101
Client ref: 2759

steer

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Glossary

ANSP	Air Navigation Service Provider
ATCO	Air Traffic Control Officer
ATSA	Air Traffic Service Assistant
ATCE	Air Traffic Control Engineer
MSG	Management Support Grades
CAA	Civil Aviation Authority
CAPEX	Capital Expenditure
CPI	Consumer Price Index
DB	Defined Benefit pension scheme
DC	Defined Contribution pension scheme
DC	Determined Cost (in context of the SES Performance and Charging Scheme)
DUC	Determined Unit Cost
FRA	Free Route Airspace
FTE	Full Time Equivalent (number of staff)
LAMP	London Airspace Management Programme
London approach	The centralised terminal approach service that NERL provides for traffic using the five main airports in the London area from the area control centre at Swanwick
NERL	NATS En Route Ltd.
NSL	NATS Services Ltd. – provides air navigation services on a commercial basis, including terminal and approach control on contract to UK airports
OPEX	Operating Expenditure
PCG	Personal Contract Group (staff on individual contracts)
RP2, RP3	Reference Period 2, 3 – European regulatory periods for ANSPs
RPI	Retail Price Index
STAR	Scientific Technical & Research grades
TATC	Trainee Air Traffic Controller
TSU	Total Service Units (measure of air traffic handled)

Executive Summary

Background to the study

The Civil Aviation Authority (CAA) is reviewing NATS (En Route) Plc's (NERL's) operating and capital cost projections in preparation for the Reference Period 3 (RP3) beginning on 1 January 2020. RP3 runs for 5 years to the end of 2024. The United Kingdom's (UK) proposed Performance Plan will be based on the CAA's assessment of NERL's own forecasts The CAA's assessment will include its view on an overall cost efficiency path for NERL, based on available evidence.

The process has involved NERL creating an initial Business Plan (iBP) in April 2018, subject to CAA review and stakeholder consultation, followed by a revised Business Plan (rBP) in October 2018. The CAA will use the rBP to inform its consultation in early 2019 on the UK Performance Plan. Throughout the remainder of this report, unless otherwise stated, references to the Business Plan (BP) refer to the rBP.

The study included reviews of the NERL capital programme, capital and operating expenditure and the potential trade-offs and synergies between them. It included a backwards-looking review of the experience of actual Reference Period 2 (RP2) level of operating expenditure to the end of 2017, compared to appropriate peers and benchmarks, as well as looking forwards to consider the appropriateness of the projections for the remainder of RP2 (2018 and 2019) and for RP3 (2020-2024).

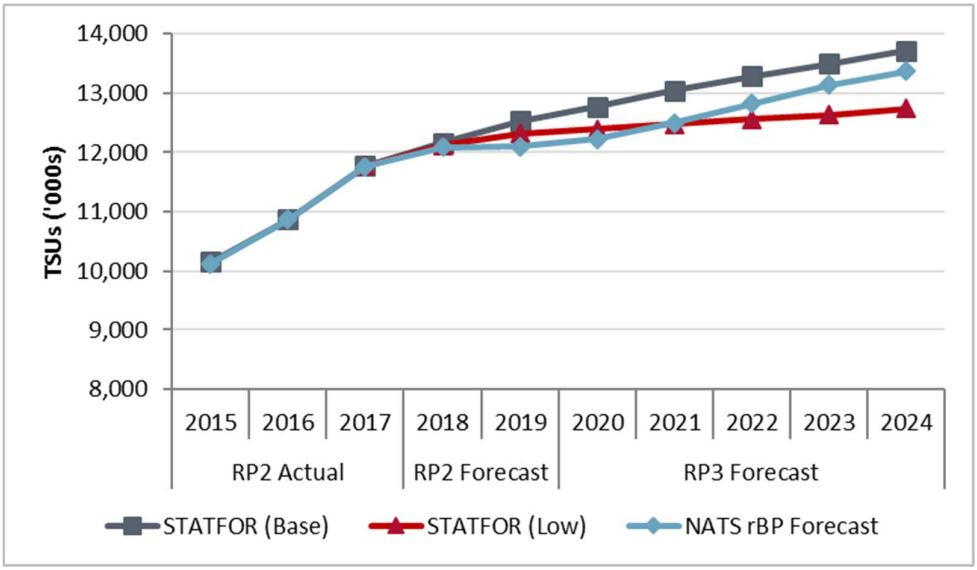
It should be noted that the purpose of this analysis and the projections which result is to develop assumptions required to calculate and define an overall cost efficiency path for NERL. Where possible, we have tried to develop a distinct approach to provide an independent view, for example in relation to projections of staff numbers. It is specifically not the intention of our analysis to specify or recommend how NERL operates its business, which is for NERL itself to determine.

Performance in RP2 and projections for RP3

The figures below respectively show:

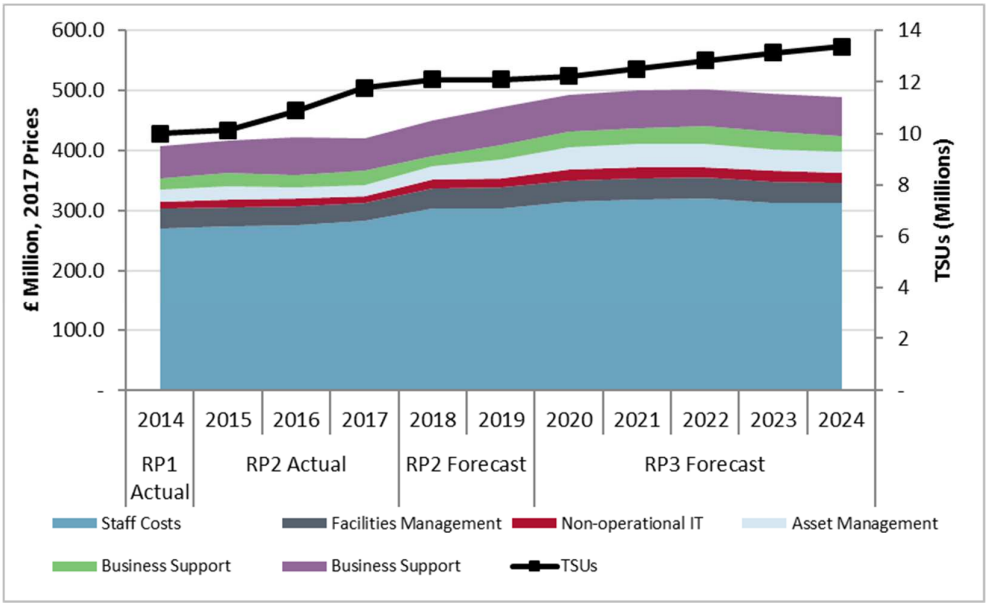
- The NATS August 2018 traffic forecast (provided to Steer on 9 November 2018), for the remainder of RP2 and RP3, against the September 2018 STATFOR Base and Low case medium-term forecasts in terms of TSUs; and
- NERL's operating costs as provided to Steer (excluding pension and redundancy costs but retaining including labour costs which have been capitalised in NERL's accounts, consistent with the staff cost figures in Appendix H of the BP), since the final year of RP1 (2014).

NERL and STATFOR total service unit historical and projected traffic (2015-2024)



Source: NATS 9 November 2018 data submission & STATFOR September 2018 Medium-term forecast

NERL's historical and projected operating costs in RP2 and RP3 (2014-2024)



Source: NATS 13 November 2018 data submission

Our conclusions from our analysis are as follows:

- Traffic has grown significantly faster during RP2 than in the RP2 Performance Plan, with total service units +11.2% higher in 2017 than in the Plan.
- NERL did not meet its delay target in 2016, but has returned to being within the target level in 2017, as it was in 2015.
- NERL's operating cost per service unit has fallen significantly since the end of RP1, with unit costs in 2017 being -12.4% below the 2014 cost level.

- NERL's operating costs are forecast to increase significantly in the final two years of RP2, which, together with its latest traffic forecasts, means unit operating costs are projected to increase by an average of +4.6% p.a. in 2018 and 2019.
- NERL's latest traffic projection is slightly below the level of the September 2018 STATFOR medium-term low forecast for the final two years of RP2, and between the STATFOR low and base forecasts throughout RP3.
- Total operating costs are forecast to remain relatively constant throughout RP3 (CAGR +0.7%), and unit total costs to slightly decrease (CAGR -1.3%), but, due to the significant growth in costs at the end of RP2, unit costs in 2024 are forecast to be slightly above the 2017 level.

Stakeholder comments on RP2

The objective of stakeholder engagement was to gain a full understanding of different stakeholders' perspectives of the issues raised by both actual RP2 performance to date as well as NERL's approach to consultation and forward-looking capital and operating expenditure projections for the remainder of RP2 and RP3. The FAS Facilitation Fund was also discussed.

We spoke to four airlines, British Airways (BA), Virgin Atlantic (VS), easyJet (EZY) and Ryanair (FR), as well as airline representative body IATA. We also spoke to the Independent Reviewer (Grant Bremer) and to NATS Trade Union representatives (Prospect union representatives for ATCOs and Engineers, and PCS union representing support staff at NATS). In addition, we spoke to the CAA's Consumers and Markets Group, acting as client, as well as to the CAA's Safety and Airspace (SARG) and Future Airspace Strategy (FAS) groups.

Many common themes emerged from these discussions, with broadly consistent views across many of them (although airlines and staff representatives had different opinions about operating costs). The key points we have identified from the stakeholder feedback are as follows:

- The RP2 planning process was welcome, but airlines felt NERL did not provide sufficient information or allow genuine consultation.
- A 10-year view of the capital and airspace development programmes would be helpful.
- The changes to NERL's strategy during RP2 meant that the work in the planning phase was wasted. There was suspicion about the fact that the increase in costs in SIP17 was balanced very closely by INEA funding.
- NERL did not provide sufficient information about its capital programme to allow users to understand the real trade-offs between costs and benefits. Its approach was described as "back-to-front", first deciding on the programme and then retro-fitting the benefits.
- Airlines accept the concept of enhancing NERL's technology before implementing major changes to airspace, but are concerned about when airspace change will actually happen.
- Airlines raised concerns about the cost-benefit of the proposed adoption of satellite-based ADS-B technology on Oceanic routes during RP3 as they consider that it is expensive.
- NERL's staff planning processes are considered by some stakeholders to have not been as robust and dynamic as needed by the changing market situation. The reduction in trainee numbers for two years during RP2, in hindsight, was a mistake.
- Some airlines felt that the FFF had been used for purposes for which it had not originally been intended (in particular mentioning the installation of Metereological Office staff at Swanwick), although there is no suggestion of misgovernance and all spending was agreed by the steering committee.

- For RP3, stakeholders emphasised the importance of airspace change and improved information on both the capital and staff development programmes.

Staff costs in RP2

Staff 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). In our assessment of historic staff costs, we have considered the drivers of staff costs by looking at planned and actual total staff costs, staff numbers and pay. We have also benchmarked the trend and level of staff costs for NATS against the wider UK economy, other major European ANSPs[1] and other comparable sectors.

We then considered how staff productivity at NERL has evolved and how it compares to productivity trends in the wider economy. We have assessed the historical relationship between staff, costs and traffic (the underlying demand driver for ATC services). Finally, we considered an appropriate model for assessing staff costs in RP3, taking account of the different factors that drive staff numbers and unit costs. This has been used to review the staff element of operating costs put forward in NERL's BP.

Our conclusions concerning staff costs in RP2 are the following:

- Staff costs were projected to fall at the start of RP2, reflecting lower traffic projections. In the event, the outturn was that staff costs were consistently above plan and flat in real terms for the first three years of RP2.This reflects higher traffic levels than expected.
- Staff numbers were correspondingly above plan and were also supplemented by additional external contractor staff brought in to help deliver the enhanced programme of technology development which was adopted early in RP2.
- Salaries for ATCOs and other NERL staff were forecast to be constant in real terms (against forecast CPI) during RP2. The outturn was higher salary levels initially, subsequently falling back in 2017, with ATCO salaries slightly higher than Plan and other staff salaries slightly below Plan.
- Since 2002, NATS salaries have risen faster than salaries in the transport and services sectors of the UK economy, and faster than salaries in the economy as a whole. However, since 2014, the rate of growth in NATS salaries has been below that in those sectors and in the wider economy.
- When benchmarked against major European ANSPs, salaries at NATS are towards the higher end, but not at the top, of the benchmark range. Salary levels are in the middle of the large five European ANSPs.
- While recognising the unique characteristics of some roles at NATS, especially ATCOs, salaries at NATS are significantly higher than salaries in skilled jobs with some similar characteristics in other sectors in the UK economy.
- The discrepancy in salaries is particularly pronounced in the case of ATSAs, who appear to be paid significantly higher salaries than is the case in similar roles elsewhere in the UK economy. This was recognised in the analysis undertaken by consultants NERA on behalf of NERL[2].
- While NERL's DB pension scheme is protected under the arrangements made at the time of the privatisation of NATS (Trust of a Promise), this does not apply to its DC scheme, in

[1] DFS, DSNA, ENAIRE, ENAV and NATS.
[2] Staff Operating Expenditure for Air Traffic Control, Prepared for NERL, March 2018

which the employer contributions are relatively high compared to benchmark UK employers of privatised utility and transport companies.
- The labour productivity of ATCOs is towards the higher end of the largest five European ANSPs.
- Across 31 European ANSPs, there is a strong statistical relationship between both ATCO hours and operating costs compared with controlled flight hours (although this is also influenced by other factors). The relationships identified look plausible and can be used as one benchmark, amongst others, for testing the projected cost growth during RP3.

Staff cost projections in RP3 Business Plan

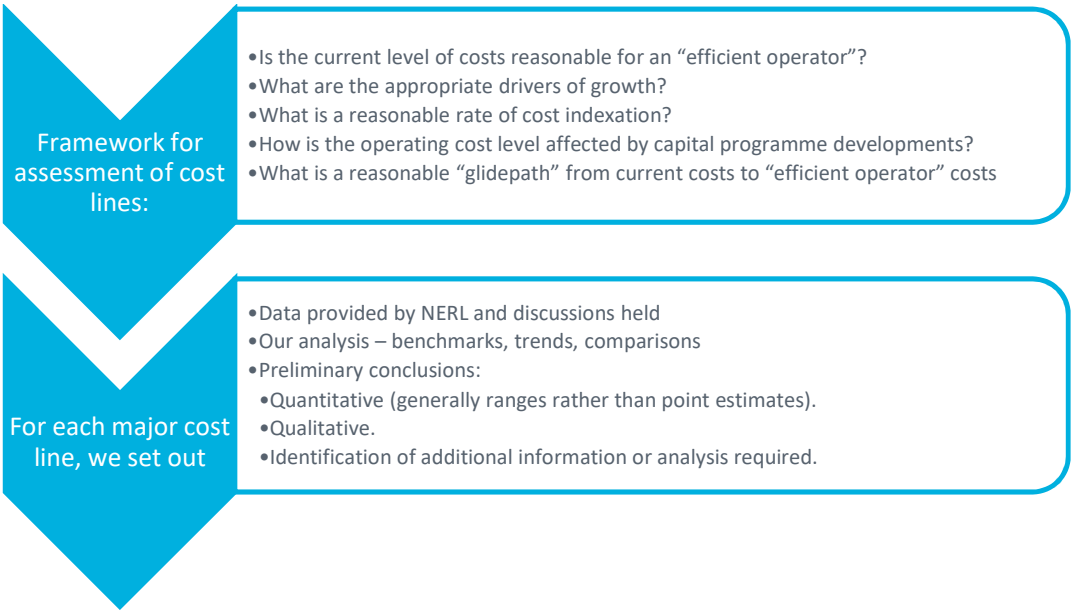
To assess the BP forecasts of NERL's staff costs in RP3, we have analysed staff costs through benchmarking of salary growth; benchmarking of pensions; and analysis of FTE requirements for the following staff categories:

- ATCOs – Operational, non-operational and trainees;
- ATSAs – Operational, simulation and training, other;
- Central Management and support staff (PCG/MSG); and
- Technical staff (ATCE and STAR).

In addition, we have considered staff salary levels for each category and the level of pension contributions made by NATS for NERL staff.

We have assessed staff costs by constructing a model for an "efficient operator" based on the process set out in the figure below.

Efficient operator assessment framework

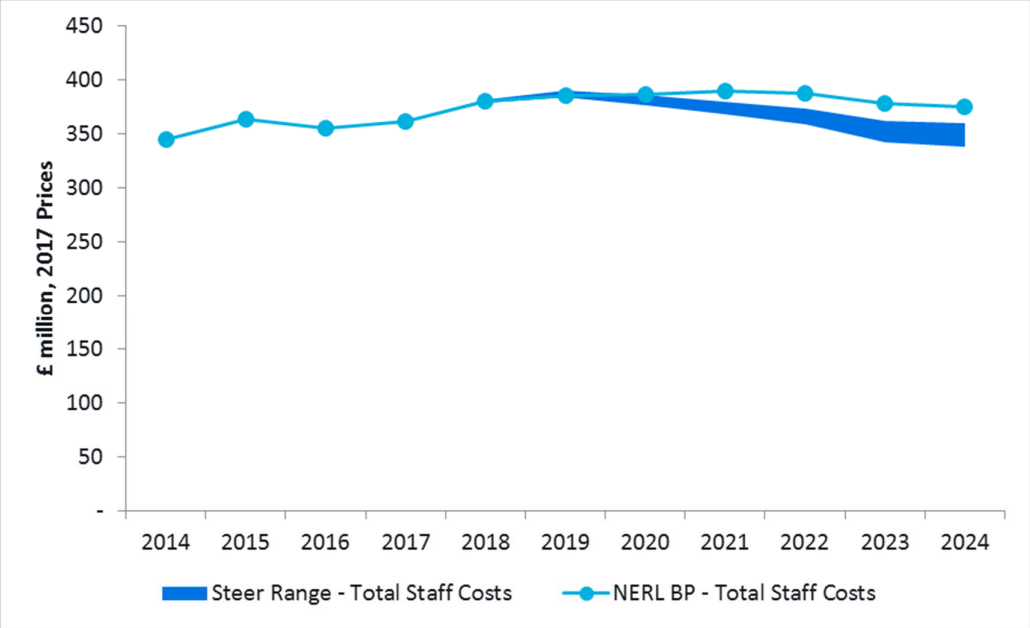


Source: Steer

Assessing the reasonableness of the current cost, is to a large extent based on the historical analysis, which considered the trends and current level of staff costs in RP2 and undertook comparisons against external benchmarks. In general, we have developed a range, as opposed to a "point estimate", of potential cost levels which may be achievable.

The figure below shows the range of potential staff cost levels identified by our efficient operator model relative to the level of NERL's projected total staff costs. Over RP3, the projected levels represent a reduction to total staff costs of between -3.0% and -7.0%, equivalent to between £57m and £133m.

Total staff costs: NERL BP and Steer identified cost levels range (2014-2024)



Source: NATS 23 April, 9 November & 13 November data submissions and Steer analysis. Note: Cost levels refer to total staff costs as per NATS data submissions (including pensions and redundancy and capitalised labour) and Steer projected levels.

Our conclusions concerning staff cost projections for RP3 in the BP are as follows:

- ATCO staff number projections in the BP, are higher than the results of Steer's bottom-up analysis. However, the number of operational ATCOs at the upper range of our projections is nevertheless +8.1% higher than the number of operational ATCOs in 2017 in the context of IFR traffic growth of +11.4% over the same period, while in the lower range of our projections the number of ATCOs is only very slightly lower than in 2017. NERL has stated that some of this increase is required to rebuild staff levels for service and resilience to take account of the findings of Project Oberon.
- Based on Steer analysis, ATSA staff number projections in the BP appear to be high with differences between Steer and NATS projections of 13% to 31% FTEs by the end of RP3 for operational ATSAs, 7.5% to 30% for training and simulation ATSAs and 4% to 8% for non-operational ATSAs. Overall, differences of between 8% and 23% of ATSA FTEs result from a comparison between the forecasts.
- ATSA salary levels appear high compared to benchmarks and given the potential impact of the new technology being adopted by NERL it would be worthwhile giving consideration to restructuring some or all ATSA roles over the longer term and potentially introducing lower salaries for new staff joiners.
- Management and support staff and associated non-staff costs for business support roles (Finance, Legal and HR, as well as non-operational IT) appear to be reasonable compared to benchmarks.

- For other support staff in the MSG and PCG grades, the planned growth in FTEs from now until the end of RP3 appears to be very high in relation to Steer's assessment of the underlying driver (traffic growth), in comparison to similar expectations at comparable organisations, leading to potential cost differences between Steer and NATS projections in the range of 13% to 16% for other MSGs and 6% to 8% for other PCG staff. In its feedback on the draft report, NERL stated that these grades play a vital role in delivering the level of safety, service, resilience and environmental performance. NERL stated that these grades also support the airspace modernisation and technology programme, the development of NERL's future ATM capability and response to safety risk posed by drones.
- While it is difficult to judge the planned level of technical services staff during RP3, the costs of this can be combined with the asset management costs of operating NERL's operational systems, showing that combined costs increase during RP3 and then fall back to a level slightly above 2017 expenditure. NERL have provided an explanation for these patterns of costs, however it is difficult for us to prove these costs provide value for money.
- Pension contributions for DC staff currently being made by NERL and planned to continue during RP3 are relatively high compared to benchmark UK companies of privatised utility and transport companies, and airlines during consultation have asked that consideration should be given to reducing these contributions, at least for new joiners.
- We have identified staff salary cost differences between Steer and NERL projections of -3.0% and -7.0% throughout RP3, equivalent to between £37m and £86m, which, when taking into account associated reductions in non-salary costs, is equivalent to total staff cost differences of between £57m and £133m.

Non-staff costs in RP2

In the long-term, as with staff costs, non-staff costs will be driven, *inter alia*, 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 – or over a single reference period.

We have analysed the evolution of NERL's non-staff operating costs in RP2, based on the level of disaggregation within NERL's data submission, based on the following five categories:

- Facilities management;
- Asset management;
- Business support;
- Non-operational IT; and
- Other.

Our conclusions concerning non-staff costs are as follows:

- Most non-staff cost elements have remained at a relatively constant level in the first three years of RP2, but are forecast to increase – in some cases significantly – in 2018 and 2019.
- Non-staff costs are less driven by traffic volumes than staff costs, so a CAGR of +0.3% for non-staff costs in the first three years of RP2 seems reasonable.
- The material increases in forecast costs in the final two years of RP2, with a CAGR of +10.7%, are significantly higher than earlier in RP2, and also higher than the cost growth projected for RP3. NERL explains that this is driven by dual running of systems, cyber security and increased training for operational staff.

Non-staff costs in RP3 Business Plan

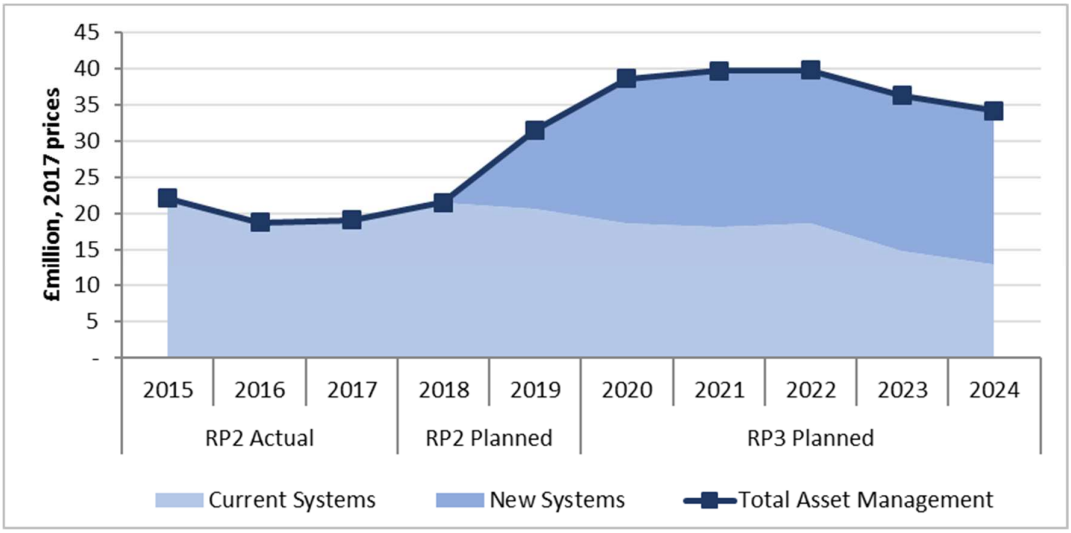
We have analysed the evolution of NERL's non-staff operating costs in RP3, by focusing on specific cost items that we class either technical systems or third-party costs; the costs we have assessed under each of these two headings are as follows:

- Technical systems costs include:
  - Asset management;
  - Future ATM capability;
  - FAS Facilitation Fund / Opex Flexibility Fund.
- Third party costs include:
  - Rent and rates;
  - Utilities;
  - Maintenance; and
  - Catering.

The cost items listed above do not account for all of NERL's non-staff costs; however we have not carried out a detailed assessment on every cost item due to lack of availability of benchmarks, the unique nature of some of NERL's costs, making comparability difficult, or because some cost lines represent only small amounts.

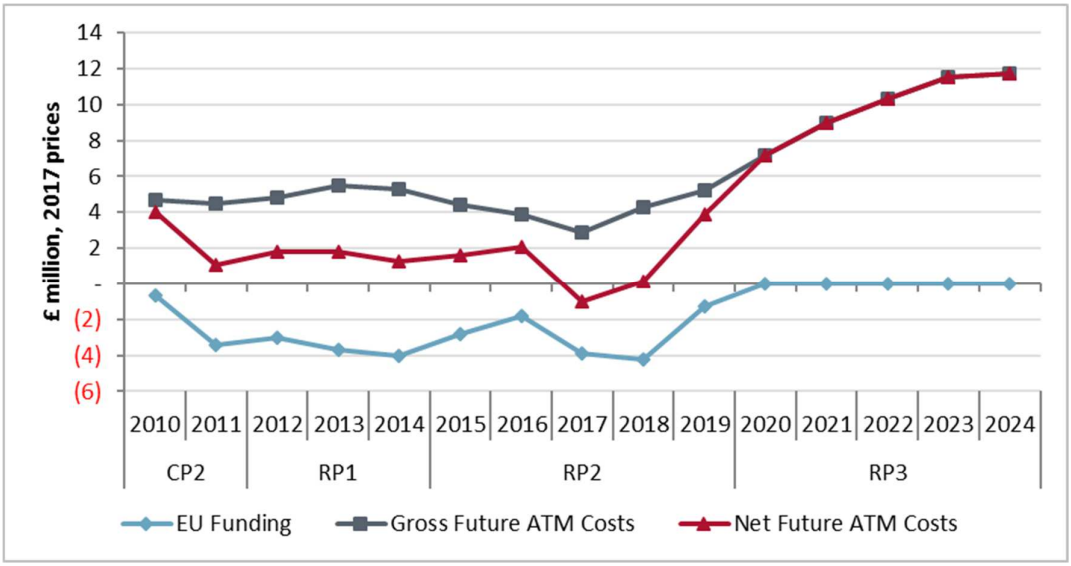
The figures below show two of the key non-staff operating cost items. The first figure shows total asset management costs, throughout RP2 and RP3, split into the costs of the current and new systems, and the second shows future ATM capability costs, between 2010 and 2024, split into gross costs, net costs and EU funding (shown as a negative cost). The second figure shows gross spending on Future ATM Capability, as well as the corresponding figure net of EU funding (which is assumed not to be available in RP3).

NERL historical and projected asset management costs (2015-2024)



Source: NATS 9 November 2018 data submission

NERL historical and projected Future ATM capability costs (2010-2024)



Source: NATS 22 June & 13 November 2018 data submissions

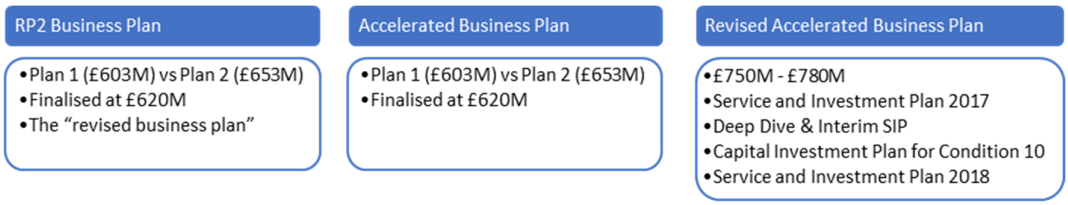
Our conclusions concerning non-staff cost projections for RP3 in the BP are as follows:

- Asset management operating costs for the operational systems increase significantly in the last two years of RP2 and remain at a level in RP3 which is significantly higher than has historically been the case. NERL has explained that the introduction of new operational systems running in parallel with legacy systems increases capabilities, resilience and cyber protection associated with the new systems justify the cost; however it is difficult for us to prove these costs provide value for money. Although we have not quantified any potential cost differences, it is possible operating costs would reduce alongside a lower Steer capex scenario compared to NERL's BP which might be adopted due to reduced system scope. However, any restructuring costs incurred would need to be allowed for.
- Future ATM Capacity spend increases in RP3 partly due to the loss of EU funding but also driven by higher levels of actual expenditure. While these proposed levels remain within benchmark proportions of R&D spend in comparable organisations, given the nature of the funds, governance measures giving stakeholders the opportunity to influence their use should be considered.
- The proposed Opex Flexibility Fund (OFF), replacing the FAS Facilitation Fund (FFF), appears to have reasonable levels of expenditure, but further justification, through discussion with stakeholders, is needed for the proposed governance mechanisms which would give less control to industry partners than is currently the case for the FFF.
- Third party costs, including rent & rates, utility, maintenance and catering costs have been benchmarked against expenditure by similar organisations and the rate of growth reviewed. Based on this analysis, in broad terms these costs appear reasonable.

Capital expenditure in RP2

We have assessed NERL's capital investment plan for RP2, and the way in which it has evolved over the course of that period (2015-2019), by analysing the story of each plan applied during RP2, along with the transparency of costs and benefits presented by NERL. Each analysis concludes with an opinion section giving our assessment of the plan, validation of NERL's reasoning, and potential lessons learnt for the RP3 planning process. The figure below shows the main stages of evolution of the plan.

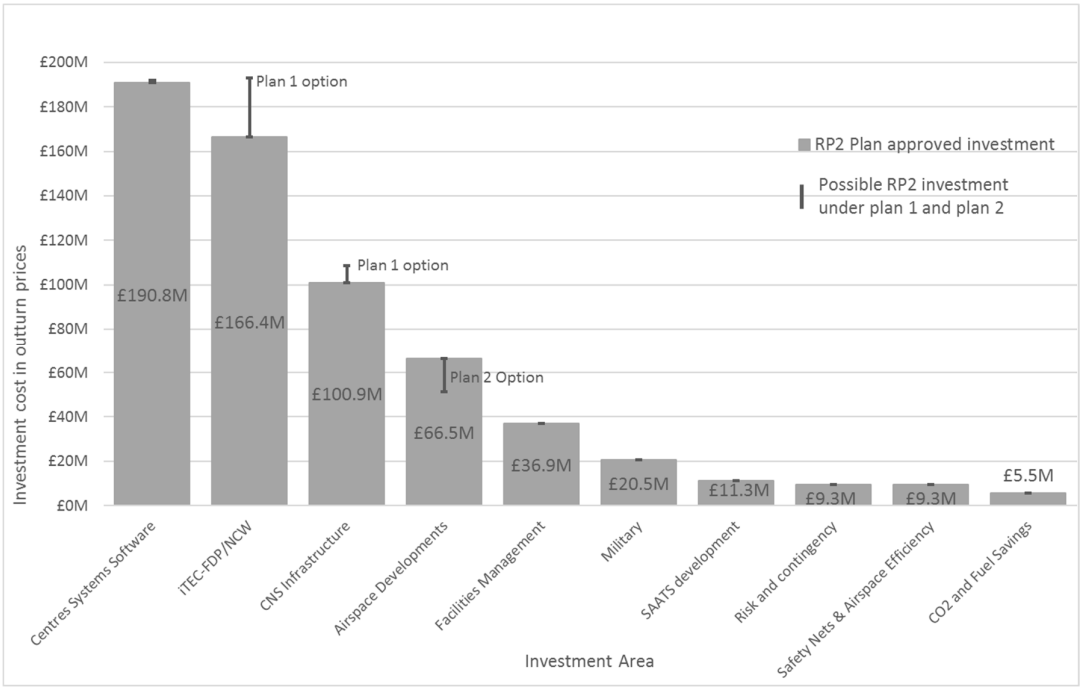
Evolution of the RP2 capital investment plan (outturn prices)



At the start of RP2, there were some significant external drivers (eg CAA/DFT policy developments around the LAMP project and a decision by Gatwick to delay its airspace change process) which impacted the plan for RP2 and were some of the reasons behind the revisions.

The investment band proposed under the two plans, and the final approved investment, is shown in the figure below.

NERL's initial RP2 Capital Investment Plans (1, 2 and chosen)[3]



[3] Please note that the values in the figures reflect information presented in the RP2 Capital Investment Plan Document and the RP2 Revised Business Plan document. The information presented in the subsequent consultations (e.g. SIP16) present slightly different values.

In relation to the RP2 Business Plan, our analysis shows that:

- The airlines' expectations that the higher cost option offered during the original RP2 Business Plan consultation would be the upper limit of the investment programme turned out to be incorrect.
- The analysis of benefits improved but was high level and unclear in its link to the programme.

In relation to the Accelerated Business Plan, our analysis shows that:

- There were valid reasons for adjusting the original plan. However, change management and risk management at the start of RP2 was not clear enough and potentially not robust enough.
- Impacts on the benefit mechanism needed to be clearer.
- There was a lack of transparency in the changes and a limited set of projects was detailed, while the understanding of dependencies was lacking.

In relation to the Revised Accelerated Business Plan, our analysis shows that:

- The clarity of the plan improved markedly at this point. However, this raises questions about the quality of the previous RP2 plans, and about whether the factors on which the changed plan was based could have been anticipated.
- Top-down planning needed to be supplemented with more detail through bottom-up planning.
- We recommend that explicit confirmation be provided when costs are indicative, with upper and lower bounds provided, and planned contingency arrangements to deal with expected risks.
- NERL provided more detail and transparency than previously. However, the changes have been hard to track, making it difficult to distinguish true acceleration from additional cost, delay or overspend.
- We question whether the INEA funding obscures the acceptability of the changes in the plan.

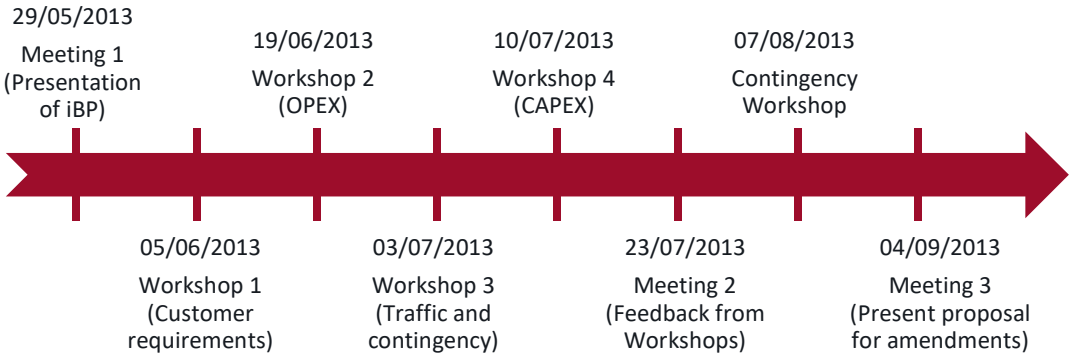
Review of RP2 consultation process

This analysis reviewed the quality of the consultation process for RP2 in terms of:

- Appropriateness of consultations (user ability to influence outcomes, accuracy, visibility, detail and maturity of options);
- Transparency of option implementation (feedback look, accountability process); and
- Strategic decision process (management of risks, dependencies, make vs buy decisions, supply change and programme).

This analysis did not comment on the content of the plans and NERL's delivery of it. The consultation meetings undertaken are presented in the figure below.

RP2 Customer Consultation meetings



In relation to the RP2 consultation process, our analysis shows that:

- NERL conducted a relatively intensive consultation process, which was more detailed than that conducted by other ANSPs. Providing two options was appreciated by users.
- However, the ability to meaningfully affect the size of the investment given in the options was limited to three out of ten investment areas.
- The consultation documents (for example the 20130710_ RP2 Capital Investment Plan Release 1 12) presented an acceptable level of detail. However, this level of information was not presented in the approved RP2 Business Plan documentation (e.g. 20131018_Revised Business Plan).
- The consultation documents (for example the 20130710 RP2 Capital Investment Plan Release 1 12) presented an acceptable level of detail. However, this level of information was not presented in the approved RP2 Business Plan documentation (e.g. 20131018_Revised Business Plan).
- Airlines were not consulted on issues such as interdependencies within the programme, or risk.
- NERL should ensure that strategic decision processes are reflected on clearly, with dependencies and trade-offs clearly identified to allow uses to understand the plans in sufficient detail.

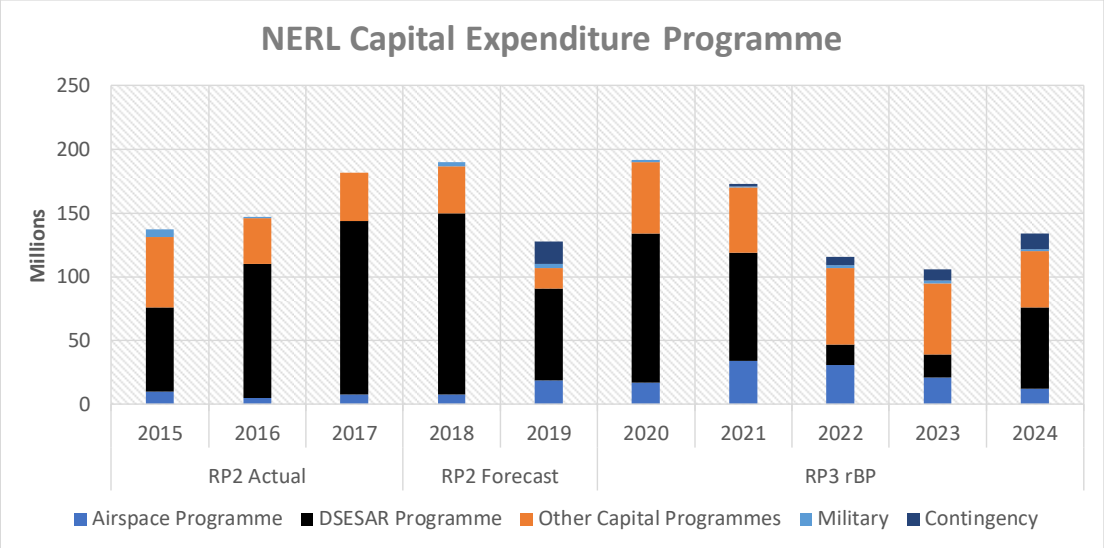
In relation to the SIP consultation process, our analysis shows that:

- Users confirmed that they were generally satisfied with the format of the consultation process. However, the significant change undermined their confidence.
- The reporting on individual projects in the SIPs only covered a relatively low percentage (around 20%) of the value of the programme.
- The information reported in the Revised Accelerated Business Plan was significantly greater.
- Risk and dependency management was not reported in detail in the first half of RP2, but this improved in the Condition 10 Report and the 2018 SIP.
- The role of the Independent Reviewer was highly appreciated by airlines and should be continued.

In the BP, NERL proposes a capital investment programme with a similar investment level to RP2. Expenditure in 2017 prices is forecast to total £782 million in RP2 and £763 million in RP3,

equating to £1.55 billion in 2017 prices across the 10 years[4]. The figure below provides a visual representation of the capital programme.

NERL's Capital Expenditure Portfolio



Within the BP, CAPEX is presented in five major programmes (plus the oceanic programme which is not addressed in this analysis) with a breakdown of sub-programmes presented within Appendix L. In contrast to the RP2 business plans and consultation documents (such as the service and investment plans) which were produced in outturn prices, the BP is denoted in 2017 prices.

Our conclusions concerning the capital programme for RP3 in the BP are as follows:

- NERL has presented a capex plan which continues the core system replacement presented to the CAA and users in the C10 / SIP process. The capital programme for RP3 is of a similar size to the RP2 programme, at £763 million. Features of the programme include:
  - Replacement of old systems is the central benefit driver of RP3 with airspace change only planned to deliver benefits in the last year of the period.
  - The new systems allow ANS to be provided for a higher level of traffic with similar performance outcomes
  - Airspace change follows technical deployment, and therefore many of the benefits are expected in RP4 and beyond.
- NERL is committed to DSESAR and legacy escape within the range of £750 million – £830 million outturn:
  - This originally included the necessary costs to accelerate TC FourSight into RP3. Since then, TC FourSight has been moved and is no longer part of the DSESAR programme. Given this significant scope change (TC FourSight is likely to have a capex requirement of more than £100m across RP3 and RP4), it is reasonable to question why the DSESAR programme capex envelope remains the same. The use of ExCDS for DP Lower and the airspace sector changes (which were undertaken instead) would not appear to justify the maintained capex envelope.

[4] This includes military spend covering £13 million in RP2 and expected to cover £8 million in RP3. It also includes contingency and the accelerated RP2 spend.

- There is insufficient detail provided on the capital programme in the BP to assess, for example, the sub-programme benefits and there appear to be inconsistent views of the BP as either "cost and benefit envelopes" or a "detailed plan" as required by Condition 10.
- The plan gives qualitative detail on the proposed capex programme in RP3, but it does not allow:
  - traceability of quantitative benefits at sub-programme level;
  - testing of whether the benefits proposed are appropriate or underplayed;
  - testing that the costs proposed are efficient;
  - understanding of programmatic risks and their impact.
- There is a mix of "maintain operations" and "new capabilities within the plan and the latter elements require more details on the resulting benefits. In particular, the benefits from future operational changes (DSESAR tools and airspace) need more information.
- 69% of the capital programme has "high maturity", which reflects its stage in the lifecycle, but there is considerable uncertainty about remaining investment, especially the airspace programme.
- There are three separate contingency mechanisms proposed for the operational and capital expenditure, each of which may require additional governance arrangements.
- The P3O approach is useful, but benefits of its adoption have not yet been demonstrated through the content of the BP. For example, we would expect more evidence of risks and benefits to be present.
- As such, Value for Money and efficiency of the development programmes is hard to test, especially DSESAR. The CAA could aim to engage with appropriate groups to understand whether the costs of new ATM systems could be benchmarked across Europe.
- An audit process to ensure that capital expenditure has delivered expected benefits should be considered.
- A reduction in the CAPEX programme could be considered. We have proposed a scenario reducing CAPEX spend from £751M to £610M over RP3, with regulatory mechanisms in place to agree and accelerate development of new programmes in the latter part of RP3 if feasible.

  More adaptability in the CAPEX plan could reduce risk and allow efficiency to be better tested. For example, major projects should be reviewed prior to commencement so that their cost and risk can be tested before work starts. Specific milestones and the procurement methodology could be tested at this time. This would mean the CAPEX plan could change at that point.

  This should be balanced against the risk of reduced flexibility in internal programme delivery that is assured by a firm long timeframe commitment of regulated income. Nevertheless, if there is no clear costing or benefits for certain programmes, it would appear logical to not allow this theoretical capital to be used for other internal programme delivery constraints or de-risking, as this would usually be the role of contingency.

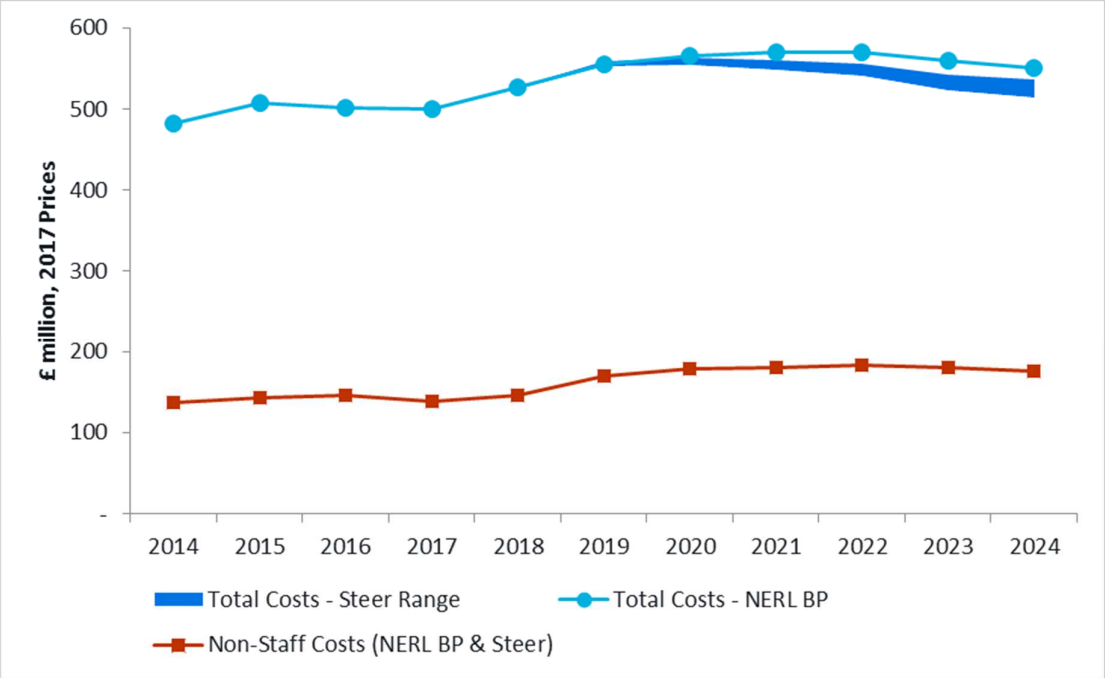
Summary of differences between NERL BP and Steer projections

Operating costs

We have identified staff cost differences compared to NERL's RP3 Business Plan of between -3.0% and -7.0% throughout RP3, equivalent to between £57m and £133m. On the non-staff cost side, although we have not quantified any differences, it is possible that some cost items would reduce in line with identified differences between the Steer capital scenario and NERL's BP capital programme – particularly asset management costs.

The identified range of total operating cost differences is shown in the figure below. Over RP3, the identified differences represent a total operating cost reduction of between -2.0% and -4.7%.

Total operating costs: NERL BP and Steer identified cost levels range (2014-2024)



Source: NATS 23 April, 9 November & 13 November data submissions and Steer analysis. Note: Cost levels refer to total staff costs as per NATS data submissions (including pensions and redundancy and capitalised labour) and Steer projected levels.

Capital expenditure

For capital expenditure, a feasible scenario can be tested taking account of:

- Benchmarking to RP2 spend;
- Viability and deliverability of programme plans (particularly given current delays to key milestones evident from SIP 19);
- Uncertainty of longer term programmes (TC FourSight) in terms of timing, cost, benefit and need.

Taking this into account, the table below proposes a reduced CAPEX scenario for RP3, moving TC FourSight spend to RP4 and reducing spend on non-core programmes.

Potential capital expenditure savings scenario for RP3

	Business Plan	CAPEX reduction scenario
Airspace programme	£115M	£115M
DSESAR	£300M	£220M
Non-core programmes	£271M	£210M
Military	£8M	£8M
Contingency	£34M	£34M
Acceleration to RP2	£23M	£23M

	Business Plan	CAPEX reduction scenario
TOTAL (excluding Oceanic)	**£751M**	**£610M**

Restructuring costs

In response to the draft report NERL has identified that any reductions in staff numbers could incur restructuring costs, which, as a result of the cost level differences within Steer's efficient operator model, it estimated to be in the region on £20 million. Steer accepts that NERL would incur some restructuring costs as a result of the cost level differences, and we have therefore estimated the level of restructuring costs in the upper and lower bound scenarios based on the methodology set out below.

Based on the average salary across RP3 for each staff type, [✂] , these staff level differences would incur total restructuring costs of between £4 million and £15 million in the lower and upper bound scenarios respectively.

NERL has also commented to us that reducing the CAPEX programme could also incur restructuring costs. NERL stated that the costs associated with a £141 million reduction in CAPEX could be in the range of £20 million to £40 million. Our estimate, based on assumptions consistent with those used in relation to staff opex savings, is that it could require about £14 million in restructuring costs.

These restructuring costs would be offset against the cost differences identified above. However, how these restructuring costs are treated would need to be agreed between NERL and CAA based on the CAA's final proposals.

1 Introduction

Background to the study

1.1 The Civil Aviation Authority (CAA) is reviewing NATS (En Route) Plc's (NERL's) operating and capital cost projections in preparation for the Reference Period 3 (RP3) beginning on 1 January 2020. RP3 runs for 5 years to the end of 2024. The United Kingdom's (UK) proposed Performance Plan will be based on the CAA's assessment of NERL's own forecasts The CAA's assessment will include its view on an overall cost efficiency path for NERL, based on available evidence.

1.2 The process has involved NERL creating an initial Business Plan (iBP) in April 2018, subject to CAA review and stakeholder consultation, followed by a revised Business Plan (rBP) in October 2018. The CAA will use the rBP to inform its consultation in early 2019 on the UK Performance Plan. Throughout the remainder of this report, unless otherwise stated, references to the Business Plan (BP) refer to the rBP.

1.3 The study included reviews of the NERL capital programme, capital and operating expenditure and the potential trade-offs and synergies between them. It included a backwards-looking review of the experience of actual Reference Period 2 (RP2) level of operating expenditure to the end of 2017, compared to appropriate peers and benchmarks, as well as looking forwards to consider the appropriateness of the projections for the remainder of RP2 (2018 and 2019) and for RP3 (2020-2024).

Terms of Reference

1.4 The terms of Reference of the Study required advice to inform and support the CAA decisions relating to the 2020-2024 price control for NATS (En Route) Plc. Even though the shape of the price control framework for RP3 was not known at the time of commissioning the study, the CAA nevertheless expected estimates of efficient operating and capital expenditure to be important inputs to its decision about the UK's Performance Plan.

1.5 The CAA required this study to evaluate NERL's forward-looking capital programme, and the current and forecast of capital and operating expenditure efficiency of NERL. The study was also required to examine the cost efficiency and governance arrangements of the FAS Facilitation Fund (FFF).

The study team

1.6 The team comprised experienced consultants who have worked in the ANS and regulated industries from Steer[5] and Helios. Steer is responsible for the study, with Helios providing support across the issues, but in particular concentrating on the capital expenditure plan.

[5] Steer is the trading name of Steer Davies & Gleave Limited (formerly trading as Steer Davies Gleave)

Purpose of the report

1.7 This Final Report represents the outputs of Phases 1, 2 and 3 of the project. Phase 1 was a review of performance during RP2 (both historical to 2017 and as projected for 2018 and 2019), while Phase 2 was a review of the proposals for RP3 set out by NERL in its initial Business Plan (iBP) published on 9 April 2018. Phase 3 was a review of the updated proposals for RP3 set out by NERL in its revised Business Plan (rBP or BP) published on 26 October 2018 and an identification of potential operating cost or capital programme differences to levels projected by Steer using its assumptions.

1.8 The findings of Phase 1 were presented to stakeholders at a workshop on 14 May 2018, the findings of Phase 2 were presented at a workshop on 11 July 2018 and the findings of Phase 3 were presented to the CAA on 4 December 2018. This report combines the findings from all three phases and includes both the material presented and additional information based on discussions with NERL and stakeholders, as well as on our analysis.

About NATS Limited, NERL and NSL

1.9 NATS Limited operates through its subsidiaries NERL and NSL.

Services provided

By NERL

1.10 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[6] and North Sea helicopter advisory services are regulated by this licence. NERL also operates the Oceanic service and provides MOD with engineering, surveillance and communications services.

1.11 The CAA establishes revenue allowances for NERL's economically regulated services under the Single European Sky (SES) legislation. 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, which represents the value ascribed to the capital employed in the regulated businesses, 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

1.12 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.

[6] The centralised terminal approach service that NERL provides for traffic using the five main airports in the London area from the area control centre at Swanwick

1.13 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) as demonstrated through recent contract losses to other providers at London Gatwick, Edinburgh and Birmingham airports, as well as the recent contract win at Luton airport.

1.14 According to NATS 2017 Annual report, services to UK Airports (including engineering support) represent c.73% of its revenue and Defence c.16%. Services to UK customers represent c. 96% of its revenue.

Structure of the report

1.15 The remainder of the report is structured as set out below.

- Chapter 2 sets out our overall methodology and approach to the study, including data reviewed and our interaction with NERL and other stakeholders.
- Chapter 3 provides an overview of NERL's performance during RP2 so far (based on actual results to calendar year 2017) and its projections for the remainder of RP2 (2018 and 2019) and for RP3 (2019 to 2024 inclusive).
- Chapter 4 gives an overview of stakeholder comments on the preparation for and performance during RP2, based on discussions during Phase 1 of the project.
- Chapters 5 to 8 set out our review of NERL's operating costs:
  - Chapter 5 reviews staff costs during RP2 as well as benchmark analysis and the development of a conceptual framework for staff number projections in RP3;
  - Chapter 6 reviews the Business Plan staff cost projections for RP3;
  - Chapter 7 reviews the non-staff costs in RP2; and
  - Chapter 8 reviews the Business Plan non-staff cost projections for RP3.
- Chapters 9 to 11 set out our review of NERL's capital programme:
  - Chapter 9 provides a review of the capital programme in RP2;
  - Chapter 10 reviews the RP2 consultation process; and
  - Chapter 11 reviews the Business Plan capital programme.
- Chapter 12 provides a summary of the potential operating cost and capital programme differences between NERLs rBP to levels projected by Steer using its assumptions.

1.16 Where data or words are excised due to confidentiality this is signalled by the following symbol: ✂.

2 Methodology

Interaction with NERL

2.1 During the early part of the project, Steer and Helios met with representatives of NERL and explained their approach to data requests and interaction with NERL.

2.2 The approach outlined included the following steps:

- Data requested;
- Receipt of the data and the opportunity to review it; and
- Follow up meetings with NERL to discuss the content.

2.3 During Phase 1 of the project, a data request was made (in relation to historical and projected information for RP2 and RP3) to NERL. This was provided by NERL before the stakeholder presentation on Phase 1 of the project on 14 May 2018. Following the Phase 1 stakeholder workshop, during Phase 2 of the project, a meeting was held with NERL at its Swanwick offices on 1 June 2018, at which a number of presentations were made by NERL, and additional data was provided in response to subsequent follow-up requests from Steer.

2.4 A stakeholder workshop was held on 11 July 2018 at which we presented our preliminary Phase 2 findings. Following this workshop, which was attended by NERL as observer, NERL requested that a meeting be held with Steer, the CAA and airline stakeholders, at which NERL would present its views on its planning of operational and management support staff numbers for RP3. This took place on 23 August 2018.

2.5 During Phase 3 of the project, an additional data request was made to NERL in relation to the updates within the Business Plan, which was provided by NERL. There were no additional stakeholder workshops or meetings with NERL.

Data collection

2.6 The table below provides the status of our data collection:

Table 2.1: Data and documentation collected

Data	Possible source	Status
Previous benchmarking and efficiency assessments for CAA in RP2 and RP1	Websites and CAA	Received
ACE and route charges tables	Websites and CAA	Received
PRB Monitoring reports for RP2	Websites	Received
Annual reports submitted by NERL to CAA or during stakeholder consultations (e.g. SIP 2015, SIP 2016, SIP 2017, SIP 2018. Including supporting analysis, presentations and user submissions and reviews)	Websites and CAA	Received
RP2 business plan (NERL specific), and supporting data / analysis	CAA	Received
Detailed actual costs incurred to date, by cost line and for capital at portfolio, programme and project level	NERL	Received (23/4/2018)
Capital programme and expenditure • Customer engagement, benefit target setting and capital programme options analysis	NERL	Received

Data	Possible source	Status
• Detailed understanding of P3O monitoring and compliance, including reporting and measures • Clarification of links between performance targets, benefit metrics, programme and project contributions • Project management documentation, reporting etc • Decision making on supply arrangements (internal vs external) for key purchases • Risk registers, mitigations and reporting of implementation • Dependency management processes and outcomes • People Plan (referenced in SIP 2017 review), showing staff allocation to meet service quality and programme deliverability assumptions		
Operating expenditure: justifications and evidence for assumptions on forward projections including choice of real indexation, step changes and benefits from traffic economies of scale and productivity improvements. • 1 June meeting with Steer; – 'Operational service: Resourcing and resilience' presentation on ATCO resourcing; – 'Facilities Services Transformation 2013-2017' presentation on Facilities management; – 'Cost of delivering the service' presentation on DUC and opex overview; – 'Non-staff opex' presentation on technical staff, asset management future ATM, IT, facilities management. – Kinect energy group *NATS Electricity Price Projections: Review of Assumptions* • 4 June submission – Traffic forecast; – FTE grade/service reconciliation; – Disaggregated FAS costs; – Disaggregated utilities costs and usage; – Disaggregated IT costs; – Disaggregated rent and rates costs; – Site square meterage. • 8 June submission – Contract information; – iBP/ financial model reconciliation; – Facilities management information; – Disaggregated facilities management costs; – JLL maintenance benchmarking report. • 11 June submission – Asset management costs commentary; – Technical services headcount commentary; – Asset management benchmarking description. • 13 June submission – Operational manpower and planning data and commentary. • 14 June submission – 'NERL's pay assumptions for RP3' presentation; – Central support functions costs; – Contractor FTEs and costs. • 20 June submission – Breakdown on bonuses and benchmarking; – ATSA FTE breakdown and commentary; – Further commentary on pay assumptions; – 2016 Pay Offer Briefing; – LHR Airports Limited Pay Offer 2016-2018[7]. • 22 June submission – Future ATM capability summary; – Detailed salary information. • 23 August presentation to Steer and stakeholders; – ATCO headcount; – Comparison of DSESAR productivity benefits to PCP; – ATSA headcount; – MSG/PCG headcount.	NERL	Received (December 2018)

[7] Also available in the public domain

Data	Possible source	Status
• 9 November submission – Explanation of difference between projected NERL determined cost and PRB target; – Technical services and resilience information; – rBP updates of previous data submissions (including traffic, technical services FTEs, FAS, utilities, rent and IT). • 13 November submission – Further resilience information; – Comparison of all iBP and rBP operating cost lines. • 19 November submission – Further technical services FTE information.		
Operating expenditure: access to airport and airline operating cost benchmarks that might be held by the CAA.	CAA	Not received
When available throughout the process: • Interim Business Plan for RP3, including supporting data and analysis sufficient to understand logic and justification for assumptions, targets, costs and scheduling • Revised Business Plan for RP3, including supporting data and analysis sufficient to justify changes to iBP • Updated People Plan for RP3 • Updated risk register for RP3 • Updated dependency management for RP3 • Detail of any change in approach for Supply Chain Management, P3O processes, etc for RP3	NERL/ CAA	iBP received (9/4/2018)

Stakeholder engagement

2.7 A number of stakeholder meetings and workshops were held during Phase 1 and 2 of the project, which are described in detail below. No stakeholder meetings or workshops were held during Phase 3 of the project.

Engagement during Phase 1

2.8 The objective of stakeholder engagement was to gain a full understanding of different stakeholders' perspectives of the issues raised by both actual RP2 performance to date as well as NERL's approach to consultation and forward-looking capital and operating expenditure projections for the remainder of RP2 and RP3. The FAS Facilitation Fund was also discussed.

2.9 For Phase 1, the table below summarises the status of our stakeholder engagement.

Table 2.2: Phase 1 stakeholder engagement status

Type	Name	Details
Regulator	CAA	Consumer and Markets Group – kick-off meeting and subsequent regular update calls. Safety & Airspace Regulation Group / Future Airspace Strategy Group – meeting on 10/4/2018
ANSP	NATS En Route Ltd (NERL)	Meeting on 27/2/2018
Airlines / IATA	British Airways	Meeting on 16/3/2018
	easyJet	Telephone call on 5/4/2018
	Virgin Atlantic	Telephone call on 9/4/2018

Type	Name	Details
	IATA	Telephone call on 12/4/2018
	Ryanair	Telephone call on 12/4/2018
Independent Reviewer	Grant Bremer	Meeting 19/3/2018
NATS Trade Union representatives	Prospect and PCS trades unions	Meeting on 23/3/2018

2.13 As noted above, a stakeholder workshop was held at Heathrow on 14 May 2018 for Steer and Helios to feed back their initial findings from Phase 1 of the project to stakeholders. Although by this time the iBP had been published by NERL, the focus was specifically on a review of RP2 rather than on NERL's plans for RP3, as set out in the iBP.

2.14 The presentation given by Steer and Helios at the workshop covered:

- the background and objectives of the study;
- traffic development and projections to the end of RP2;
- operating cost development and projections to the end of RP2;
- an analysis of staff and non-staff operating costs during RP2;
- the capital programme and expenditure during RP2 including:
  - the original RP2 plan;
  - the "accelerated plan"; and
  - the revised plan;
- a review of the RP2 consultation process; and
- the FAS Facilitation Fund.

Engagement during Phase 2

2.15 During Phase 2 of the project, there was little stakeholder engagement, although, as noted above, a significant level of interaction with NERL.

2.16 Following Steer's and Helios's review and analysis of the iBP, the details of which are set out in chapters 6, 8 and 9.91 below, a second stakeholder workshop was held, on 11 July 2018, at which Steer and Helios presented their findings in relation to the content of the iBP. This covered:

- NERL's traffic projections for RP3;
- NERL's overall cost projects for RP3;
- an analysis of major cost lines in the iBP, including:
  - operational staff costs;
  - central management and support costs;
  - technical staff costs;
  - asset management (technical systems) costs;
  - costs allowances for "Future ATM capacity" and "Opex flexibility"; and
  - third party costs (rent, rates, utilities, maintenance, catering);
- a review of the capital programme for RP3;
- consideration of the following aspects of the capital programme:
  - options offered in the plan;
  - benefits of the capital programme;
  - uncertainty and contingency; and
  - programme delivery.

2.17 Following the stakeholder workshop, the airlines who had attended this requested a follow-up meeting for more detailed discussion on the issues raised. This meeting was held on 27 July 2018, attended by representatives from British Airways, Virgin Atlantic, International Airlines Group and IATA.

2.18 A number of suggestions for further consideration were made by the airlines, in particular in relation to staff salary levels and company pension contributions. Where time has allowed, analysis has been undertaken on these suggestions. The results of this analysis have been incorporated in this report.

2.19 In addition to the follow-up meeting with the airlines, NERL, which attended the workshop on 11 July 2018 as an observer, also requested that a further meeting be held with Steer, the CAA and airline stakeholders. The purpose of this further meeting was for NERL to present its views on its planning of operational and management support staff numbers for RP3. This "manpower planning" workshop took place on 23 August 2018. NERL provided a slide-pack to accompany its presentation, as well as notes of the meeting following its completion. These have been reviewed and taken into account in the analysis presented below.

Analytical approach

2.20 Steer and Helios have adopted an independent approach to the analysis of the information provided by NERL, other stakeholders and public sources. We have analysed information provided by NERL, asking follow-up questions where we perceived that insufficient detail had been made available, or where the information was unclear. We have worked to reconcile data from different sources (e.g. from the SIP process in RP2 and the BP) and we have undertaken benchmarking against external sources where appropriate (e.g. to understand salary levels or cost trends in relation to volume growth).

2.21 In general, we have not tried to second-guess analysis provided by NERL (e.g. in relation capital programme benefits or air traffic controller staff deployment), but have sought to identify where the Business Plan does not appear to provide a satisfactory narrative. Where possible, we have developed our own approach and assumptions to provide an independent view, for example in relation to projections of staff numbers. Where our view differs from the narrative provided by NERL, we have 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.

2.22 Relative to the iBP, there have been very few material changes to the level of operating costs within the revised Business Plan. Although we have highlighted where notable differences exist, our approach has remained unchanged since our Phase 2 report – in many cases we have updated our analysis to account for small changes but the conclusions remain unchanged.

3 Performance in RP2 and projections for RP3

Achievement against UK Performance Plan in RP2

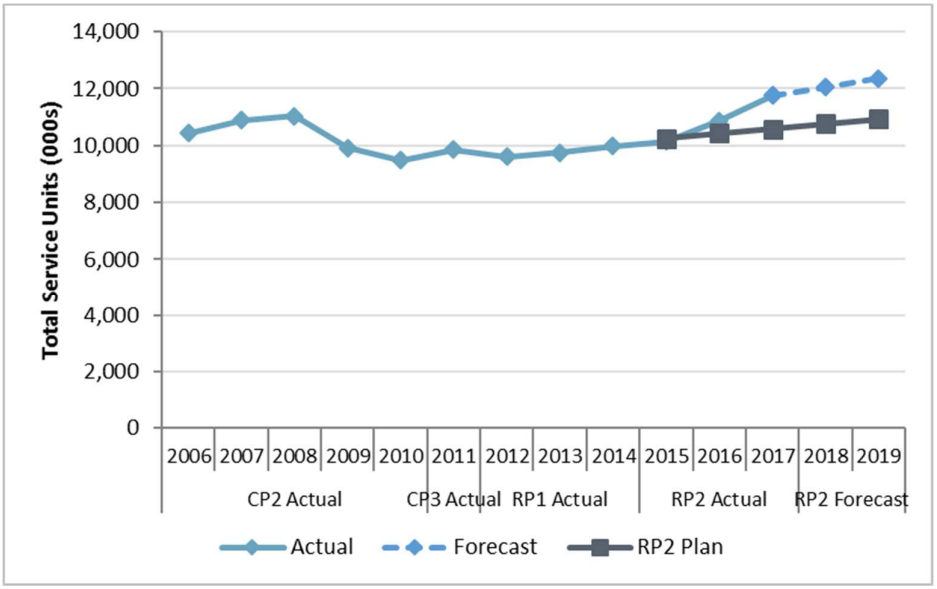
NERL business plan for RP2

3.1 When the United Kingdom and Ireland submitted their FAB Performance Plan for Reference Period 2 (RP2) in 2013, the context underlying the assumptions made for NERL in the performance plan and in its business plan was different from today.

3.2 In 2012 and 2013, traffic had been lower than planned (-6.9% and -8.6% respectively), and while NERL's actual en-route costs for both 2012 and 2013 were lower than its RP2 Performance Plan (by -€39 million and -€18 million respectively (2009 prices), this was not enough to compensate for the drop in traffic, with NERL generating a net loss of -€7.4 million in 2013 (2009 prices) on the en-route activity.

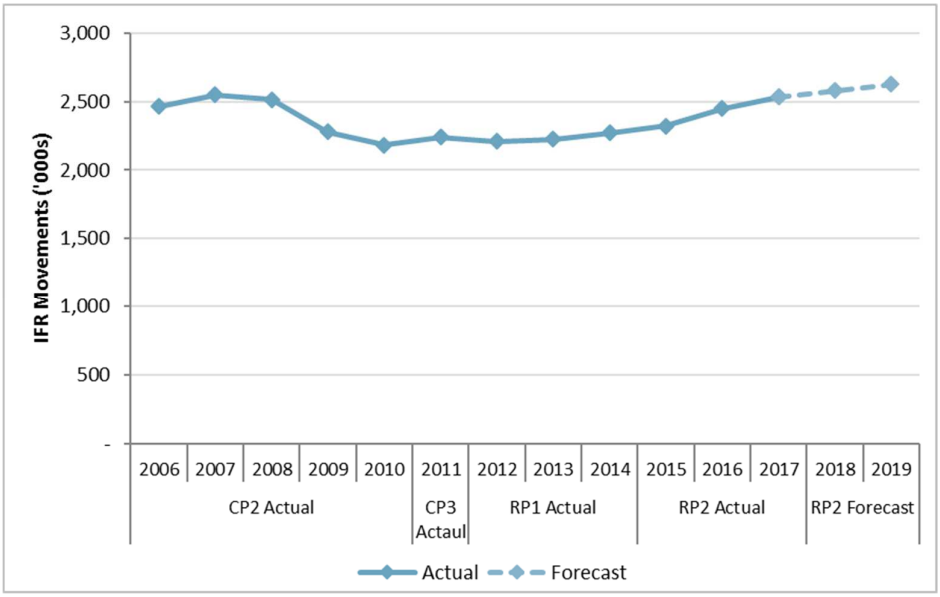
3.3 For RP2 (2015-2019), the traffic growth forecast by NERL in its Performance Plan was higher than STATFOR February 2014 baseline scenario (+2.6% p.a. vs +1.8% p.a. respectively). However, NERL's forecast was nevertheless lower than the outturn and current projections, as shown in the chart below. Actual volumes in 2017 were higher than in the previous peak year, 2008. Forecast traffic data is taken from STATFOR's February 2018 forecast for UK en-route. This is shown in Figure 3.1 in terms of total service units (TSUs) and in Figure 3.2 in terms of IFR flight movements.

Figure 3.1: NERL en route total service unit traffic volumes – RP2 plan, actual and forecast



Source: Steer analysis of Performance Plans, STATFOR (2006-2017 actual, 2018-19 forecasts)

Figure 3.2: NERL en route IFR movement traffic volumes – actual and forecast



Source: STATFOR (2006-2017 actual, 2018-19 forecasts)

3.4 The UK also forecast a (-5.3% p.a.) annual en-route Determined Unit Cost (DUC) decrease over the 2014-2019 period, which was more ambitious than the Union-wide cost-efficiency target (i.e. -3.3% p.a.), due to the fact that Determined Costs (DCs) were planned to fall by -2.8% p.a. The fall in determined costs was expected to be driven by a decrease in costs in all categories:

- Staff costs (-2.4% p.a.), reflecting a planned reduction in NERL staff numbers (-100 staff), pay allowances capped at inflation level, and lower allowances for pension costs;
- Non-staff operating costs (-1.0% p.a.);
- Depreciation costs (-2.9% p.a.);
- Cost of capital (-10.4% p.a.), reflecting both a declining asset base and a reduction in the WACC rate; and
- Exceptional costs (-5.7% p.a.).

3.5 NERL investments during RP2 were also planned to be on average -10% lower than for the period 2010-14 as the capital investment had been adjusted downwards in line with the traffic forecast.

Performance against RP2 plan

Traffic

3.6 The most significant change in the operational situation in the UK has been the realisation of materially higher actual traffic levels than foreseen in the performance plan, as illustrated above in Figure 3.1: Total service units were +4.2% in 2016 compared to RP2 PP and +11.2% in 2017. The higher than forecast average UK traffic has also led to significant increases of traffic in particular sectors of airspace, including the London TMA.

Table 3.1: En-route service units in RP2 for NERL: forecast and actuals

TSU	2015	2016	2017	2018	2019
Forecast in RP2 PP (in 000s)	10,244	10,435	10,583	10,758	10,940
Actuals	10,154	10,875	11,768	N/A	N/A

Source: Steer analysis of Performance Plans and PRB Monitoring Reports, STATFOR

Capacity

3.7 An important service quality target for NERL relates to capacity, measured in terms of average flight delay (in minutes). The capacity targets are set to include all causes of delay, not just ANSP-attributable delay. NERL consistently exceeded the capacity targets in the three years of RP1 until the end of 2015. Higher traffic experienced from the start of RP2 has led to changes in customer requirements, with capacity-based metrics (delay) being prioritised more at the start of RP2. In 2016, NERL did not meet its delay targets (0.31 minutes per flight vs target of 0.23 minutes), but improved to 0.17 minutes in 2017, within the target. Therefore across the first three years of RP2, NERL has achieved a better than target performance in two of the three years. NERL expects to incur a service penalty for 2018, and according to Eurocontrol data the average all causes delay per flight was 0.29 minutes, compared to the target of 0.23 minutes.

Table 3.2: En-route capacity target for RP2 for NATS Continental: forecast and actuals

ATFM mins delay per flight	2015	2016	2017	2018	2019
Forecast in RP2 PP	0.22	0.23	0.23	0.23	0.23
Actuals	0.08	0.31	0.17	N/A	N/A

Source: Steer analysis of Performance Plans and PRB Monitoring Reports

Cost efficiency

3.8 The UK's unit rate charged to airspace users (which is comprised of approximately 90% NERL costs, with the remainder made up by CAA, DfT and Met Office costs) has remained one of the highest in Europe over RP1 and the start of RP2. It gradually increased after 2011, but there is a current downward trend.

Table 3.3: En-route unit costs (including MET & NSA) for RP2: forecast and actuals (in GBP 2009 prices)

Determined unit-costs (GBP 2009)	2015	2016	2017	2018	2019
Forecast in RP2 PP	56.68	54.66	53.06	50.62	48.13
Actuals	56.00	52.63	46.95	N/A	N/A

Source: Steer analysis of Performance Plans and PRB Monitoring Reports

3.9 Since the start of RP2, NERL's actual unit costs have been below determined unit costs (in real terms). NERL anticipates that its unit costs will continue to fall over the remainder of the RP2 period.

3.10 In 2015, costs for NERL were c. £10.8 million under the determined cost forecast for 2015 in the Performance Plan, with a DUC slightly below the RP2 in real terms - 2009 prices (nominal costs were £25.7 million lower than planned, mainly due to savings in operating costs and lower exceptional items).

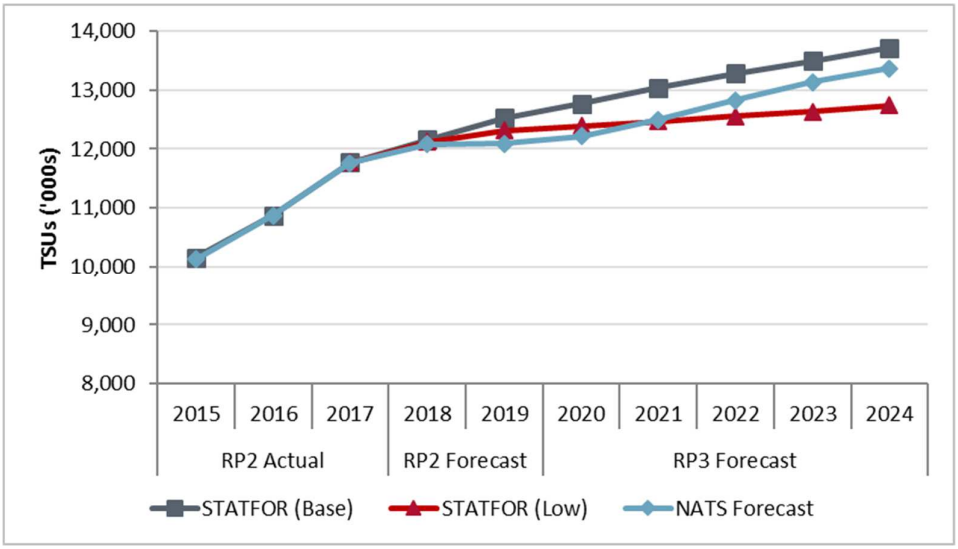
3.11 In 2016, actual unit cost for NERL was below determined unit cost forecast for 2016 by -4.1% (in real terms), reflecting in part the benefits of higher than expected traffic. Actual costs were £0.2 million lower than planned (2009 prices).

3.12 In 2017, NERL's unit costs fell sharply compared to planned unit costs (-12.3% in 2009 prices) due to a combination of costs that were lower than planned (£12.2 million in 2009 prices or -2.5%) and large increases in service units compared to the plan (+11.2%).

RP3 traffic forecasts in the BP

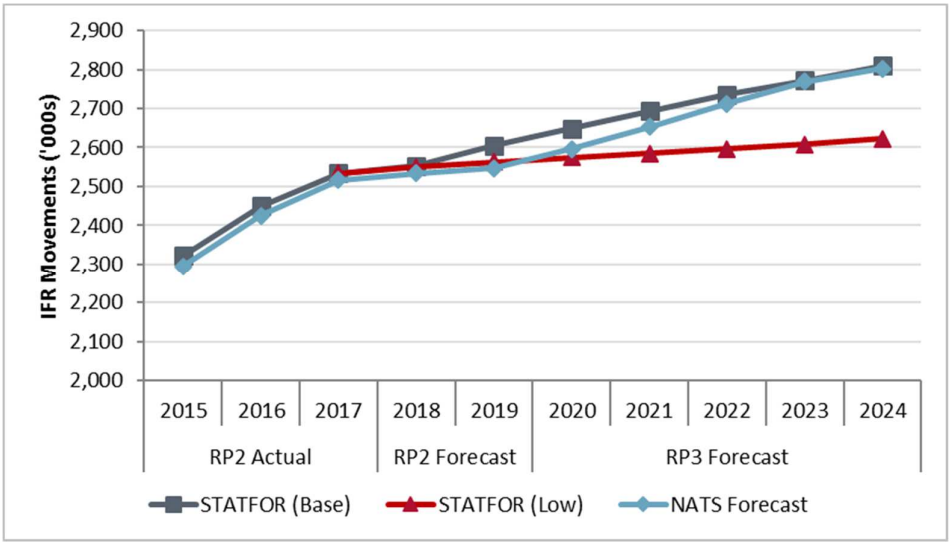
3.13 Figure 3.3 shows the NATS August 2018 traffic forecast, for the remainder of RP2 and RP3, against the latest STATFOR Base and Low case forecasts in terms of TSUs. Figure 3.4 shows the same in terms of IFR flight movements.

Figure 3.3: NERL and STATFOR total service unit historical and projected traffic (2015-2024)



Source: NATS 9 November 2018 data submission & STATFOR September 2018 Medium-term forecast

Figure 3.4: NERL and STATFOR IFR movement historical and projected traffic (2015-2024)



Source: NATS 9 November 2018 data submission & STATFOR September 2018 Medium-term forecast

3.14 STATFOR projects NERL's TSU traffic to increase slightly (+0.7%) in 2018 and grow throughout the last year of RP2 and throughout RP3: with a CAGR of +1.8% in RP3. NERL's TSU projection is below the level of the STATFOR Low forecast in 2019 and 2020 and is between the level of the STATFOR Low and Base forecasts for the remainder of RP3. However, although NERL's IFR movement projection is also below level of the STATFOR Low forecast in 2019 and 2020, it is almost equivalent to the level of the STATFOR Base forecast by the end of RP3.

3.15 As highlighted in customer consultation, NATS considers that the STATFOR forecast is overstated as it considers that these differences arise "mainly due to STATFOR overcorrecting for Monarch failure, Ryanair cancellations, and using 'northabout' flight projections". We have not requested additional detail on this from NERL as an assessment of the traffic forecast is not within the scope of this study.

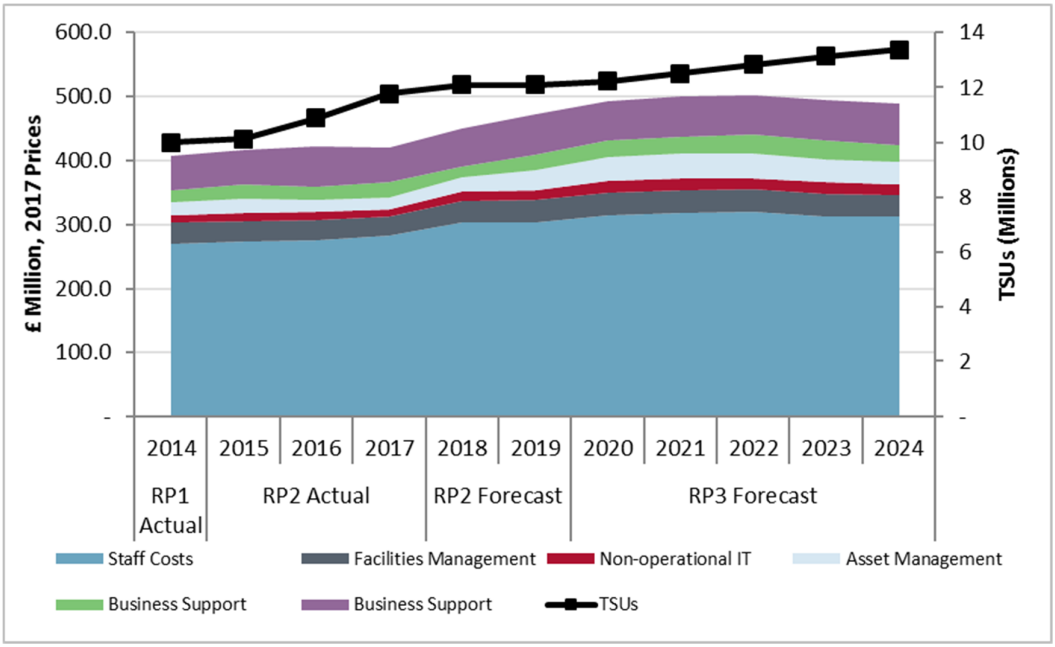
Analysis of NERL Operating Cost performance and projections

3.16 Figure 3.5 shows how NERL's operating costs (excluding pension and redundancy costs, but retaining labour costs which have been capitalised in NERL's accounts, and consistent with the staff cost figures in Appendix H of the BP), have developed since the final year of RP1 (2014). Latest forecast values for the last two years of RP2 (2018 and 2019) and RP3 were provided by NATS and are shown in the chart. The historical growth of traffic (in TSUs) is shown for comparison, with NERL's forecasts for UK en-route traffic also included.

3.17 The analysis of this data complements, but cannot be directly compared with the overall performance against the RP2 Performance Plan set out in the sections above. This is because the formal Performance Plan data also includes other factors affecting the Determined Cost (DC) and hence the Determined Unit Costs (DUC):

- NERL staff pensions and redundancy costs;
- NERL depreciation;
- NERL allowed returns;
- Reductions to account for non-regulated revenues; and
- Costs not due to NERL, i.e. MET, NSA (National Supervisory Authority), and DfT.

Figure 3.5: NERL's historical and projected operating costs in RP2 and RP3 (2014-2024)



Source: NATS 9 & 13 November 2018 data submissions

3.18 The chart demonstrates the dominance of staff costs in the overall operating cost base. Staff costs grew slowly in real terms since the start of RP2, with a real CAGR of +1.4% p.a. between 2014 and 2017, but are projected to rise significantly this year (2018), so that the CAGR 2014-19 is +2.3% p.a. (real-terms).

3.19 Based on NERL's traffic figures, traffic grew significantly with a CAGR of +5.6% between 2014 and 2017, so that real staff unit costs had a CAGR of -4.0% p.a. However, based on NERL's traffic forecast and the higher planned costs for the last two years of RP2, the real staff unit costs reduction over the period 2014 to 2019 is lower, with a CAGR of -1.5% p.a.

3.20 Other operating costs rose in 2015 and 2016, but fell back in 2017 to a level similar to that in 2014 (in real terms). Hence the CAGR from 2014 to 2017 was close to zero, at +0.3% p.a. Unit other operating costs fell with a CAGR of -5.1% p.a. over the same period.

3.21 Other operating costs are projected to grow rapidly in the last two years of RP2, with an average real terms growth rate of +10.7% p.a., resulting in a projected real CAGR of +4.3% p.a. over the whole RP2 period (CAGR 2014-19). In unit cost terms, other operating costs are projected to have a real CAGR of +0.4% p.a. over the 2014-19 period. The projected increases in costs in the final years of RP2 are analysed and discussed further in Chapter 7.

3.22 Notwithstanding the significant increase in costs in the final two years of RP2, NERL's operating costs are projected to remain relatively constant throughout RP3. Total costs are projected to grow with CAGR of +0.7%, with staff and non-staff costs growing with CAGRs of +0.6% and +0.8% respectively. Based on NERL's traffic forecast, this means unit total costs are projected to fall with CAGR of -1.3%, with unit staff and unit non-staff costs falling with CAGRs of -1.4% and -1.2% respectively. The corresponding data are shown in the table below.

Table 3.4: NERL historical and projected operating costs in RP2 and RP3 (2017 prices)

Cost Line	Units	RP1 Actual	RP2 Actual			RP2 Forecast		RP3 Forecast					CAGRs				
		2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2014-2017	2017-2019	2014-2019	2019-2024	2014-2024
Traffic	TSUs 000s	9,993	10,127	10,873	11,764	12,085	12,094	12,220	12,498	12,823	13,133	13,366	5.6%	1.4%	3.9%	2.0%	3.0%
Staff Costs	£m 2017 prices	**270.8**	**273.0**	**275.1**	**282.4**	**303.7**	**303.7**	**315.2**	**319.2**	**319.5**	**313.6**	**312.7**	**1.4%**	**3.7%**	**2.3%**	**0.6%**	**1.4%**
Facilities Management	£m 2017 prices	31.9	32.8	32.5	29.6	33.0	34.6	35.4	35.2	35.4	35.2	34.3	(2.5%)	8.1%	1.6%	(0.2%)	0.7%
Non-operational IT	£m 2017 prices	12.2	13.0	12.3	11.9	14.6	15.8	17.0	16.9	17.1	17.1	16.7	(0.9%)	15.6%	5.4%	1.0%	3.2%
Asset Management	£m 2017 prices	20.3	22.0	18.7	19.1	21.8	31.8	38.4	39.6	39.4	36.1	34.2	(2.0%)	29.0%	9.4%	1.5%	5.4%
Business support	£m 2017 prices	18.5	22.4	20.5	23.1	18.0	23.3	24.5	25.9	28.6	29.6	27.0	7.8%	0.3%	4.7%	3.1%	3.9%
Other	£m 2017 prices	54.0	52.4	62.5	54.2	58.0	63.5	62.6	62.4	61.8	62.7	63.7	0.1%	8.2%	3.3%	0.1%	1.7%
Total Non-staff Costs	£m 2017 prices	**136.8**	**142.6**	**146.5**	**137.9**	**145.3**	**168.9**	**177.9**	**180.1**	**182.2**	**180.7**	**175.9**	**0.3%**	**10.7%**	**4.3%**	**0.8%**	**2.5%**
Total Operating Costs	£m 2017 prices	**407.6**	**415.7**	**421.6**	**420.2**	**449.0**	**472.6**	**493.1**	**499.2**	**501.8**	**494.2**	**488.6**	**1.0%**	**6.0%**	**3.0%**	**0.7%**	**1.8%**
Total Cost Per TSU	£/TSU 2017 prices	40.8	41.0	38.8	35.7	37.2	39.1	40.4	39.9	39.1	37.6	36.6	(4.3%)	4.6%	(0.9%)	(1.3%)	(1.1%)
Staff Cost per TSU	£/TSU 2017	27.1	27.0	25.3	24.0	25.1	25.1	25.8	25.5	24.9	23.9	23.4	(4.0%)	2.3%	(1.5%)	(1.4%)	(1.5%)
Non-Staff Cost per	£/TSU 2017	13.7	14.1	13.5	11.7	12.0	14.0	14.6	14.4	14.2	13.8	13.2	(5.1%)	9.2%	0.4%	(1.2%)	(0.4%)

Source: NATS 9 &13 November data submissions

Summary and conclusions

3.23 Our conclusions from this analysis are as follows:

- Traffic has grown faster during RP2 than in the RP2 Performance Plan, with service units +11.2% higher in 2017 than in the Plan.
- NERL failed to meet its delay target in 2016 (and is expected to miss it in 2018), but has returned to being within the target level in 2017, as it was in 2015.
- Unit costs for en-route services in the first three years of RP2 fell below the planned DUC in 2016 (the last year for which the data was available).
- NERL's operating cost per service unit has fallen significantly since the end of RP1, with unit costs in 2017 being -12.4% below the 2014 cost level.
- NERL's operating costs are forecast to increase significantly in the final two years of RP2, which, together with its latest traffic forecasts, means unit operating costs are projected to increase by an average of +4.6% p.a. in 2018 and 2019.
- NATS August 2018 traffic projection is slightly below the level of the September 2018 STATFOR medium-term low forecast for the final two years of RP2, and between the STATFOR low and base forecasts throughout RP3.
- Total operating costs are forecast to remain relatively constant throughout RP3 (CAGR +0.7%), and unit total costs to slightly decrease (CAGR -1.3%), but, due to the significant growth in costs at the end of RP2, unit costs in 2024 are still forecast to be slightly above the 2017 level.

4 Stakeholder comments on RP2

Introduction

4.1 Interviews were held with stakeholders, as set out in Table 2.2 above. In addition to the CAA's Consumers and Markets Group, acting as client, we also spoke to the CAA's Safety and Airspace (SARG) and Future Airspace Strategy (FAS) groups.

4.2 We spoke to four airlines, British Airways (BA), Virgin Atlantic (VS), easyJet (EZY) and Ryanair (FR), as well as airline representative body IATA. In addition, we spoke to the Independent Reviewer (Grant Bremer) and to NATS Trade Union representatives (Prospect union representatives for ATCOs and Engineers, and PCS union representing support staff at NATS).

4.3 Many common themes emerged from these discussions, with broadly consistent views across many of them (although airlines and staff representatives had different opinions about operating costs).

4.4 The views of stakeholders contained within this chapter are those expressed during bilateral and multilateral stakeholder meetings with Steer and Helios. However, it should be noted that NERL has also undertaken extensive stakeholder consultation for RP3; the Co-Chairs' observations and conclusions on that consultation process is contained within the Co-Chairs' report[8].

Perspectives on RP2 experience

Planning for RP2

4.5 It was generally felt that the NERL's engagement with stakeholders in the run-up to RP2 had been a worthwhile exercise and that the consultations had been superior to those with other comparable ANSPs. NERL drew our attention to the Co-Chairs' report for RP2 and to the CAA's commentary, noting that the co-chairs' report had stated that the customer consultation working arrangements were appropriate, that meetings were well planned and receptive and that the consultation process addressed the CAA's mandated questions. NERL also noted that the CAA stated that the customer consultation "did provide a process for effectively identifying and acting upon trade-offs".

4.6 However, a number of serious concerns were expressed by stakeholders about the process and NERL's involvement:

- NERL was perceived as being good at "playing the game" of consultation, while not really taking account of stakeholders' views in a meaningful way;

8 https://www.caa.co.uk/uploadedFiles/CAA/Content/Standard_Content/Commercial_industry/Airspace/Air_traffic_control/RP3CustomerConsultationWorkingGroupReport.pdf

- information was provided by NERL too late in the consultation process to be useful (extracting the data was "like pulling teeth"), making it difficult for airlines to engage effectively;
- there was insufficient linkage between the individual projects and the benefits enabled for airspace users, with the capital projects being presented as a package, or as "spaghetti" which was hard to disentangle;
- the two options offered by NERL only covered a small portion of the overall capital programme and constrained the airlines into a narrow range of choices, with options outside this range not really considered; and
- there was concern that only a single point traffic forecast was used, not allowing any exploration of how to handle different outturns.

4.7 More broadly, there was a concern by stakeholders that the five-year regulatory period was too short a "snapshot" of the capital programme given the long timescales needed for technology and airspace development. This was borne out by the way in which the programme changed during RP2 and the difficulty in tracking and understanding the changes and resultant costs and benefits. Stakeholders would like to see a 10-year programme, with the Reference Period highlighted within this.

4.8 Staff representatives raised some points about the CAA's approach, of which they were critical and which was described as "vitriolic" in relation to what they felt was an excessive focus on costs, particularly staff costs. They felt the staff costs approach was driven by the report developed for the CAA by IDS, of which they were highly critical. The staff representatives also felt that the CAA micromanaged NERL's business plan, shaving costs off individual cost lines.

4.9 The staff representatives stated that the CAA had been, in RP2, hostile to the idea of contingency, but in practice the FFF (FAS Facilitation Fund) had been used as a proxy for contingency.

4.10 Unlike other stakeholders, the staff representatives felt that offering two options for RP2 had not been successful. They felt that airspace users had been "fickle", selecting the cheaper option but then complaining when service levels were lower than they wanted.

Experience during RP2

4.11 All stakeholders noted that the plan adopted for RP2, based on a particular capital programme focusing on legacy systems and the implementation of airspace change, was significantly changed soon after the start of RP2, with a new focus on technology change and with airspace change largely put on hold. It was recognised that circumstances largely outside NERL's control were responsible for the lack of progress on airspace change.

4.12 The airlines were generally unhappy with this change, since it meant that much of the discussions leading up to RP2 became redundant. From a process point of view, this was described as "unacceptable" (IATA), and airlines generally felt that:

- they were no longer getting the benefits promised (principally from airspace change);
- they were not able to understand the costs and benefits of the new programme as explained by NERL; and
- the airlines effectively were given no choice about the change of strategy.

4.13 Despite these concerns, it does appear that the airlines broadly felt that the change of strategy to technology-first was reasonable, and some stakeholders had more confidence in NERL's ability to deliver this strategy, given their strengths in managing deployment of technology.

The airlines also felt that the change of strategy fitted with emerging political issues which made delivery of airspace change, in particular LAMP2, difficult (and accepted that this was largely outside NERL's control). However, looking forward to RP3, the airlines were concerned about whether, and when, the previously promised airspace change delayed from RP2 would be delivered.

4.14 CAA SARG/FAS groups felt that the change to the technology-focused strategy may have been triggered by the appointment of a new CEO at NATS with a more technical background.

4.15 Following the initial change to the strategy, there was subsequently a second change involving a significant cost uplift to the programme, although at the time additional INEA funding became available, so that there was no net impact on user charges. The airlines again felt that they had little option but to accept the proposed changes. Considerable suspicion was expressed about the fact that the INEA funding was of a similar level to the changes in cost for the capital programme. IATA said that some consideration had been given to making the case for a re-opening of the RP Performance Plan settlement in response to the change, but on balance it had been felt that involving Brussels would not have been helpful.

4.16 Airlines generally felt that costs during RP2 were too high, with one stating that there was clearly a lot of "padding" in the planned operating costs (opex). It was stated that NERL's charges were among the highest in Europe.

4.17 On the other hand, there was criticism that NERL found itself short-staffed when traffic rose above the levels forecast for RP2. Ryanair was particularly concerned that it had suffered frequent delays at Stansted (STN) due to ATCO non-availability. It is noted that this issue has been the subject of an investigation by the CAA, who found that NERL had complied with its licence.

Capital programme

4.18 In relation to the capital programme, there was a widely held stakeholder concern about the trace-ability of the programme through time, as NERL tended to change the naming of its technical projects on a regular basis. It was also felt that the level of detail presented was superficial (slide-packs), rather than going into sufficient detail to allow stakeholders genuinely to understand what would be delivered and the drivers of costs. A key concern was the lack of links between costs of the programme and the "enabled benefits" which airspace users would consequentially enjoy. For example, it was felt that the benefits for airlines from the proposed adoption of space-based ADS-B on oceanic routes were purely notional and not credible.

4.19 Airlines generally had a concern that they were paying twice for contingency – once as part of individual project costings and again through the cost of capital, or through contingency lines.

4.20 IATA made the comment that NERL's development costs appeared to be very much higher than those of other ANSPs, including other major European ANSPs with similar levels of complexity in their airspace. NERL highlight that, according to the Eurocontrol PRU ACE reports, London TMA is by far the most complex area of European airspace.

Airspace issues

4.21 Airlines were generally unhappy about the delays to the implementation of airspace change in RP2, particularly the delivery of changes to the London TMA (LAMP2). However, as noted above, there was some understanding that this delay was largely due to factors outside NERL's control.

4.22 At the time of the interview, there was a lack of clarity among some stakeholders about when LAMP 2 would now be delivered, with some expecting this to happen during RP3 while others were concerned that it would not in fact occur until the end of RP3 or in RP4.

4.23 In general, airlines emphasised the importance to them of the airspace changes being delivered. However, they had different emphases on which elements were most important, driven by their particular situation (for example, Ryanair focused on changes to airspace around Stansted airport). Key elements of airspace change which were mentioned as high priority were LAMP 2 and Free Route Airspace.

4.24 Airlines (and CAA FAS group) stated that airspace change was necessary for LHR R3, but that it should not be linked to it. In the event that R3 was delayed, it was important that airspace change still went ahead to provide capacity in the South East of England more generally.

4.25 A number of stakeholders commented on the need for political leadership to implement airspace change. It was noted that changes to lower airspace can lead to public complaints about noise from overflown communities. In consequence, this has made NERL very cautious about becoming involved in discussions about lower airspace. However, the individual airports state that they do not have the expertise to redesign lower airspace themselves and need help from NERL (a view confirmed by CAA FAS group). In addition, different airports have different and potentially competing interests in relation to airspace redesign.

4.26 In this situation, it was felt unrealistic to expect NERL to drive forward airspace change on its own. Stakeholders felt that the lead should come from DfT, with CAA in support.

4.27 In addition to the political environment, there were also concerns about NERL's capabilities to develop airspace change. It was commented that NERL could have continued to do some work on airspace change despite the delay to LAMP, but instead chose not to do this, running down its capability.

Oceanic

4.28 The airlines were universally opposed to the planned introduction of space-based ADS-B during RP3, as they felt the costs were unjustifiably high and they did not believe that the "enabled benefits" stated by NATS would actually be achieved.

4.29 The airlines wanted the CAA to look at this, as they feel they are being ignored on this issue.

Staff and operating cost issues

4.30 Many stakeholders made comments about staffing and operating cost issues. While staff representatives and airlines, understandably, had different comments on the levels of staff required, there was a common theme in relation to NERL's staff planning processes.

4.31 NATS Trade Union representatives were critical of NERL's approach to staff planning, which they felt was inadequate, with no real link between the strategic planning level and day-to-day rostering. It was noted that four years ago, i.e. immediately before the start of RP2, there was no workforce plan at NERL (or at NATS more widely). While this has now improved, the plan is still "not fully there".

4.32 NERL's handling of the economic downturn before the start of RP2 was poor. NERL decided to "turn off the tap" of ATCOs, cutting staff numbers and strongly reducing the level of staff training. Given the lead time to train staff, this had long-term consequences when traffic subsequently rebounded. The NATS Trade Union representatives said that NATS was close to

closing its own training college, but was dissuaded from doing so. However, it was used for external candidates, rather than for NATS's own staff[9]. Currently, the college does not have enough trainers to cope with the throughput of trainee ATCOs planned as part of catch-up process to increase the number of ATCOs.

4.33 The problems with ATCO availability were exacerbated by the fact that actual ATCO numbers fell below the (already falling) planned number of ATCOs. This was partly due to new pensions legislation, which may have incentivised ATCOs in their late fifties to take retirement earlier than they would previously have considered. The NATS Trade Union representatives noted that the resulting strain on remaining staff has led to further staff considering retirement. They noted that NATS's working practices with regard to rostering were inflexible[10], making the role less attractive to working mothers and carers.

4.34 The current programme of updating NERL's technology has led to a need for additional engineering staff, and the resultant gaps have been filled by contractors. The NATS Trade Union representatives noted that there can be tensions between capital projects and normal service delivery, since ATCO staff are needed to help test new systems, but are then not available for their normal roles.

4.35 Looking forward to RP3, there will be a need do a lot in parallel – running legacy systems, delivering the new systems and running the staff training programme. This is likely to lead to a need for more flexibility, which in turn will lead to a need for more ATCOs. The NATS Trade Union representatives would like to see more flexible rostering, so there may be a need for more growth in ATCO headcount than in the number of FTEs.

4.36 In contrast to the NATS Trade Union representatives, other stakeholders did not feel that there was a need for additional staff. IATA commented that there was a lot of "padding" in the RP2 opex plan and that they did not accept that a requirement for greater resilience should lead to additional ATCOs. However, they did accept that the changes to technology meant that there might be a need for more technical staff at NERL.

4.37 An airline commented that NERL needs to put more focus on its manpower planning, with more flexibility between different sectors, helping to reduce the number of staff rostered at any one time. Another airline suggested that tweaks to rostering could be made to improve productivity.

4.38 In relation to NERL's ability to plan staffing, there was more agreement between stakeholders. The Independent Reviewer felt that NATS had not demonstrated that its staff planning processes at the time fully captured the causal relationship between increases in traffic and the increases in its operating costs (including staff) during RP2.

FAS Facilitation Fund (FFF)

4.39 A number of airlines commented on the operation of the Future Airspace Change (FAS) Facilitation Fund (FFF). This was established to help deliver airspace change, which in the event has not been delivered to the extent intended during RP2. Although there is no suggestion of misgovernance, and all spending was agreed by the steering committee, some

[9] NERL stated that these practices are largely a result of collectively bargained agreements, which Trade Unions have been highly reluctant to change.

[10] NERL stated that these practices are "largely a result of collectively bargained agreements".

airlines felt that the FFF had been used for purposes for which it had not originally been intended. In particular, the funding of the Meteorological Office staff at Swanwick, while agreed by the airlines as a practical solution, was not considered to fit with the purpose of the fund. It was commented that the FFF has become "a bit of a dumping ground".

4.40 NATS Trade Union representatives stated that the FFF was set up partly because the then CAA management was strongly opposed to the idea of including contingency in NERL's funding. As a consequence, the FFF has partially been used as a substitute for this. For RP3, they would prefer contingency to be placed back into the general NERL settlement, possibly with a mechanism for refunding unspent funds.

Focus for RP3

4.41 The concept of delivering technology change first and airspace change afterwards was broadly understood and accepted.

4.42 However, airspace change during RP3 was stated as important or essential by most stakeholders. The Independent Reviewer noted that NERL does not intend to start the LAMP airspace change until the Common Platform technology is in place in 2023, meaning that, at best, LAMP will not happen until the end of RP3. NERL states that airspace change will take place throughout RP3.

4.43 It was agreed that resilience was important, but airlines did not accept that this should lead to higher costs (whereas NATS Trade Union representatives felt this was inevitable). A capability to handle bad weather and the resultant disruption was requested by some airlines.

4.44 The need for an improved consultation process was stressed, with NATS providing more information and in particular:

- More detail on manpower planning and the evolution of staff FTEs by group
- Cost benefit analysis / business cases for proposed projects should be provided to stakeholders early in process
- More standardised tracking of projects through SIP
- Visibility of a longer-term plan (e.g. 10 years), with the RP as a snapshot within this.

4.45 There should be a process for ensuring that airlines get what they have paid for in RP3, and a compensation mechanism for repaying money in the event that this does not happen.

Summary and conclusions

4.46 The key stakeholder views which we have identified from stakeholders' feedback are as follows:

- The RP2 planning process was welcome, but airlines felt NATS did not provide sufficient information or allow genuine consultation.
- A 10-year view of the capital and airspace development programmes would be helpful.
- The changes to NERL's strategy during RP2 meant that the work in the planning phase was wasted. There was suspicion about the fact that the increase in costs in SIP17 was balanced very closely by INEA funding.
- NERL did not provide sufficient information about its capital programme to allow users to understand the real trade-offs between costs and benefits. Its approach was described as "back-to-front", first deciding on the programme and then retro-fitting the benefits.
- Airlines accept the concept of enhancing NERL's technology before implementing major changes to airspace, but are concerned about when airspace change will actually happen.

- Airlines raised concerns about the cost-benefit of the proposed adoption of satellite-based ADS-B technology on Oceanic routes during RP3 as they consider that it is expensive.
- NERL's staff planning processes are considered by some stakeholders to have not been as robust and dynamic as needed by the changing market situation. The reduction in trainee numbers for two years during RP2, in hindsight, was a mistake.
- Some stakeholders felt that the FFF had been used for purposes for which it had not originally been intended, although there is no suggestion of misgovernance and all spending was agreed by the steering committee.
- For RP3, stakeholders emphasised the importance of airspace change and improved information on both the capital and staff development programmes.

5 Staff costs in RP2

5.1 Staff 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). In this chapter we consider these elements in turn, looking at planned and 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[11] and other comparable sectors.

5.2 We then consider how staff productivity at NERL has evolved and how it compares to productivity trends in the wider economy. We assess the historical relationship between staff, costs and traffic (the underlying demand driver for ATC services).

5.3 Finally, we consider an appropriate model for assessing staff costs in RP3, taking account of the different factors which drive staff numbers and unit costs. This has been used to review the staff element of operating costs put forward in NERL's BP.

5.4 The assessment of staff costs is required to inform the CAA's assessment of the overall cost efficiency path for NERL during RP3. 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.

Staff Costs

5.5 Staff costs are made up of the following:

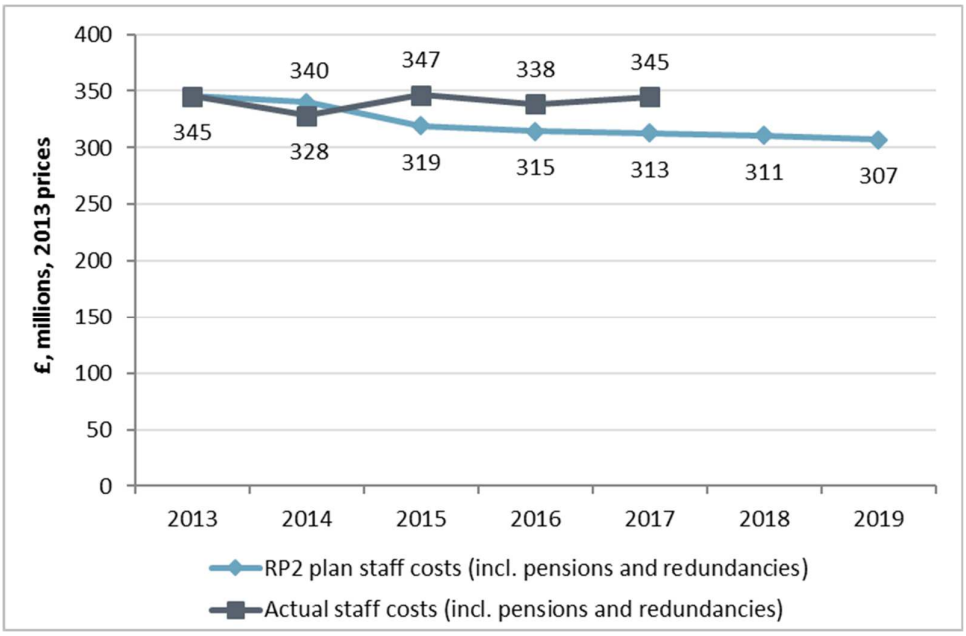
- costs of wages and salaries;
- other staff costs;
- pension costs;
- other non-pensionable staff costs (company-wide and management bonuses, holiday pay, share scheme etc.); and
- social contributions.

5.6 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 and not an analysis of pension fund deficits or any associated funding requirements. 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 chapter.

[11] DFS, DSNA, ENAIRE, ENAV and NATS.

5.7 Figure 5.1 below shows the planned and actual staff costs (including social security, pension and redundancy costs) in real terms[12] for NERL over 2013 to 2017. Staff costs were £345 million in 2013 and were planned to decrease by an average of -2.4% (CAGR 2013-2017) over 2014 and the first three years of RP2. In practice, staff costs have remained constant in real terms with 0.0% CAGR between 2013 and 2017 and were higher than planned by +8.6% in 2015, +7.6% in 2016 and +10.1% in 2017. The increased staff costs were driven by increased staff numbers compared to plan, and increased unit staff costs per FTE. These are analysed in more detail in the sections that follow.

Figure 5.1: NERL (UKATS & Oceanic) planned and actual staff costs (2013-2017)



Source: NATS RP2 Financial model and 23 April 2018 data submission

5.8 Figure 5.2 shows the planned and actual capitalised labour costs since 2013 in real terms (£2013). NATS explained that cumulatively, over 2015 to 2017, capitalised labour was +£33.7 million higher than planned. This was driven by a +£17 million volume variance and a +£16 million unit-cost variance. The main drivers of the variance were:

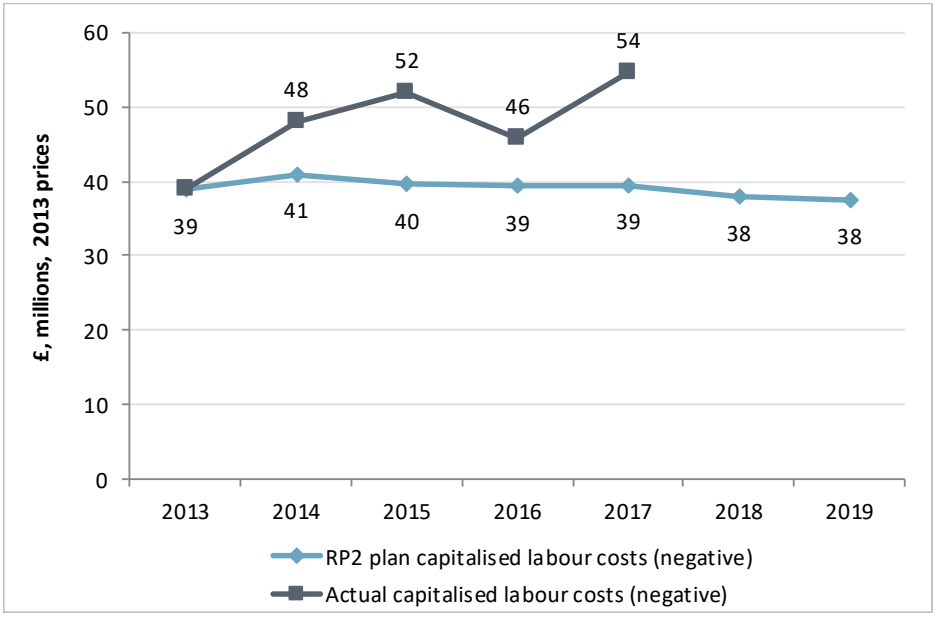
- Increased ATCO resources on airspace projects: although less has been spent on LAMP and Transition Altitude than planned, this has been offset by increases to Prestwick Lower Airspace Systemisation and new projects including Swanwick Airspace Improvement Project, Independent Parallel Approach and Farnborough Airspace Change. These projects were agreed with customers through the Service and Investment Plan consultation but use more expensive ATCO resources than originally planned for LAMP.
- Acceleration of DSESAR Programme: significantly less capital has been spent on maintaining legacy systems than originally planned, with investment focused on new

[12] In this and charts below, trend data has been expressed in 2013 prices. Plan values for subsequent years are deflated by the CPI index assumed in the RP2 Plan developed during 2013, while actual values for years after 2013 are deflated by the CPI index resulting from outturn inflation.

technology and systems on new architecture instead. These have required specialised skills and have mainly been supported in the form of contractors, who are more expensive than in-house staff. Further, more ATCO resources have been used for validation, testing and simulations of the new technology.

- Conversion of external to internal contractors: during 2017, a number of staff, previously planned as external capital, were converted to internal contractors and capitalised as labour. While this did not change the overall amount of capital expenditure, it increased the extent of capitalised labour by +£4 million. This was done to enable greater flexibility in resources deployed to capital projects.
- NERL stated that a further reason for the switch to capitalised labour costs was to provide greater visibility of the contractor pool and hence manage the headcount delivering the capex programme more effectively.

Figure 5.2: NERL (UKATS & Oceanic) planned and actual capitalised labour costs (2013-2017)

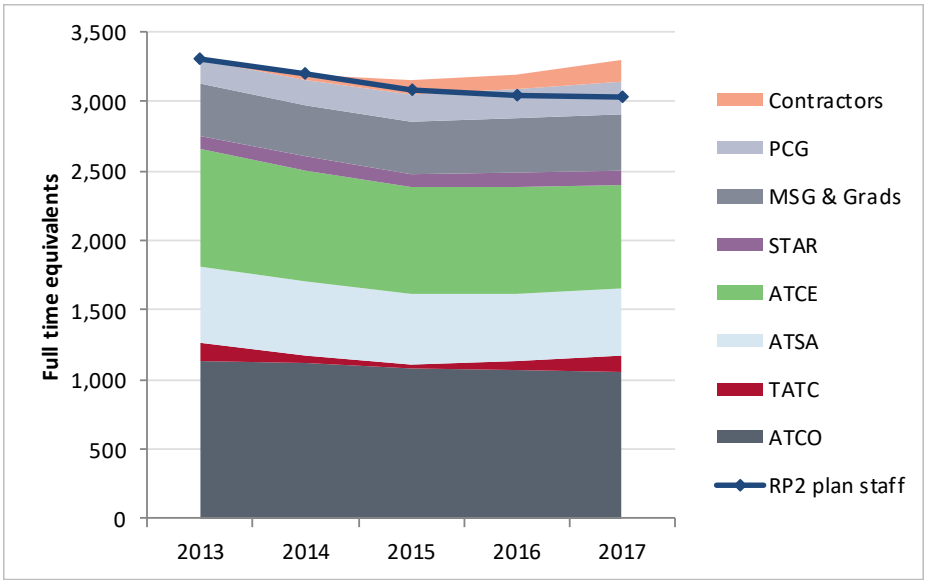


Source: NATS RP2 Financial model and 23 April 2018 data submission

Staff numbers

5.9 NERL's total staff in the first years of RP2 was higher than that planned. Figure 5.3 below shows the actual staff numbers by employee function since 2013, as well as the total number of staff in the RP2 plan. Total staff was planned to be 3,087 FTEs in 2015 and was planned to reduce, but in practice was higher by +2.2% in 2015 and has grown to be +5.1% higher in 2016 and +8.7% higher than planned in 2017. Part of this increase is attributed to the transfer of 24 Directorate of Safety FTEs, which were previously allocated as a non-staff cost, who transferred from NATS Ltd to NERL in 2015. Total staff for the remainder of RP2 was planned to be 3,040 in 2018, reducing to 3,031 in 2019.

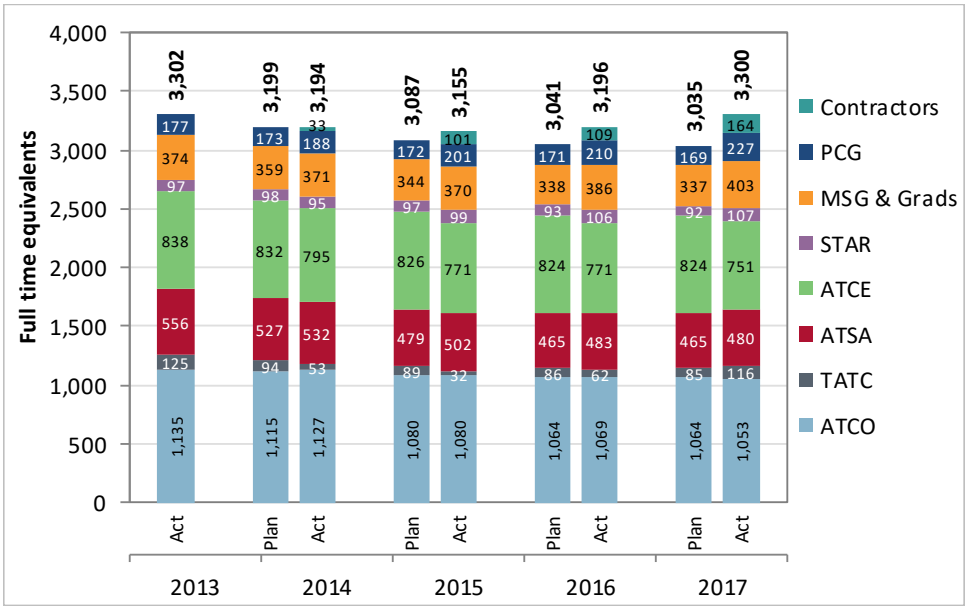
Figure 5.3: NERL (UKATS & Oceanic) actual staff by function and total planned staff (2013-2017)



Source: NATS RP2 Financial model and 23 April 2018 data submission

5.10 Figure 5.4 below shows the planned and actual staff numbers by employee function between 2013 and 2017. The increased staff has been predominantly driven by PCG, MSG & Graduate staff, as well as contractors and air traffic assistants (ATSAs).

Figure 5.4: NERL (UKATS & Oceanic) planned and actual staff (2015-2017)



Source: NATS RP2 Financial model and 23 April 2018 data submission

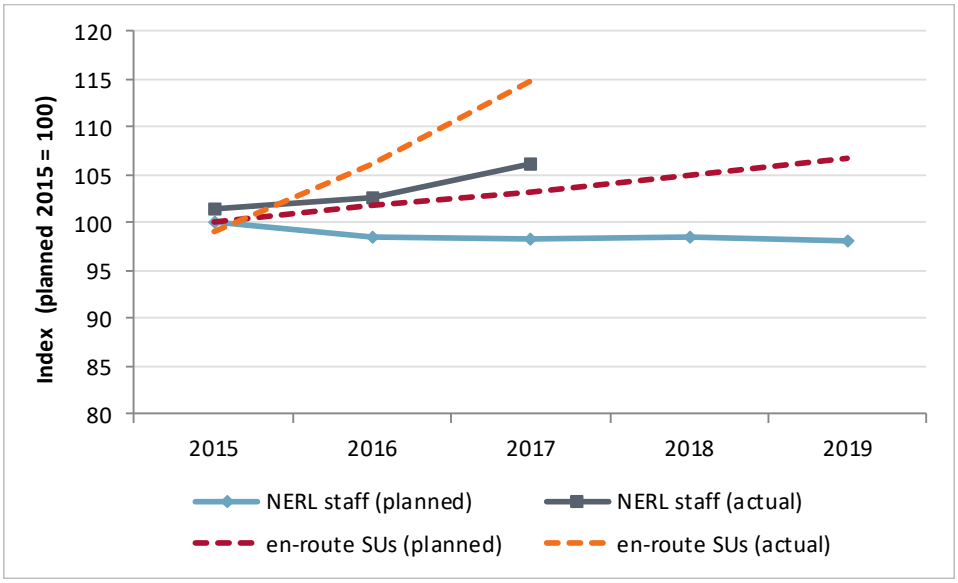
5.11 As described previously, the operating environment in the first years of RP2 was very different to that assumed when NERL prepared its performance plan in 2013. As well as traffic volumes exceeding the planned levels, NATS explained that airspace change had not progressed as assumed, meaning that this traffic had to be handled on outdated airspace structures. NERL

adjusted its operational and engineering resources to respond to this, recruiting engineers and flexible contract staff to accelerate the upgrade of its core ATC infrastructure.

5.12 Increased recruitment and training of ATCOs (shown as TATCs during training) in 2017 followed two years when there were fewer TATCs than planned. Overall, over the first three years of RP2, NERL had trained 210 ATCOs compared to 260 assumed in its plan – presumably this also started being reflected in the number of operational ATCOs, which in 2017 was -1.0% lower than planned, despite the increased in traffic. The additional ATSAs may alleviate this situation by allowing ATCOs who might have been on other duties to instead focus on front line operations.

5.13 Figure 5.5 shows planned and actual NERL staff (based on the assumptions in the NATS financial model), alongside planned and actual en-route service units for RP2, indexed to the planned value for 2015. Staff was assumed to decrease by -0.5% (CAGR 2015-2019) over RP2, in a context of modest assumed traffic growth of +1.7% (CAGR 2015-2019). In practice, staff was +5.1% higher than planned in 2016, in the context of a comparable outcome between planned and actual en-route service units (+4.2%). Staff was +8.7% higher than planned in 2017, with actual en-route service units +11.2% higher than planned. The long-term relationship between staff, costs and traffic is explored later in this section of the report.

Figure 5.5: NERL (UKATS & Oceanic) index of RP2 planned and actual staff, planned and actual en-route Service Units



Source: NATS (20180328 analysis of NERL RP2 historical operating costs) & NATS RP2 Financial model & PRB Monitoring report 2016 & STATFOR September 2018

Pay

5.14 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.

5.15 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

5.16 PCGs are not represented by a recognised trade union collectively, although some PCGs are members of the unions above.

5.17 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.

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 are 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.

5.18 [✂] .

5.19 Figure 5.6 and Figure 5.7 show the planned and actual average pensionable pay for ATCOs and support staff in real terms (£ 2013, deflated with the Plan or actual CPI, respectively). Support staff is defined as all employees other than ATCOs (but including trainee ATCOs). Pensionable pay per FTE was above the plan for ATCOs and support staff in 2014, 2015 and 2016. Actual pensionable pay per FTE reduced in 2017 compared to 2016 for both ATCOs and support staff due to the introduction of non-pensionable pay as agreed in the relevant pay deal. Pay for ATCOs remaining +1.4% above the plan, while pay for support staff moved below plan by -3.3%.

Figure 5.6: NERL (UKATS & Oceanic) planned and actual ATCO average pensionable pay

[✂]

Source: NATS RP2 Financial model and 23 April 2018 data submission

Figure 5.7: NERL (UKATS & Oceanic) planned and actual support staff average pensionable pay

[✂]

Source: NATS RP2 Financial model and 23 April 2018 data submission

5.20 Pay awards up to 2015 were based on August to August CPI and from 2016 onwards are based on the actual calendar year CPI of the previous year and are applied from January the following year. This lag means that there may be a difference between the pay award and actual CPI for a given calendar year. Figure 5.8 below shows the planned (based on forecast CPI) and actual pensionable pay index, as provided by NATS, as well as the outturn CPI index. [✂] .

The cost sharing inflation mechanism applicable under the SES Regulations means that that if outturn inflation is below that planned, then the resulting cost differences are returned to airspace users in year n+2 and vice versa so CPI risk is effectively borne by the airspace users. There are, however, impacts on cash flow.

5.21 Additionally, non-pensionable pay awards of 0.5% and 1.0% were given in 2016 and 2017, as well as a one-off non-pensionable lump sum payment of £2,000 per FTE in 2016. There were no assumptions for separate pensionable/non-pensionable pay awards in the RP2 plan, as this was introduced as part of the 2016/17 pay award.

Figure 5.8: NERL (UKATS & Oceanic) index (2013=100) of planned and actual pay awards

[✂]

Pay awards	2014	2015	2016	2017
Planned CPI pensionable pay award	[✂]	[✂]	[✂]	[✂]
Actual pay pensionable pay award	3.0%	1.5%	0.5%	0.2%
Actual CPI	1.5%	0.0%	0.7%	2.7%
Actual non-pensionable pay award	0.0%	0.0%	0.5%	1.0%
One-off non-pensionable lump sum per FTE			£2,000 Total NERL cost: £6.9m incl. NI	

Source: NATS RP2 Financial model and 23 April 2018 data submission

Note: Pay awards are based on the previous year's CPI Benchmarking of labour unit costs

5.22 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 Gatwick, 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. In many countries there are tight labour conditions with a shortage of available ATCO staff.

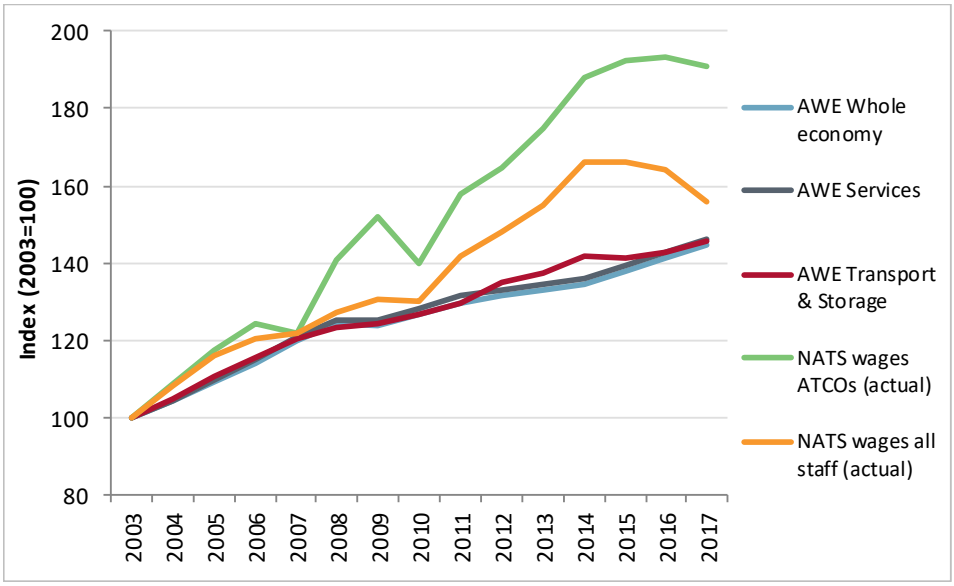
5.23 Here we benchmark the trend of staff costs for NATS against the wider UK economy, and the level of NATS staff costs against those of other large ANSPs. We also show how ATCO wages and salaries compare with those of other safety-critical jobs in transport.

Evolution of NATS salaries

5.24 The evolution of average wages for ATCOs and average wages for all staff at NERL since 2003 is shown in Figure 5.9 alongside the trends in average weekly earnings (AWE) for the whole economy, for the services sector and for the transport & storage sector. The figure also includes the projected growth in average wages for NERL in RP2, taken from the NATS financial model.

5.25 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 since from 2009 through to 2017, slowing slightly in the last three years. 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 other staff wages, respectively, grew by an average of +5.7% (CAGR 2003-2013) and +4.4% (CAGR 2003-2013) annually, compared with +3.2% (CAGR 2003-2013) for AWE in transport & storage and +2.9% (CAGR 2003-2013) in the wider economy.

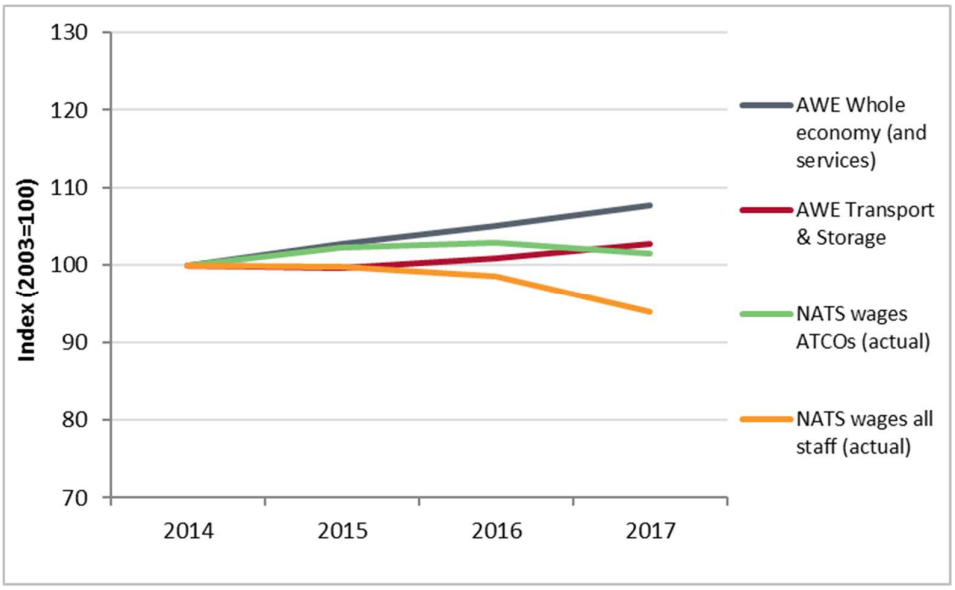
Figure 5.9: Index (2003=100) of Average Weekly Earnings (AWE), nominal.



Source: NATS RP2 Financial model, 23 April 2018 data submission & Office for National Statistics

5.26 Looking at trends from 2014 (Figure 5.10), wages at NATS for ATCOs and, particularly, other staff, have grown more slowly than those in the broader transport and service sectors and across the wider economy, indicating that NERL has been able to control unit pay costs during RP2.

Figure 5.10: Index (2014=100) of Average Weekly Earnings (AWE), nominal.



Source: NATS RP2 Financial model, 23 April 2018 data submission & Office for National Statistics
Note: The 2014-2017 index for AWE whole economy and AWE service is the same

Comparison with other ANSPs

5.27 To assess the level of staff costs at NERL, we have relied on ATM Cost Efficiency (ACE) and CANSO benchmarking data. The resolution of this 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, however this is possible at the all staff level. As a result, below we show:

- Total unit costs for ATCOs in OPS, including pensions and social costs; then
- Total unit costs for all staff, including pensions and social costs; before then isolating Unit wages and salaries for all staff, excluding pensions and social costs.

5.28 The data presented in the figures below is for 2016.

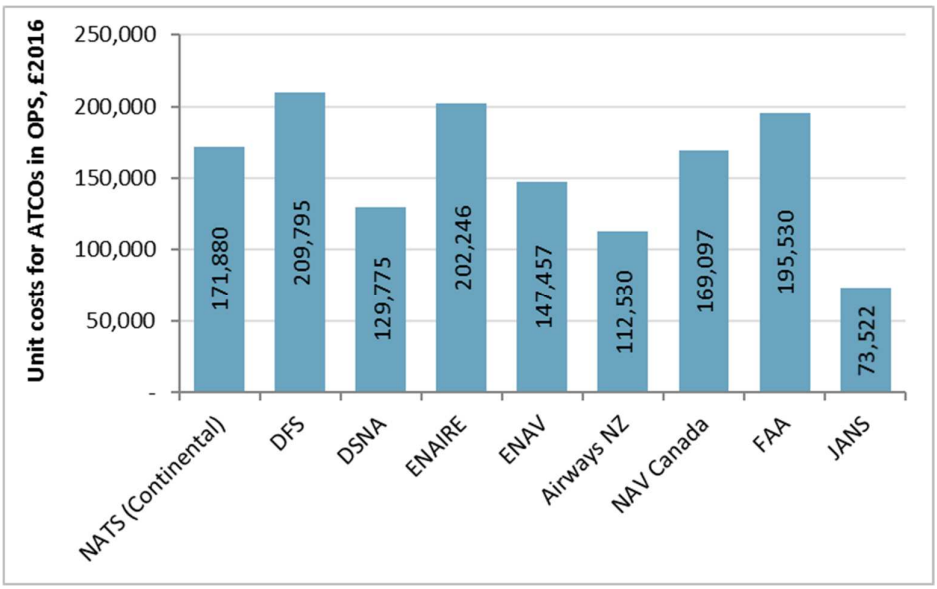
5.29 The ANSPs included in the analysis are:

- 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.

5.30 The charts below compare unit salary costs across all the ANSPs listed above (including pension costs), and then for the subset of the five largest European ANSPs (with and without pension costs). The data is presented in real 2016 prices and has not been purchasing power parity (PPP) adjusted.

5.31 The unit cost (including pensions) for ATCOs at NATS was 11% higher than the average across the other large ANSPs globally in 2016 (or 3% higher if JANS is not included), as shown in Figure 5.11. Although it should be noted that some smaller European ANSPs (including AustroControl, BelgoControl, and Skyguide) had higher costs, it should also be noted that funding arrangements for pensions differ across different ANSPs.

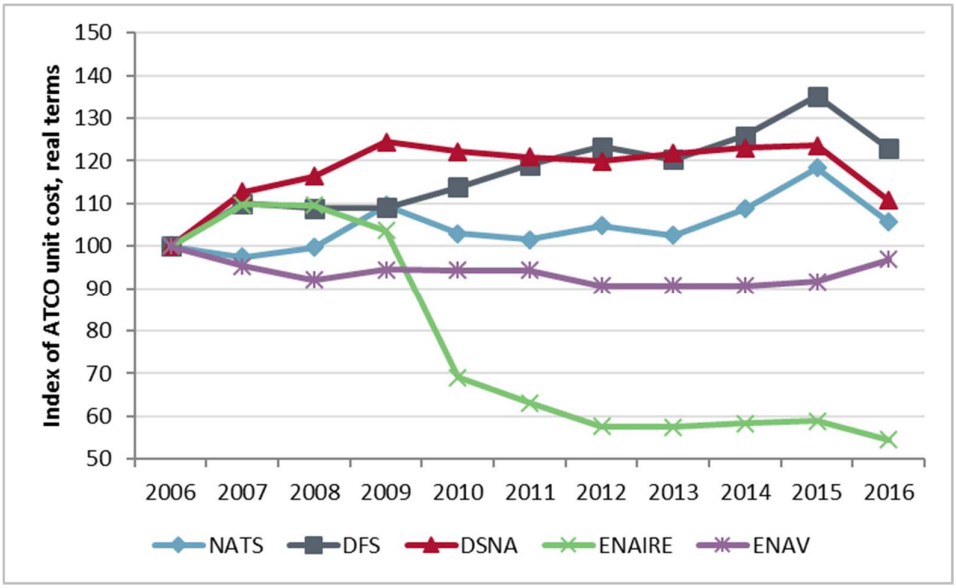
Figure 5.11: 2016 unit costs (incl. pensions and social costs) for ATCO in OPS, £2016



Source: ACE (in EUR) & CANSO (in USD) benchmarking data, Eurostat 2016 average market exchange rates to GBP

5.32 Figure 5.12 below shows the trend in unit cost (including pensions) for ATCOs at NATS and other large European ANSPs, in real terms. Overall, NATS lies behind DFS and DSNA in terms of growth in ATCO employment costs between 2006 and 2016, and although NATS's (and DFS's) ATCO unit costs grew strongly between 2013 and 2015, they dropped significantly in 2016 (as did DFS and DSNA). The significant reduction in ATCO unit costs at ENAIRE in 2010 was the result of the restructuring of the ANSP.

Figure 5.12: Index of ATCO unit costs (incl. pensions), real terms (2006-2016)



Source: ACE benchmarking data

Comparisons across the UK labour market

5.33 To benchmark NERL's average staff costs with similar jobs in comparable industries, we have used ONS 4-digit Standard Occupational Classification (SOC) gross annual pay data for 2017. We have separately benchmarked NERL's average pensionable pay costs for ATCOs, ATSAs, ATCEs and MSGs with the mean average annual pay for similar job roles. For each of the four NERL roles, we have we have used a sample of comparator SOC job titles used in NERA's staff operating expenditure report[13], which were selected based on similarities between the respective job descriptions, and any additional roles that we think are useful comparators.

5.34 It should be noted that the 4-digit SOC code data aggregates a number of similar job roles. For example, within the SOC data 'Air traffic controllers' includes air traffic control officers, air traffic controllers, air traffic services assistant and flight planners; this may partially explain why the average salary for NATS ATCOs is higher than SOC classified air traffic controllers. Similarly, 'Aircraft pilots and flight engineers' aggregates several different aircraft related job roles; if airline pilot salaries could be isolated, it is likely that they would be more comparable to ATCO salaries. However, SOC data is not available at this level of disaggregation.

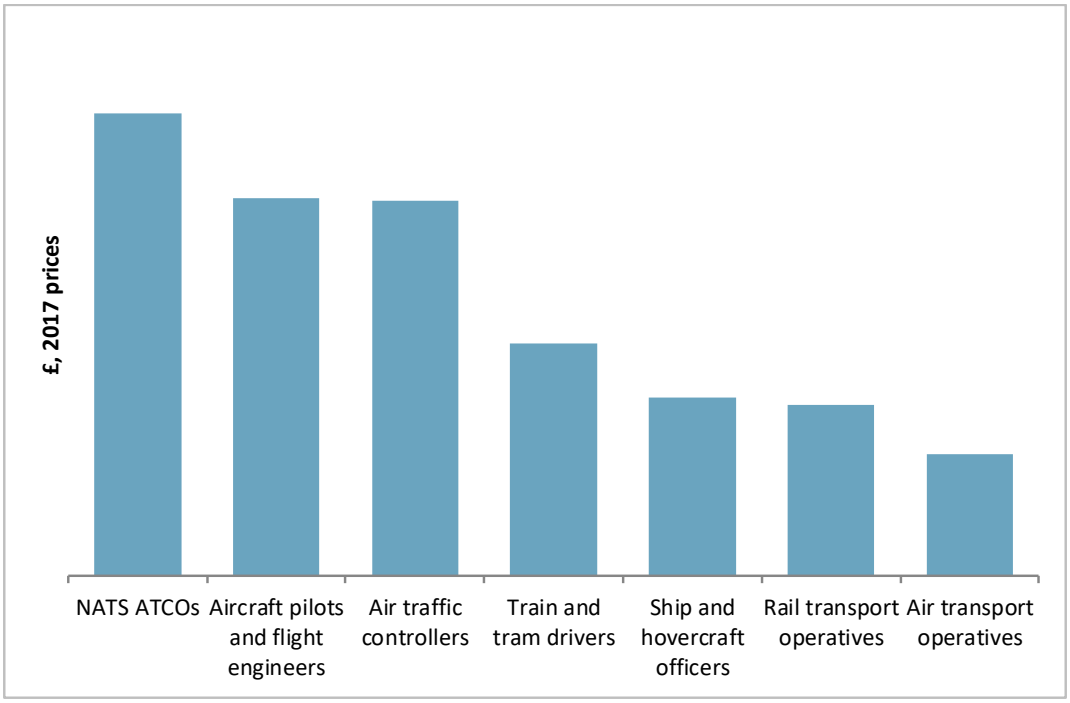
5.35 Within the UK labour market, relevant comparator roles to NERL ATCOs may include pilots, train drivers and rail signallers, as well as ATCOs at other UK ANSPs providing terminal services. We have attempted to collect relevant data to benchmark the trend and level of cost or wages per employee from desktop research and from stakeholders, with limited success so far.

5.36 Figure 5.13 shows the average salary for NATS ATCOs in 2017 compared with the annual gross pay in similar transport controller and driver job roles. NATS ATCOs appear to have the highest

[13] Staff Operating Expenditure for Air Traffic Control, Prepared for NERL, March 2018

salary within the sample, with higher salaries than other job roles within the aviation industry and significantly higher salaries than roles in other transport industries.

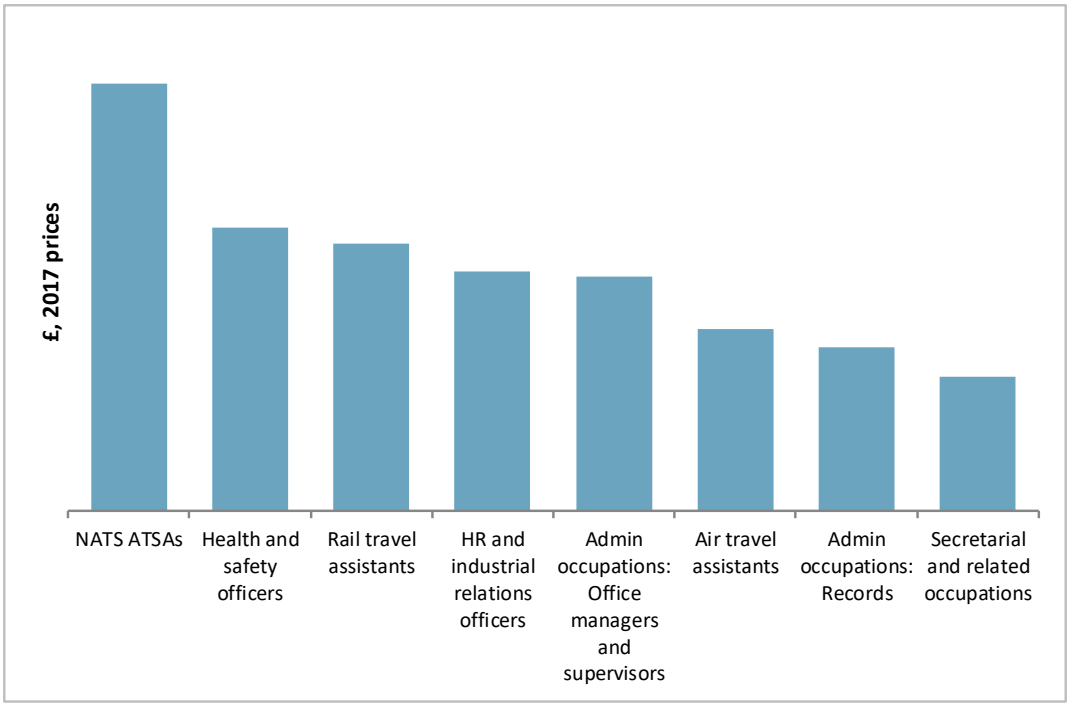
Figure 5.13: NATS ATCO salary benchmarking with other industries (✂ data values excised)



Source: Source: NATS 23 April 2018 data submission & ONS

5.37 Figure 5.14 shows the average salary for NATS ATSAs in 2017 compared with the annual gross pay in similar assistant and administration roles. NATS ATSA's average salary appears to be significantly higher than both comparable assistant and administration roles in other industries. However, NERL does not consider there is good comparability of ATSAs to the other roles shown in the chart as they are not safety critical roles as ATSAs are.

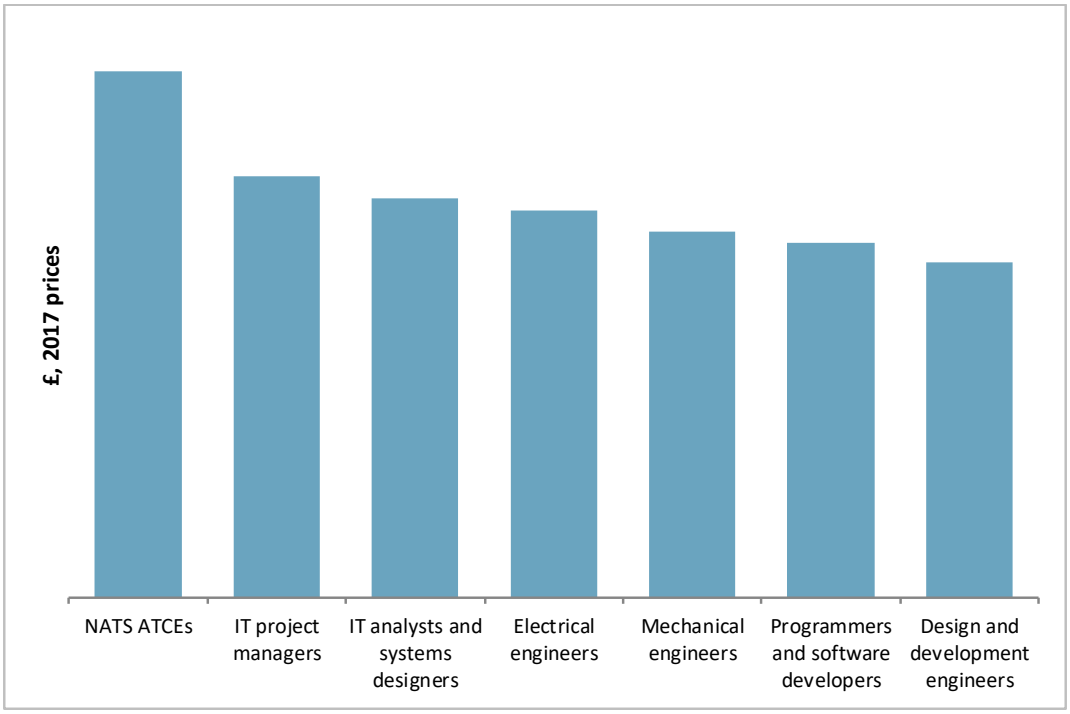
Figure 5.14: NATS ATSA salary benchmarking with other industries (✂ data values excised)



Source: Source: NATS 23 April 2018 data submission & ONS

5.38 Figure 5.15 shows the average salary for NATS ATCEs in 2017 compared with the annual gross pay in similar IT and engineering job roles. NATS ATCE's average salary appears to be significantly higher than both comparable IT and engineering roles in other industries.

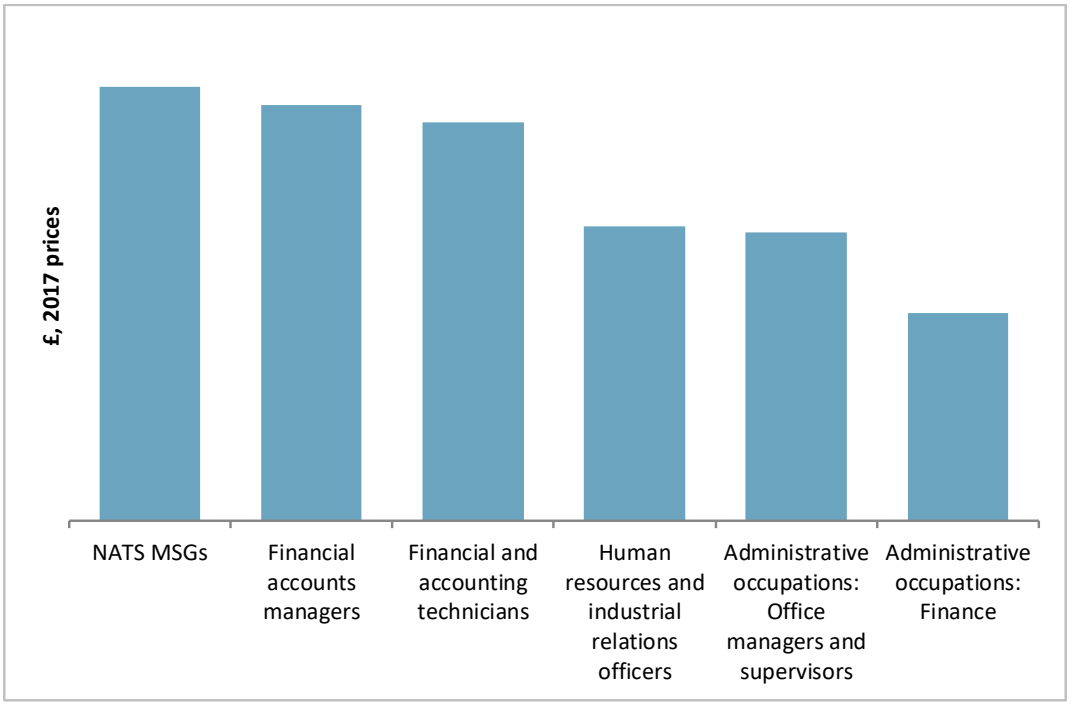
Figure 5.15: NATS ATCE salary benchmarking with other industries (✂ data values excised)



Source: Source: NATS 23 April 2018 data submission & ONS

5.39 Figure 5.16 shows the average salary for NATS MSGs in 2017 compared with the annual gross pay in similar corporate support staff job roles. Although, like ATCOs and ATCEs, NATS MSG's average salary is higher than the other job roles within the sample, it appears to be a at similar level to comparable corporate finance roles. It is, however, significantly higher than comparable HR and administration roles.

Figure 5.16: NATS MSG salary benchmarking with other industries (✂ data values excised)



Source: Source: NATS 23 April 2018 data submission & ONS

5.40 This benchmarking analysis suggests the average salaries at NATS are significantly higher compared to similar roles in other industries, however, there are a few other factors that need to be taken into account. Firstly, NATS operates in a very unique industry, which means that the roles may not be directly comparable to other roles – even within the transport industry.

5.41 Secondly, we have not considered other differences between job roles that may explain pay disparities – such as required education level, required training or level of unionisation. Lastly, as noted above, the SOC job roles used in the analysis aggregate several job roles, which means it is not possible to isolate roles that may have more comparable average salaries to NATS employees – for example airline pilots and ATCOs.

Pension costs

5.42 Pensions alongside wages and salaries are the one of the main components of staff costs. In this section we analyse the trend and level of pension cost for NATS against the wider UK economy, other ANSPs and companies in other comparable sectors.

Types of pension plan

5.43 There are two main types of pension plans: defined benefit (DB) plans and defined contribution (DC) plans. Defined benefit plans guarantee a certain pay-out at retirement according to a formula typically related to the length of employment and employee earnings. Entities operating defined benefit pension plans bear the risk for ensuring that the accumulated value of the pension plan is sufficient to cover the liability the company has to existing and future retirees.

5.44 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.

5.45 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.

Pension scheme evolution at NATS

5.46 Until 31 March 2009, NATS offered an occupational defined benefit scheme which provides benefits based on final pensionable salary. The pension scheme that NATS employees partake in is the NATS section of the Civil Aviation Authority Pension Scheme (CAAPS); the section was formed after the business of NATS was separated from the CAA requiring pension assets relating to NATS employees to be separately identified within CAAPS.

5.47 Members of the defined benefit scheme have benefits which are protected from a “no decrement” clause in the Trust Deed & Rules. This clause prevents any amendment which reduces previously accrued or prospective benefits of existing members, including any increase in member contribution rates. This was further reinforced by a “Trust of a Promise” undertaking provided by the UK Government at the time of the NATS Public Private Partnership (PPP) established in July 2001. The Trust of a Promise provides a guarantee that an employee who was a member of CAAPS on or before the PPP date will have their pension maintained for as long as they remain an employee of NATS and an active member of CAAPS.

5.48 From 1 April 2009, all new joiners were enrolled to the new defined contribution scheme.

Comparison with European ANSPs

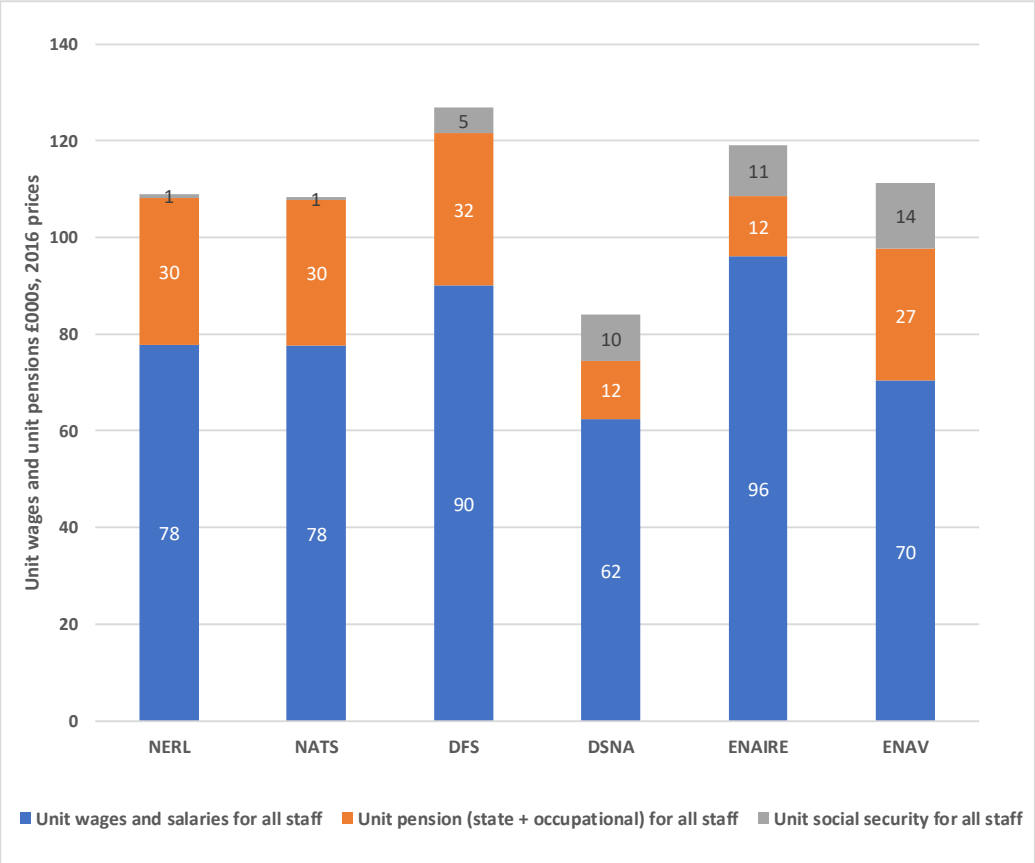
5.49 To assess the level of pension cost at NERL we have compared the pension cost alongside wages and social security at a unit level for the five largest European ANSPs: NATS, DFS, ENAIRE, ENAV and DSNA. NATS and NERL have been presented separately and the comparison of the total staff cost encompasses the following:

- Unit wages and salaries for all staff;
- Unit pension (including state and occupational pension) cost for all staff; and
- Unit social security for all staff.

5.50 The data presented in Figure 5.17 has been taken from the 2016 annual reports for the European ANSPs, the statutory annual reports for the 2016/17 financial year for NERL and NATS, and the Performance Review Commission Study on ANSPs Pension Schemes and their Costs ("The PRC Study"). The pension costs include the contributions to the state pension which has been approximated using data from the UK Government actuary's report. We have used the pension portion of total expenditure (92% in 2015/16) to estimate the pension portion of total social security contributions. Pensions-related social security costs, which have been verified by ANSPs, have been taken from the PRC study; non-pensions-related social security costs (which are not included within the PRC study) have been estimated using Eurostat, by removing the "old age [costs]" from "social protection expenses". It should also be noted that different ANSPs' pensions are funded differently.

5.51 The data shown in Figure 5.17 is conceptually similar to that shown in Figure 5.11 above, but applies to all staff, rather than just ATCOs, and is taken from a different source (annual reports for 2016, rather than ACE and CANSO 2016 data). It also highlights the proportion of staff costs which pension costs represent. Note that, as shown on the chart, "NATS" includes both NERL and NSL staff.

Figure 5.17 Unit wages, pension and social security for all staff, £2016[14]



Source: 2016 Annual Reports, 2016/17 financial year end annual reports (NERL, NATS), UK government actuary report, EUROSTAT

5.52 The unit pension cost at NERL (£30,000) was 43% higher than the average (£21,000) of the four European ANSPs. The types of pension schemes offered by each of the comparators differ with some ANSPs only contributing to the state pension. In 2016, DFS offered a defined benefit scheme; ENAV offered a defined contribution scheme whereas DSNA offered an enhanced state pension scheme and ENAIRE offers an occupational scheme for employees (although the scheme is in place, it is important to highlight that no contributions have been made since 2012)[15].

5.53 It should be noted that different funding mechanisms of each pension scheme means the comparison is not completely like for like as NERL's pension costs are fully funded by the company while the costs of some other of the European ANSP's are funded on a pay-as-you-go basis. In addition, the high pension cost of NERL and DFS is not unexpected due to their defined benefit schemes which are in deficit due to the financial market conditions.

[14] The exchange rate used for conversion was 1 EUR: £0.819, source ACE data. The unit pension cost for DSNA and ENAIRE relates to the state pension, PRC Study on ANSPs Pension Schemes and their Costs.

[15] PRC – Study on ANSPs Pension Schemes and their Costs

Comparison with other UK ANSPs

5.54 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 Airport;
- Birmingham Airport Air Traffic Limited (BAATL); and
- Highlands and Islands Airport Limited (HIAL) in Scotland.

5.55 The benchmarking recognises that new UK comparators do not have the same legacy pension arrangements of NERL.

5.56 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.[16] HIAL also offers a defined contribution scheme according to their 2016/17 annual report.

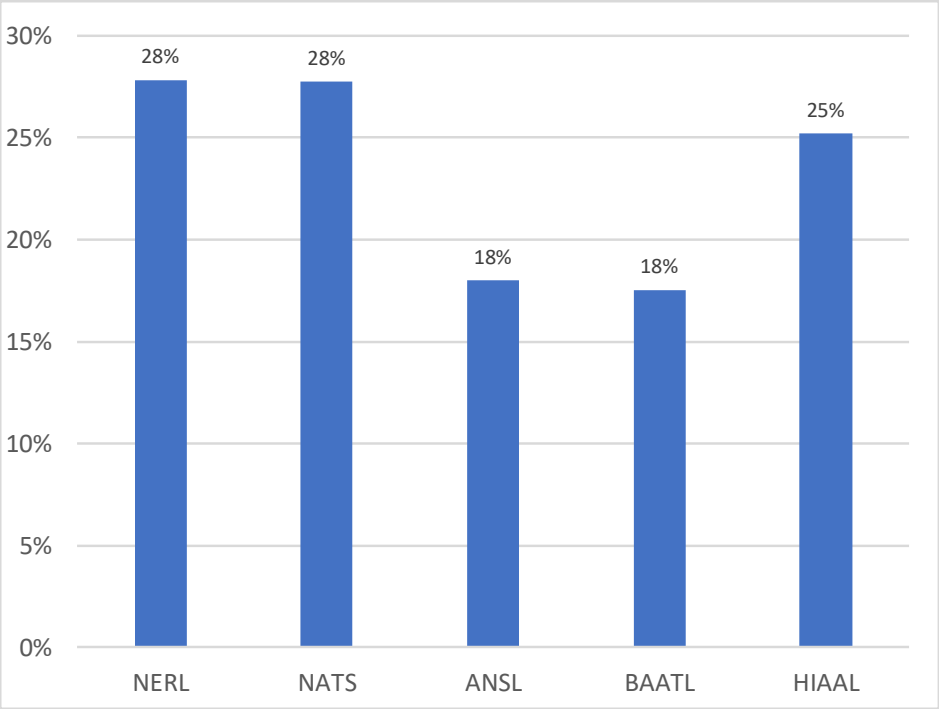
5.57 NSL provided TANS at Gatwick Airport until 2016, at which point these services were transferred to ANSL. Existing staff transferring from NSL and new recruits were provided with a similar defined contribution scheme to the one that had been offered by NATS (though not identical in terms of allowance).

5.58 Similarly, BAATL offered all ATCOs a defined contribution scheme which matched NSL's defined contribution terms and conditions.

5.59 Figure 5.18 shows the pension cost as a proportion of total staff cost for NERL, NATS and the three other UK ANSPs in 2016. The pension cost forms a much larger component of the staff cost at NERL (28%) compared to the other UK ANSPs, with a difference of 8 percentage points compared to the average (20%) of the other three UK ANSPs.

[16] HIAL Trainee Air Traffic Control Officers – Information for Candidates 2017

Figure 5.18 Pension cost as a proportion of staff cost



Source: 2016/17 Annual Reports

Transition from defined benefit to defined contribution schemes

5.60 The rising cost of defined benefit schemes has meant a gradual change in the last few decades in the type of occupational pension schemes being offered by employers, with a shift towards defined contribution schemes, aimed at reducing the cost and risk for employers (as above, the risk of the final value of the pension pot is borne by employers in defined benefit schemes but scheme members in defined contribution schemes).

5.61 To compare the transition from defined benefit schemes to defined contribution schemes we analysed the pension offering of previously public companies in the aviation sector and across the transport, utilities and logistics sectors. The companies analysed alongside NATS include:

- British Airways
- Gatwick Airport Limited
- Heathrow Airport Limited
- Network Rail
- Centrica
- Thames Water
- Royal Mail.

5.62 Steer recognises that, in the transition from defined benefit to defined contribution pension schemes, NERL compares favourably to other ANSPs in Europe.

5.63 The occupational defined benefit scheme offered by NATS was closed to new members from 1 April 2009. After this date, all new joiners were enrolled to the new defined contribution scheme. NATS introduced a salary sacrifice scheme for the defined benefit and defined contribution schemes on 1 April 2009. Members benefits from the defined benefit scheme

were protected from a no decrement clause in the Trust Deed & Rules meaning that NATS were unable to alter their benefits.

5.64 In comparison to other companies NATS introduced a defined contribution scheme after the early adopters such as Network Rail, Heathrow Airport Limited and Centrica. However, this is still considerably earlier than some of the other previously public companies. Gatwick Airport Limited only finalised the transfer of defined benefit scheme members to either the new defined contribution scheme or a revised defined benefit scheme with reduced benefits and risk share in 2017; some members elected to take the special severance pay instead.

5.65 More recently in 2018, British Airways has introduced a new defined contribution scheme which replaces the existing defined contribution scheme, British Airways Retirement Plan (BARP), and the New Airways Pension (DB) scheme. The new defined contribution scheme will provide members with a choice of contribution rates and the ability to choose cash instead of a pension. In the same year, Royal Mail has introduced a collective defined contribution (CDC) scheme which will run alongside a defined benefit (DB) cash balance scheme with the defined benefit scheme closed to future accruals. The CDC schemes invest savings in a large collective pot which provides an income on retirement.

5.66 A timeline which shows when a defined contribution scheme was introduced by each company is shown in Figure 5.19. In recent years, even companies with strong trade unions such as British Airways and Royal Mail have been able to consult and transition their pension scheme offering to defined contribution schemes. This has come as a result of offering strong incentives to transfer to the new scheme such as through transition arrangements including a cash lump sum or additional company pension contributions. Similarly, NATS offered a generous contribution rate with salary sacrifice option and matching contribution in the ratio of 2:1 back in 2009. NATS also offers a company-wide cash alternative payment scheme in lieu of pension contributions for those with total pension savings close to the Lifetime Allowance; this has derisked the defined benefit scheme significantly. As NATS introduced the defined contribution scheme back in 2009, the terms of the defined contribution offering could potentially be looked at for revision for new joiners. NERL has stated that these terms reflected the outcome of hard-fought negotiations without major industrial actions.

Figure 5.19 Timeline of introduction of DC schemes across the sectors

Source: Annual Reports, Company websites and pension booklets

Contribution Rates (DC schemes)

5.67 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.

5.68 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 15% in 2016. The different contribution rates at each of the benchmarked companies are shown in Table 5.1 below.

Table 5.1: Employer contribution rates for each company

Company	Plan Name	Contribution rate
NATS	NATS defined contribution scheme	Employer contribution rate is 15% 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.
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. [17]

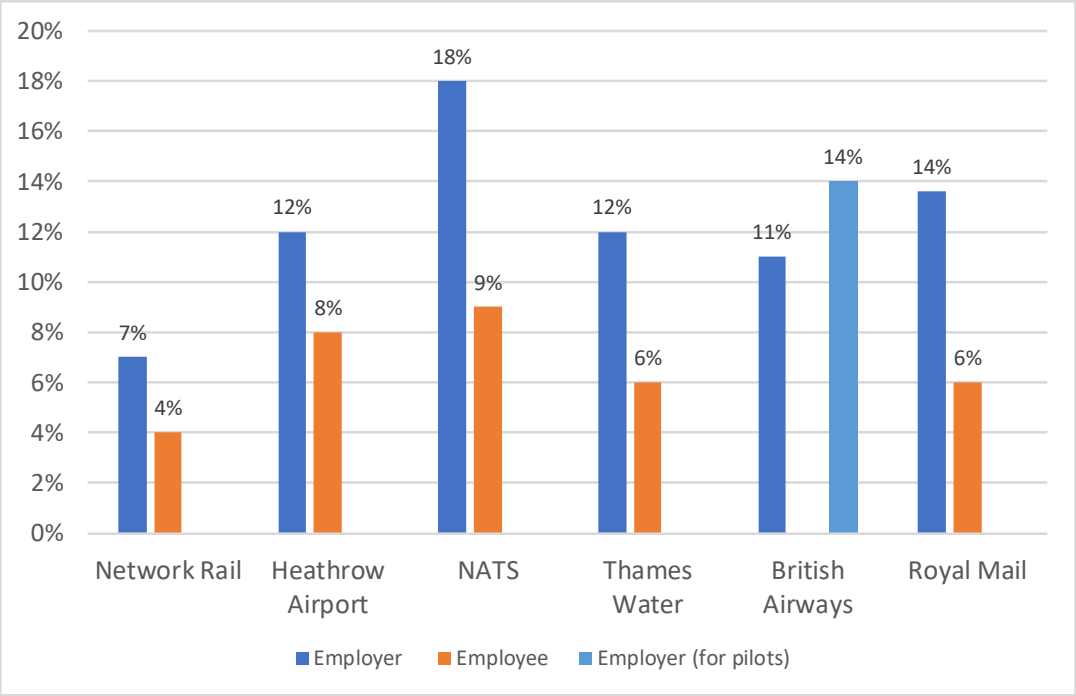
Source: Annual reports, company websites and pension booklets

5.69 Figure 5.20 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 high compared to the average of 11% across the benchmarked companies[18].

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

[18] Note: Gatwick Airport and Centrica have not been included in the benchmarking as contribution rates for these companies were not available. The employee contribution rate for Heathrow was not known.

Figure 5.20: Employer and employee contribution rate benchmarking[19]



Source: Annual reports, company websites and pension booklets

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

National Insurance Rebate

5.71 The closure of the additional State Pension in 2016 brought an end to contracting out, which is where those part of a workplace pension could opt out (contract out) of the additional State Pension. This affected the employers that sponsored an open, contracted out defined benefit pension scheme, until 5 April 2016. Previously, employers that sponsored a contracted-out scheme and scheme member employees received a rebate on their National Insurance contributions. Employers received a rebate of 3.4% and employees received 1.4%. Following the change to the State Pension, the rebate was no longer obtainable.

5.72 Employers were able to make changes to their workplace pension scheme to help offset the end of the National Insurance rebate for employers with the consent of trustees and in line with scheme rules. British Airways decided to pass on the company National Insurance liability of 3.1%[20] to its staff, resulting in employees paying an extra 4.5% National Insurance as a result of the change. However, protections introduced at the Public Private Partnership meant that the statutory override provisions could not be applied without shareholder consent. NATS were not granted consent, and as a result were barred from passing some of the employer national insurance costs to scheme members.

[19] British Airways employer contribution rate applies for other non-pilot staff, the employer contribution rate is 14% for pilots, source British Airways

[20] https://www.travelmole.com/news_feature.php?news_id=2020937

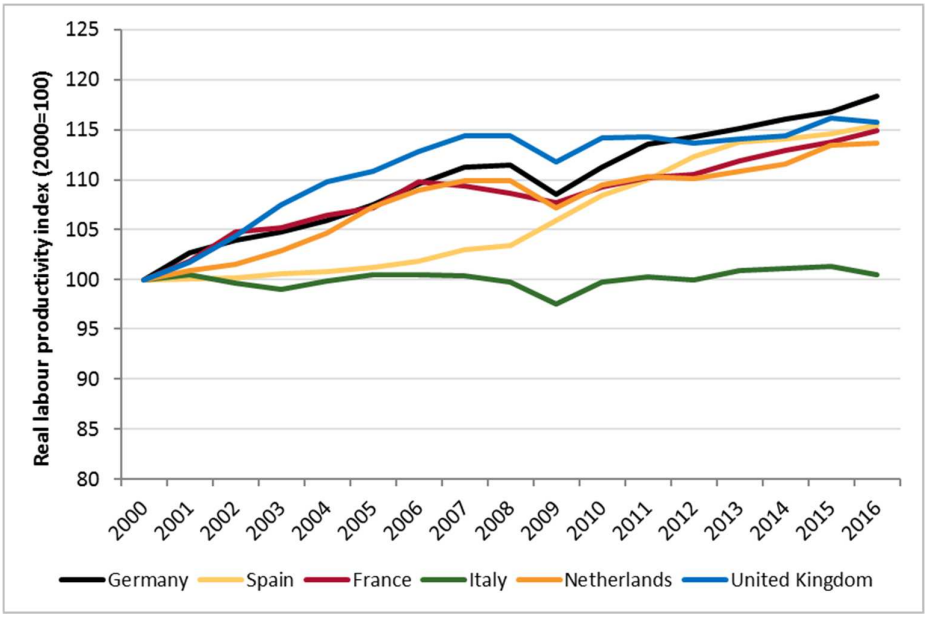
5.73 As these changes only applied to DB pension schemes, NERL's DC scheme contributions have not been affected by these changes.

Staff productivity

Productivity trends

5.74 Trends in labour productivity per hour worked[21] since 2000 in Europe's six largest economies are shown in Figure 5.21. In the majority of the countries displayed below, productivity has continued to improve relatively steadily since 2000, albeit with a slight fall in the wake of the 2007 financial crisis. This trend has been particularly marked in the UK, where productivity grew strongly compared to other countries until 2007, but has remained relatively flat in the subsequent years.

Figure 5.21: Labour productivity per hour worked in selected European countries (index 2000-2016)



Source: Eurostat – Labour productivity per hour worked

5.75 Productivity, in terms of output per hour worked[22] in the UK, both across the national economy as a whole and in transport industries, since 2000 is shown in Figure 5.22. The definition of each of the four separate transport industries is based on the 2-digit NACE classicisation of each industry.

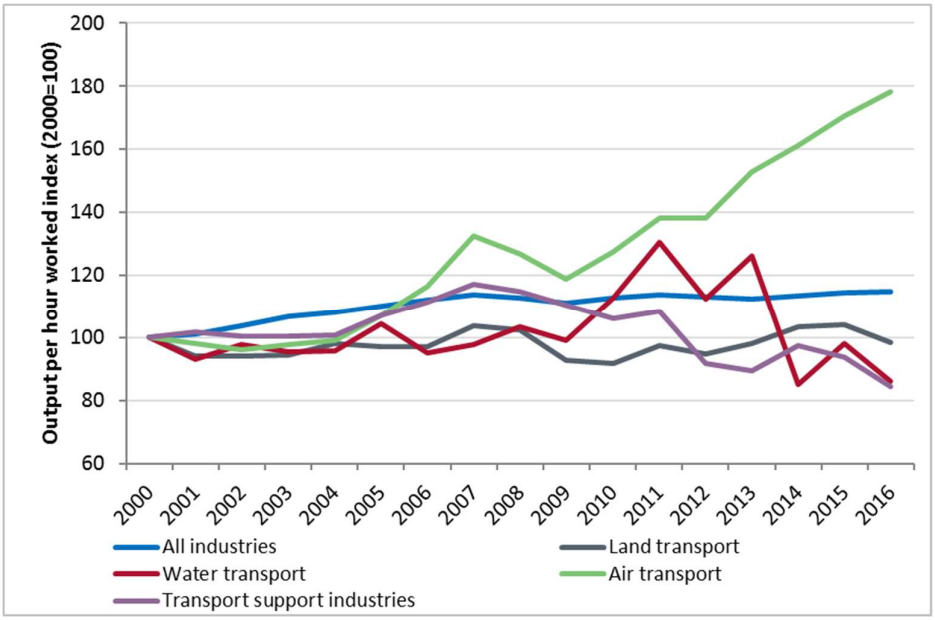
5.76 Productivity in the land transport, water transport and transport support industries has either remained relatively constant or decreased since 2000 – in some cases, the level of productivity over the period has also been quite volatile. However, productivity in the air transport industry has grown significantly since 2000, especially since 2007.

[21] Labour productivity per hour worked is calculated by national statistical offices as real output (deflated GDP measured in chain-linked volumes, reference year 2010) per unit of labour input (measured by the total number of hours worked)

[22] Output per Hour (Chained Volume Measure, Seasonally Adjusted)

5.77 This increase in productivity in the air transport industry is likely to reflect the large increase in passenger numbers during the same period, during which the number of staff (and hours worked) have not grown at the same rate.

Figure 5.22: Labour productivity per hour worked in the UK in selected industries (2000-2016)



Source: ONS – Labour productivity

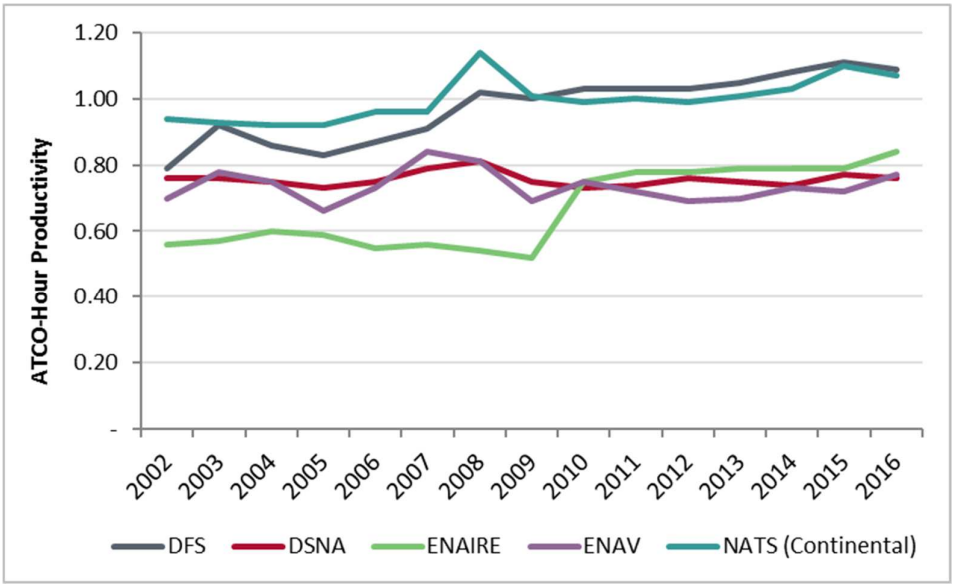
5.78 The above analysis shows that since 2007, productivity in the UK has grown slowly compared to both other major European economies and pre-2007 levels of growth. However, productivity in the UK air transport industry has improved significantly in recent years, compared to both the UK economy as a whole and other UK transport industries.

NERL productivity

5.79 The evolution in ATCO-hour productivity[23] at the five largest European ANSPs since 2002 is shown in Figure 5.23. The evolution of productivity performance across the five ANSPs has been mixed. Although volatile across the period, the 2016 level of productivity at DSNA and ENAV is similar to the 2002 level. While the productivity of both DFS and ENAIRE has improved significantly since 2002, DFS's productivity has improved relatively steadily through the period, whereas most of ENAIRE's improvement is as a result of a restructuring of the organisation in 2010. Aside from a spike in 2008, NATS's productivity has improved relatively steadily since 2002, but not as strongly as DFS's. Levels of productivity need to be considered in the context of the relative complexity of airspace, which is relatively high for UK airspace.

[23] Defined as the number of composite flight hours per hour of ATCOS in OPS

Figure 5.23: ATCO-Hour productivity at selected ANSPs (2002-2016)



Source: ACE Benchmarking reports

Staff and cost elasticity analysis

5.80 To analyse the elasticity relationship between staff, costs and traffic, we have undertaken a series of panel data regression analyses. Panel data analysis is an econometric technique used analyse relationships within data containing multiple entities over multiple time periods. We have run a series of panel data regressions using the specifications described below.

- Each regression uses data for the years 2006 to 2015 inclusive, for the 30 ANSPs under the SES plus DHMI (Turkey).
- The independent variables used, separately in each regression, are;
  - ATCOs in operation hours on duty (ATCO in OPS); and
  - Operating costs, which includes total gate-to-gate ATCO costs, support staff costs and non-staff operating costs (but not depreciation, cost of capital or exceptional items).
- The explanatory variables used in each regression are;
  - Gate-to-gate composite flight hours (flight hours); and
  - En-route delay minutes (delay).
- Each regression uses the logarithmic difference of each variable – this is an econometric technique used to calculate the percentage change between a time series of data points.
- Each regression uses a fixed effects assumption – this is an econometric technique used to control for entity-unique attributes not included within the analysis (such as GDP).

5.81 We have carried out this analysis using data contained within ACE Benchmarking Reports provided by the PRU at Eurocontrol as well as Eurocontrol's Performance Review Reports.

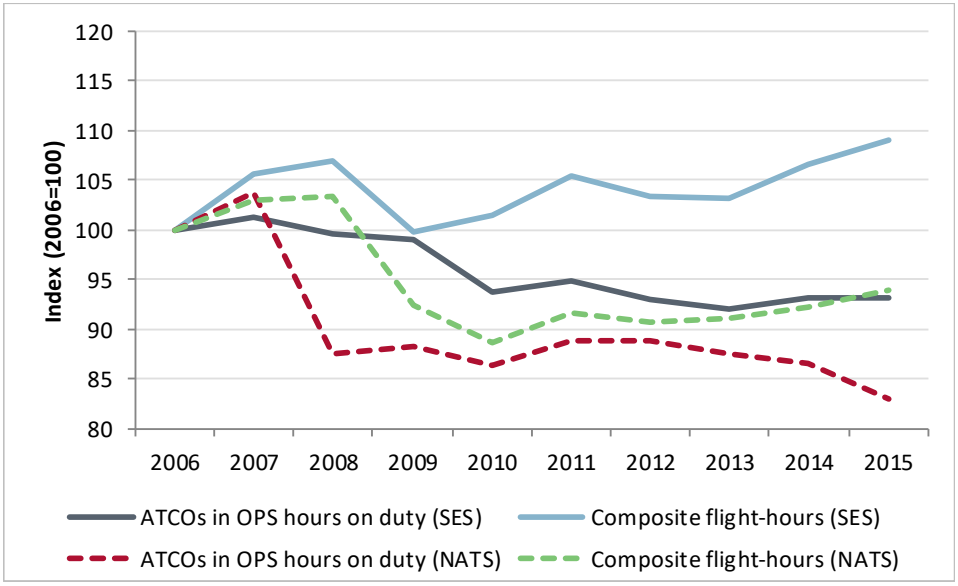
ATCO hours in operation

5.82 The indexed relationship between ATCOs in OPS and flight hours across the 31 ANSPs are shown in Figure 5.24. It should be noted that considerable disruption was caused in 2008 by a combination of capacity and staffing issues, and in 2010 by the eruptions of Eyjafjallajökull

volcano in Iceland. The values for each of these years do not appear to fit the trend of the other years within the time period.

5.83 There appears to be a relatively strong relationship between ATCOs in OPS and flight hours; the annual change of each variable moves in the same direction in every year – except in 2008 and 2010.

Figure 5.24: Total ATCOs in OPS hours and composite flight hours index (SES ANSPs and NATS, 2006-2015)



Source: ACE and PRR report data, Steer analysis. Note: Data point for 2010, which is a significant outlier, not shown.

5.84 The results of the regression analysis showed that there was a relationship between the number of ATCOs in OPS and the number of flight hours. ATCOs in OPS, across the 31 ANSPs, had an elasticity of 0.46 to the number of composite flight hours. This parameter was highly statistically significant, with a t-statistic of 5.32 (and P-value under 0.0005). There was also a statistically significant relationship between the en-route delay minutes and the number of ATCOs in OPS, but the relevant elasticity parameter (0.008) is so small that there is no useful practical implication of this result. Overall, the regression had a relatively low R-squared value of 0.2, implying that there are significant unmodeled factors driving the number of ATCOs. Nevertheless, the relationship between flight operations and the number of ATCOs is robust, as may be expected given the natural relationship between the two variables.

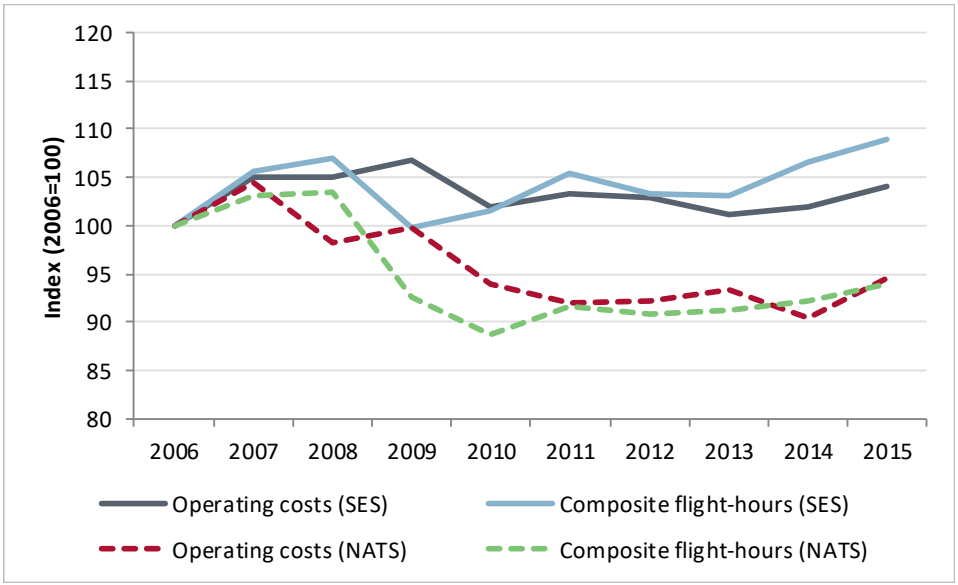
5.85 We also ran a version of the regression that included airspace complexity scores. However, the coefficient associated with airspace complexity was not statistically significant, so we have dropped it from the final version of the analysis.

5.86 A key point to note is that ATCOs form only a minority of staff at ANSPs. For example, including trainees, ATCOs were only 35% of employees at NERL. If we assume that there is a very low elasticity to traffic volumes for other staff (e.g. 10%), then the overall elasticity to staff numbers is about half of the value found in the regression, i.e. about 0.23. This is very comparable with the number used in NERL's BP for RP3, which states that staff costs are 75% fixed and 25% variable (Appendix I of BP, p64).

Operating costs

5.87 The indexed relationship between operating costs and, flight hours across the 31 ANSPs, as well as at NERL, are shown in Figure 5.25. As with the number of ATCOs, there appears to be a relatively strong relationship between operating costs and flight hours, although the pattern was disrupted in 2009-10 when traffic fell significantly, probably reflecting the difficulties of shedding costs quickly.

Figure 5.25: Total operating costs and composite flight hours index (SES ANSPs and NATS, 2006-2015)



Source: ACE and PRR report data, Steer analysis

5.88 The results of the regression analysis showed that there was a relationship between operating costs and the number of flight hours. Operating costs across the 31 ANSPs, had an elasticity of 0.32 to the number of composite flight hours. This parameter was highly statistically significant, with a t-statistic of 2.86 (and P-value of 0.005). There was no statistically significant relationship between operating costs and delay, or the airspace complexity factor. The R-squared parameter was low, at about 0.1, but this does not detract from the significance of the flight hours elasticity parameter.

5.89 The interpretation of the results is that ANSP operating costs have an elasticity to flight hours of approximately 0.3, so that a 10% increase in flight hours controlled would lead to a 3% increase in operating costs. This is consistent with elasticity of 0.4 observed by the PRU in the period 2003-2008 and that previously used by the UK CAA (0.3) in determining the price control for NATS[24].

5.90 A lower elasticity coefficient for operating costs compared to ATCOs staff numbers, compared to the regression with ATCOs in OPS as the independent variable, makes sense. The number of flight hours, or in other words, the level of traffic, will have more of a direct impact on ATCOs

[24] Performance Scheme: Initial EU-wide Targets Proposals, Consultation Document, Produced by the EUROCONTROL Performance Review Commission upon the invitation of the European Commission DG-MOVE, 2nd August 2010. p.62 section 6.3.39 and footnote 25

in OPS compared to total operating costs, which are likely to include a fixed elements or elements influenced by other factors.

Strategic staff growth model

Background

5.91 The end of RP1 and beginning of RP2 saw NERL reduce the number of ATCOs required to operate services from approximately 1,330 in 2008 (based on the weighted average of 2007/08 and 2008/09) to 1,069 in 2016. At the same time, NERL decided to reduce very materially the number of ATCO trainees in the early years of RP2, as the prospects for traffic growth were uncertain.

5.92 In practice, traffic growth has returned and in 2012, traffic as measured by the number of en-route service units, has recovered from the economic downturn and in 2017 was 11,768 TSUs for the first year above the 2008 peak of 11,044 TSU.

5.93 As we look forwards to RP3, there is an expectation of further growth in traffic, as well as the receipt of benefits from very material investment in systems and processes undertaken in RP2 and promised for RP3 that should yield material benefits in terms of ATCO productivity.

Stakeholders

5.94 A number of stakeholders assess that the transparency of NERL's approach to strategic staff planning is very limited, both with respect to the process that took place in RP2 and the amount of information provided through the SIP process. Going forwards and to justify the RP3 plan, stakeholders considered that clear ATCO and trainee numbers should be provided for on the following basis:

- Operational: by main location (Swanwick, Prestwick, other);
- Support to operational systems implementation and airspace change programmes; and
- Contingency arrangements, or headroom for operational resilience.

Estimating the requirements for RP3

5.95 With a starting point of 2017 actual data, we would expect any changes to staff complement to be driven by:

- Traffic growth: in the event that capacity is constrained and sector reconfiguration or development of new capacity is needed.
- Staff productivity: provided through improvements in technology, processes and working methods, facilitated by the very large investment programme invested by NERL in RP2 and proposed for RP3.
- Changes to resilience arrangements: providing more or less contingency and headroom to operations than currently.
- Support to investment programme: including systems implementation and airspace redesign.

5.96 This framework is applied in later chapters of the report.

Summary and conclusions

5.97 Our conclusions concerning staff costs are the following:

- Staff costs were projected to fall at the start of RP2, reflecting lower traffic projections. In the event, the outturn was that staff costs were consistently above plan and flat in real terms for the first three years of RP2. This reflects higher traffic levels than expected.
- Staff numbers were correspondingly above plan and were also supplemented by additional external contractor staff brought in to help deliver the enhanced programme of technology development which was adopted early in RP2.
- Salaries for ATCOs and other NERL staff were forecast to be constant in real terms (against forecast CPI) during RP2. The outturn was higher salary levels initially, subsequently falling back in 2017, with ATCO salaries slightly higher than Plan and other staff salaries slightly below Plan.
- Since 2002, NATS salaries have risen faster than salaries in the transport and services sectors of the UK economy, and faster than salaries in the economy as a whole. However, since 2014, the rate of growth in NATS salaries has been below that in those sectors and in the wider economy.
- When benchmarked against major ANSPs, salaries at NATS are towards the higher end, but not at the top, of the benchmark range. Salary levels are in the middle of the large five European ANSPs.
- While recognising the unique characteristics of some roles at NATS, especially ATCOs, salaries at NATS are significantly higher than salaries in skilled jobs with some similar characteristics in other sectors in the UK economy.
- The discrepancy in salaries is particularly pronounced in the case of ATSAs, who appear to be paid significantly higher salaries than is the case in similar roles elsewhere in the UK economy. This was recognised in the analysis undertaken by consultants NERA on behalf of NERL[25]. NATS note that most of these comparators do not play safety critical roles as ATSAs do.
- While NERL's DB pension scheme is protected under the arrangements made at the time of the privatisation of NATS (Trust of a Promise), this does not apply to its DC scheme, in which the employer contributions are relatively high compared to benchmark UK employers of privatised utility and transport companies.
- The labour productivity of NATS's ATCOs is towards the higher end of the largest five European ANSPs.
- Across 31 European ANSPs, there is a strong statistical relationship between both ATCO hours and operating costs compared with controlled flight hours (although this is also influenced by other factors). The relationships identified look plausible and can be used as one benchmark, amongst others, for testing the projected cost growth during RP3.

[25] Staff Operating Expenditure for Air Traffic Control, Prepared for NERL, March 2018

6 Staff cost projections in Business Plan

Introduction

6.1 In this chapter we analyse the Business Plan forecasts of NERL's staff costs in RP3, based on information and data provided by NATS through presentations and data requests between the dates of 23 April 2018 and 13 November 2018. In addition, we have taken into account the information presented by NERL at the "manpower planning" workshop held on 23 August 2018, and the associated meeting notes.

6.2 The level of disaggregation within the analysis is based on what has been provided within NATS's submissions and we have analysed staff costs through benchmarking of salary growth; benchmarking of pensions; and analysis of FTE requirements for the following staff categories:

- ATCOs – Operational, non-operational and trainees;
- ATSAs – Operational, simulation and training, other;
- Central Management and support staff (PCG/MSG); and
- Technical staff (ATCE and STAR).

6.3 In addition, we have considered staff salary levels for each category.

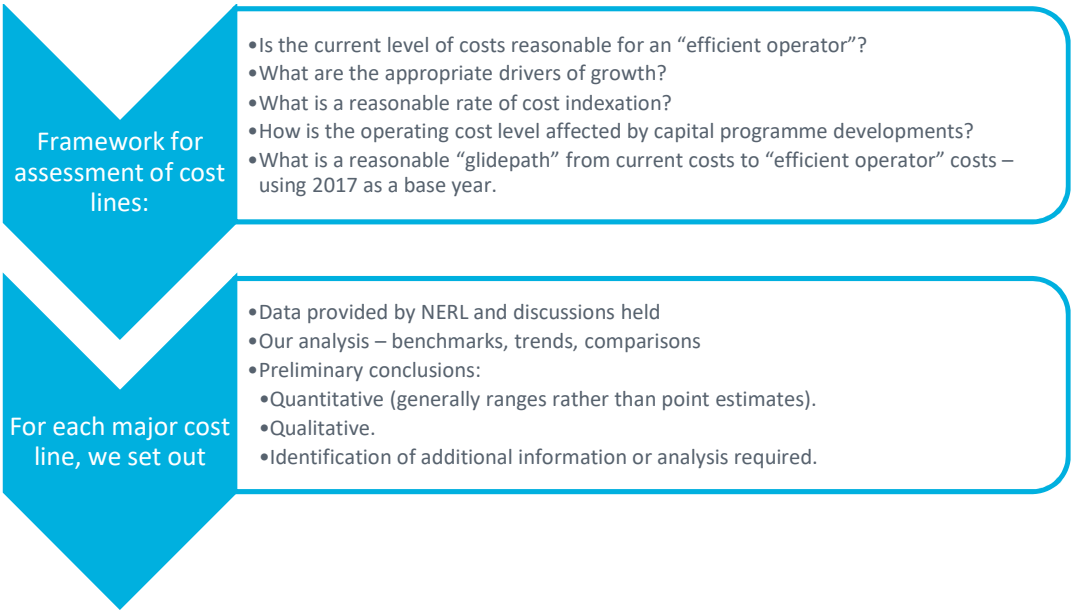
6.4 Given the very sensitive nature of future salary increases, which are negotiated by NATS with its trade unions (for all staff groups other than PCG staff on personal contracts), we have considered planned staff salary increases during RP3 at a high level only, and have not included in this report information which was shared with us by NATS on its expectations for outturn staff pay.

6.5 We have also considered the level of pension contributions made by NATS for NERL staff. This has been undertaken at a total staff level, given the data available, and has focused on those staff in the Defined Contribution (DC) scheme, recognising that special protections apply to those in the Defined Benefit (DB) scheme.

6.6 The assessment of staff cost projections in the Business Plan is to inform the CAA's assessment of the overall cost efficiency path for NERL during RP3. The decisions on how many staff NERL should employ in RP3, how much they should be paid and what pension contributions NERL should make for them are decisions for NERL to make.

6.7 We have assessed staff costs by constructing a model for an "efficient operator" based on the process set out in Figure 6.1. We have adopted a consistent approach for each of the major cost lines, to the extent made possible by the availability of suitable data and comparators.

Figure 6.1: Efficient operator assessment framework



Source: Steer

6.8 The first step of the process shown above, assessing the reasonableness of the current cost, is to a large extent based on the analysis in Chapter 5, which considered the trends and current level of staff costs in RP2 and undertook comparisons against external benchmarks.

6.9 In general, rather than identifying a "point estimate" for the efficient operator model, given the level of uncertainty for certain assumptions, we have felt it more appropriate to develop a range of potential cost levels which may be achievable.

It should be noted that the purpose of this analysis and the projections which result is to develop assumptions required to calculate and define an overall cost efficiency path for NERL. As noted in paragraph 2.18 above, where possible, we have tried to develop a distinct approach to provide an independent view, for example in relation to projections of staff numbers. It is specifically *not* the intention of our analysis to specify or recommend how NERL operates its business, which is for NERL itself to determine.

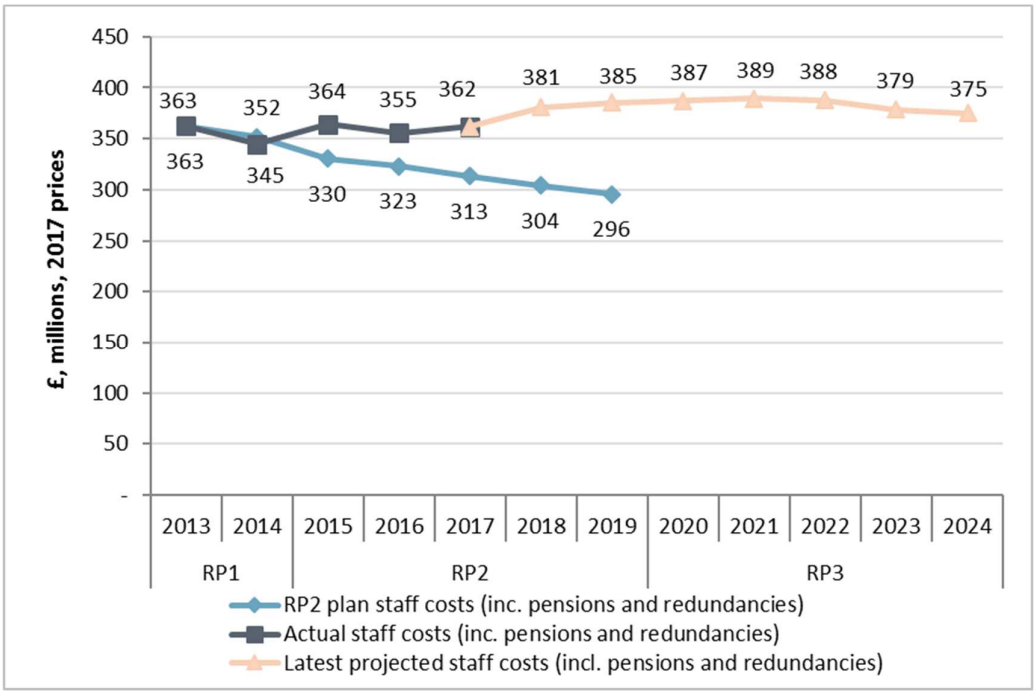
6.10 The analysis in this chapter is based on the following years:

- Actual data for the final year of RP1 (2014);
- Actual data for the first three years of RP2 (2015-2017); and
- NERL's latest forecast for the final two years of RP2 (2018-2019) and RP3 (2020-2024).

Overview of staff cost projections

6.11 Figure 6.2 shows NERL's historical staff costs and projected staff costs within its RP2 and RP3 plans.

Figure 6.2: NERL historical and projected planned and actual staff costs (2013-2024)

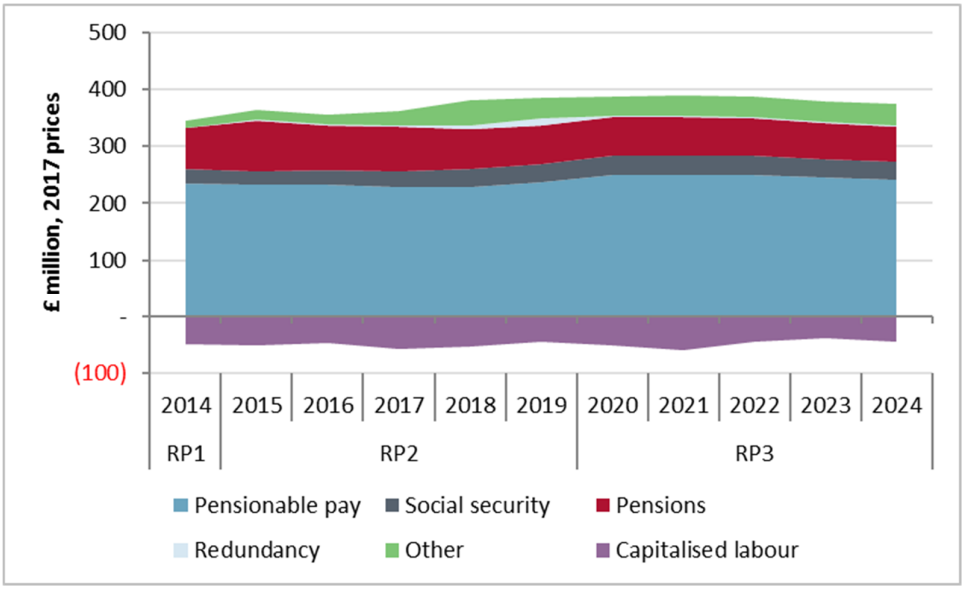


Source: NATS RP2 financial model and 23 April & 13 November data submissions. RP2 plan data adjusted by outturn inflation (to 2017), inflation post 2017 based on NERL assumptions from 23 April data submission.

6.12 The latest staff cost forecast is higher than planned for RP2 due to higher staff numbers compared with RP2 plan – total staff costs are forecast to increase by +5.1% in 2018, but remain relatively constant in subsequent years and throughout RP3 (CAGR -0.5%).

6.13 Figure 6.3 shows NERL's staff costs, between 2014 and 2024, split by the different cost types.

Figure 6.3: NERL historical and projected disaggregated staff costs (2014-2024)



Source: NATS 23 April & 13 November data submissions

6.14 Over the period, pensionable pay and pensions account for over 80% of total staff costs. Pensionable pay accounts for 60-65% of total staff costs throughout the period and increases slightly from £232 million at the start of RP2 to £241 million at the end of RP3 (CAGR +0.4% in RP3). Pensions costs fall from £90 million at the start of RP2 to £60 million at the end of RP3 (CAGR -2.5% in RP3), not including pension cash payments[26].

6.15 Social security costs account for 6% to 9% over the period and increase from £24 million at the start of RP2 to £33 million at the end of RP3, but are relatively constant throughout RP3 (CAGR +0.5), while redundancy costs relatively small and are generally between £1m and £2m in most years with a spike of £8 million to £13 million from 2018 to 2019. Other costs (which include contractors and additional pay) increased from £17 million at the start of RP2 to £39 million at the end of RP3 (CAGR +2.0% in RP3). Capitalised labour is equivalent to 10-15% of staff costs over the period and fluctuates between £40 million and £60 million.

Air Traffic Controllers and Trainees (ATCOs & TATCs)

6.16 We have assessed the BP projections for ATCOs based on the following data received and discussions held:

- Staff FTE and salary cost projections for ATCOs.
- Breakdowns by function, operational area; commentary on productivity.
- Bridge for staff FTEs End-RP2 to End-RP3 by cause (traffic, resilience, SESAR, etc.).
- Anticipated churn and trainees / recruits.
- Face to face discussion with NERL on 1 June 2018.
- Information provided by NERL during and following the manpower planning workshop on 23 August 2018.

[26] Figures based on data provided by NERL on 13 November 2018, accounting cost basis for pensions

6.17 Our independent analysis includes:

- Operational ATCOs projected from 2017 base, taking into account ranges for:
  - Elasticity to traffic growth.
  - Allowance for enhanced resilience.
  - Efficiency gains from implementation of SESAR and airspace change.
- Trainees projected on the basis of operational ATCO forecast range.
- Non-operational ATCOs adjustments.

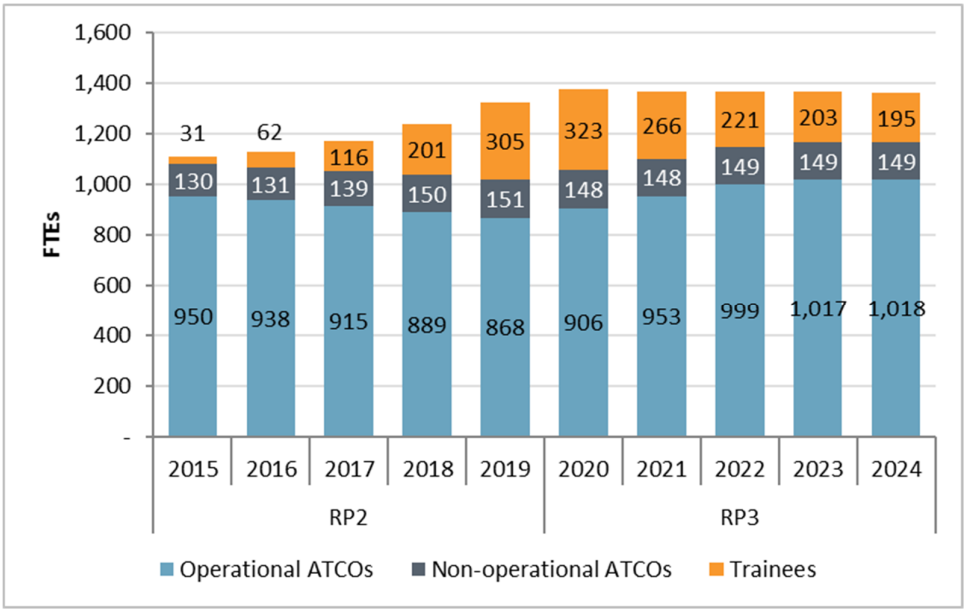
ATCOs – BP projections

6.18 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.

6.19 Figure 6.4 shows historical and NERL's projections of operational ATCOs, non-operational ATCOs and trainee FTEs through RP2 and RP3.

Figure 6.4: NERL historical and projected ATCO FTEs (2015-2019)



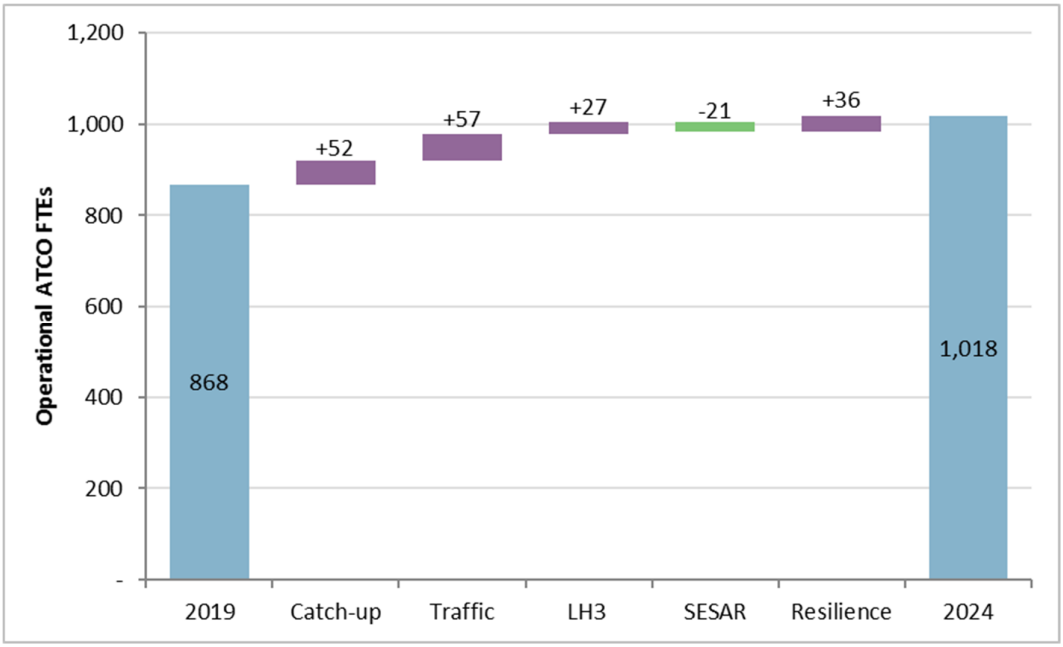
Source: NATS 9 November 2018 data submission

6.20 Each element of Figure 6.4 can be understood as follows:

- Operational ATCOs decrease throughout RP2 from 950 in 2015 to 868 in 2019 (CAGR -2.2%), before increasing to 1,018 by the end of RP3 (CAGR +3.2%);
- Non-operational ATCOs increase throughout RP2 from 130 in 2015 to 151 in 2019 (CAGR +3.7%), before falling slightly to 149 by the end of RP3 (CAGR -0.3%); and
- Trainees increase significantly throughout RP2 from 31 in 2015 to 305 in 2019 (CAGR+76.5), before decreasing to 195 by the end of RP3 (CAGR -8.6%).

6.21 Figure 6.5 shows NERL's assumptions in relation to the growth of operational ATCO FTEs throughout RP3, starting with the number of ATCOs they project for the end of RP2 in 2019. FTE increments are shown in purple and decrements are shown in green.

Figure 6.5: NERL BP 'ATCO bridge' (2019-2024)



Source: NATS presentation to Steer 1 June 2018

6.22 NERL's explanation for each of the incremental and decremental elements is as follows:

- **Catch-up**; recover the expected deficit of 52 ATCOs in 2019, derived by taking the expected operational requirement in 2019 and subtracting the average forecast operational ATCO headcount for this period, as well as including an allowance for additional effort provided by non-operational staff and tactical overtime.
- **Traffic growth**; uses Position Staffing Schedule (PSS) to review of the number of airspace sectors that were used during the last season, taking into account anticipated changes in flight volumes and routings used to predict the number of airspace sectors that will be required to service the forecast traffic, and therefore the staffing and shift patterns that will be required
- **Heathrow third runway (LH3)**; also based on PSS process described above based on the assumption that the runway will open in 2025.
- **SESAR**; defined by reference to planned project delivery (e.g. dynamic sectorisation, combined supervision) and initial estimates of the staffing efficiencies that may result.
- **Resilience**; maintain the number of ATCOs slightly above the operational requirement in order to provide a measure of staffing resilience, enable the delivery of projects into service without undue service disruption or reliance on voluntary overtime and allow for the impact of newly valid staff initially having fewer sector validations than those that retire.

6.23 At the workshop on 23 August 2018, NERL provided a detailed analysis of how the figure of 57 additional staff to handle traffic growth during RP3 was derived. Assumptions have been made on the number of positions open in each sector by time of day in the Position Staffing

Schedule (PSS), taking account of the forecast traffic growth. This is estimated to drive an increase of 140 hours of position opening per day, which in turn feeds into the additional shifts required and hence into additional headcount.

6.24 The work done by NERL demonstrates that significant effort has been made to estimate the impact of traffic growth in a systematic way. However, it is predicated on assumptions about how many additional staff positions need to be opened each day sector by sector, and these assumptions appear to derive from management expertise (rather than from a proven algorithm). NERL noted that there was a significant number of variables and uncertainty, and that "this is an art not a science". More broadly, NERL does not appear to have focused on trying to achieve efficiencies from the expansion of its operation, but rather to have added resource within existing structures. We note that NERL believes that this view represents a misunderstanding of its operation, stating that there is a limit to the efficiencies which can be achieved due to constraints on the number of aircraft that an ATCO can handle at any one time, and also that there are constraints on the number of validations that an ATCO can hold.

6.25 We therefore consider that it remains valid to compare the BP projections against those estimated using the "efficient operator" approach described from paragraph 6.6 above.

ATCOs – Efficient operator model

Operational ATCOs

6.26 We have developed modelled projections of the number of operational ATCOs which may be required by an efficient operator, which can be compared with NERL's RP3 projections in the BP. In line with the approach set out at the start of this chapter, we have generally adopted a range of efficiency assumptions, rather than point estimates. Our model has based on the following assumptions:

- **Catch-up:** While NERL's analysis is based on an assumed starting position in 2019 (i.e. immediately before the start of RP3), we assess that a more robust starting point is the actual staff numbers for 2017. We also noted that, in 2017, NERL's delay performance was within target, indicating that there was no evidence of a need for additional resource, and therefore took our "upper bound" to be no "catch-up" requirement. Recognising that overtime shifts increased during 2017, at a level equivalent to 23 staff, we took a catch-up of 23 as the "lower bound". Hence the range of "catch-up" requirement was assumed to be between 0 and 23 (compared to 52 assumed by NERL). In response, NERL has stated that 2017 is not a robust starting point for calculating catch-up because there was no major transition activity, in contrast to RP3, during which there will be significant airspace and technology transitions in every year of the period.
- **Traffic growth:** We have assumed that there is a relationship between the volume of traffic and the number of operational ATCO staff required and we consider that this can reasonably be expressed in terms of a volume elasticity parameter[27]. This is in contrast with NERL, which stated that "there is no direct relationship between operational headcount and traffic growth"[28]. In order to identify this elasticity parameter, we

[27] An elasticity is generally defined as the ratio between the percentage increase in the output variable (here, ATCO operational hours) and the percentage increase in the driver variable (here flight operational hours controlled)

[28] NERL's "Response to Steer questions on operational manpower and planning", 13 June 2018, p17

undertook the analysis set out in Chapter 5 (from paragraph 5.73), which found a value of 0.46. We also noted the elasticity of operating cost to traffic identified by the PRU (0.4) and the CAA (0.3), which, bearing in mind that ATCO costs represent approximately half of total operating costs, leads to an elasticity value of 0.6. Hence, we identified a range of elasticity to traffic of 0.46 to 0.6, leading to an impact on FTEs of +41 to +61 during RP3 (compared with the +57 identified by NERL).

- **Heathrow third runway (LH3)**: NERL assumed that an additional 27 staff would be required in relation to Heathrow's third runway. However, our understanding is that there is no possibility that LH3 could open before 2026, well after the end of RP3, and there are considerable risks that the implementation date slips till later. Therefore, even allowing for training time before LH3 opening, we do not consider there to be a need to include additional staff during RP3. We note that NERL disagrees, assessing that it needs to train the ATCOs to be used for LH3 during RP3 due to a 2 to 3 year lead time.
- **DSESAR**: NERL is implementing the SESAR programme of technical improvements during RP3, as set out in Appendix L of the BP. An important purpose of the SESAR programme is to increase the efficiency of ANSPs such as NERL. Efficiency targets were identified in the analysis undertaken in advance of the adoption of SESAR in legislation, in particular in the Pilot Common Project (PCP). This identified an efficiency gain for ATCO productivity of 12% from the implementation of SESAR technology[29]. In material presented at the manpower workshop on 23 August 2018, NERL indicated that it considered that no material productivity benefits would accrue from the ATM Functionalities (AF1 to AF6) identified in the PCP during RP3. NERL stated that this was because the key elements of the PCP which are expected to generate productivity benefits are not yet mature, noting that this status was acknowledged by the SESAR deployment manager. However, NERL did indicate that a 1% productivity gain would arise during RP3 from dynamic sectorisation and a further 1% from sector team operations (neither considered in the PCP as not considered sufficiently mature at the time of its publication), leading to a 2%, or 21 staff, saving, as shown in Figure 6.5.
  - In our assessment, such a limited productivity gain from a very large investment of several hundred million pounds in DSESAR during both RP2 and RP3 puts into question the value for money of the size of the proposed capital programme for RP3[30]. In contrast, other stakeholders have an expectation that operational procedures and working practices should improve as a result of planned changes to airspace and technology in RP3, as indicated in the recently issued draft CAA guidance on Airspace Modernisation Strategy[31]. We also note that in the meeting minutes

[29] Footnote on p34 of the Proposal on the content of a Pilot Common Project, SESAR Joint Undertaking, 6 May 2013, **https://ec.europa.eu/transport/sites/transport/files/modes/air/consultations/doc/2014-01-31-sesar/sju1.pdf**

[30] While NERL stated at the workshop on 23 August that most of the workload benefits delivered by the new technology are utilised to deliver additional capacity rather than reduce controller numbers, we consider that this is equivalent to saying that the increase in controllers due to traffic growth is higher than stated by NERL (i.e. above the 57 additional controllers identified by NERL). We consider that the improvements in efficiency due to the technology should be explicitly recognised and, if necessary, the increase due to traffic growth adjusted accordingly, so that each adjustment can be considered separately.

[31] CAP 1690, tables on p67, p69

following the manpower workshop[32], it was stated that "NERL expected greater flexibility for upper airspace in RP3" and was aiming for "ATCOs to qualify on equipment, rather than on a geographical sector (tools based validation)". However, no quantified benefit was identified for this additional flexibility – NERL states these benefits will materialise in RP4 as it requires the airspace and technology programmes to be implemented before it can move to a tools-based validation approach.

  - We further note that, in the presentation given to airlines on "evolving the service" as part of the consultation process[33], NERL discussed operational changes due to introduction of iTEC suite and integration with controller tools in upper air space, stating that: "iTEC would be integrated with NERL's advanced controller tool 'interim Future Area Control Tools' (iFACTs) in Foursight to increase the capacity of controllers". We would expect this capacity increase to create some margin in early years, which could be reflected as productivity improvement. We would also expect to see similar changes with the integration of ExCDS and iTEC in lower airspace and the move of certain TC and Prestwick lower airspace sectors to en-route, recognising that additional benefits will follow in RP4 with the development of Foursight for lower air space.
  - Overall, we consider that these benefits of DSESAR, identified but not quantified by NERL, could lead to efficiency gains in the range of 2% to 3% during RP3. Incorporating the 2% efficiency gains already identified by NERL, this leads to an overall target for efficiency gains from DSESAR in RP3 of between 4% and 5%. We also consider that NERL should demonstrate the benefits of DSESAR by providing clear statements of the efficiency gains that are expected to be achieved during RP4, where they cannot be delivered during RP3.

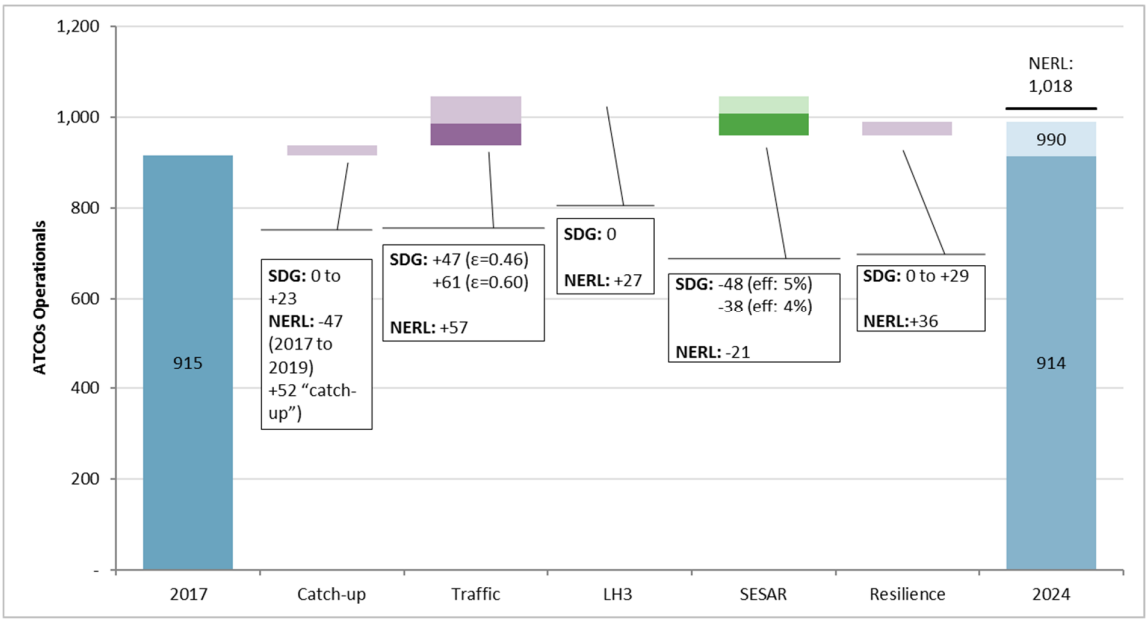
- **Resilience:** NERL has made an allowance for additional ATCO staff to increase the resilience of its operation (+36) staff. For our efficient operator model, we have assumed an upper bound to be that no additional staff are required. This is based on our starting point being the actual staff numbers during 2017, when delay performance was within target and hence can be considered to be satisfactory. As the lower bound, we have assumed that an additional 3% of staff would be required for resilience, similar to the allowance applied by NERL, but applied to the lower overall forecast level for ATCOs (taking account of the factors described above).

6.27 Figure 6.6 shows the projected incremental and decremental changes to operational ATCO FTEs, between 2017 and 2024, arising from each of these elements within our efficient operator modelled projections (with NERL's projections also shown in the text boxes). FTE increments are shown in purple and decrements are shown in green.

[32] Draft note of meeting on NERL iBP for RP3

[33] 1665_RP3-CCWG-Evolving-the-Service-23-May-2018-minutes-draft-for-customer-review

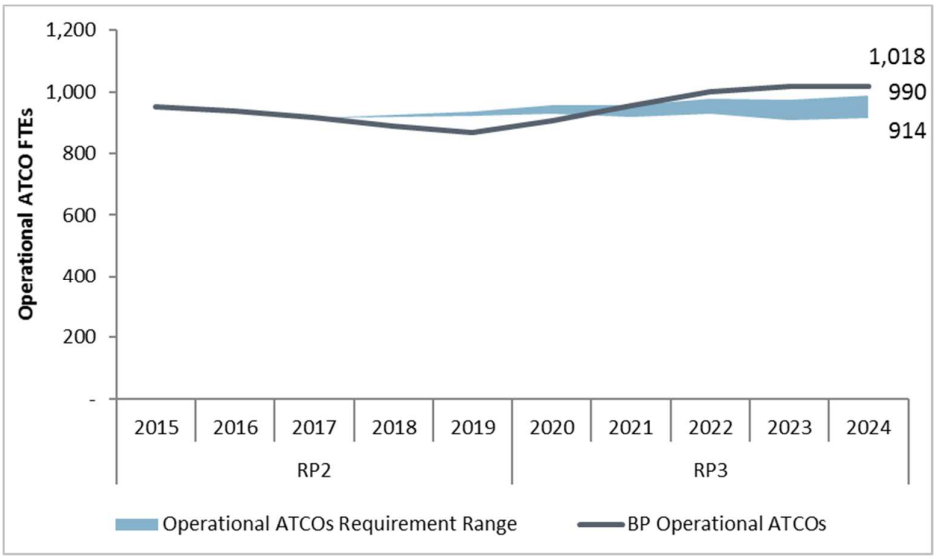
Figure 6.6: Efficient operator model and NERL BP 'ATCO bridge' (2017-2024)



Source: NERL data and Steer analysis. Numbers do not add up exactly due to rounding.

6.28 The outcome of our efficient operator modelling for operational ATCOs for each year is shown in Figure 6.7 in comparison with the projections in NERL's BP. Note that due to our model starting with 2017 actual data, we are unable to replicate the reduction in ATCO numbers shown by NERL for 2018 and 2019, which is based on NERL's detailed knowledge of likely workforce churn. The implication is that NERL will be below the "efficient operator" optimum staffing level in those years, consistent with NERL's own view. The difference in our "catch-up" assumptions compared to NERL's, as described above, accounts for this discrepancy over the longer term, where our model indicates that NERL will have more staff than required by an efficient operator.

Figure 6.7: Efficient operator model and NERL BP operational ATCO FTE projections (2015-2024)



Source: NATS 9 November data submission and Steer analysis

6.29 The chart shows that, relative to NERL's BP, our efficient operator model has identified potential differences in staff levels of 2.8% to 10.2% for operational ATCOs by the end of RP3. However, the number of operational ATCOs at the upper range of our projections in 2024 is nevertheless 8.1% higher than the number of operational ATCOs in 2017 in the context of NERL's forecast of IFR traffic growth of 11.4% over the same period[34], while in the lower range of our projections the number of ATCOs is only very slightly lower than in 2017.

6.30 NERL has stated that proposed reductions of up to 104 ATCO FTEs (i.e. the top of the range of Steer's reductions), would not enable it to deliver the level of service performance that customers require (c.11 seconds average delay per flight) along with the resilience required based on experience from RP2 and the CAA's recommendations in the Oberon investigation. NERL explained that its impact analysis in its rBP business plan indicated that a reduction of 50 ATCOs (less than half the reduction proposed by Steer) would increase average delay by 7 seconds per flight by the end of RP3. NERL stated that this is equivalent to an indirect cost to customers of £28 million p.a., using Eurocontrol methodology, which would continue into RP4. NERL further stated that such a reduction would harm its ability to deliver the airspace modernisation programme in RP3 and the resources required for Heathrow runway 3.

6.31 Although NERL delay modelling assumes a 1% efficiency gain, we consider that NERL has identified this additional level of delay based on the same assumptions which underlie its own projections, in which the focus has been to identify where more resource may be required within the current staffing structures, rather than to identify potential efficiencies and improvements to process that would be required in a competitive environment.

6.32 We therefore consider that our "efficient operator" analysis represents a legitimate challenge for NERL to identify a more efficient way to resource the service provided by ATCOs without significantly impacting delay, particularly given that increasing traffic and the adoption of more modern technical systems should provide the opportunity to improve ways of working, in a way similar to that found in other industries where competitive pressures tend naturally to drive efficiencies and improvements in processes by service providers.

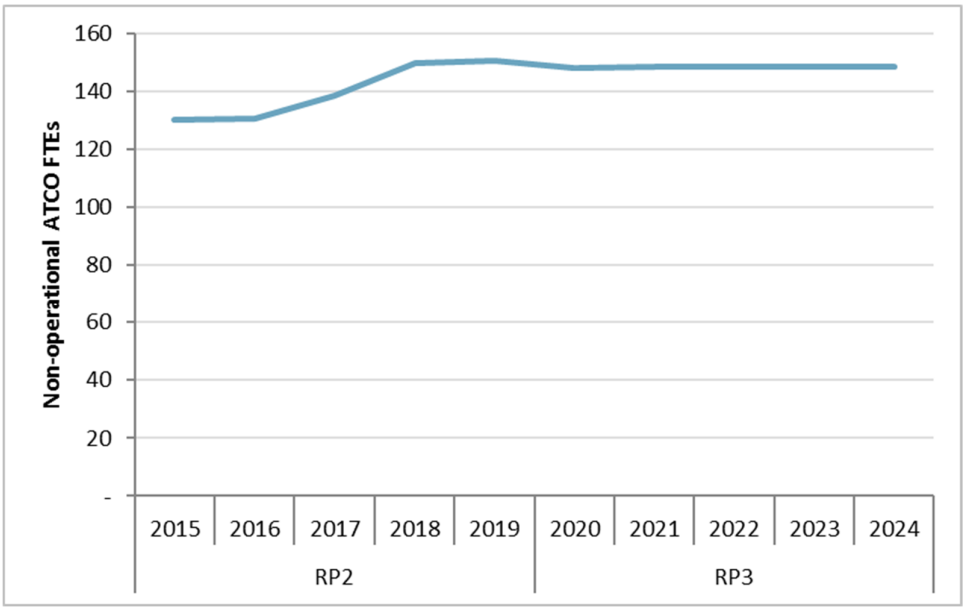
6.33 In relation to the headcount in 2018 and 2019, we recognise that our approach, which pivots off the actual staff levels in 2017 rather than projections for the end of RP2 in 2019, is unable to capture the reduction in staff levels which are anticipated this year and next by NERL. Therefore, we do not suggest that our projections for these two years should be considered as more "efficient" than those in the BP, accepting that NERL is better placed to understand the likely short-term staff losses which drive these numbers. However, from the start of RP3 in 2020, we believe that our modelled projections generate a credible range of required ATCOs for an efficient operator based on the assumptions used by Steer.

Non-operational ATCOs

6.34 Figure 6.8 shows NERL's BP projection for non-operational ATCOS.

[34] Data supplied by NERL to Steer on 4 June 2018

Figure 6.8: NERL BP non-operational ATCO FTE projections (2015-2024)



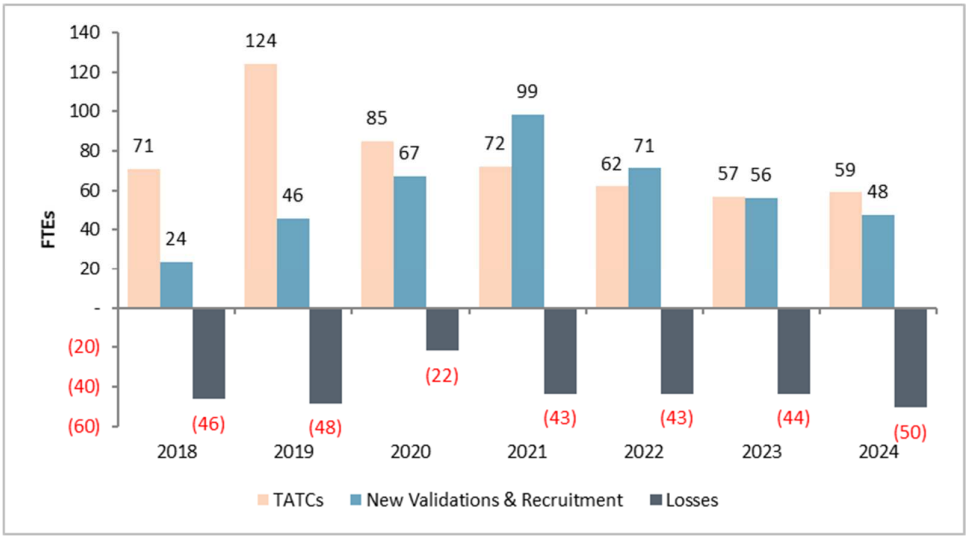
Source: NATS 9 November data submission

6.35 Non-operational ATCO projections remain constant during RP3, following an increase during 2018 and 2019 which we assume relates to the start of the introduction of new technology. We have not identified any particular basis for differences in staff levels for this staff group.

Trainee ATCOs

6.36 Figure 6.9 shows NERL's projected turnover of staff from 2018 to 2024. New ATCOs are either new recruits or trainees (TATCs) that have recently become a "validation". NERL has assumed 411 new validations to take place between 2018 and 2024, which will be sourced primarily (95%) from new validations from training centres and will result in a net increase of approximately 115 FTEs.

Figure 6.9: NERL projected turnover of operational ATCO FTEs (2018-2024)



Source: NATS 13 June 2018 data submission

6.37 Over the course of these years approximately 530 new trainees will enter the training programme which take approximately 2 years in Prestwick and 3 years in Swanwick to complete. At Prestwick, 100% of trainees are assumed to get inducted, while at Swanwick 75% are assumed to pass.

6.38 The Operational ATCO figure within the efficient operator model (shown in Figure 6.7), of 990 in the upper bound case and 914 in the lower bound, implies that only between (approximately) 308 and 385 additional operational ATCOs (comprised off new validations, external recruits and internal transfers) would be required between 2018 and 2024, compared to the 411 required under the BP[35]. Assuming no change to the additional operational ATCOs in RP2, this represents a difference in level of between 7.5% and 30% on the additional operational ATCOs in RP3 assumed by the BP, or a 6.3%-25% difference in level between 2018 and 2024. The number of trainees could therefore be reduced proportionally. This will affect other costs lines, for example ATSA Trainers requirements, which would be reduced proportionally, as described below.

6.39 NERL has stated that the cuts to trainee numbers would prevent it from having sufficient ATCOs to provide the service level required. NERL stated that it would also prevent mitigation of the risks caused by the projected retirement of a significant proportion of its highly experienced and multi-validated workforce in RP3 (c200 FTEs) and RP4 (c250 FTEs). NERL considered that addressing this risk is critical because, after three years new controllers will become operational with only a single validation and will obtain validations on additional positions only after gaining a further two years of operational experience – a total lead time of five years. Therefore, NERL considered that there will be a period of reduced operational flexibility until the new controllers gain additional validations. In addition, NERL considered that the new controllers will be required to deliver the service using their initial validation and will therefore not be able to be released to undertake additional skills training.

ATCO salaries

6.40 The analysis in Chapter 5 indicates that ATCO salaries at NATS (and hence at NERL) are comparable to those at other European ANSPs, but high in relation to the salaries of comparable jobs in the UK, in particular air traffic controllers at other organisations and airline pilots/flight engineers. In our view, given the unique skills of the role and strong trade union representation, it is not realistic for NERL to achieve significant real terms reductions in salary levels for particular ATCO grades and "Spine Points" during RP3.

6.41 We have discussed with NATS the level of salary growth which it expects during RP3. Having assessed relevant benchmarks and forecasts of salary growth across the economy, we consider that the anticipated salary growth is reasonable.

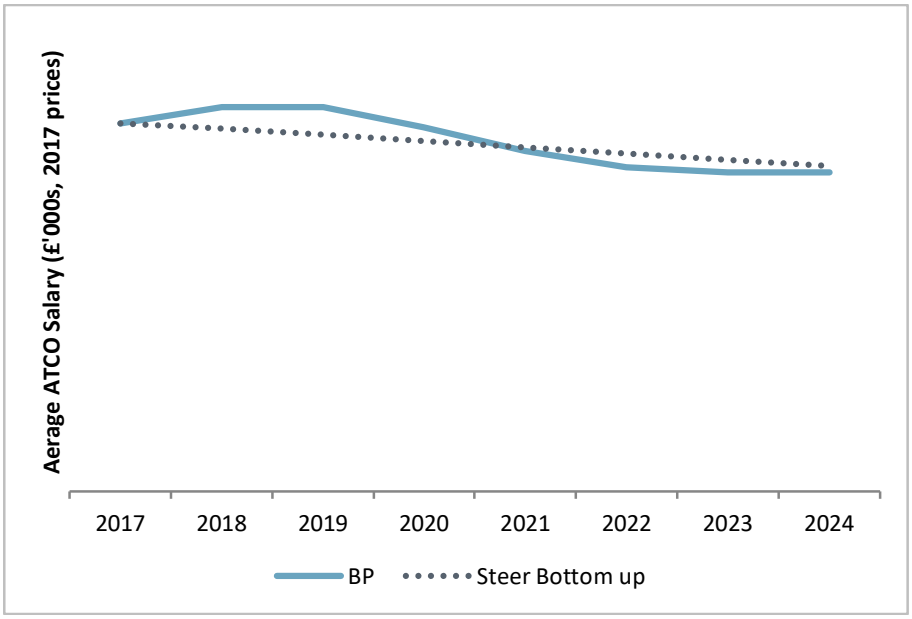
6.42 Nevertheless, due to the significant expected churn in ATCO staff during RP3, with many older staff retiring and newly qualified trainees joining the workforce, a reduction in average salaries per ATCO FTE is anticipated, based on data provided by NATS. The change to the average ATCO salary associated with this staff turnover is shown in Figure 6.10.

[35] Source: NERL's "Response to Steer questions on operational manpower and planning", 13 June 2018, p11. Note the 411 figure includes, in addition to 389 new validations, 6 external recruits and 16 internal staff transfers.

6.43 As part of our efficient operator analysis, and using a breakdown of ATCOs at different levels provided by NATS, we have modelled the average ATCO salary with assumptions on FTEs progressions and salary increases based on the following assumptions:

- 2017 is calculated bottom up using January 2018 FTEs and Salary Assumptions and calibrated to match 2017 actuals.
- We assumed retirements will affect only FTEs who have reached the max level of salary within their role (people earning 100% of Max Salary) and will be proportionally equal across all ATCO Categories.
- We assumed new validations would join as ATCO2 at the minimum level of salary within the ATCO2 category.
- New validations will join the following year as ATCO2 at the lowest level and will increase Spine Point every year.
- We assumed for modelling purposes that the number of progressions across the existing staff members to the next Spine Point will be equal to the number of annual retirements although we recognise there is no automatic link. We assume salary level increases consistent with benchmarks.

Figure 6.10: Efficient operator model and NERL BP average ATCO salary (2017-2024) (✂ Data values excised)



Sources: NERL data and Steer analysis

6.44 Our analysis suggests the decrease in average ATCO salary due to change in the mix of experienced ATCOs vs. new validations is consistent with the BP.

6.45 Given this analysis of the impact of staff churn and our view of the salary levels, we have not identified any changes in cost levels related to ATCO salaries.

Air Traffic Service Assistants (ATSAs)

6.46 We have assessed the BP projections for ATSAs based on the following data received and discussions held:

- Staff FTE and salary cost projections for ATSAs.

- Breakdowns by function.
- Rationale for operational staff reduction (ExCDS); explanation for increase in other ATSAs.
- Face to face discussion with NERL on 1 June 2018.
- Information provided by NERL during the manpower planning workshop on 23 August 2018.

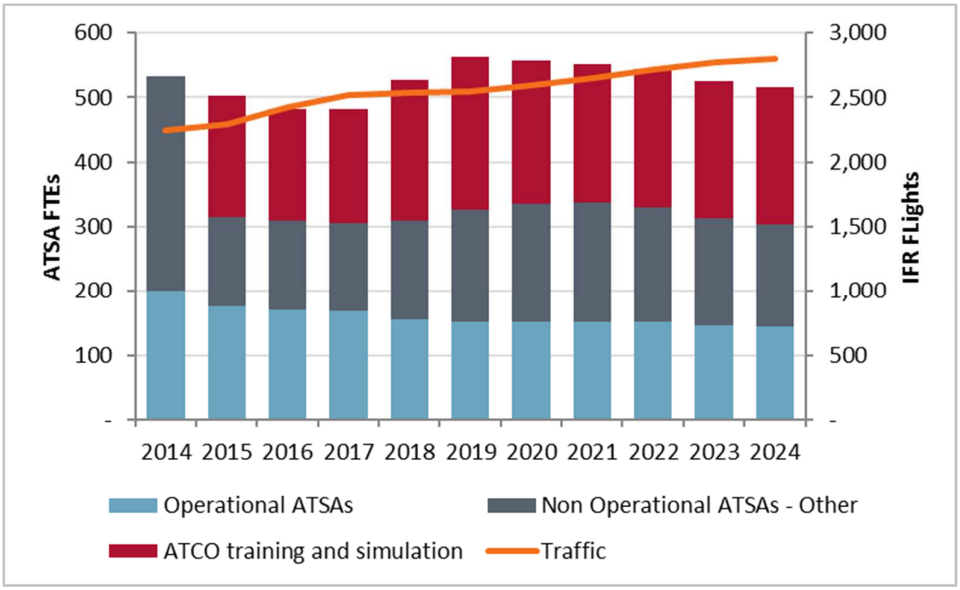
6.47 Our analysis includes:

- The impact of SESAR on operational ATSAs;
- The knock-on impact of changes to ATCO forecast on training/simulation ATSA resource;
- A review of impact of legacy system escape on need for other ATSAs; and
- A review of ATSA roles and salaries.

ATSAs – BP projections

6.48 Figure 6.11 shows the number of ATSA FTEs, between 2014 and 2024, disaggregated into the three staff types provided by NATS.

Figure 6.11: NERL historical and projected ATSA FTEs (2014-2019)



Source: NATS 20 June & 9 November 2018 data submissions

6.49 ATSA FTEs will have increased during RP2 from 532 in 2014 to 562 in 2019 (CAGR +1.1%), and decrease to 516 by 2024 at the end of RP3 (CAGR -1.7%). The increase in ATSA FTEs throughout RP2 is driven by other non-operational and ATCO training staff – which both increase throughout the period while operational staff decrease. During RP3 all three types of ATSAs decrease. NATS explained the profile of each staff type as follows:

- The number of operational staff are projected to continue to fall, throughout the remainder of RP2 (CAGR -5.3%[36]) and during RP3 as ExCDS (electronic flight progress

[36] CAGR calculated from 2017 to 2019

strips) is introduced and new ATC methodologies are introduced at the end of RP3, but the rate of reduction is much lower during RP3 (CAGR -0.8%[37]).
- ATCO training staff increase in the last two years of RP2 (CAGR +16.1%) driven by the need to increase trainee ATCO throughput and increase demand for simulation capacity, before levelling off throughout RP3 (CAGR -2.0%).
- Other non-operational staff are forecast to continue to increase in the last two years of RP2 (CAGR +12.6%) due to their role in the airspace and technology change programme, before also levelling off throughout RP3 (CAGR -2.0%).

6.50 In the material provided at the workshop on 23 August 2018, NERL provided a description of how it expected ATSA staff numbers to evolve during RP3. It indicated that ATSAs were needed to support the operation, support ATCO training and simulation and to support development. For the operational and development roles, the explanations for the need to retain (and in the case of development, increase) staff numbers were general rather than specific, and did not appear to factor in the opportunity for more efficient working as the operation grew in size and new technology was introduced. In the case of ATSA staff supporting ATCO training and simulation, this is inter-linked to the level of trainee ATCO staff required, and hence would reduce if the ATCO trainee requirement itself were to reduce as discussed above.

6.51 NERL noted that current operational ATSA roles are expected to continue during RP3 and that the option of removing this role was discounted due to cost and programming constraints as well as the need to negotiate changes of grade with the Trade Unions.

6.52 We consider that it remains valid to compare the BP projections against those estimated using the "efficient operator" approach described from paragraph 6.6 above. Moreover that an "efficient operator" in a competitive market would be expected to address current operational ATSA roles as soon as permissible by technology and process opportunities.

ATSAs – Efficient operator model

6.53 Figure 6.12 shows our efficient operator model projection for ATSA FTEs from 2017 against those within NERL's BP. The assumptions we have used to generate the efficient operator range, for each staff type, are as follows:

- For operational ATSAs, on the basis of the continuation of the previous trend (but at a lower rate), we have assumed a range of 5 – 10 FTE reductions per year in RP3 consistent with the reduction of 50 (or 10 p.a.) FTEs during RP2. Operational ATSAs perform functions many of which should become much more efficient, or disappear, with deployment of new technology (such as sector coordination, Class D clearances). While NERL provided some explanation of the need to continue with operational roles for ATSAs during RP3, we note that NERL discounted options to remove some roles for reasons which we do not consider fundamental to a consideration of efficiency, e.g. programming constraints and the need for Trades Union agreement. Therefore, we believe that it should be possible for an efficient operator to continue to decrease staff levels in this area.
- For ATSAs supporting ATCO training and simulation, we have assumed a reduced requirement due to the reduced number of ATCOs trainees required (c. 7.5 to 30% of the BP level), based on our efficient operator model for ATCO trainees (see ATCOs section

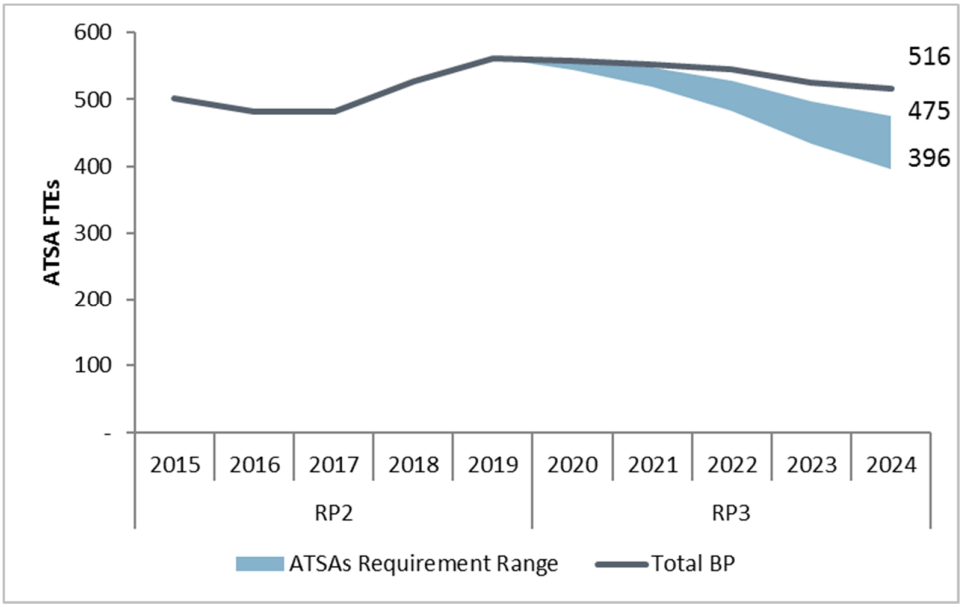
[37] CAGR calculated from 2019 to 2024

from paragraph 6.28 above). Hence, we assume ATSA training staff FTEs to fall by a similar range versus the BP projections, as the ATSA training staff complement is sufficiently large for a proportional reduction to be reasonable.

- Non-operational ATSAs will support the airspace and technology change programmes over the next few years. We understand that NERL is planning to increase ATSAs supporting the network management capability and to support the change programme, leading to increases in staff to 2020. However, we consider that ATSA numbers could then be reduced more rapidly from 2020 than is assumed by NERL. We have assumed a rate of reduction between 1.25 and 1.50 times faster after 2020 than assumed by NERL in the BP to reflect a more efficient use of staff once the new technology implementation is underway as we assess new systems and ways of working should be targeted as quickly as possible.

6.54 Combining these assumptions across the three groups of ATSA staff leads to lower projections of ATSA FTE requirement that in the BP, as is shown in Figure 6.12 below. The range covers the high and low assumptions for each category.

Figure 6.12: Efficient operator model and NERL BP ATSA FTE projections (2015-2024)



Source: NATS 13 November 2018 data submission & Steer analysis

6.55 Therefore, relative to NERL's BP, our efficient operator has identified potential ATSA FTE staff level differences of 13-31% for operational staff, 7.5%-30% for ATCO training staff and 4-8% for other non-operational staff by the end of RP3. Overall, staff level differences of between 8% and 23% of ATSA FTEs by the end of RP3 appear possible based on Steer's assumptions.

6.56 NERL has stated that the proposed reduction to ATSA headcount would risk lower service performance (e.g. due to insufficient resource to fully support airspace capacity management) and would jeopardise timely implementation of the capex programme (e.g. due to insufficient resource to fully support simulations and training requirements). NERL stated that reducing ATSAs would also require NERL to use scarce operational ATCO resource to support these tasks, resulting in higher delay and cost for customers.

ATSA roles and salaries

6.57 The analysis above, together with the significant changes to the underlying technology used by NERL through the deployment of SESAR which should lead to more automation and greater flexibility in ATCO working practices, appear to indicate that there may be scope in the medium term to make significant changes to the roles undertaken by ATSAs.

6.58 This is strengthened by the analysis in Chapter 5 (see paragraph 5.36 and Figure 5.14), which indicates that ATSA salaries are significantly higher than benchmark roles in the wider UK economy. This point was recognised by NERA, the consultants appointed by NERL to review its salary costs (see Figure 4.2 on p32)[38], whose analysis confirms the high level of ATSA pay. NERL has stated that both the Steer and NERA analysis is not comparable due to the safety critical nature of the work performed by ATSAs.

6.59 There is therefore strong evidence that ATSA staff costs need to be reduced to be efficient, both in terms of staff numbers and unit costs. While it is for NERL to determine how to address this, we think there would be merit in NERL giving consideration to developing a long-term plan to consider the classification of the roles currently undertaken by ATSA grade staff, with some of the roles potentially being reclassified as administrative roles. Salaries for these reclassified roles should be benchmarked against suitable external roles and adjusted accordingly.

6.60 Recognising that it may be difficult for NERL to adjust the salary levels of existing ATSA staff, it may be worthwhile giving consideration to the idea of the introduction of different, lower, salary rates for new joiners in such reclassified roles, an approach that has been taken in other UK privatised transport companies.

Central management and support staff

6.61 We have assessed the BP projections for Personal Contract Group (PCG) and Managerial Support Grade (MSG) staff based on the following data received and discussions held:

- Staff FTE and salary cost projections.
- Breakdowns by function.
- Rationale for projections including operational support, technical services, HR, IT.
- Face to face discussion with NERL on 1 June 2018.
- Information provided by NERL during and following the manpower planning workshop on 23 August 2018.

6.62 Our analysis includes:

- Benchmarking of number of central staff compared with other organisations.
- Benchmarking of rate of growth compared with traffic.
- Historical Elasticity to traffic growth.
- For PCG – consideration of salary growth, including bonus pool.

Business support functions

6.63 To assess the level of support staff costs, we have combined the staff and non-staff elements of key support functions and compared the combined total cost with external benchmarks. The business support functions we have assessed include:

[38] Staff Operating Expenditure for Air Traffic Control, Prepared for NERL, NERA, March 2018

- Finance;
- Human Resources (HR); and
- Legal.

6.64 Although these support functions listed above do not account for a significant proportion of staff or non-staff costs, their level against industry benchmarks provides an indication of the reasonableness of NERL's costs for its wider business support functions.

6.65 Table 6.1 shows finance, HR and legal costs against pan-industry benchmarks on either a proportion of costs, proportion of revenue or per FTE basis, depending on the type of benchmark available. All external benchmarks are presented as median values across the companies surveyed.

Table 6.1: Business support costs benchmarking

Cost line	Source	Coverage	Year	Staff costs %	% of Revenue	% of Costs	Cost per FTE
HR	**NERL**	**Staff (ATCO, ATCE, MSG, contractors & personal contracts) & non-staff costs**	**2016**	**66%**	**0.62%**	**0.74%**	[✂]
	Bloomberg 'HR Department Benchmarks and Analysis'	*681 US companies*	*2016*	-	-	*1.6%*	*£1,008*
Finance	**NERL**	**Staff (MSG, STAR, graduate, contractors & personal contracts) & non-staff costs**	**2016**	**86%**	**0.56%**	**0.68%**	[✂]
	PwC 'Finance Effectiveness Benchmark Report'	*600 global organisations*	*2016*	-	*0.89%*	-	-
Legal	**NERL**	**Staff (MSG, contractors & personal contracts) & non-staff costs**	**2016**	**61%**	**0.10%**	**0.12%**	[✂]
	Major, Lindsay & Africa 'Global Legal Department Benchmark Survey'	*241 global companies*	*2015*	-	*0.27%*	-	-

Source: NATS 23 April, 14 June & 13 November 2018 data submissions, NERL financial accounts, and publicly available benchmarks

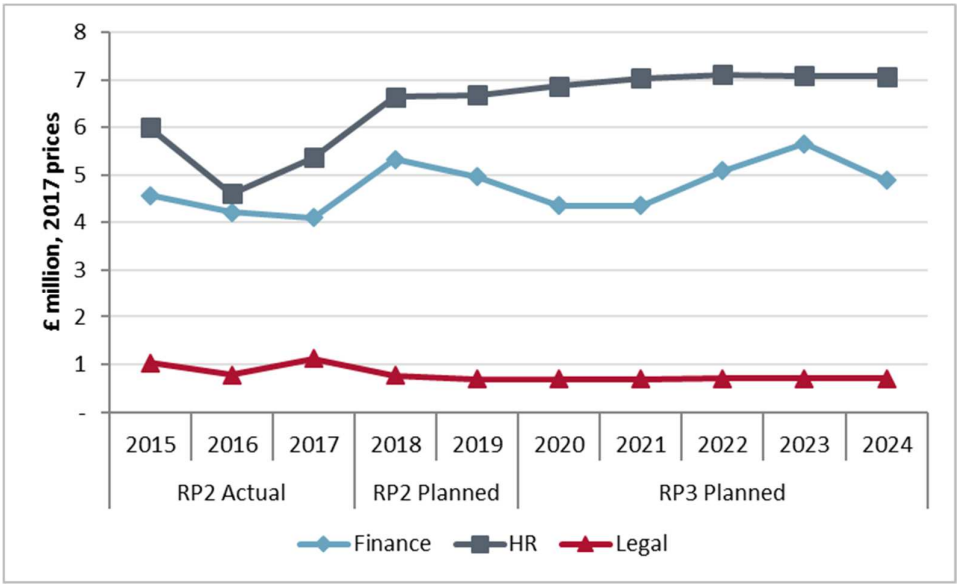
6.66 Finance and legal costs are below pan-industry benchmarks, although HR costs, (on a per FTE basis) are above benchmarks this is to be expected given the high level of unionisation of NERL's staff (and the associated engagement and negotiation required). For all three business support functions, staff costs account for the majority (61-86%) of total costs.

6.67 The total costs of the three business support functions are shown in Figure 6.13. HR costs are forecast to increase in RP2 (from £4.6m in 2016 to £6.9m in 2020) but remain relatively constant in RP3 (CAGR +1.2%). NERL stated this increase was due to additional demand associated with, amongst other things, ATCO recruitment, DSESAR changes and employee relations (including pay bargaining). [✂] .

6.68 Finance costs are relatively cyclical as NERL stated that, during the planning process for each reference period, the finance team provides the expertise for the financial component of

business plans. Between 2017 and 2024, finance costs are forecast to fluctuate between £4.1 million and £5.7 million. Legal costs are relatively small in comparison to the other two business support functions and remain constant at £0.7 million throughout the remainder of RP2 and RP3.

Figure 6.13: NERL historical and projected business support costs (2015-2019)



Source: NATS 23 April, 14 June & 13 November 2018 data submissions

6.69 Alongside the three business support functions discussed above, we have also combined staff and non-staff non-operational IT costs and compared the total costs with pan-industry benchmarks. However, unlike the business support functions, non-operational IT costs are made up predominately (approximately 80%) of non-staff costs.

6.70 Table 6.2 shows non-operational IT costs against pan-industry benchmarks on a proportion of proportion of revenue and per FTE basis. NERL stated a proportion of some the non-operational IT cost items (such as cyber security and rostering technology) relate to operational activities and therefore not truly non-operational costs. The table below shows two totals for non-operational IT costs – with and without the costs that relate to operational activities included.

Table 6.2: Non-operational IT costs benchmarking

Source	Coverage	Year	Staff costs %	% of Revenue	Cost per FTE
NERL – excluding operational costs	**Non-staff & staff Non-operational IT**	**2017**	**20%**	**1.81%**	[✂]
NERL – including operational costs			**23%**	**2.06%**	[✂]
Deloitte 'CIO Insider'	*747 Global Companies*	*2016-17*	-	*3.28%*	-
Computer Economics 'IT spending & staffing benchmarks'	*200+ organisations in USA & Canada*	*2016*	-	*1.98%*	*£3,999*

Source: NATS 23 April, 14 June 2018 & 13 November data submissions, 01 June 2018 NERL presentation to Steer and publicly available benchmarks

6.71 Non-operation IT costs are marginally higher than pan-industry benchmarks (on a per FTE basis) when costs related to operational activities are excluded, although rise to approximately 15% higher than benchmarks when these costs are included. Although NERL's non-operational IT costs are projected to slightly increase in RP3 (CAGR +0.9%), the costs rise significantly to £19.1 million in 2019 from 15.3m in 2017.

Other central staff – NERL BP assumptions

6.72 NERL provided information about its MSG and PCG staff projections for RP3 at the manpower workshop on 23 August 2013. These staff fulfil three different broad categories of roles at NERL:

- operations support;
- technical services support; and
- other support staff.

6.73 Operations support MSG/PCG staff form a significant element of the operations support function at NERL, with 115 FTEs in 2017 out of a full NERL complement of 845, i.e. 14% of the total. Similarly, technical services support MSG/PCG staff represented 191 out of the full NERL complement of 1,028 in 2017, i.e. 19% of the total. In the other support category, MSG/PCG represented 289 out of a full NERL complement of 396 staff in 2017, i.e. 73% of the total. NERL explained that the "other support" category was closest to the idea of traditional corporate support services at other companies. The HR, Finance, Legal and non-operational IT staff discussed above fall into this group.

6.74 NERL argued that it made sense to use MSG/PCG staff in this wide range of roles because it is more efficient and cost effective than recruiting to other grades, such as ATCOs, which are more expensive. While this logic may be sound, it does impact on the assessment of the level of resourcing of those other grades (in particular, ATCOs, ATSAs and ATCEs), and may indicate that the levels of efficiency indicated by the current staff numbers in those other grades has been overstated. For example, NERL's assessment at ATCO efficiency in comparison with other ANSPs does not take account of any use of MSG/PCG (or ATSA) staff in roles elsewhere undertaken by ATCOs.

6.75 NERL did not provide a rationale for the current level of MSG/PCG staffing, but it did provide detailed explanations of the additional MSG and PCG staff required for each of the three categories, i.e. operations support, technical services and other support staff. While we consider that the level of detail provided demonstrates that NERL has considered in some depth what additional resource it feels is required, we do not consider that this necessarily demonstrates that this level of resource is, in fact, efficient.

6.76 We therefore consider that it remains valid to compare the BP projections against those estimated using the "efficient operator" approach described from paragraph 6.6 above.

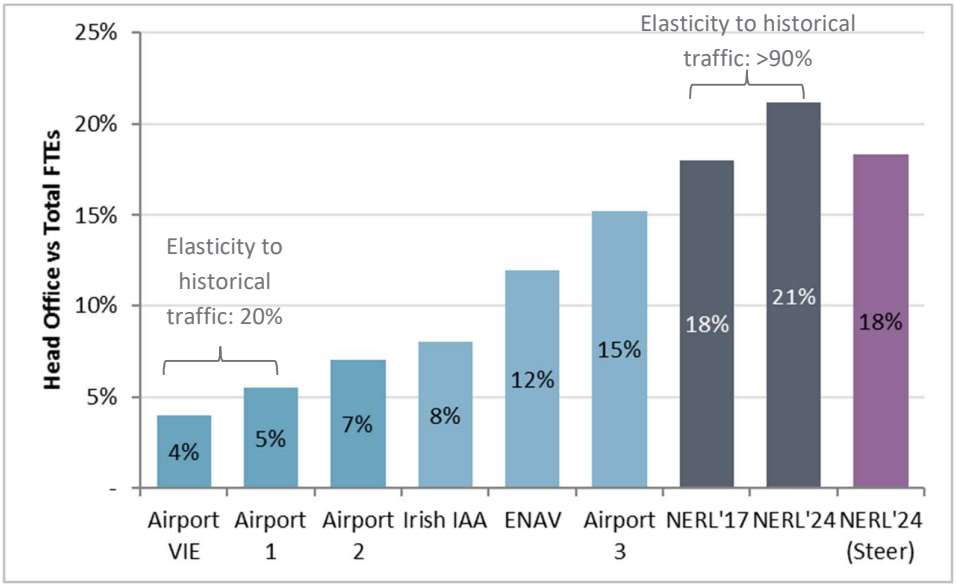
Other central staff – Efficient operator model

6.77 To assess the level of Other MSGs and Other PCGs (i.e. those which are not included in the four business support functions discussed above), we have analysed the number of these FTEs as a proportion of total staff and their historical relationship to traffic growth against comparable organisations.

6.78 Figure 6.14 shows the proportion of MSGs and PCGs, compared to the total number of total staff at NERL (in 2017 and 2024), and at a number of comparator organisations. We have also

identified the rate of growth in these staff at NERL compared to traffic volumes, as well as at two of the benchmark organisations for which this information was available.

Figure 6.14: NERL BP MSG and PCG FTEs as a proportion of total FTEs compared efficient operator model and comparator organisations



Source: NATS 13 November data submission, public reports and Steer confidential information

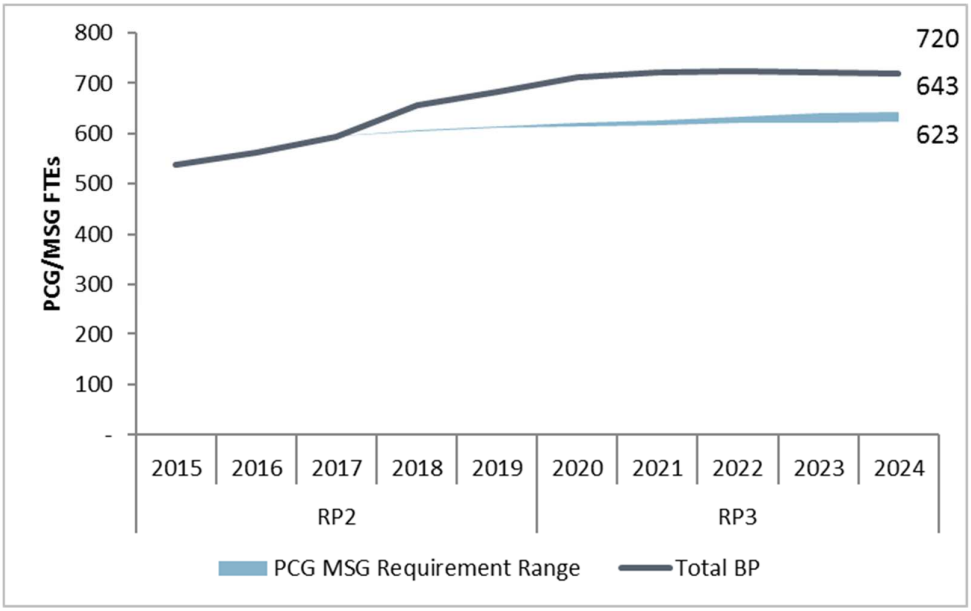
6.79 Comparing the rate of growth of FTEs at NERL with traffic, we have identified a historical elasticity relationship, with Other MSG staff growing at a rate of 71% of traffic growth and Other PCG staff growing at a rate of 170% of traffic growth (or combined at a rate of 107% of traffic growth). These are very high rates for non-operational staff. For two airport examples where we have access to relevant data, the corresponding elasticity to volume growth was only 20%. We note that NERL does not accept that traffic is the main driver of MSG/PCG growth, but we consider that, ultimately, operational activity volume does drive the size of the non-operational staff complement. NERL further does not consider that airports are valid comparators, but we consider that airports are, like NERL, large organisations with significant management support headcount, so a comparison is, while imperfect, nevertheless valid.

6.80 In addition, NERL's MSG and PCG staff are also forecast to increase by 15% between 2017 and 2019, which appears to be very high.

6.81 We have developed an efficient operator model to cover Other MSG and Other PCG staff numbers (FTEs) at NERL. Starting in 2017 (so not including the 15% growth to 2019), we have tested an elasticity range of 0.25 to 0.75 for MSGs and 0.20 to 0.50 for PCGs, in each case in relation to projected traffic growth. Therefore, our higher bound is based on elasticities similar to those found at the benchmark organisations, while our lower bound is based on relatively higher elasticity values (which are nevertheless below those found at NERL).

6.82 Figure 6.15 shows our efficient operator model projection for other MSG and PCG FTEs from 2017 against those within NERL's BP.

Figure 6.15: Efficient operator model and NERL BP other MSG and PCG FTE projections (2015-2024)



Source: NATS 13 November 2018 data submission & Steer analysis

6.83 Based on this analysis, relative to NERL's BP, our efficient operator has identified potential FTE staff level differences of 13-16% for Other MSG staff and 6-8% for Other PCG staff by 2024.

6.84 Our review of salary levels and projected salary growth levels in the BP for these staff groups did not identify any basis for a difference.

6.85 NERL has stated that the proposed reduction to MSG and PCG headcount will increase the risk associated with the delivery of its complex technology programmes, airspace modernisation in RP3 and in developing its future ATM capability.

Technical staff

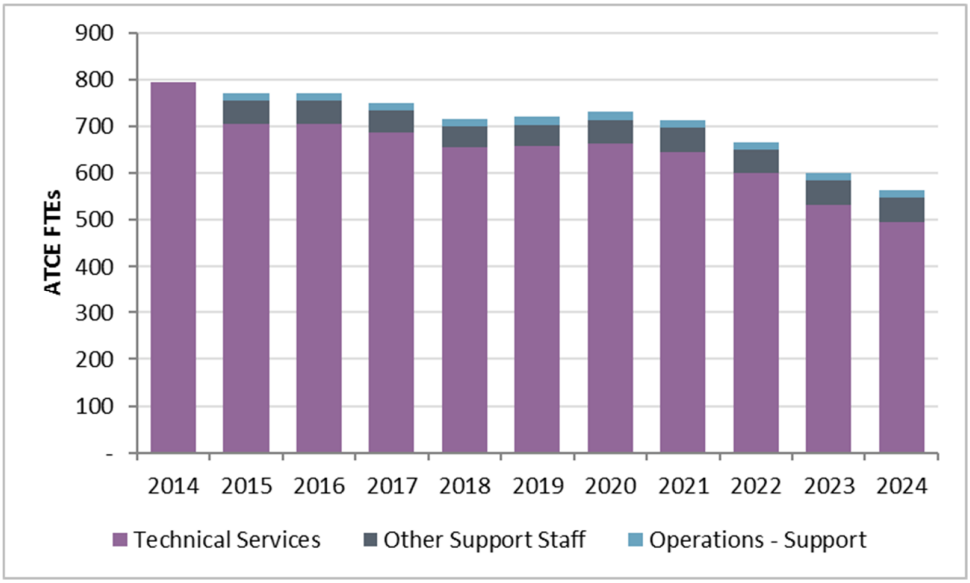
6.86 We have assessed the BP projections for ATCEs based on the following data received and discussions held:

- Staff FTE projections for Air Traffic Control Engineer (ATCE) staff.
- Breakdowns by function, rationale for staff reductions.
- Face to face discussion with NERL on 1 June 2018.

6.87 Due to the highly technical nature of these roles, together with the introduction of new technology at NERL during RP3, it has been difficult to assess the technical staff numbers in isolation. Our assessment has therefore also considered the costs of asset management (non-staff costs of running operational systems) in combination with the technical staff costs, to give an overall picture of level and trends in the costs of operating and maintaining NERL's operational systems. More detail on the asset management costs themselves is provided in Chapter 8.

6.88 Figure 6.16 shows the number of ATCEs, between 2014 and 2024, split by the three functional groups provided by NERL (Technical Services, Other Support Staff and Operations Support). Total ATCEs decrease throughout RP2 (CAGR -2.0%) to 721 in 2019 and RP3 (CAGR -4.8%) to 565 in 2024.

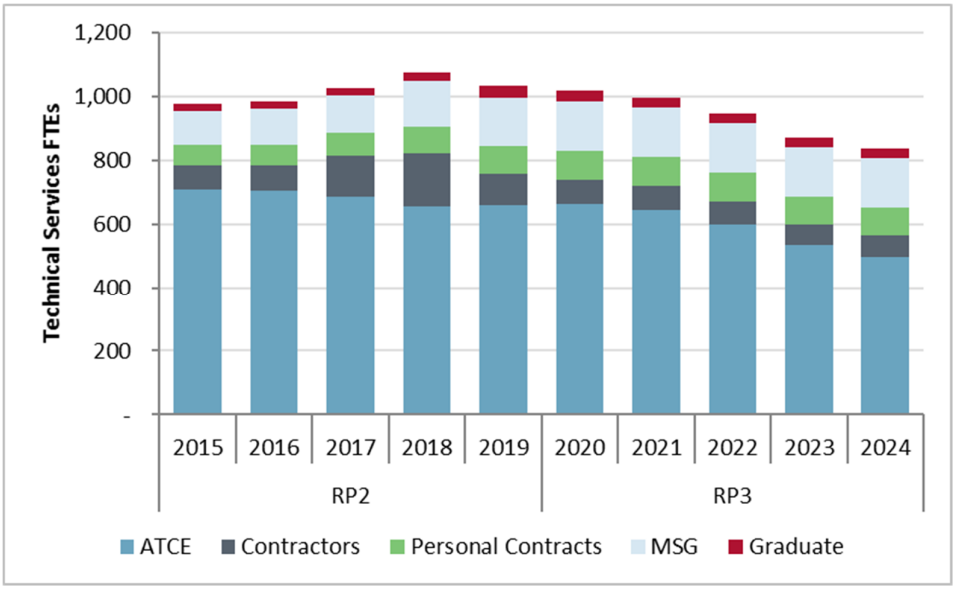
Figure 6.16: NERL historical and projected ATCE FTEs (2014-2019)



Source: NATS 4 June & 9 November 2018 data submission

6.89 As ATCEs are not fully deployed on technical services (as implied by Figure 6.16), while other staff groups and contractors are also used to support the technical systems, we also show the total number of staff dedicated to technical services in Figure 6.17 below. This shows NERL's projections for all technical services FTE types throughout RP2 and RP3.

Figure 6.17: NERL historical and projected technical services FTEs (2015-2019)



Source: NATS 4 June & 9 November data submissions

6.90 Technical services staff, approximately 60% of which are comprised of ATCEs, peak in 2018 at 1,076, and fall to 839 in 2024 (CAGR -4.1%).

6.91 Following the approach described above, we have combined NERL's technical services costs combined with its asset management costs to get an overall picture of the costs of operating and maintaining NERL's operational systems.

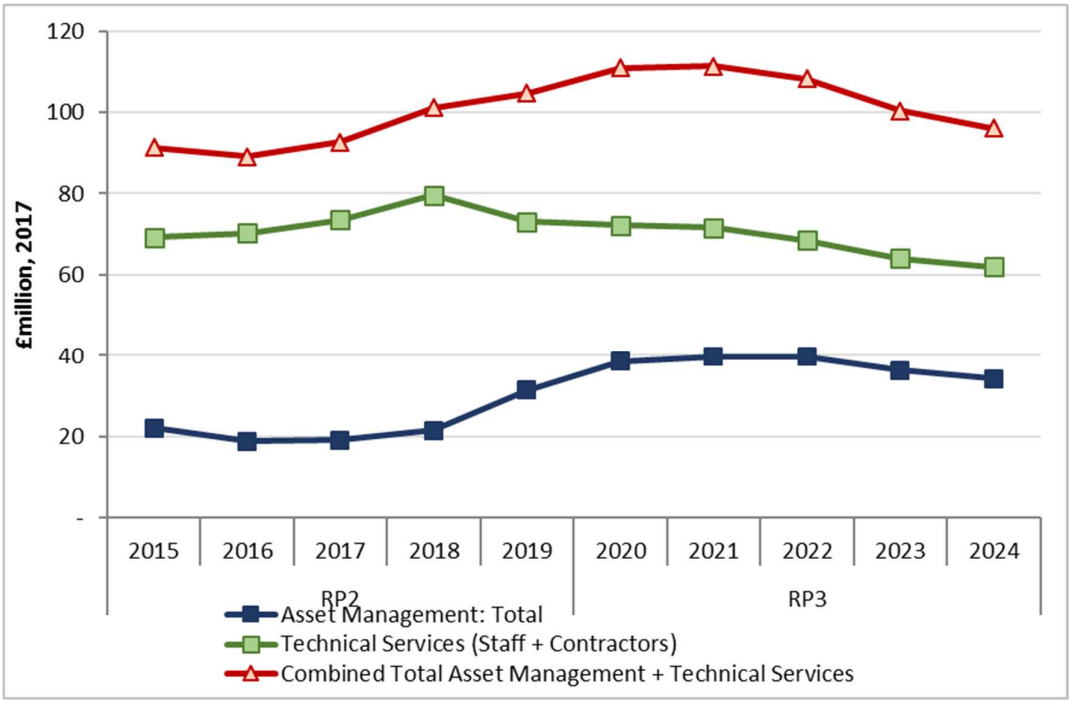
6.92 Technical services costs are comprised of the following (the values in brackets are the share of technical services costs through RP2 and RP3):

- ATCEs (60-62%);
- PCGs (10-13%);
- MSGs (8-11%);
- Graduates (1%);
- Contractors (11-16%); and
- Non-staff costs (4%).

6.93 Asset management costs are comprised of NERL's current and new systems, which are discussed further in Chapter 8.

6.94 Figure 6.18 below shows the combined costs of NERL's technical services staff and its asset management operating costs.

Figure 6.18: NERL historical and projected technical services and asset management costs (2015-2019)



Source: NATS 23 April, 4 June, 13 June & 13 November 2018 data submissions

6.95 Total asset management costs increase by +79.2% from £21.5 million to £38.5 million between 2018 and 2020, and decrease in RP3 (2020-2024) with a CAGR of -2.9% to £34.3m in 2024. The increase in asset management costs at the end of RP2 is driven by the dual-running of the current and new systems, and this leads to a decrease in costs throughout RP3 as the current legacy systems are decommissioned – although NERL stated full legacy escape does not occur until RP4. Disaggregated asset management costs are shown in Figure 8.2.

6.96 Technical services costs peak in 2018 at £78.3 million and fall to £61.1 million in 2024 (CAGR -4.1%). NERL stated the increase in technical services costs towards the end of RP2 is driven by the airspace and technology programme, and support for training programmes – staff providing 'early life support', as it operates both current and new systems. Costs fall in RP3 as NERL decommission some of their current systems and the engineering requirement reduces.

6.97 Total combined costs increase from £91.3 million at the start of RP2 to £111.3 million in 2021, before falling to £95.3 million at the end of RP3. Therefore, the combined total of asset management and technical services costs at the end of RP3 does not fall to below the level at the start of RP2. Combined costs in 2024 are forecast to be slightly above the costs incurred in 2017, but below the higher costs projected for the end of RP2 (i.e. in 2019).

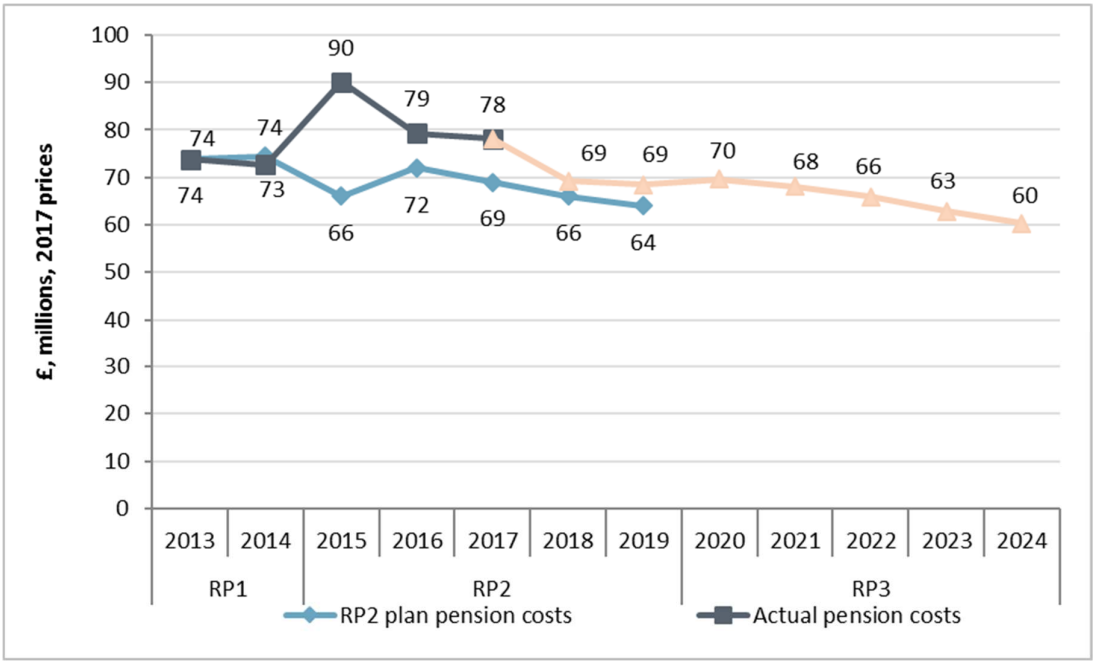
6.98 While NERL has provided projections of asset management costs during RP4, which continue to fall below the RP3 levels, it has not provided projections of technical services costs during RP4. It is therefore not possible to see the trends for the combined costs through RP4.

6.99 While recognising the difficulty in assessing the "right" level of costs for operating such a bespoke and complex technical system, the fact that operating costs are projected to be above historical levels despite the introduction of significantly more advanced technology must be regarded as a challenge to reaching cost efficient outcomes. NERL should seek to provide Stakeholders a better rationale and supporting information for the level of technical services and asset management costs over RP3 and RP4.

Pension costs in Business Plan

6.100 NERL's projections for pension costs in RP3 are set out in Appendix H of the BP, with the values shown on a cash contribution basis, rather than an accounting basis. The accounting pension costs were provided separately by NERL to Steer. These show a steadily declining level of pension cost, as shown in Figure 6.19 below.

Figure 6.19: NERL (UKATS & Oceanic) planned and actual pension cost (2013-1017)



Source: NATS RP2 financial model and 23 April & 13 November data submissions. RP2 plan data adjusted by outturn inflation.

6.101 As overall staff costs remain relatively constant during RP3, as shown in Figure 6.2 above, this means that pension costs, which reached 21.6% of total staff costs in 2017, fall to 16.1% in 2024. However, this reduction results largely from the changing share of Defined Contribution (DC) compared to Defined Benefit (DB) staff, as NERL makes much lower contributions for DC staff (15% on average in 2017 according to the BP) than for DB staff (53%).

6.102 As noted in Chapter 5, while accepting that DB contributions by NERL are protected by the agreement made with staff at the time of NATS's privatisation, no such protection applies to DC contributions – although they are the outcome of Trade Union-NATS negotiations. We undertook a benchmarking exercise of these contributions (see from paragraph 5.63 above) against comparable UK employers, which indicated that NERL's contributions were higher than those made by other employers (see Figure 5.20 above), at up to 18%, depending on the employee's own contributions.

6.103 In the BP, the assumed average level of contribution for DC staff remains at 15% (its 2017 value) throughout the remainder of RP2 and RP3. This indicates that NERL does not intend to reduce its contributions to the DC schemes during RP3 (and we understand this was confirmed by NERL during its consultation with airlines).

6.104 Based on our benchmarking analysis, we consider that the current level of DC pension contributions by NERL cannot be considered to be economically efficient, given the wide discrepancy with contributions made by other comparable organisations. While we have not quantified any potential cost differences, NERL should give consideration to identifying ways to reduce this level of cost (or to provide a stronger rationale to stakeholders for why it is justified). While we appreciate that it may be difficult, either contractually or from an IR perspective, to reduce DC contributions for existing staff, we are not aware of any reason why lower contributions could not be applied for new joiners to the organisation.

6.105 NERL has 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.

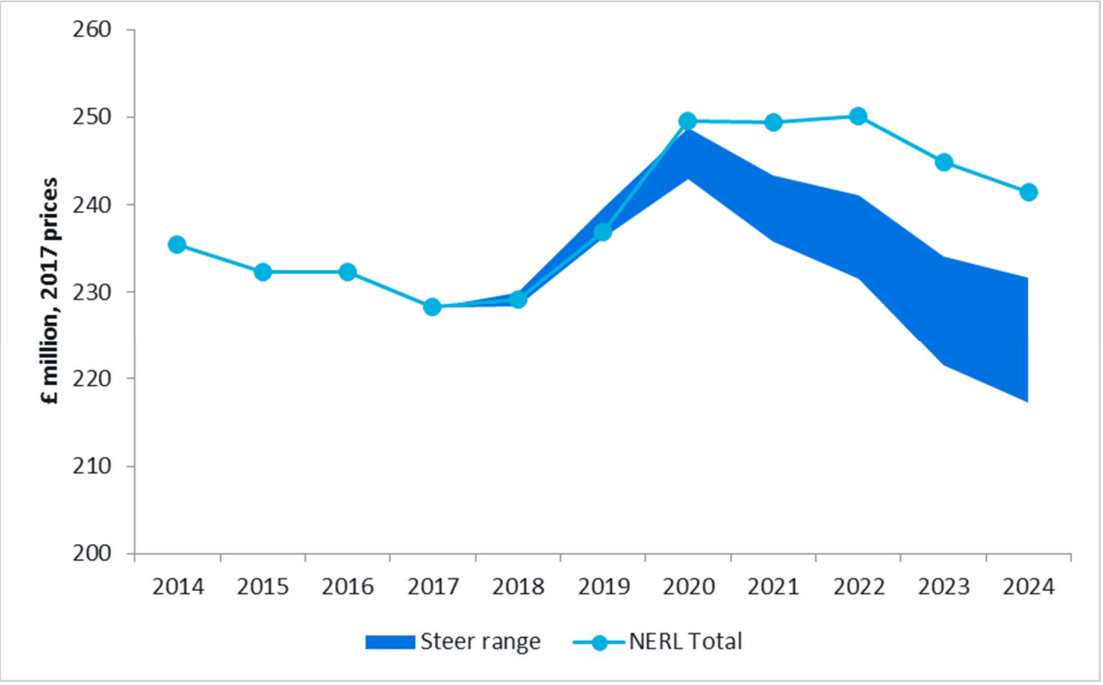
Overall identified staff level and cost differences

Staff salaries

6.106 The identified FTE staff level differences described above (assuming no change to unit staff costs) imply a staff salary cost reduction of between -4.1% and -10.0% by 2024, equivalent to between £10 million and £24 million in 2024 (in 2017 prices). Over the five years of RP3, the identified staff salary cost reduction of between -3.0% and -7.0%, is equivalent to between £36 million and £86 million (2017 prices, undiscounted).

6.107 The range of potential staff salary cost differences between the NERL BP and Steers modelled assumptions are shown in Figure 6.20 – the costs and cost differences shown refer to pensionable pay only.

Figure 6.20: Staff salaries: NERL BP and Steer identified range of costs (2014-2024)

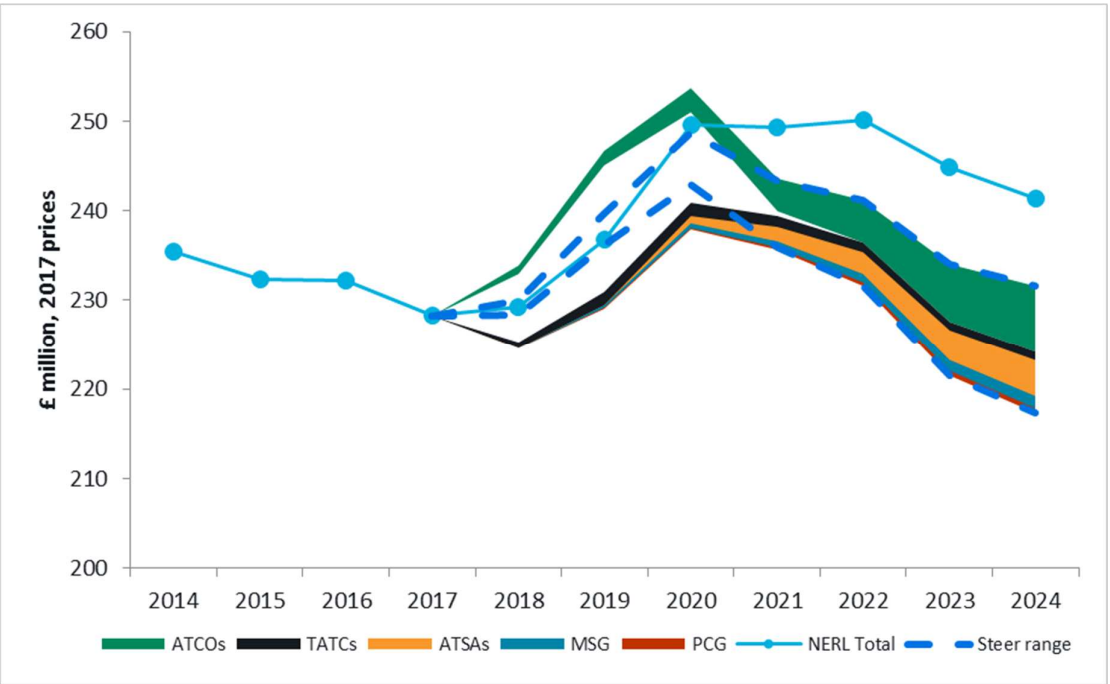


Source: NATS 23 April, 9 November & 13 November data submissions and Steer analysis

6.108 In 2018 and 2019, some of our range of staff salary costs (implied by the FTE differences calculated by our efficient operator model) is above NERL's projected level of staff costs. This is because, as shown in Figure 6.7, we do not assume a fall in the number of ATCOs in 2018 and 2019, whereas NERL has modelled expected staff attrition in those years which results in a net fall in the number of ATCOs available before newly trained ATCOs come on stream. Therefore, our ATCO staff salary cost estimates are higher than NERL's projections in these years.

6.109 This is further illustrated in Figure 6.21, which shows the same data as Figure 6.20, but split into the identified cost differences range for each staff type. The area between the two blue dashed lines represents the same total staff salary cost differences range shown in Figure 6.20.

Figure 6.21: Staff salaries: NERL BP and Steer disaggregated identified cost differences range (2014-2024)



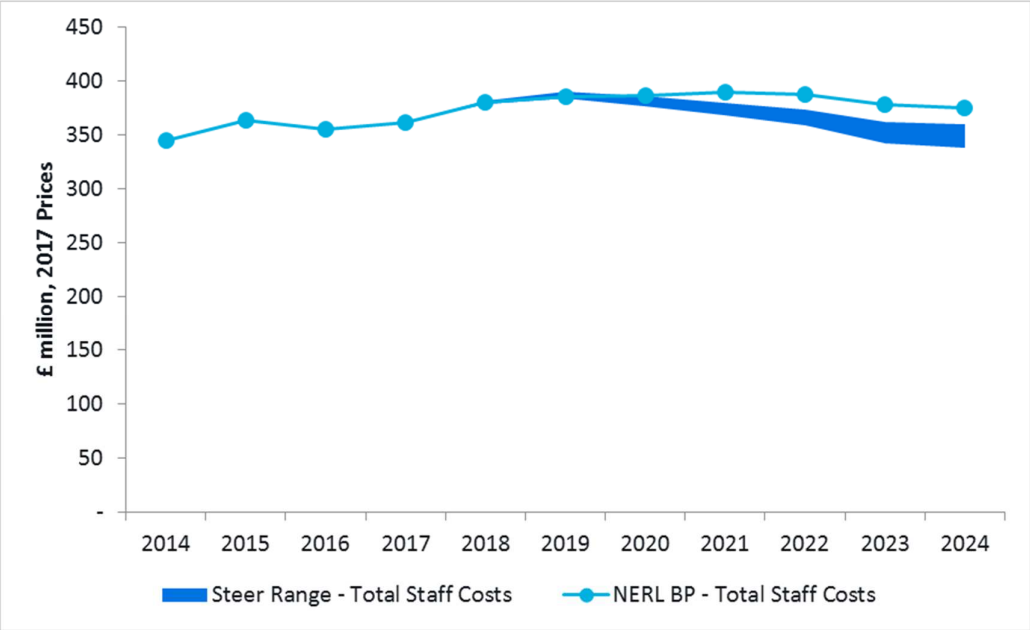
Source: NATS 23 April, 9 November & 13 November data submissions and Steer analysis

6.110 The level of ATCO FTEs within our efficient operator model means the range of ATCO staff costs are above NERL's projections between 2018 and 2020. However, as we have assumed a lower level of FTEs in other staff groups from 2018, our identified range of staff salary costs fall below NERL's projections after 2019. By 2024, ATCOs (51.4%) and ATSAs (28.7%) account for the majority of potential staff salary cost differences.

Total staff costs

6.111 Total staff cost differences are shown in Figure 6.22. We have reduced non-salary (social security, pensions, redundancy and other) staff costs proportionally with the reduction in staff salary costs.

Figure 6.22: Total staff costs: NERL BP and Steer identified staff costs range (2014-2024)



Source: NATS 23 April, 9 November & 13 November data submissions and Steer analysis
Note: Cost levels refer to total staff costs as per NATS data submissions (including pensions and redundancy and capitalised labour)

6.112 Including non-salary costs the identified cost differences represent a reduction of between £15 million and £37 million (2017 prices) in total staff costs by 2024. Over RP3, the differences represent a reduction of between -3.0% and -7.0%, equivalent to between £57 million and £133 million (2017 prices, undiscounted).

6.113 A summary of the cost differences between Steer modelled assumptions range and NERL BP for each staff type in each year is shown in Table 6.3 – cost reductions are shown as positive, costs increases as negative.

Table 6.3: Range of identified staff cost differences between Steer and NERL projections (2020-2024)

Cost level		£m, 2017 prices						%					
		2020	2021	2022	2023	2024	RP3	2020	2021	2022	2023	2024	RP3
ATCO	Low	(5.0)	(0.2)	2.3	4.1	2.8	**3.9**	(4.7%)	(0.2%)	2.0%	3.6%	2.5%	**0.7%**
	High	(2.3)	3.4	6.9	10.5	10.2	**28.6**	(2.1%)	3.1%	6.1%	9.2%	8.9%	**5.1%**
	Range	*2.7*	*3.6*	*4.6*	*6.4*	*7.3*	***24.8***	*2.5%*	*3.3%*	*4.1%*	*5.7%*	*6.4%*	***4.4%***
TATC	Low	0.5	0.4	0.4	0.3	0.3	**1.9**	7.5%	7.5%	7.5%	7.5%	7.5%	**7.5%**
	High	2.1	1.7	1.4	1.3	1.3	**7.8**	30.0%	30.0%	30.0%	30.0%	30.0%	**30.0%**
	Range	*1.5*	*1.3*	*1.1*	*1.0*	*0.9*	***5.8***	*22.5%*	*22.5%*	*22.5%*	*22.5%*	*22.5%*	***22.5%***
ATSA	Low	(0.0)	0.2	1.0	1.5	2.2	**4.8**	(0.1%)	0.7%	3.4%	5.3%	8.0%	**3.4%**
	High	0.8	1.8	3.4	4.9	6.3	**17.1**	2.5%	5.9%	11.6%	17.3%	23.3%	**11.8%**
	Range	*0.8*	*1.6*	*2.4*	*3.4*	*4.1*	***12.2***	*2.6%*	*5.2%*	*8.2%*	*12.0%*	*15.3%*	***8.5%***
MSG	Low	3.3	3.5	3.4	3.2	3.0	**16.4**	15.5%	15.8%	15.0%	14.1%	13.4%	**14.7%**
	High	3.8	4.2	4.3	4.3	4.3	**21.0**	17.8%	18.9%	19.4%	19.3%	19.1%	**18.9%**

Cost level		£m, 2017 prices						%					
		2020	2021	2022	2023	2024	RP3	2020	2021	2022	2023	2024	RP3
	Range	*0.5*	*0.7*	*1.0*	*1.2*	*1.3*	***4.6***	*2.3%*	*3.1%*	*4.4%*	*5.2%*	*5.7%*	***4.2%***
PCG	Low	2.0	2.2	2.0	1.7	1.5	**9.5**	8.2%	8.7%	7.9%	6.6%	5.7%	**7.4%**
	High	2.2	2.5	2.4	2.2	2.1	**11.5**	8.9%	9.8%	9.5%	8.7%	8.1%	**9.0%**
	Range	*0.2*	*0.3*	*0.4*	*0.5*	*0.6*	***2.0***	*0.7%*	*1.1%*	*1.6%*	*2.1%*	*2.4%*	***1.6%***
Total Salary costs	Low	0.8	6.1	9.0	10.8	9.8	**36.5**	0.3%	2.4%	3.6%	4.4%	4.1%	**3.0%**
	High	6.5	13.5	18.5	23.3	24.1	**85.9**	2.6%	5.4%	7.4%	9.5%	10.0%	**7.0%**
	Range	*5.7*	*7.4*	*9.5*	*12.5*	*14.3*	***49.5***	*2.3%*	*3.0%*	*3.8%*	*5.1%*	*5.9%*	***4.0%***
Total staff costs	Low	1.3	9.5	13.9	16.7	15.2	**56.6**	0.3%	2.4%	3.6%	4.4%	4.1%	**3.0%**
	High	10.2	21.1	28.7	36.0	37.4	**133.4**	2.6%	5.4%	7.4%	9.5%	10.0%	**7.0%**
	Range	*8.9*	*11.6*	*14.8*	*19.3*	*22.2*	***76.8***	*2.3%*	*3.0%*	*3.8%*	*5.1%*	*5.9%*	***4.0%***

Source: NATS 23 April, 9 November & 13 November data submissions and Steer analysis

Summary and conclusions

6.114 Our conclusions concerning staff cost projections for RP3 in the BP are as follows:

- ATCO staff number projections in the BP, are higher than the results of Steer's bottom-up analysis. . However, the number of operational ATCOs at the upper range of our projections is nevertheless 8.1% higher than the number of operational ATCOs in 2017 in the context of IFR traffic growth of 11.4% over the same period, while in the lower range of our projections the number of ATCOs is only very slightly lower than in 2017. NERL has stated that some of this increase is required to rebuild staff levels for service and resilience to take account of the findings of Project Oberon.
- Based on Steer analysis, ATSA staff number projections in the BP appear to be high with differences between Steer and NATS projections of 13% to 31% FTEs by the end of RP3 for operational ATSAs, 7.5% to 30% for training and simulation ATSAs and 4% to 8% for non-operational ATSAs. Overall, differences of between 8% and 23% of ATSA FTEs result from a comparison between the forecasts
- Based on Steer analysis, ATSA salary levels appear high compared to benchmarks and given the potential impact of the new technology being adopted by NERL it would be worthwhile giving consideration to restructuring some or all ATSA roles over the longer term and potentially introducing lower salaries for new staff joiners.
- Management and support staff and associated non-staff costs for business support roles (Finance, Legal and HR, as well as non-operational IT) appear to be reasonable compared to benchmarks.
- For other support staff in the MSG and PCG grades, the planned growth in FTEs from now until the end of RP3 appears to be very high in relation Steer's assessment of the underlying driver (traffic growth), in comparison to similar expectations at comparable organisations, leading to potential cost differences between Steer and NATS projections in the range of 13% to 16% for other MSGs and 6% to 8% for other PCG staff by 2024. In its feedback on the draft report, NERL stated that is does not consider that traffic is the underlying driver of staff numbers in these groups. Steer assesses that operational activity volume directly or indirectly does drive the size of the non-operational staff complement.
- While it is difficult to judge the planned level of technical services staff during RP3, the costs of this can be combined with the asset management costs of operating NERL's

operational systems, showing that combined costs increase during RP3 and then fall back to a level slightly above 2017 expenditure. NERL have provided an explanation for these patterns of costs, however it is difficult for us to prove these costs provide value for money.

- Pension contributions for DC staff currently being made by NERL and planned to continue during RP3 are relatively high compared to benchmark UK companies of privatised utility and transport companies, and airlines have asked that consideration should be given to reducing these contributions, at least for new joiners. We note that NERL has stated that it provides a competitive DC scheme necessary to attract and retain specialist staff, and also that NERL considers that seeking to compare its fully funded pension arrangements with those of other European ANSPs does not provide a fair comparison.
- We have identified staff salary cost differences between Steer and NERL projections of -3.0% and -7.0% throughout RP3, equivalent to between £37 million and £86 million (2017 prices, undiscounted), which, when taking into account associated reductions in non-salary costs, is equivalent to total staff cost differences of between £57 million and £133 million.

6.115 NERL has stated that reducing its planned levels of staff would have a material detrimental impact on service performance and resilience in RP3, and RP4, and on its ability to implement airspace modernisation and provide the resources for Heathrow runway 3.

7 Non-staff costs in RP2

Introduction

7.1 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 – or over a single reference period.

7.2 In this chapter we analyse the evolution of NERL's non-staff operating costs in RP2, based on the data provided by NERL between 23 April and 13 November 2018. 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;
- Asset management;
- Business support;
- Non-operational IT; and
- Other.

7.3 Consistent with the analysis in Chapter 3, the analysis in this chapter is based on the following years;

- Actual data for the final year of RP1 (2014);
- Actual data for the first three years of RP2 (2015-2017); and
- NERL's latest forecast for the final two years of RP2 (2018-2019).

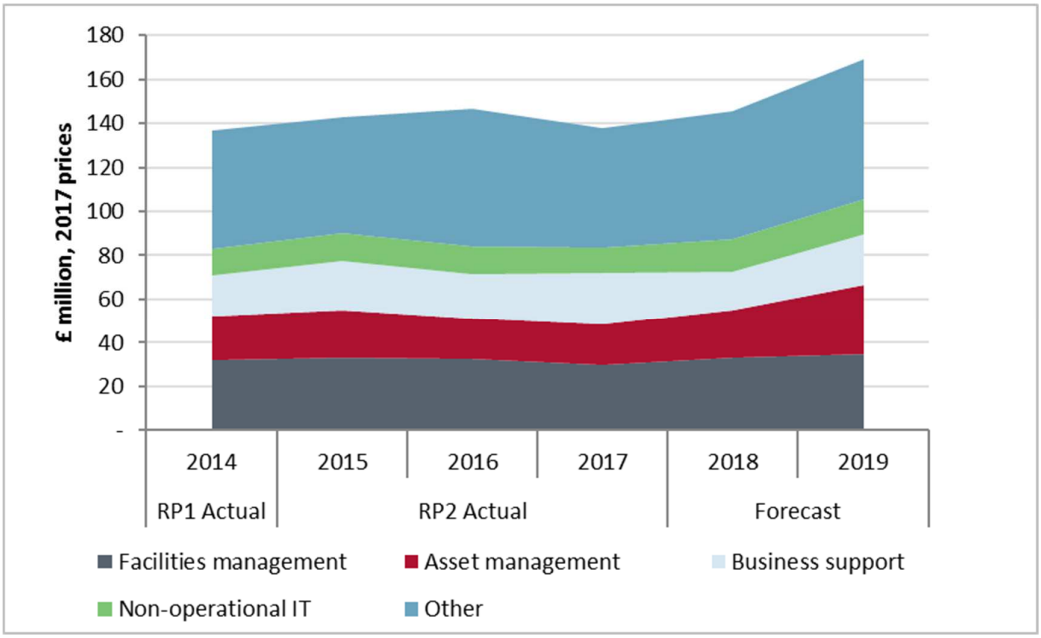
7.4 All monetary values are presented in real terms in 2017 prices.

7.5 As with the assessment of staff costs in RP2, the assessment of non-staff costs is to inform the CAA's assessment of the overall cost efficiency path for NERL during RP3. 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.

Overview of RP2 non-staff costs

7.6 Figure 7.1 shows NERL's total non-staff operating costs, between 2014 and 2019, split into the five cost categories listed above.

Figure 7.1: NERL historical and projected total non-staff operating costs (2014-2019)



Source: NATS 23 April & 13 November 2018 data submissions

7.7 As discussed in Chapter 3, non-staff operating costs rose in both 2015 and 2016, but fell in 2017 back to close to the 2014 level. Between 2014 to 2017, the CAGR of total non-staff operating costs was close to zero, at +0.3% p.a., while the CAGR of unit non-staff operating costs was -5.1% p.a. over the same period.

7.8 Non-staff operating costs are projected to grow rapidly in the last two years of RP2, with an average real terms growth rate of over +10% p.a. For the entire RP2 period, this implies a real CAGR of +4.3% p.a. for total non-staff operating costs, and a real CAGR of +0.4% in unit cost terms[39].

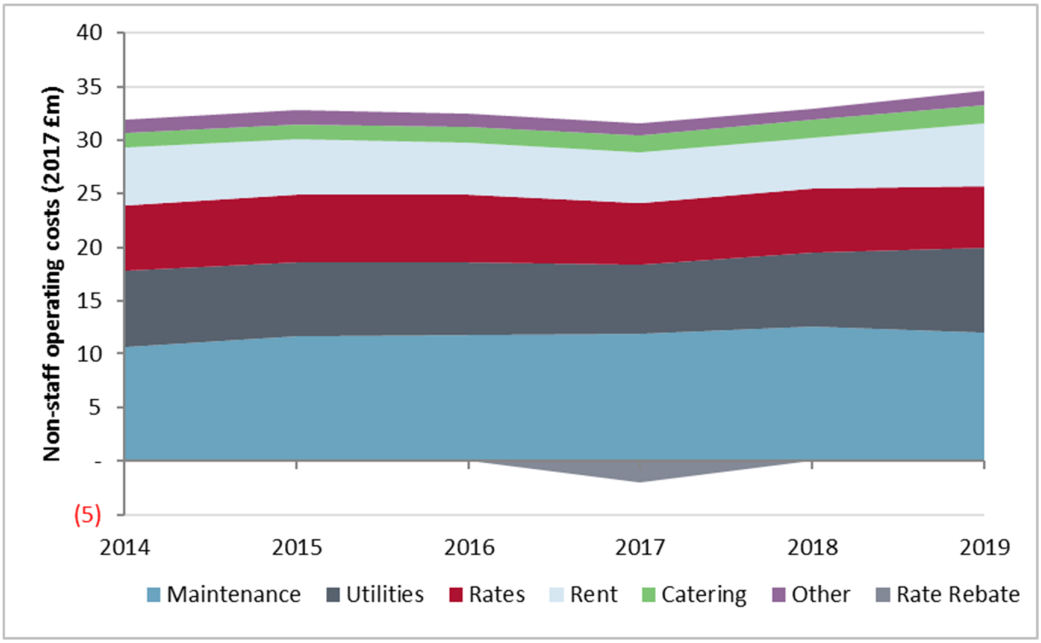
7.9 Between 2014 and 2017, 'Other' costs accounted for approximately 40% of total non-staff costs. The remaining costs were made up of facilities management (approx. 23%), asset management and business support (both approx. 15%), and non-operational IT (approx. 9%). In the remainder of this chapter, we analyse the evolution of each of these cost categories in more detail.

[39] CAGR values for RP2 have been calculated based on the value immediately before the start of RP2 (i.e. 2014, the last year of RP1) and the value at the end of RP2 (i.e. 2019).

Facilities management

7.10 Figure 7.2 shows NERL's facilities management costs between 2014 and 2019, 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 7.2: NERL historical and projected total facilities management costs (2014-2019)



Source: NATS 23 April & 13 November 2018 data submissions

7.11 Total facilities management costs (taking account of the £-2.0m rate rebate) decreased by -9.1% in 2017 and with a CAGR of -2.5% between 2014 and 2017; however, total costs are forecast to increase by an average of over +8.0% in 2018 and 2019. Each of the sub-categories have evolved, and are forecast to evolve, as follows:

- Maintenance costs increased by over +9% in 2015, increased by under +2% in 2016 and 2017, and are forecast to remain relatively constant for the remainder of RP2. NERL stated that there is limited scope for reducing maintenance costs given the age of its asset base.
- Utilities costs decreased in each of the first three years of RP2, by between -2% and -5%, but are forecast to increase by an average of over +10% in 2018 and 2019. NERL stated the increased costs at the end of RP2 is due to dual running of legacy and new DSESAR assets (and that some savings in relation to retiring the legacy assets are expected in 2023 and 2024).
- Rent costs decreased by a CAGR of -4.5% in the first three years of RP2 and are forecast to increase slightly by +0.9% in 2018. However, rent costs are forecast to increase by over +22% in 2019, due to external data centres transferring from the DSESAR build programme to an operational service.
- Rates, which represent business rate charges for NERL's corporate and remote sites, decreased by a CAGR of -1.8% in the first three years of RP2, and are forecast to decrease by an average of -0.2% in 2018 and 2019.

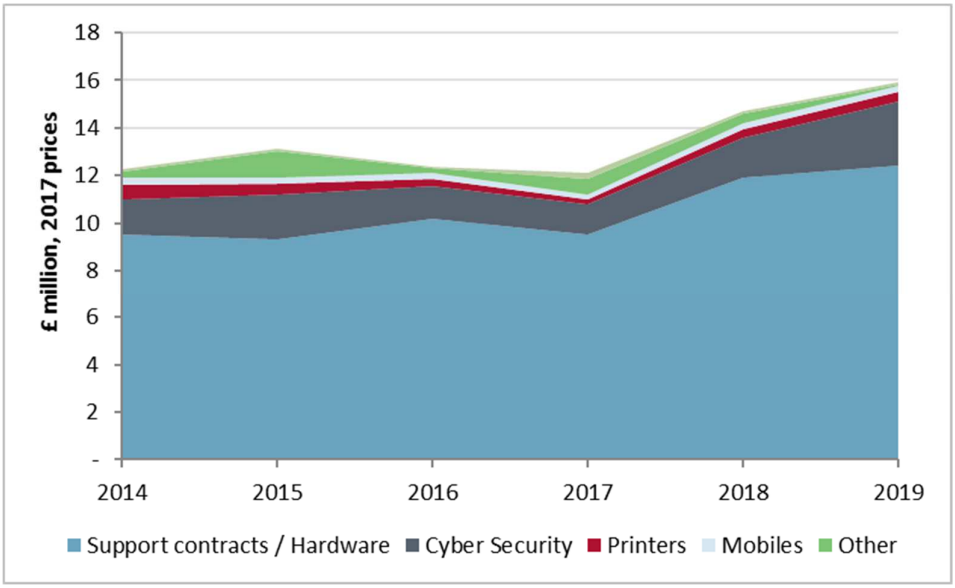
- Catering costs, have increased with a CAGR of +4.9% in the first three years of RP2 and are forecast to further increase by an average of over +5% in 2018 and 2019. NERL stated that this increase is driven by increased labour costs arising from increased to the national minimum wage, increased commodity costs arising from Brexit and increased usage of food catering facilities.
- Other costs (including, for example, security vetting, legal fees and management consultancy) increased by over +9% in 2015, decreased by an average of more than-4% in 2016 and 2017, and are forecast to increase by an average of +2.5% in 2018 and 2019.

7.12 Based on the analysis of each of the facilities management sub-categories, it appears that the reduction in total costs, between 2014 and 2017, was driven primarily by reductions in in utilities and rent costs. The forecast cost increases in the remaining years of RP2 appear to be driven by increases in utilities and rent costs.

Non-operational IT

7.13 Figure 7.3 shows NERL's non-operational IT costs between 2014 and 2019, disaggregated into five sub-categories.

Figure 7.3: NERL historical and projected total non-operating IT costs (2014-2019)



Source: NATS 23 April & 13 November 2018 data submissions

7.14 Total non-operating IT costs decreased with a CAGR of -0.9% between 2014 and 2017. Support contracts / hardware costs, which account for the vast majority (approx. 80%) of non-operating IT costs, remained almost constant and other cost items including cyber security costs (which account for a little over 10% of non-operating IT costs), as well as mobile and printer costs, also decreased with CAGRs of between -5% and -30% in the first three years of RP2. NERL stated the cost decrease at the start of RP2 is driven by reduced spending on external cyber security support (while at the same time recruiting an internal team) and savings on IT assets as they are disposed of before their replacement.

7.15 In spite of the slight decrease at the start of the period, Non-operational IT costs are forecast to increase by over +21% and +8% in 2018 and 2019 respectively. Support contracts / hardware costs are forecast to increase by over +25.0% in 2018 (and increase by +4.3% in

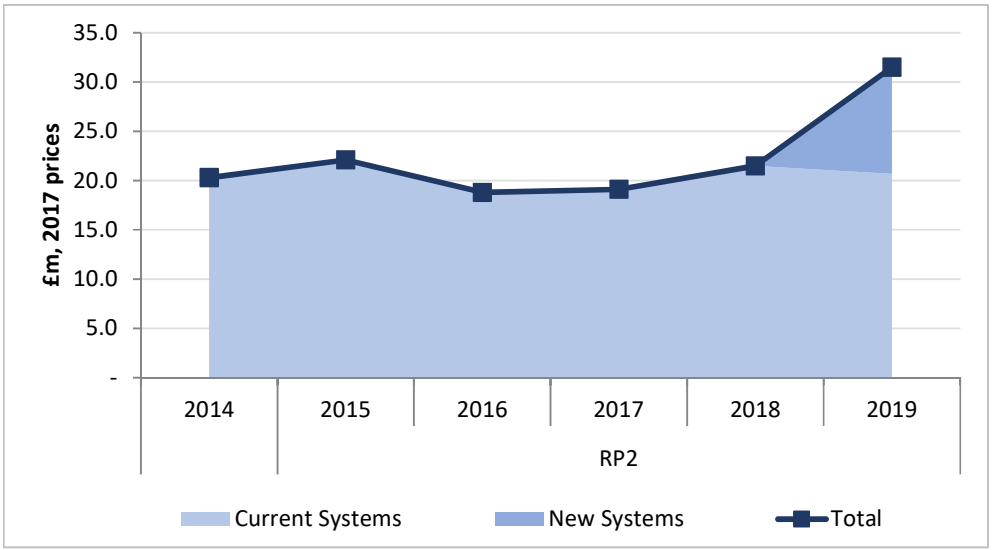
2019) and other cost items are forecast to increase by between +30% and +60% in 2018 – and remain relatively constant or increase further in 2019 – except cyber security costs which are also projected to increase by over +60% in 2019.

7.16 NERL stated these costs reflect new application support costs (Rostering, ADQ & PowerBI), cyber security and data protection costs (mostly SIEM[40]) and an industry shift from asset based on-premise IT to consumption of technology and software as a service with incremental technology/security refresh cycles. This includes CapEx Microsoft license renewals, moving SAP and other services to the cloud and a new desktop (EUS).

Asset management

7.17 Figure 7.4 shows NERL's asset management costs between 2014 and 2019, disaggregated into the current and new systems.

Figure 7.4: NERL historical and projected asset management costs (2014-2019)



Source: NATS Steer9 November data submission

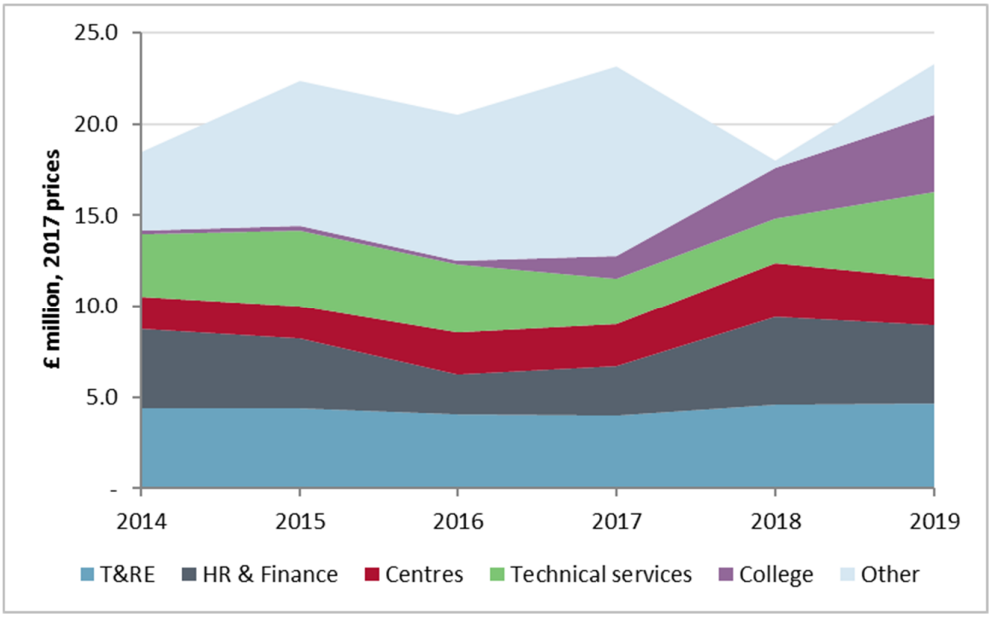
7.18 In the first three years of RP2, asset management costs decreased with a CAGR of -2.0% but are forecast to increase by an average of almost +30% in 2018 and 2019, with a forecast CAGR for the five years of RP2 of +9.2%. NERL stated this cost profile reflects moving from its current legacy asset-based systems to a managed service on new infrastructure to support DSESAR.

Business support

7.19 Figure 7.5 shows NERL's business support costs between 2014 and 2019, disaggregated into six sub-categories.

[40] Security Incident and Event Management

Figure 7.5: NERL historical and projected total business support costs (2014-2019)



Source: NATS 23 April & 13 November 2018 data submissions

7.20 Total business support costs increased by +21% in 2015 and with a CAGR of +7.8% in the first three years of RP2. Costs are forecast to decrease by -22.3% in 2018 and increase by +29.4% in 2019, with the forecast CAGR of +4.7% of the five years of RP2. Each of the sub-categories have evolved, and are forecast to evolve, as follows:

- Travel and related expenses (T&RE) costs decreased with a CAGR of -3.1% for the first three years of RP2, but are forecast to increase by over +14.4% in 2018 and by +2.5% in 2019.
- HR & finance costs decreased with a CAGR of -14.8% in the first three years of RP2, but are forecast to increase by over +80% in 2018, and decrease by over -12% in 2019. NERL stated that some of the increased cost in 2018 is due to increased finance costs associated with the CAA's regulatory review.
- Centres costs, which represent non-staff costs within operational centres, increased with a CAGR of +9.6% in the first three years of RP2 and are forecast to increase with a CAGR of +7.7% over the five years of RP2.
- Technical services costs decreased with a CAGR of -10.1% in the first three years of RP2, but are forecast to increase by over +94% in 2019 (following a -2.3% decrease in 2018). These costs also include '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 and 2018, which accounts for some of the large increase in costs in 2019.
- College costs, which represent the outsourcing of ATCO training, increased significantly in 2017 by over +500% in 2017 and are forecast to increase by an average of over +89% in 2018 and 2019. The significant increase in these costs seemingly reflects a greater amount of ATCO training being outsourced by NERL.
- Other business support costs increased with a CAGR of +33.9% in the first three years of RP2, are forecast to decrease significantly (by over -95%) in 2018 and increase significantly (by over +600%) in 2019. Other business support costs are comprised of:

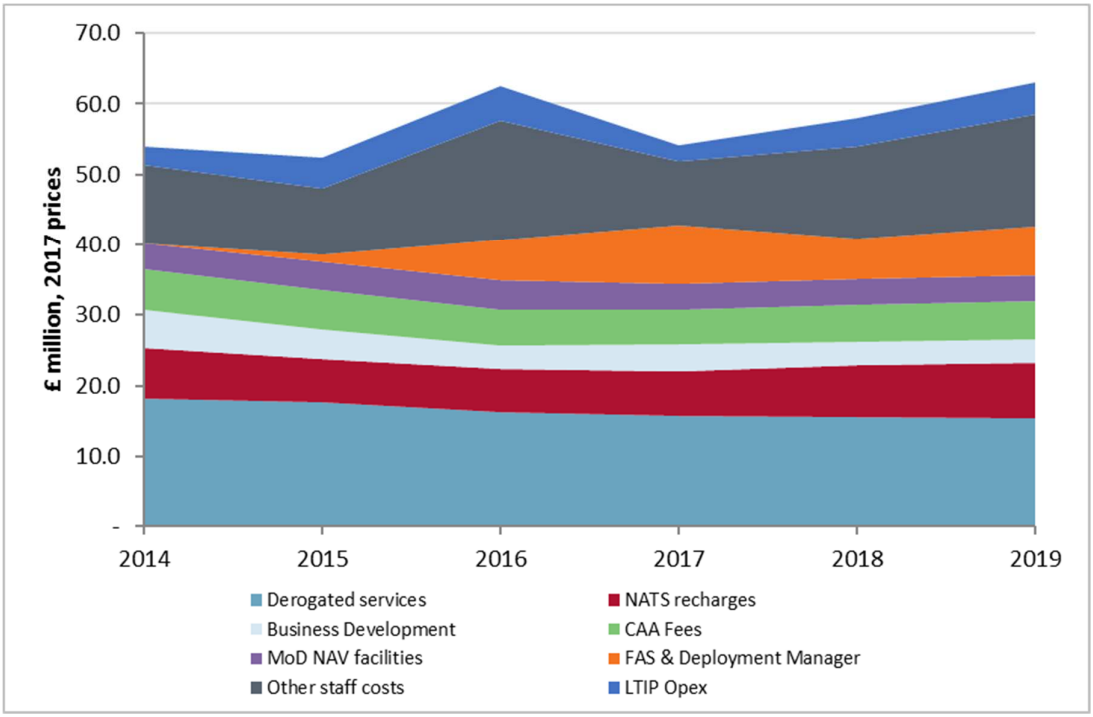
- Other support and corporate services (such as legal, safety, supply chain etc.), which grew with a CAGR of over +10% in the first three years of RP2 and are forecast to grow with a CAGR of over +10% over the five years of RP2; and
- Calendarization adjustments (which converts between calendar and financial years) that include some negative costs of -£5m and -£2.1m 2018 and 2019 respectively, which to a large extent account for the large decrease and increase in other costs in these years.

7.21 The increase in business support costs, in the first three years of RP2, appear to have been driven primarily by technical services, college and other costs. The forecast increase in business support costs in the last two years of RP2, appears to be due to increases in each cost item – every cost item is forecast to significantly increase in the last two years of RP2. NERL stated this increase is due in part to increased regulatory costs associated with the CAA's regulatory review for RP3.

Other non-staff operating costs

7.22 Figure 7.6 shows NERL's other non-staff costs between, 2014 and 2019, disaggregated into eight sub-categories.

Figure 7.6: NERL historical and projected total other non-staff operating costs (2014-2019)



Source: NATS 23 April & 13 November 2018 data submissions

7.23 Other non-staff operating costs grew with a CAGR of +0.1% between 2014 and 2017 – although there were large variations between years – and are forecast to grow with a CAGR of +3.3% between 2014 and 2019. Each of the sub-categories have evolved, and are forecast to evolve, as follows:

- Derogated services, which account for a significant proportion of other non-staff costs, decreased in the first three years of RP2, with a CAGR of -4.8%, and are also forecast to decrease in the remaining two years of RP2 – the forecast CAGR decrease over RP2 is -3.2%. These 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.
- NATS recharges, which we understand represent payments from NERL to NSL, decreased with a CAGR of -3.6% in the first three years of RP2 but are forecast to increase by an average of over +10% in the remaining two years of RP2 – with a forecast CAGR of +1.9% over the five years of RP2.
- Business development costs are forecast to decrease throughout RP2; these costs decreased by a CAGR of -11.3% in the first three years of RP2 and are forecast to decrease with a CAGR of -9.3% over the five years of RP2.
- CAA fees (comprised of SRG and ERG fees) decreased with CAGR of -5.0% in the first three years of RP2, and are forecast to increase by an average of +3.9% in the remaining two years of RP2.
- MOD navigation facilities costs, although there has been some variation between years, have remained relatively constant in the first three years of RP2 decreasing with a CAGR of -0.3%. Over the five years of RP2, these costs are forecast to increase with a CAGR of +0.1%.
- Future Airspace Strategy (FAS) and deployment manager costs are capital expenditure 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 an average of over +200% in 2016 and 2017, but are forecast to decrease in the last two years of RP2 by an average of -6.0%. NERL stated that in RP3, the FAS facilitation fund used in RP2 will be phased out and replaced with an opex flexibility fund.
- Other staff costs (which is comprised of staff bonuses and employee share plan costs) decreased with a CAGR of -6.5% in the first three years of RP2 (although there was a large spike in these costs in 2016 due to a one-off pay award in this year), but are forecast to increase with a CAGR of +7.3% over the five years of RP2.
- LTIP opex, which represents long-term Investment plan support costs decreased with a CAGR of -4.5% in the first three years of RP2 – although costs grew in the first two years of RP2, they fell significantly in 2017. Costs are projected to increase with a CAGR of +11.6% over RP2.

7.24 Although there were large variations in some years for specific cost items, total other non-staff operating costs remained relatively constant between 2014 and 2017. In last two years of RP2, total other non-staff operating costs are forecast to increase by an average of over +8%; the above analysis suggests that the main drivers of these increases are other staff costs, NATS recharges and CAA fees.

7.25 It should be noted that some of the largest components of other non-staff operating costs are staff (employee share plan and bonus costs) and capital expenditure (FAS, Deployment Manager and long-term investment plan costs) related costs, which account for much of the increase in total other non-staff costs in 2018 and 2019. If these costs are not taken into account, total non-staff operating costs decreased with a CAGR of -5.0% in the first three years of RP2, but are still forecast to increase in 2018 and 2019 (by an average of over +2.0%).

Summary and conclusions

7.26 A summary of each of the non-staff cost categories, from 2014 to 2019, is shown in Table 7.1

Table 7.1: NERL historical and projected non-staff operating costs in RP2

Cost Line	Units	RP1 Actual	RP2 Actual			RP2 Forecast		CAGRs		
		2014	2015	2016	2017	2018	2019	2014-2017	2017-2019	2014-2019
Traffic	TSUs 000s	9,979	10,154	10,875	11,768	12,085	12,094	5.6%	1.4%	3.9%
Facilities Management	£m 2017 prices	31.9	32.8	32.5	29.6	33.0	34.6	(2.5%)	8.1%	1.6%
Non-operational IT	£m 2017 prices	12.2	13.0	12.3	11.9	14.6	15.8	(0.9%)	15.6%	5.4%
Asset Management	£m 2017 prices	20.3	22.0	18.7	19.1	21.8	31.8	(2.0%)	29.0%	9.4%
Business support	£m 2017 prices	18.5	22.4	20.5	23.1	18.0	23.3	7.8%	0.3%	4.7%
Other	£m 2017 prices	54.0	52.4	62.5	54.2	58.0	63.5	0.1%	8.2%	3.3%
Total Non-staff Costs	**£m 2017 prices**	**136.8**	**142.6**	**146.5**	**137.9**	**145.3**	**168.9**	**0.3%**	**10.7%**	**4.3%**
Non-Staff Cost per TSU	**£/TSU 2017 prices**	**13.7**	**14.0**	**13.5**	**11.7**	**12.0**	**14.0**	**(5.1%)**	**9.2%**	**0.4%**

Source: NATS 23 April, 4 June 2018 & and 9 November data submissions, and NERL comments on draft final report

7.27 The theme that emerges from the analysis of the five cost categories, is that (with a few exceptions) costs have remained relatively constant level in the first three years of RP2, but are forecast to increase – in some cases significantly – in 2018 and 2019.

7.28 Although we would expect non-staff costs to be related to the level of operations in the long-term, unlike staff costs (which are more volume driven), we would not expect non-staff costs to significantly change from year with the level of traffic. With this mind, a CAGR of +0.3% for non-staff costs in the first three years of RP2 seems reasonable, as we would expect the majority of non-staff costs to remain relatively constant in the short-term. The material increases in forecast costs in the final two years of RP2, with a CAGR of +10.7%, are significantly higher than earlier in RP2, and also higher than the cost growth projected for RP3. NERL explains that this is driven by dual running of systems, cyber security and increased training for operational staff

7.29 NERL's non-staff costs appear to have been kept under good control during the first three years of RP2. However, all major cost elements are forecast to increase significantly during 2018 and 2019. The increase in the Asset Management costs can be attributed to the development of the new technology while the existing systems need to be maintained. NERL has stated that other factors include increased licensing costs and cyber security, as well as increases needed to establish NERL's capability to handle drone traffic, to increase NERL's future ATM capability and to compensate for the loss of European funding following Brexit. We have reviewed the explanations provided by NERL to the CAA and customers during consultation, but have not been able to independently verify the increases.

8 Non-staff costs in Business Plan

Introduction

8.1 In this chapter we analyse the evolution of NERL's non-staff operating costs in RP3, based on information and data provided by NERL through presentations and data requests between the dates of 23 April 2018 and 13 November 2018. The level of disaggregation within the analysis is based on what has been provided within NERL's submissions and we have analysed non-staff costs based on the same five cost categories as the historical analysis in Chapter 7.

8.2 The assessment of non-staff costs in the BP is to inform the CAA's assessment of the overall cost efficiency path for NERL during RP3. 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.

8.3 We first present an overview of the evolution of non-staff costs, based on the five cost categories discussed in the previous chapter, and then provide a detailed assessment of specific cost items. In this chapter we have analysed specific cost items as either technical systems or third-party costs; the costs we have assessed under each of these two headings are as follows:

- Technical systems costs include:
  - Asset management;
  - Future ATM capability;
  - FAS Facilitation Fund / Opex Flexibility Fund.
- Third party costs include:
  - Rent and rates;
  - Utilities;
  - Maintenance; and
  - Catering.

8.4 The cost items listed above do not account for all of NERL's non-staff costs, however we have not carried out a detailed assessment on every cost item due to either unavailability of benchmarks, the small size of some costs or the unique nature of some of NERL's costs. Some non-staff costs (business support and non-operational IT costs) have also been assessed in combination with staff costs in Chapter 6.

8.5 The analysis in this chapter is based on the following years;

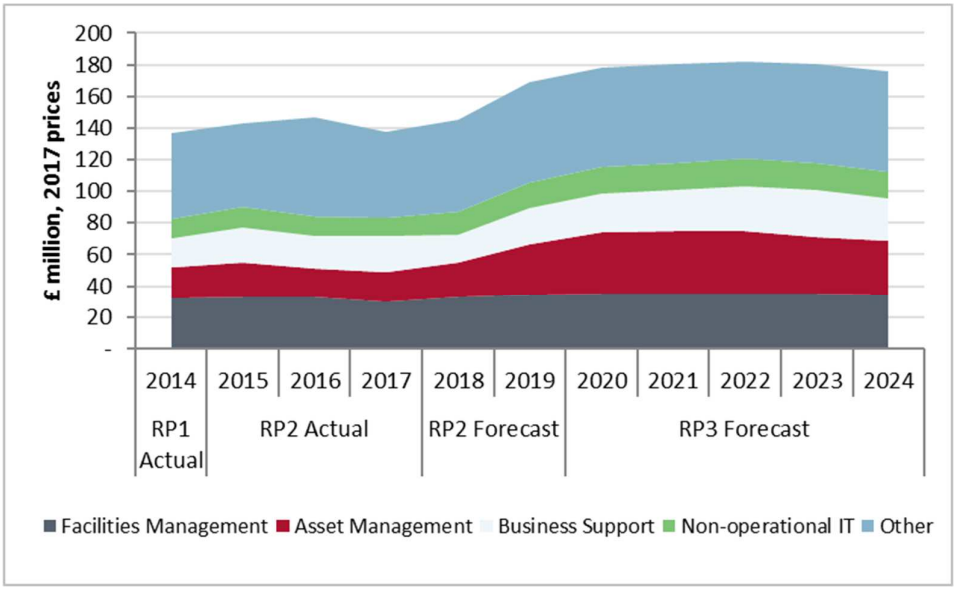
- Actual data for the final year of RP1 (2014);
- Actual data for the first three years of RP2 (2015-2017); and
- NERL's latest forecast for the final two years of RP2 (2018-2019) and RP3 (2020-2024).

8.6 All monetary values are presented in real terms in 2017 prices.

Overview of Business Plan non-staff costs

8.7 Figure 8.1 shows NERL's non-staff operating costs, between 2014 and 2024, split into the five cost categories discussed in Chapter 7. Throughout RP3, total non-staff operating costs grow with a CAGR of +0.8% from £168.9 million in 2019 to £175.9 million in 2024, however, costs do not grow continuously through the period. Costs increase by +5.3% in 2020, in a continuation of the significant increase in costs at the end of RP2, and increase by +1.2% following two years, before falling by -0.9% and -2.6% in the final two years.

Figure 8.1: NERL historical and projected non-staff operating costs (2014-2024)



Source: NATS 23 April & 13 November 2018 data submissions

8.8 Each of the five cost categories can be understood as follows:

- Facilities management costs account for 19.6% of non-staff costs in RP3 and remain relatively constant throughout the period, decreasing with a CAGR of -0.2%.
- Non-operational IT costs account for 9.4% of non-staff costs in RP3 and increase with a CAGR of +1.0% over the period.
- Asset management costs account for 20.9% of non-staff costs in RP3 and grow with a CAGR of +1.5% over the period, although costs increase by +22.3% in 2020, and by +3.1% in 2021, and fall by an average of -4.7% over the following three years.
- Business support costs account for 15.1% of non-staff costs in RP3 and grow with a CAGR of +3.1% over the period, although these costs increase by an average of over +6% in the first four years and fall by -8.6% in the final year.
- Other costs account for 34.9% of non-staff costs in RP3 and remain relatively constant through the period, growing with a CAGR of +0.1%.

8.9 The profile of non-staff costs during RP3 therefore appears to be driven primarily by changes to asset management costs and business support costs – which in turn are driven predominately by future ATM capability and other costs.

Technical systems

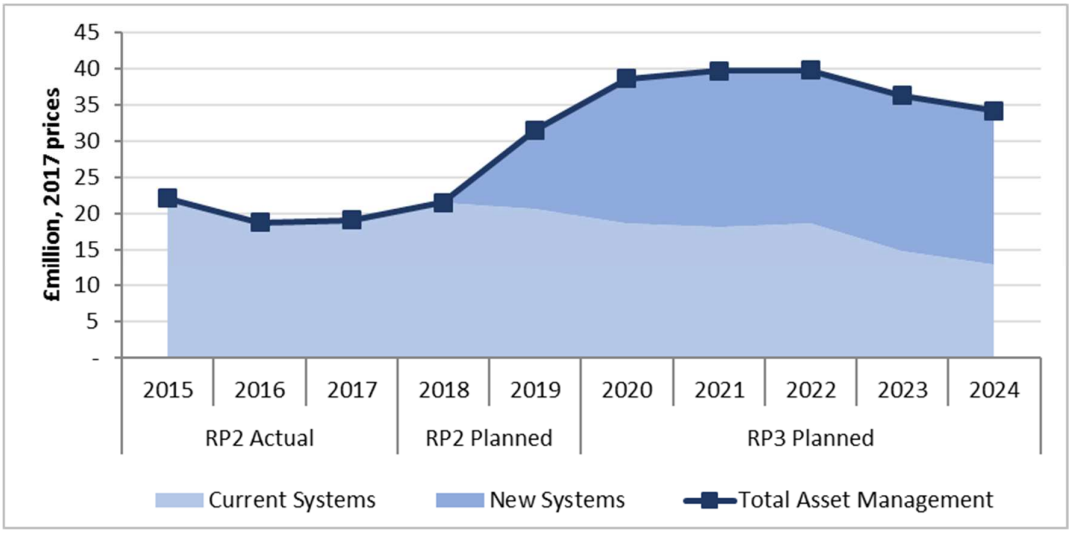
Asset management

8.10 We have assessed the BP projections for asset management costs based on the following data received and discussions held:

- Breakdown of costs by system function, with split between new technology and legacy systems.
- Benchmarking exercises relating to purchase of operational systems (iTEC/Foursight).
- Face to face discussion with NERL on 1 June 2018.

8.11 To assess NERL's asset management costs, we have analysed the growth of the current and new systems costs. Figure 8.2 shows total asset management costs, throughout RP2 and RP3, split into the costs of the current and new systems. NERL are introducing the new systems because, if not replaced, current system costs are expected to escalate due to maintenance problems and traffic growth, and it is therefore not an option to continue with the current systems indefinitely.

Figure 8.2: NERL historical and projected asset management costs (2015-2024)



Source: NATS Steer9 November data submission

8.12 The new systems start to run in parallel with current systems, with significant operational costs starting from 2018. The new systems are set to replace "core elements" of the current "legacy" systems. However, peripheral infrastructure elements (such as radar equipment) are not replaced by the new technology – by 2024 the current legacy systems still account for 38.0% of total asset management costs.

8.13 Figure 8.2 can be interpreted as follows:

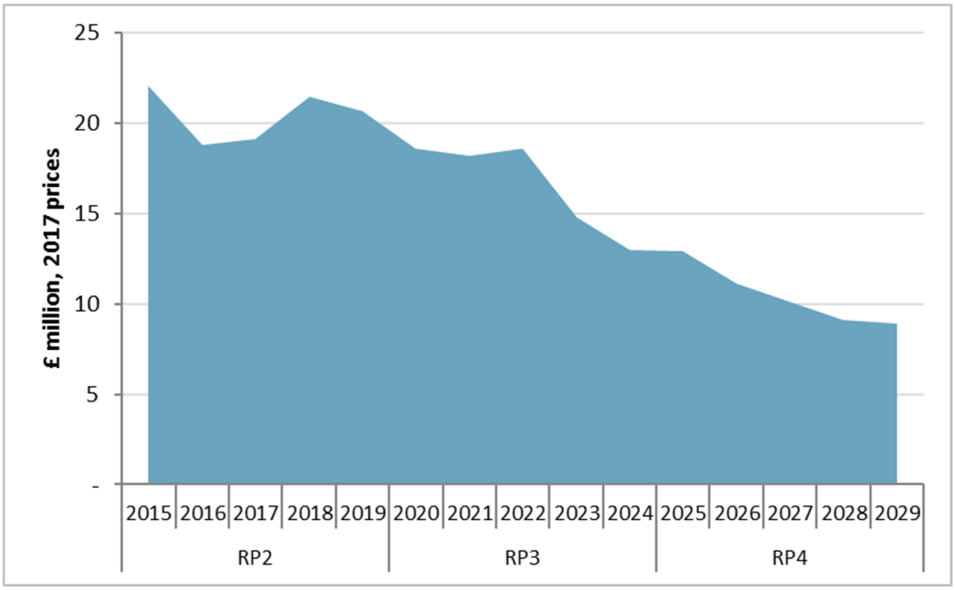
- The costs of the current systems decrease with a CAGR of -8.0% from £21.5 million in 2018 to £12.9 million in 2024;
- The costs of the new systems, between 2018 and 2020, increase from 0 to £20.0 million and remain relatively constant from 2020 to 2024, with a CAGR of +1.6%; and
- Total asset management costs, between 2018 and 2020, increase by +79.2% from £21.5 million to £38.5 million and slightly decrease from 2020 to 2024, with a CAGR of -2.9%.

8.14 Once fully introduced, the new systems' operational costs are higher than the cost of current legacy systems. NERL explained this was because the new systems required the purchase of processing power and software (and associated licence fees) as opposed to the ownership of hardware under the current systems. NERL stated that, where possible, the new systems have been purchased through a competitive tendering process.

8.15 NERL has provided procurement and contract information in relation to some of the new systems; several of its on-going contracts have been procured through competitive tenders and negotiated agreements. In addition, NERL has used benchmarking where systems were purchased from a sole source; KPMG and QuinetiQ carried out a benchmarking and value for money assessments for NERL, in 2018 and 2016 respectively, in relation to several software support contracts. This suggests that, in relation to the new systems for which it has provided contract information, NERL has undertaken procurement processes which should lead to it paying market rates for the services procured. As well as the higher costs of the new systems, the combined total cost of both systems in RP3 is higher than the current total systems costs. The higher combined total cost is due to some elements of legacy systems costs (such as radars) remaining in use after "legacy escape" due to continued support for hardware outside core processing systems.

8.16 NERL stated that legacy escape does not fully occur until RP4, although costs of approximately £9 million per annum for legacy systems will continue to the end of RP4 and beyond, as shown in Figure 8.3. NERL stated these costs are primarily controller communication, connectivity and surveillance costs and can be thought of as "field systems" (such as remote radars), which are not within the scope of DSESAR, "which is fundamentally a 'Centres' & related infrastructure focused programme" and will therefore "not be materially affected" by DSESAR changes.

Figure 8.3: NERL historical and projected legacy asset management systems costs (2014-2029)



Source: NATS 11 June & 9 November 2018 data submissions

8.17 NERL has provided an explanation for the costs of the new asset management systems in RP3. However given cost projections for these systems do not yet exist for RP4, it has not been possible for NERL to assess the extent to which total asset management costs would come down in the future. We have not been able to independently verify the rationale for the costs

of the new asset management systems in RP3, and, as cost projections for these systems in RP4 are not available it is therefore unclear whether total asset management costs would come down in the future. It is also possible operating costs would reduce alongside identified differences between Steer's capex scenario and the NERL BP which might be adopted due to reduced system scope. However any restructuring costs would need to be allowed for.

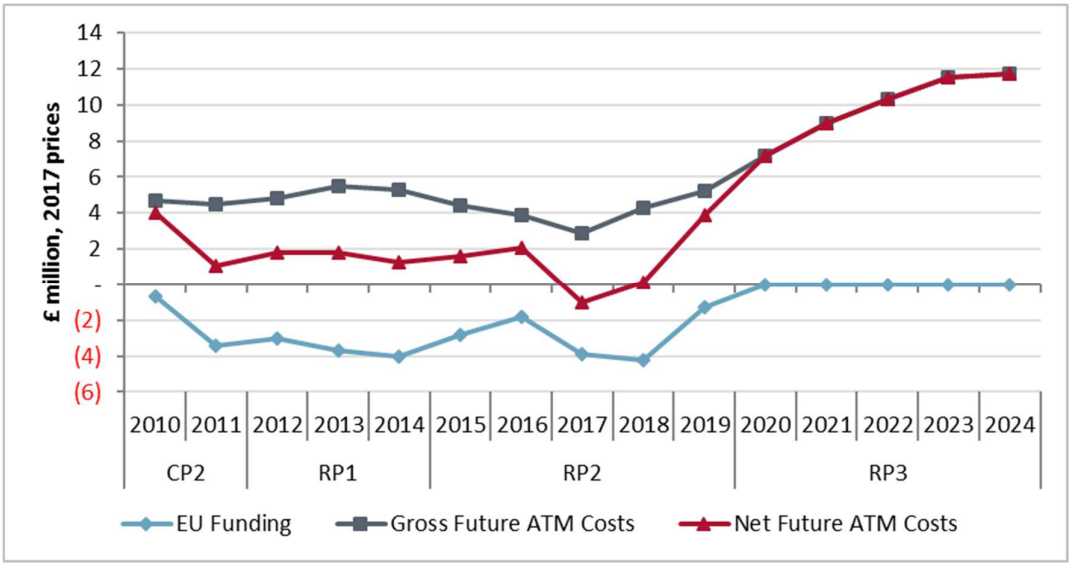
Future ATM capability

8.18 We have assessed the BP projections for "Future ATM capability" costs based on the following data received and discussions held:

- Gross staff and non-staff costs, and SESAR R&D income.
- Face to face discussion with NERL on 1 June 2018.
  - NERL stated increases due to increased traffic, complexity, safety & optimisation

8.19 To assess NERL's future ATM capability costs, we have analysed the growth of the gross and net costs. Figure 8.4 shows future ATM capability costs, between 2010 and 2024, split into gross costs, net costs and EU funding (shown as a negative cost). The costs shown include both staff and non-staff costs.

Figure 8.4: NERL historical and projected Future ATM capability costs (2010-2024)



Source: NATS 22 June & 13 November 2018 data submissions

8.20 Net costs increase significantly from -£1.0 million in 2017 to +£11.7 million in 2024. This increase in driven in part by the removal of EU funding, which was approximately £4 million in 2017 and 2018, and although currently an unknown, it is a reasonable assumption that EU funding will disappear and not be replaced after Brexit. However, the main driver of the increase in net costs, is the increase in gross costs, which increase from £2.9 million in 2017 to £11.7 million in 2024, with a CAGR of +22.1%.

8.21 NERL stated the increase in gross costs in RP3 is needed to support the increasing number of aircraft (including drones), airspace redesign, and the need to harness new innovations and technologies (such as satellite surveillance, automation and AI). The costs reflect a combination of staff costs, concept development facilities, academic partnerships, procurement of data, and third-party costs of suppliers and consultants.

8.22 NERL's gross future ATM costs represented 0.6% of revenue in 2016, which grows to 1.6% in 2024 (based on 2016 revenue). In spite of this increase, the future ATM costs as proportion of revenue are low compared to R&D benchmarks; across the companies surveyed within the 2017 Strategy & Global Innovation 1000 study, the average R&D spend as proportion of revenue was 8.4% across all industries[41].

8.23 Therefore, although costs rise above RP2 levels in RP3, even allowing for loss of EU funding, costs remain low compared to R&D benchmarks. On this basis, we have not identified the basis for any differences to the BP forecast, but governance mechanisms that allow other stakeholders to influence the use of these funds, should be considered.

FAS Facilitation Fund / Opex Flexibility Fund

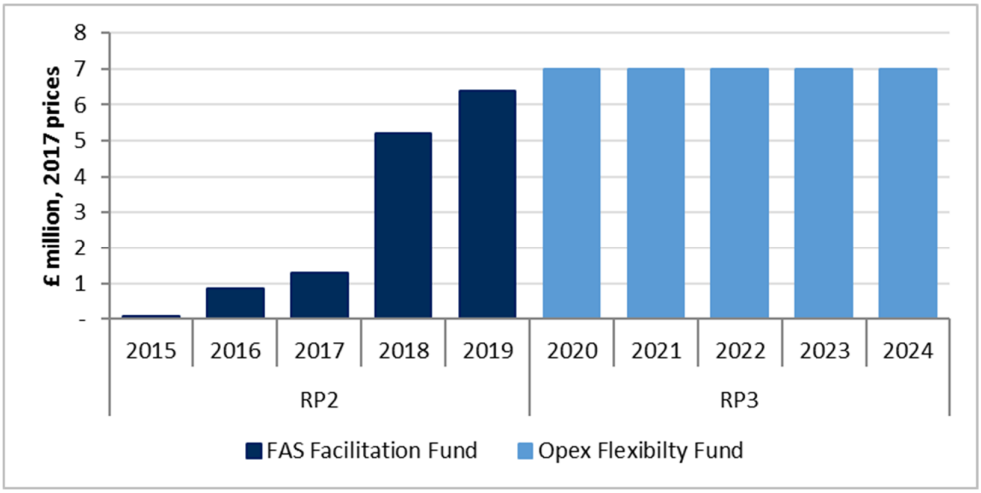
8.24 We have assessed the BP projections for FAS Facilitation Fund / Opex Flexibility Fund costs based on the following data received and discussions held:

- FAS data – NERL and Small Gaps fund expenditure by year.
- Face to face discussion with NERL on 1 June 2018.

8.25 To assess NERL's Opex Flexibility Fund (OFF), which is intended to replace the FAS Facilitation Fund (FFF), we have analysed the growth in costs across the two funds and the governance arrangements of each fund.

8.26 OFF and FFF costs, throughout RP2 and RP3, are shown in Figure 8.5. FFF costs increase from £0.1m to £6.4 over RP2 and are replaced by the OFF in RP3, which remains at £7.0m throughout the period.

Figure 8.5: NERL historical and projected FAS Facilitation Fund and Opex Flexibility Fund costs (2015-2024)



Source: NATS 23 April & 13 November 2018 data submissions

8.27 The FFF is allocated to projects by the FAS Deployment Steering Group, which includes representatives from airlines, airports, general aviation, the MOD, the DfT and the CAA. NERL stated that the governance process for the FFF restricts its ability to secure funds quickly and is limited in scope. For RP3, NERL has therefore proposed the OFF with fewer governance

[41] Excluding the healthcare sector

restrictions, which can be spent as opex or capex, with any unspent funds returned to airspace users at the start of RP4.

8.28 Although the costs associated with the OFF seem reasonable, further justification is required for the new governance arrangements, which gives less control to industry partners.

Third party costs

Rent and rates

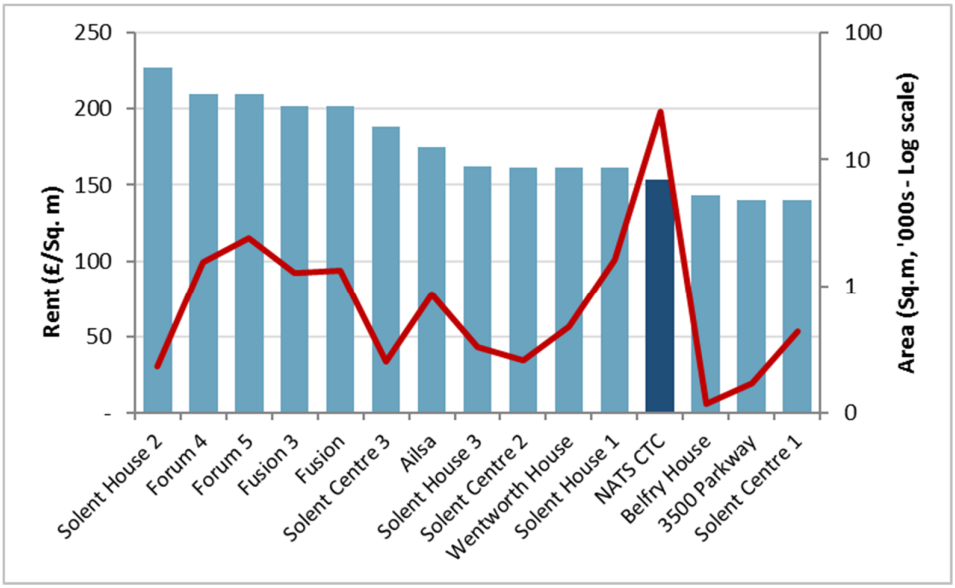
8.29 We have assessed the BP projections for rent and rates costs based on the following data received and discussions held:

- Rent, rates and area of each site.
- Face to face discussion with NERL on 1 June 2018.

8.30 To assess NERL's rent costs, we have benchmarked NATS' Corporate and Technical Centre (CTC) – which accounts for over 70% of NERL's on-site rent costs – against prices of other offices to let in the Solent Business Park in Whiteley (where CTC is located). We have also analysed the growth of NERL's total rent costs throughout RP2 and RP3. To assess NERL's business rates costs, we have analysed the growth of these costs throughout RP2 and RP3 – business rates are to be pegged to CPI from 2018, so these costs should remain relatively constant on a £ per square metre (£/Sq.m) basis.

8.31 Figure 8.6 shows the rent paid to be paid in 2018 by NATS at CTC, on a £/Sq.m basis, the listed price of fourteen other offices available for rent in The Solent Business Park, as well as the area of each site[42].

Figure 8.6: NERL CTC rent costs benchmarking (2018)



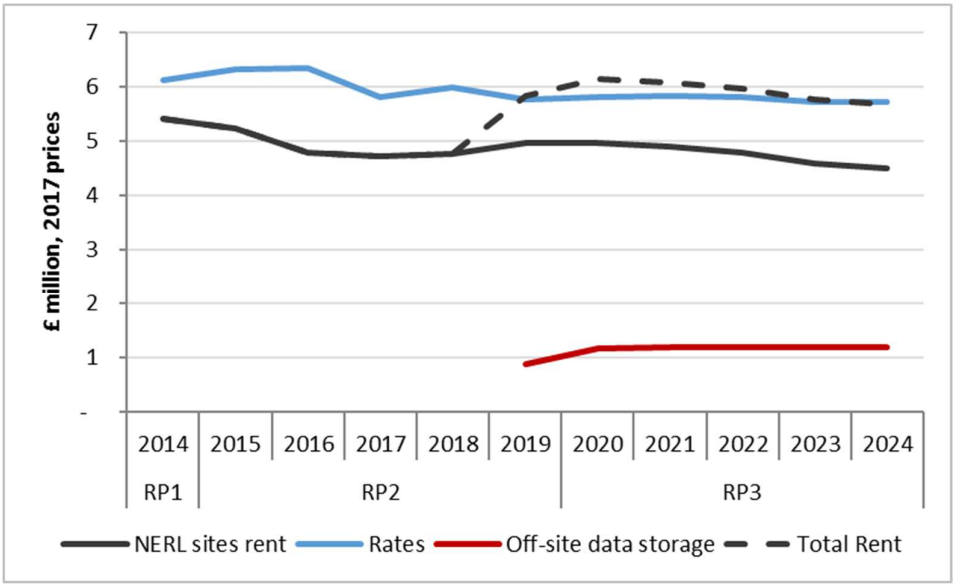
Source: NATS presentation to Steer 1 June 2018 & letting agent websites

[42] Areas have been presented on a logarithmic scale to allow meaningful comparison between different sized offices – CTC is significantly larger than the comparators.

8.32 Although CTC is a significantly larger site, on a £/Sq.m basis, it is cheaper than majority of the benchmarks.

8.33 Figure 8.7 shows NERL's rent and rates costs, throughout RP2 and RP3, with rent costs split into off-site data storage and the costs of NERL's sites.

Figure 8.7: NERL historical and projected rent and rates costs (2015-2024)



Source: NATS presentation to Steer 1 June 2018 & 13 November data submission

8.34 Total rent costs increase significantly at the end of RP2 from £4.8 million in 2018 to £5.8 million in 2019, due primarily to new off-site data storage costs. Total rent costs then slowly decrease throughout RP3, to £5.7 million in 2024 (CAGR -0.6%) and business rates slightly decrease at the end of RP2 to £5.8 million in 2019 and remain relatively constant throughout RP3 (CAGR -0.1).

8.35 Rent and rates costs on the whole appear reasonable and we have therefore not identified any basis for differences to the BP projections.

Utilities

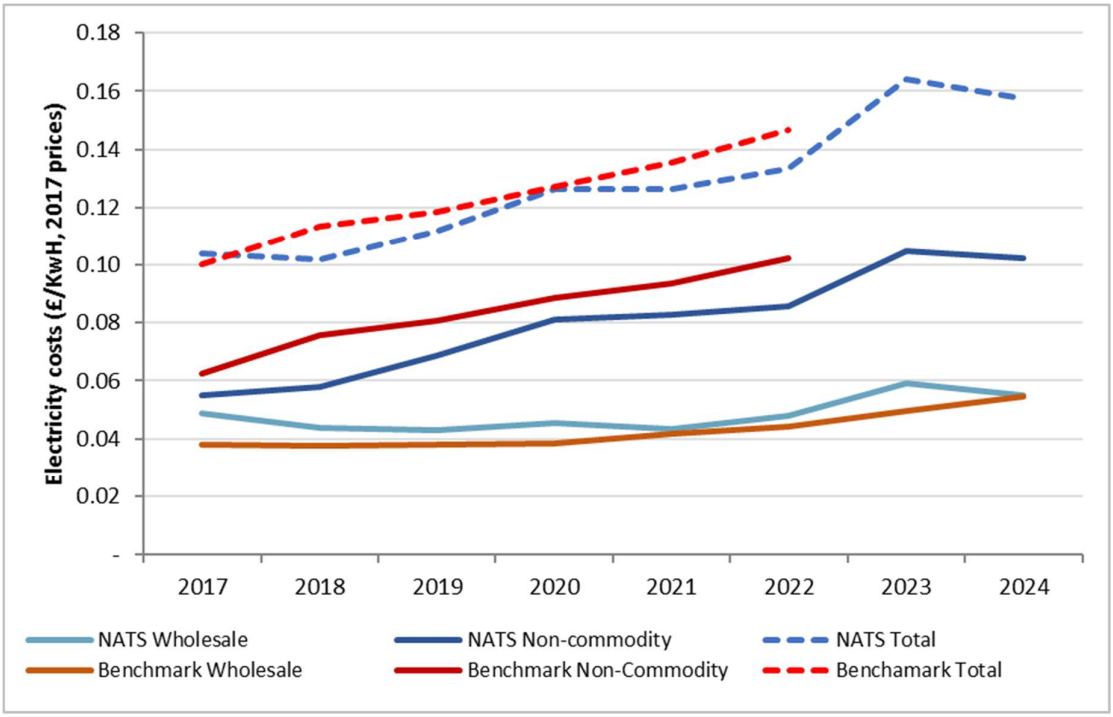
8.36 We have assessed the BP projections for utilities costs based on the following data received and discussions held:

- Utilities consumption, and unit commodity and non-commodity utilities costs.
- Face to face discussion with NERL on 1 June 2018.

8.37 To assess utilities costs, we have analysed the growth of electricity (85%+ of utilities costs) and gas (3 to 4% of utilities costs) costs against publicly available benchmarks. Electricity and gas wholesale prices have been benchmarked against the latest Department for Business, Energy & Industrial Strategy (BEIS) reference scenario forecasts and non-commodity electricity costs have been benchmarked against British Independent Utilities (BIU) forecast – equivalent non-commodity forecasts were not available for gas.

8.38 Figure 8.8 shows the growth of NERL's unit electricity costs against benchmarks, between 2017 and 2024, split by wholesale and non-commodity costs.

Figure 8.8: NERL historical and projected unit electricity costs benchmarking (2017-2024)[43]



Source: NATS presentation to Steer 1 June 2018 & 9 November 2018 data submission, BEIS & BIU

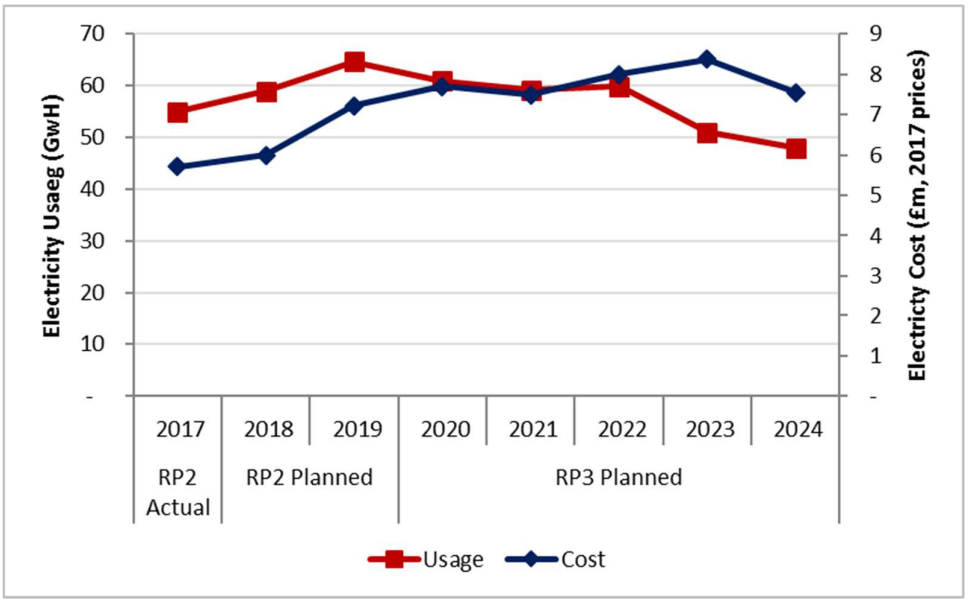
8.39 Each element of Figure 8.8 can be understood as follows.

- NERL's wholesale unit electricity cost is +29.0% above the benchmark level in 2017, but is projected to grow with a CAGR of +1.7% until 2024, compared to the benchmark CAGR of 5.4%. Therefore the 2024 level of wholesale unit electricity cost is very similar to the benchmark level.
- NERL's unit non-commodity electricity cost is -11.7% below the benchmark level in 2017 and is projected to grow with a CAGR of +9.2% to 2022 (the latest year the benchmark forecast is available) at a similar rate to the benchmark level. Therefore the 2022 level of unit non-commodity electricity cost is -16.3% below the benchmark level.
- NERL's unit total electricity cost is +3.7% above the benchmark level in 2017 and is projected to grow with a CAGR of +5.1% to 2022, slightly below the benchmark level of +7.9%. Therefore the 2022 level of unit total electricity cost is -0.9% below the benchmark level.

8.40 NERL's total electricity usage and costs are shown in Figure 8.9.

[43] A) Total unit cost calculated based on total electricity cost and usage (provided 4 June in CY 2017 prices). B) Split between wholesale and non-commodity costs based on unit price assumptions (provided 9 November in FY outurn prices). C) 2017 CY unit cost of wholesale and non-commodity costs calculated by applying %s in B) (after converting to CY) applied to total unit cost calculated in A)

Figure 8.9: NERL historical and projected electricity consumption and costs (2017-2024)

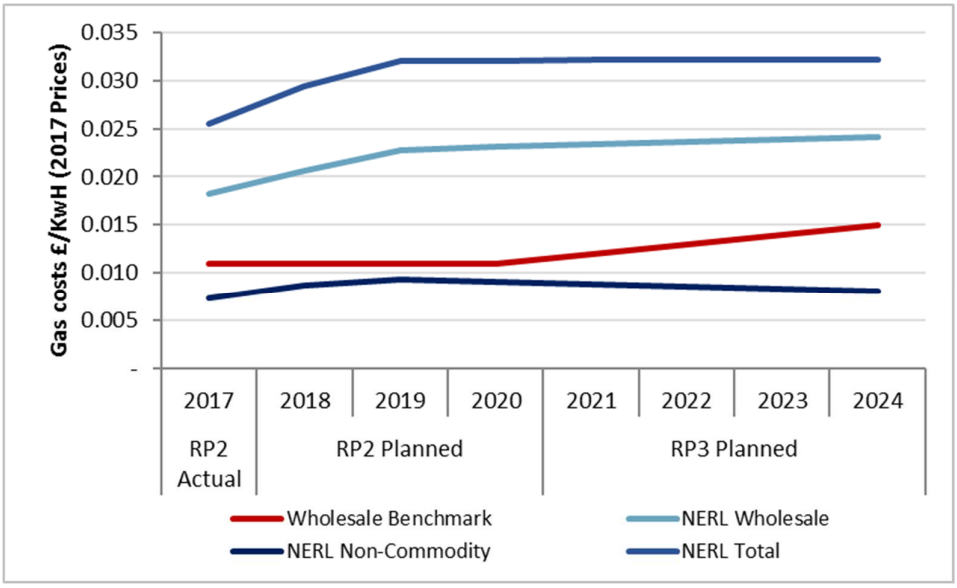


Source: NATS 9 November data submission

8.41 Electricity usage is projected to decrease after 2019, but due to rising unit costs, total electricity costs do not start to decrease until 2024. Total costs rise from £5.7 million in 2017 to a peak of £8.4 million in 2023, before falling to £7.5 million in 2024.

8.42 Figure 8.10 shows the growth of NERL's unit gas wholesale costs against benchmarks, between 2017 and 2024.

Figure 8.10: NERL historical and projected unit gas costs benchmarking (2017-2024)



Source: NATS presentation to Steer 1 June 2018, 9 November 2018 data submission & BEIS

8.43 NERL's wholesale unit gas costs are projected to grow with a CAGR of +4.1%, between 2017 and 2014, and are projected to remain relatively flat throughout RP3 (CAGR +1.2%). NERL's

wholesale unit gas costs are also projected to be between 60% and 111% higher than the wholesale benchmark throughout the remainder of RP2 and RP3. NERL's non-commodity unit gas costs are projected to decrease with a CAGR of -1.3% between 2018 and 2024, which means total unit gas costs are projected to remain constant throughout RP3.

8.44 NERL's gas consumption is also projected to remain constant from 2018 onwards, which means total gas costs remain constant through RP3 at £0.3m per annum.

8.45 Utilities costs at an overall level appear reasonable and we have therefore not identified any basis for differences to the BP projections.

Maintenance

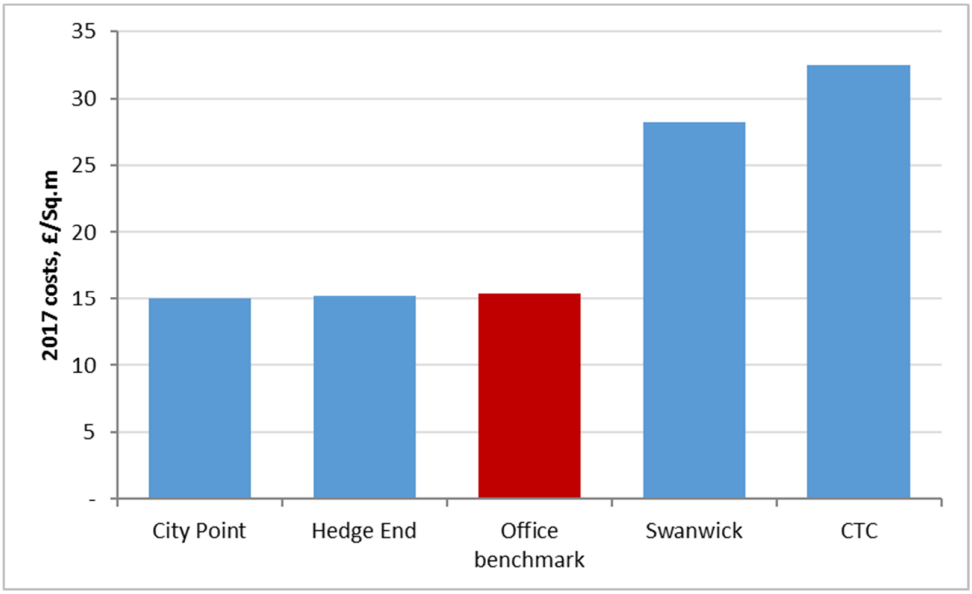
8.46 We have assessed the BP projections for maintenance costs based on the following data received and discussions held:

- Total maintenance costs, area of each site, and maintenance costs of major sites (within JLL benchmarking report).
- Face to face discussion with NERL on 1 June 2018.

8.47 To assess maintenance costs, we have benchmarked maintenance costs, on a £/Sq.m basis[44], against comparable sites. We have benchmarked NERL's maintenance costs across all of its sites against two airports – which have been taken from Steer projects and have been anonymised – and have benchmarked the costs of individual sites against The Building Owners and Managers Association (BOMA) benchmarks.

8.48 Figure 8.11 shows NERL's maintenance costs at some of its sites (taken from the JLL Report for NATS) against the BOMA office benchmark cost[45].

Figure 8.11: NERL maintenance costs benchmarking at specific sites (2017)



Source: Data sent by NATS 04 June 2018, JLL report for NATS & BOMA

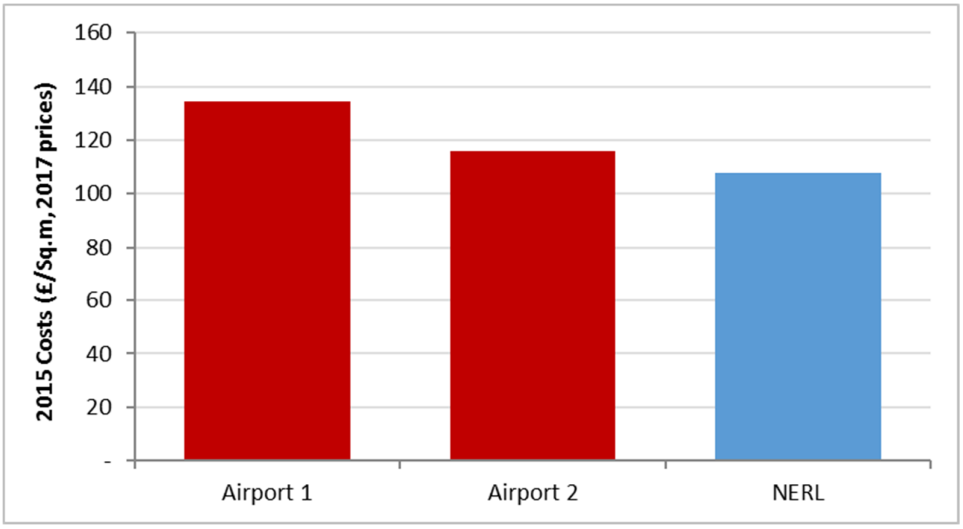
[44] Based on the area of NERL's sites provided on 4 June 2018.

[45] Converted to £s from $s using a PPP adjusted exchange rate of 0.7.

8.49 NERL's City Point and Hedge End sites' maintenance costs are a similar level to the benchmark level of £15.4/Sq.m. Although Swanwick and CTC's costs are significantly higher than the benchmark level, this is to be expected given a proportion of these sites are operational use.

8.50 Figure 8.12 shows the NERL's maintenance costs across all of sites, on a £/Sq.m basis, against two airport comparators. These airports have been used as comparators as their total area is of a similar magnitude to the total area of NERL's sites and, like NERL's sites, are a mix of office and operational use.

Figure 8.12: NERL maintenance costs benchmarking across all sites (2015)



Source: Data sent by NATS 4 June 2018 & Steer projects

8.51 NERL's maintenance cost in 2015 (the latest year available for benchmarks) was £108/Sq.m, which was lower than the comparators airports, whose costs were £134/Sq.m and £116/Sq.m. NERL's £/Sq.m maintenance costs are projected to decrease slightly throughout the remainder of RP2 and RP3 with a CAGR of -0.7%. Given there is no planned change to the total square meterage of NERL's sites, total maintenance costs decrease at the same rate, from £12.0m in 2017 to £11.6m in 2024.

8.52 Maintenance costs appear reasonable and we have therefore not identified the basis for any differences to the BP projections.

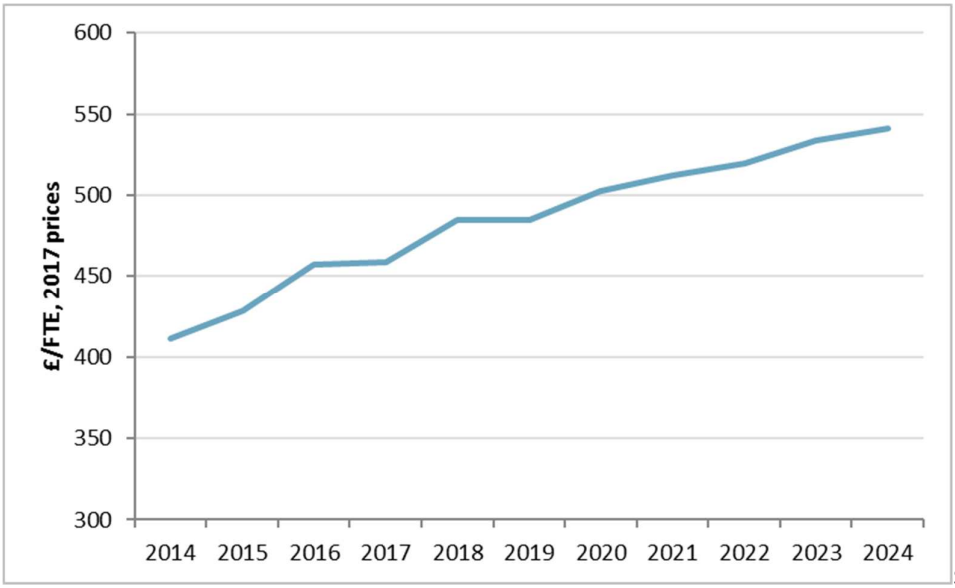
Catering

8.53 We have assessed the BP projections for catering costs based on the following data received and discussions held:

- Total catering costs.
- Face to face discussion with NERL on 1 June 2018.
  - NERL states that increased costs derive from minimum wage growth by 2020.

8.54 To assess catering costs, we have analysed the growth of costs per FTE throughout RP2 and RP3, shown in Figure 8.13.

Figure 8.13: NERL historical and projected catering costs per FTE (2014-2024)



Source: NATS 23 April & 13 November 2018 data submissions

8.55 Costs per FTE increase from £411 to £485 between 2014 and 2019, with a CAGR of +3.4% throughout RP2; NERL stated this increase is driven by the need to meet the new minimum wage requirement by 2020, increased commodity costs arising from Brexit and increased usage of food catering facilities. Costs per FTE increase to £541 by the end of RP3, with a lower CAGR of 2.2% throughout RP3. Total catering costs increase from £1.4 million at the start of RP2, to £1.8 million at the start of RP3 and to £1.9 million at the end RP3.

8.56 We have not identified any basis for differences to the BP catering cost projections, and although catering costs increase significantly throughout RP2, the growth throughout RP3 appears reasonable.

Summary and conclusions

8.57 Our conclusions concerning non-staff cost projections for RP3 in the BP are as follows:

- Asset management operating costs for the operational systems increase significantly in the last two years of RP2 and remain at a level in RP3 which is significantly higher than has historically been the case. NERL has explained that the introduction of new operational systems running in parallel with legacy systems increases capabilities, resilience and cyber protection associated with the new systems justify the cost; however it is difficult for us to prove these costs provide value for money. It is also possible operating costs would reduce differences between the Steer Capex Scenario and NERL BP which might be adopted due to reduced system scope. However any restructuring costs would need to be allowed for.
- Future ATM Capacity spend increases in RP3 are partly due to the loss of EU funding but also driven by higher levels of actual expenditure. While these proposed levels remain within benchmark proportions of R&D spend in comparable organisations, given the nature of the funds, governance measures giving stakeholders the opportunity to influence their use should be considered.
- The proposed Opex Flexibility Fund (OFF), replacing the FAS Facilitation Fund (FFF) appears to have reasonable levels of expenditure, but further justification, through

discussion with stakeholders, is needed for the proposed governance mechanisms which would give less control to industry partners than is currently the case for the FFF.

- Third party costs, including rent & rates, utility, maintenance and catering costs have been benchmarked against expenditure by similar organisations and the rate of growth reviewed. Based on this analysis, in broad terms these costs appear reasonable.

9 Capital expenditure in RP2

Introduction

9.1 This section examines NATS EN Route plc (NERL)'s capital investment plan for Reference Period 2 (RP2) and the way in which it has evolved over the course of that period (2015-2019). The story of each plan applied during RP2 is analysed, along with the transparency of costs and benefits presented by NERL. Each analysis concludes with an opinion section giving our assessment of the plan, validation of NERL's reasoning, and potential lessons learnt for the Reference Period 3 (RP3) planning process.

9.2 Figure 9.1 shows the main stages of evolution of the plan. These are discussed in the following sections with an additional section on the 2018 consultation.

Figure 9.1: Evolution of the RP2 capital investment plan (outturn prices)

RP2 Business Plan

Overview

9.3 The RP2 Capital Investment Programme was initially laid out as a choice between two business plans for airspace users:

- Plan 1 totalled £653 million in outturn prices i.e. the actual price expected to be spent inclusive of inflation. Plan 1 focused on price reduction, whilst maintaining the current levels of service quality as the key priority i.e. a reduction in fuel burn and minimal delay (both en-route and airport ATM-related).
- Plan 2 totalled £603 million (in outturn prices) and aimed to deliver a good performance but with customers taking on more risk and uncertainty around day-to-day service quality (without compromising on safety) in return for a lower price in RP2.

9.4 The plans were presented in the RP2 initial Business Plan and the Capital Investment Plan for Customer Consultation.

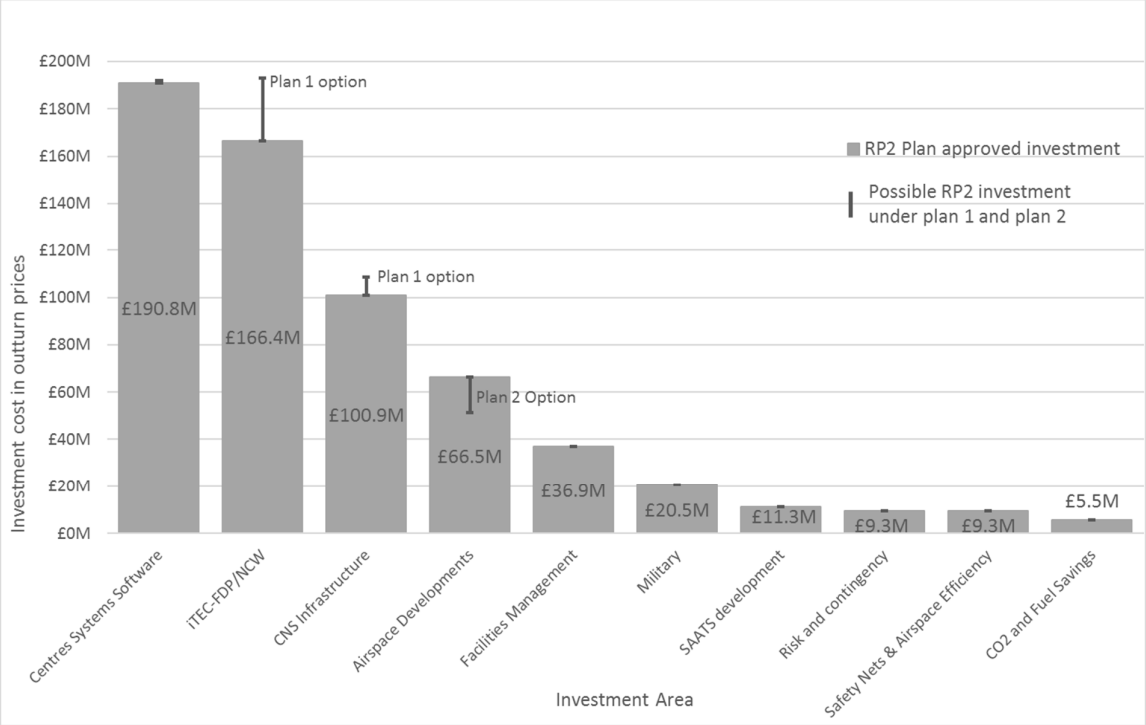
9.5 The Capital Investment Plan for Customer Consultation listed all the investments that would be undertaken and specified the RP2 costs and benefits expected to be generated annually by the end of RP2. However, it was not clear when and where the benefits were expected to commence. For example, it was noted that several investments would increase capacity by enabling a given number of "additional flights per busy hour" but it was not clear where this capacity would be enabled. Benefits were specified for the majority of investments at a

programme level, but no distinction was made between benefits of Plan 1 or Plan 2 under the sub-programmes (pages 15-45), i.e. it was not clear which plan the benefits applied to.

9.6 Investments were presented in ten programme areas, with investment under seven of them identical for Plan 1 and Plan 2. The users were offered options in the investment undertaken in four categories: iTEC-FDP/NCW, CNS Infrastructure, Airspace Development and Centre Systems Software Development. Changes could also be requested outside of these areas through the consultation.

9.7 The business plan options were described at the time as "book-ends" – i.e. Plan 2 as low, and Plan 1 as high, as NERL felt it could meet its performance goals with either plan. The investment band proposed under the two plans, and the final approved investment, is presented in Figure 9.2.

Figure 9.2: NERL's initial RP2 Capital Investment Plans (1, 2 and chosen)[46]



9.8 The principal drivers for the £50M (7.7%) lower spend in Plan 2 compared to Plan 1 were:

- £27 million (14%) lower iTEC FDP capital investment;
- £15 million (23%) lower Airspace Development capital investment;
- £8 million (7%) lower CNS Infrastructure capital investment; and
- £1 million (1%) lower Centre Systems Software Development capital investment.

[46] Please note that the values in the figures reflect information presented in the RP2 Capital Investment Plan Document and the RP2 Revised Business Plan document. The information presented in the subsequent consultations (e.g. SIP16) present slightly different values due to the need to restate the figures from a financial year basis to a calendar years basis.

9.9 Airlines emphasised that the priority was to 'maximise fuel savings and service quality at the lowest price'[47] which resulted in the final business plan being a blend of both Plans. The revised plan aimed to deliver a significant price reduction, but with controller numbers and investment at a level to achieve Plan 1 fuel savings of up to £180M per annum by the end of RP2, and to underpin service consistency. These were noted as key customer primacies at the time. The main capex as described in the blended RP2 Business Plan can be seen in Figure 9.2 (outturn prices).

9.10 The evolution of these programmes is examined in the next sections.

Our opinion and lessons learnt for RP3

9.11 In the consultation documentation the issue of taking "more risk and uncertainty around day-to-day service quality" in return for a lower price was not well explained for the capex programme. In practical terms, it appears to have reduced the margin (adaptability) available to NERL to deal with stresses in the system, and whilst the exact impact wasn't known, it may have contributed to increasing delays and the Stansted/Luton controller shortfalls but the traffic growth in RP2 will also have had a bearing.

9.12 **The expectation of these plans being book-ends was incorrect**: The airlines' expectation was that the £653 million figure represented an upper limit to the capital investment programme. The evolution of the programme, set out in the sections below, shows this to be misleading. NERL have recently explained that the prices set out were "indicative". This was not understood by the airspace users at the time.

9.13 Whilst we accept that content evolution takes place as programmes mature, when looking back to the consultation process, it is important to take care with how expectations are set. Clear understanding of the maturity of the plans, and potential financial risks, must be set out.

Benefits + Risk

9.14 **The benefit mechanism was high-level and unclear in its link to the programmes**: The final RP2 business plan documents a high-level overview of the expected benefits of the new combined plan, and maps out the way in which elements from the old plans have been incorporated into the new plan, as well as the way in which feedback from customer consultation has been considered.

9.15 The RP2 business plan gave an indication of some of the benefits that customers were to receive and the overall RP2 goal, but was given at a high level which made it unclear exactly what programmes/projects created which benefits (although a breakdown of costs was given). This means that as we look forward to address changes in the capital programme, it is difficult to predict how the benefits matrix should have evolved alongside the changing capital programme.

Accelerated Business Plan

Overview and rationale

9.16 A presentation was delivered to the CAA in September 2014, identifying the possibility of accelerating the capital investment plan. The 2015 Service and Investment Plan (SIP) was

[47] RP2 Revised Business Plan 2015 – 2019, 18th October 2013, NATS (En Route) plc

created towards year end of 2014 and gave a formal mention of NERL's initial proposal to accelerate planned capital expenditure in RP2.

9.17 As a background to this accelerated plan, in June 2014, the PCP (Pilot Common Project) regulation was released providing further clarity and direction to the SESAR European ATM Master Plan. The PCP regulation signalled that several implementation project investments could be brought forward, with funding available, and firmer plans needed to be made for deployment within the schedule set out in the regulation.

9.18 In addition, on 7 December 2013, there was a system failure at Swanwick ATC centre which caused significant disruption to air travel through that day with 300 flights cancelled, hundreds more delayed and thousands of passengers left frustrated at airports[48]. After the events of 7 December 2013, the importance of service resilience to NERL's airline customers was re-enforced. NERL believed these factors gave rise to the need to refine the RP2 investment plan to focus on new technology, rather than legacy enhancement, for the benefit of RP2.

9.19 During the customer consultation for SIP15, NERL stated that "NATS has decided to postpone the submission of proposed high-level network changes (above 4,000ft) relating to Gatwick Airport, which was part of Phase 1 of LAMP. This postponement follows the Airport's decision to undertake additional analysis in order to better understand their options and next steps for the low-level airspace that they are responsible for (primarily routes below 4,000ft). NATS is still committed to delivering changes to the high-level network, in phases, out to 2020; this programme of change will meet CAA requirements and is part of the Government's Future Airspace Strategy (FAS)." [49]

9.20 From SIP2016 onwards, NERL emphasised that issues with the implementation of LAMP (and specifically integration with Gatwick Airport) were the key factor behind the RP2 capital investment plan change – this wasn't the case in the earlier consultations regarding the need to change the agreed plan.

Two-phased plan

9.21 A two-phased plan was proposed by NATS. Phase 1 was legacy escape which was to be achieved by circa 2018 and a SESAR-compliant platform implemented. This gave the foundational technical infrastructure (i.e. the tools) to allow Phase 2. Phase 2 was RP3 capability by circa 2020 with improved customer service and cost effectiveness, including airspace change and resultant benefits.

9.22 The acceleration of SESAR deployment projects falling under the ten RP2 programme areas is presented in Table 9.1[50].

Table 9.1: Proposed acceleration, SIP 15 plan, NATS

Deploying SESAR Projects	Proposal
London Airspace Management Plan (LAMP)	No acceleration – were already scheduled for completion in RP2
Transition Altitude (TA)	
Voice Communications (Voice Comms)	Completion accelerated from RP3 to RP2

[48] NATS, Air Traffic Control Disruption – A Report to the Civil Aviation Authority, 7 December 2013
[49] Draft Service and Investment Plan 2015 customer consultation, NATS (En Route) Plc, 7 October 2014
[50] NATS (En Route) Plc, Service and Investment Plan 2015, 28th December 2014

Deploying SESAR Projects	Proposal
NATS Common Workstation (NCW)	
ITEC	
Network Upgrade	
Legacy Sustainment	

9.23 According to SIP 2015, the Deploying SESAR programme was to:

- enable the reduction in operating costs to be realised earlier in RP3 than would otherwise be the case (with a corresponding reduction in user charges by the end of RP3);
- better position NERL for the start of RP4; and
- enable NERL to be better placed to achieve the SESAR performance targets.

9.24 NERL did not provide further detail on other benefits of the plan.

9.25 NERL stated it would be possible to accelerate a number of concepts previously planned for RP3 into RP2 (accelerating SESAR deployment) whilst still delivering all of its RP2 commitments and remaining within the RP2 capital investment cost envelope. This was to be achieved by replacing systems that would otherwise be sustained for the same level of capital investment. During the consultation, there is no written record of NERL indicating any associated risks, although NERL has told us they were discussed verbally.

RP2 investment strategy

9.26 In September 2015, NERL prepared an RP2 Investment Strategy at the request of CAA to provide more information on the acceleration and the reasoning behind it:

- An accelerated technical capex plan was created, affirming the legacy sustainment programme was still in place, but with reduced expenditure due to earlier system retirement.
- The new platform programme was the same, but with increased expenditure due to earlier implementation.
- Other investment programmes had only minor revisions to integrate the new platform.

9.27 In a further NERL document on the needs of the network and the resulting requirement for an accelerated investment, more detail was presented on the current capacity plan, and the challenges and opportunities which led to the resulting proposed changes. The three key challenges to the original plan's success were:[51]

- Uncertainty over the optimum approach to airspace design approaches to manage noise impact for local communities.
- The challenges associated with delivering new airspace concepts on existing air traffic management systems.
- Reduced benefits if changes are delivered without a framework to ensure that airspace developments are aligned with linked changes at related airports.

[51] Modernising the UK's Air Transport Network – A New Way Forward, NATS (En route) plc, 15 September 2015

9.28 Tackling these issues led to a proposed reordering of the changes in the plan. A breakdown of the proposal of the revised capacity plan projects is given in Annex 1.

9.29 Following consultations on the accelerated business plan, the 2016 SIP was released providing a strategic update and formal plan to customers of the desire to accelerate investments, giving the rationale for proposed changes.

9.30 Critically, by September 2015, NERL describes how public reaction to a change in noise patterns and reduced willingness of airports to support LAMP developments also contributed to the need for a change to the business plan. Delivery of LAMP Phase 2 as originally envisaged was no longer possible because of the aforementioned changes[52].

Benefits

9.31 The accelerated business plan (£620 million) committed to delivering the following benefits in line with the original RP2 blended performance plan to customers[53] (see Table 9.2).

Table 9.2: NERL RP2 commitments to customers

	Cost Efficiency (real DUC reduction per annum)	Price Reduction (real saving end RP2 v RP1)	Operating cost (real saving v 2011 actual)	Service (NERL attributable En Route ATFM delay)	Service (resilience risk)	Safety (lower risk per flight)	Fuel Saving by 2019	Capital Expenditure (RP2 total 2012 prices)
Revised Business Plan	-4.8% (-£80M pa)	-21% (-18%, -£102M)	-13%	<6s	Low risk	13%	£180M	£575M

9.32 Figures for cost efficiency and price reduction (i.e. -£80 million p.a. and £102 million respectively) were not given in the 2015 SIP. These have been extracted from 2015-2019 Business Plan originally released by NERL in 2013. The proposed price reduction appears to have increased from 18% to 21% reduction in real terms[54].

9.33 Due to the delay of LAMP, some components were considered undeliverable in the RP2 timeframe: the new plan proposed lower annual fuel savings at the end of RP2 compared to the original plan (c.155kT v 275kT p.a.). However, some of the new opportunities (including those elements of LAMP phase 2 which could be delivered independently), which were to replace the final elements of LAMP Phase 2 that were being deferred, were expected to be delivered earlier in RP2 and therefore deliver a cumulative fuel saving over the 5 years that was 'very similar to the Original Plan'[55].

9.34 Fuel prices had also fallen from c£650/T (when the business cases for LAMP and other airspace changes were developed in 2013) to c£300/T during RP2 (see Table 9.3). Although this does not affect the amount of fuel saved, it impacts the value and potential cost savings to airlines.

[52] Service and Investment Plan 2016, NATS (En Route) Plc, 31 December 2015

[53] NATS (En Route) plc, RP2 Investment Strategy, 9 September 2015

[54] This is as a result of using final PRB methodology and including additional cuts made by CAA in the final UK NPP

[55] Service and Investment Plan 2016, NATS (En Route) Plc, 31 December 2015

Table 9.3: Impact on Fuel Savings, SIP 2016, NATS

Option	End RP2 Fuel Benefit (per annum)	RP2 Fuel Cumulative Benefit	RP2 Cost
Original Plan	275kT £83M*	c500kT £150M	Up to £68M
Proposed Plan (Including new opportunities)	c155kT £47M	c500kT £150M	Up to £68M

*rBP equivalent £180M at 650/T

9.35 All other benefits originally proposed were to remain the same, as well as new opportunities arising due to the acceleration.

9.36 Deploying SESAR technology earlier was to deliver the following benefits sooner (see Table 9.4).

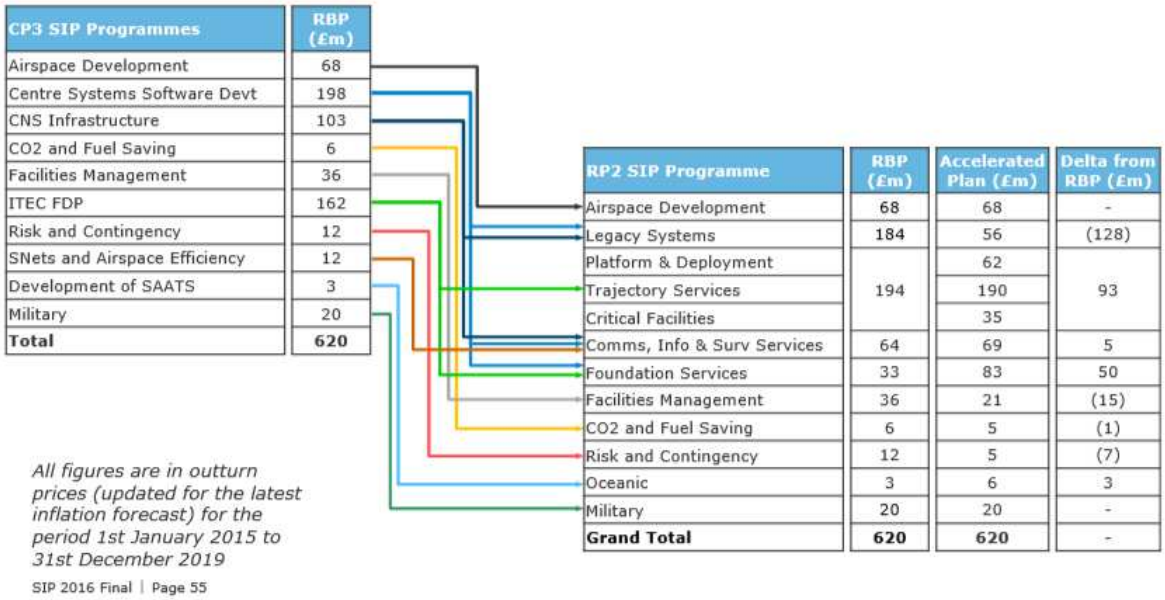
Table 9.4: Earlier benefits to customers, SIP 16

Area	Customer benefit
Safety	Maintain existing high standards of safety performance with increased levels of traffic.
Capacity	c.25% additional capacity to maintain service levels with increased traffic.
Environment	Reduce environmental impact through free route upper airspace and systemised terminal airspace contributing to NATS 10% target.
Price	Further price reduction by end of RP3 than previously anticipated (-21% vs -18%)
Service	Increased levels of service resilience and improved operational flexibility for both normal operations and contingency.

New programme structure

9.37 To deliver the revised technology plan, a new Programme structure was created to optimise the management of the updated portfolio (Figure 9.3).

Figure 9.3: New programme structure (SIP 2016)



CP3 SIP Programmes	RBP (£m)
Airspace Development	68
Centre Systems Software Devt	198
CNS Infrastructure	103
CO2 and Fuel Saving	6
Facilities Management	36
ITEC FDP	162
Risk and Contingency	12
SNets and Airspace Efficiency	12
Development of SAATS	3
Military	20
Total	**620**

RP2 SIP Programme	RBP (£m)	Accelerated Plan (£m)	Delta from RBP (£m)
Airspace Development	68	68	-
Legacy Systems	184	56	(128)
Platform & Deployment	194	62	93
Trajectory Services		190	
Critical Facilities		35	
Comms, Info & Surv Services	64	69	5
Foundation Services	33	83	50
Facilities Management	36	21	(15)
CO2 and Fuel Saving	6	5	(1)
Risk and Contingency	12	5	(7)
Oceanic	3	6	3
Military	20	20	-
Grand Total	**620**	**620**	-

All figures are in outturn prices (updated for the latest inflation forecast) for the period 1st January 2015 to 31st December 2019

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9.38 The programmes with a new naming convention were Centre Systems Software Development, CNS infrastructure, ITEC FDP, Safety Nets and Airspace Efficiency, and Development of SAATs. The '*reduction in legacy spend was to be offset by additional expenditure on new platform, critical facilities and trajectory services*'[56]. It is noted that the cost allocation between the categories represented NATS' current view at the time and, as the delivery plan matured, was also to be subject to revision.

Our opinion and lessons learnt for RP3

Overall

9.39 **There were valid reasons for adjusting the plan**. Overall, NERL gave valid reasoning for the need to accelerate some of the capital investments and it was clear to see how high-level requirements evolved over time, for example with the release of PCP encouraging faster SESAR deployment (by regularising the timeline and reducing risk), the need for improved resilience, and the evolution of airspace change risk.

9.40 By keeping the total investment during RP2 to the same amount, we can conclude that the risks arising from these changes were foreseen, and appropriate contingency put in place to manage those risks.

9.41 However, change management and risk management at the start of RP2 was not clear enough, and potentially not robust enough. In all cases the reasons for adjusting the plan could be foreseen.

9.42 Whilst we accept that the PCP happened after the RP2 determination, the technologies included were already available and it was only the regulatory baseline that changed. During the RP2 determination (2013), there were therefore risks in proceeding with SESAR deployment too fast (without the regulatory support which followed through PCP), and risks in not including SESAR deployment in the RP2 plan (since the regulatory package was already in

[56] SIP2016, NATS (En Route) plc, 2015

process, it could be foreseen that action would need to be taken during RP2). In the event, NERL was willing to continue the heavy reliance on legacy systems at the time of the original blended RP2 plan. Understanding both risks, and the eventual decision taken, is recognised as a nuanced decision, but one which had significant and material bearing on the eventual capital investment plan. Therefore, there must be better explanation of the decisions at each stage.

9.43 Nine months into RP2, NERL had already proposed to change the capital expenditure plan. In this plan, NERL described the biggest risks to the plan. Then in the accelerated plan, there were three challenges (mentioned in overview above) that were not previously described. We believe these challenges should have been foreseen and consulted on. Looking forward to the RP3 plan, NERL need to demonstrate that the future environment is thoroughly considered, to avoid a repeat of this situation.

Reasoning

9.44 **There was a lack of detail in the reasons for the pace of change in systems upgrade.** The rationale for change i.e. 'the earlier the new platform is delivered, the less has to be spent on sustaining legacy systems. Therefore, divert investment from sustaining legacy systems'[57] is justified irrespective of the 7 December 2013 events, and could have been made in the original RP2 business plan.

9.45 The consultations at the time included some discussion of the pace of legacy system change, but the factors impacting this were not well understood. Without understanding the underlying factors, it is very difficult to hold NERL to account with clarity over internal risks or issues, versus external dependencies (e.g. supplier issues). As a consequence, **more detail should be provided on the factors impacting timelines and technical schedules in the RP3 consultation**. There is no opportunity to test the deliverability of the capital investment programme otherwise. The changes seen during RP2 reinforce the need for the CAA to have a view on this.

Benefits

9.46 Although NERL did inform customers within the original RP2 business plan that 'successful delivery of the full benefits of LAMP will require completion of actions by industry partners…as well as extensive public consultation on airspace changes'[58] it was evident LAMP delivery and benefits were the main driving force and reason customers accepted the extra £15M investment in addition to the lower investment plan. It is argued that NERL should have originally consulted on alternative action that was to be taken if industry buy in was not received, or refunded airspace users in the extreme case.

9.47 **Impact on the benefits mechanism needs to be clearer**. NERL indicated that cumulative fuel savings from accelerated and new projects to replace undeliverable LAMP components would be similar to that of the original plan. This is something that we haven't been able to calculate and a key problem we believe needs to be looked at in RP3. These fuel savings provide an example of how NERL communicated to customers a plan which seems an obvious choice to customers as it appears unlikely to impact on customer benefits; however, the way in which it

[57] NERL RP2 Investment Strategy, NERL, 9 September 2015

[58] RP2 Revised Business Plan (2015-2019), NATS (En Route) plc, 18 October 2013

will do so or the follow up of whether it has met the objectives originally set does not appear to be given.

9.48 **The impact of changes in RP2 on RP3 should have been tested during RP3 consultation.** During consultation for the accelerated plan, several claims were made describing a better RP3 as a result of changing the capital expenditure plan for RP2. These claims (e.g. a reduction in operating costs to be realised earlier in RP3; c.25% additional capacity) should have been explicitly demonstrated/validated during the RP3 consultation but were not.

Transparency

9.49 **There was a lack of transparency in the changes**. Whilst a diagram has been given to demonstrate project name changes (where a new project name is made up of elements of more than one of the previous project names) the actual amounts that feed into the new project names are hard to determine and it is unclear what projects would now be included in the new scope. The same is true for the capacity plan (annex 1) where new/changed names have been given for projects under the accelerated plan, but again no mention of the actual investment amounts.

9.50 **A limited sample set of projects was detailed**. Both the SIPs report on the progress of ten key projects, tracking a lot of detail on items such as capex spend, benefits, risks, key issues and a delivery traffic light (rating cost, timescale, and benefits realisation). A good level of detail is given however there are examples of discrepancies in the few projects that are reported in both years.

9.51 **Understanding of dependencies was lacking.** In terms of key dependencies, aside from listing a number of projects, no other detail was given to explain what the dependencies required to deliver the new platform truly meant or how their completion/delay would impact the delivery of the new platform. When looking at the RP3 business plan, we believe this is something that will need to be better analysed. A clear benefits structure also needs to be implemented to help with understanding what slippages of key dependencies could mean for the overall capex plan.

Revised Accelerated Business Plan

Overview

9.52 At the end of 2016, the SIP17 was released which set out a revision of the accelerated business plan during RP2 which was to offer the 'best' overall outcome for customers, the wider aviation industry and the travelling public[59].

9.53 NERL held a number of customer consultations during the year and used the SIP17 to respond and address the key points raised during 2016 (Table 9.5).

Table 9.5: Key Outcomes of Consultations, SIP17

Key Points Raised
Confirmation that LAMP2 needs to be delivered at the earliest opportunity
The need to provide transparency and detail to customers on the Deploying SESAR Programme, to facilitate an understanding of the status/risks of the programme, and status of capital expenditure, and to provide assurance that the plan is delivering value

[59] NATS (En Route) plc, Service and Investment Plan 2017, NATS, 28 December 2016

Key Points Raised
The need to justify the increase in RP2 capex envelope from £620M to £750M-£780M, and to explain the dis-benefits of constraining RP2 capex to £620M, and to describe alternative options that had been considered
A description of the £750M-£780M plan's expected impact on user charges, compared to the £620M plan, is necessary
Customers raised concerns over the SENATE investment as part of the Oceanic Consultation
Clarity on the use and treatment of the INEA funding is required

9.54 During consultation for this revised plan, NERL informed stakeholders of the INEA co-funding that had been received from the European Commission to accelerate Deploying SESAR. NERL had been successful in securing a total of c.£100 million (€118 million) over the 2014 and 2015 award cycles and planned to apply for a further c.£30 million (€35 million) INEA funding under the 2016 Award cycles. This INEA co-funding was able to offset the impact of capital expenditure accelerated from RP2 to RP3 and result in reduced Determined Unit Rates during RP3 compared to what would have happened otherwise.

9.55 A capital investment plan was released during 2017 which provided further rationale regarding the increase in the investment envelope. The document explained in more detail why the programme had changed (citing the changed business environment and technological landscape against which the original business plan was framed), why NERL believed that it was the right approach and the plans underpinning them.[60] In making the proposal, NERL considered whether the £750M-£780M plan represented the best way forward for customers by assessing the value and feasibility of the approach and the alternatives (following the original RP2 Plan, or following the revised strategy but constraining the spend to 620M).

9.56 The relative merits of the plans are compared in Table 9.6 below.

Table 9.6: Assessment of the three approaches

Benefit type	RP2 Plan	620 Plan	SIP 2017 Plan
Delivering benefit to customers	Discounted as this plan is no longer practical given changes to the investments already made following the SIP 2015 and 2016 consultations and the changed nature of the revised Airspace Change Process.	Customer benefits would be significantly delayed by at least 2-3 years.	Delivers new technology and results in customer benefits earlier.
Minimising overall capex profile		Capex costs for RP2 would remain within the original envelope but the overall lifecycle cost across multiple Reference Periods would be increased by at least £50M on legacy systems.	The lowest overall cost to customers, optimising accelerated technology investment and legacy sustainment but would exceed the original RP2 forecast.
Meeting regulatory requirements		Our ability to meet regulatory requirements would be jeopardised.	Enables NERL to comply with PCP and other regulatory requirements.

[60] RP2 Capital Investment Plan (2015-2019) For Condition 10, NATS, 31 March 2017

Benefit type	RP2 Plan	620 Plan	SIP 2017 Plan
Maintaining INEA funding		NERL would risk losing c55% of secured INEA funding (approx. £50M) and would be unable to pass this EU investment onto customers.	We would maintain eligibility to receive INEA funding secured to date, and in the future, and pass this EU investment onto customers.
Mitigating level of risk		An unnecessary level of risk to service performance would be introduced.	Offers the path of least risk to service performance.

9.57 A breakdown of the additional £130 million -£160 million is shown in Table 9.7below.

Table 9.7: Summary of changes from SIP16 (£620M) to SIP17 (£750-780M) [from March 2017 Customer-Deep-Dive-Workshop-Slides]

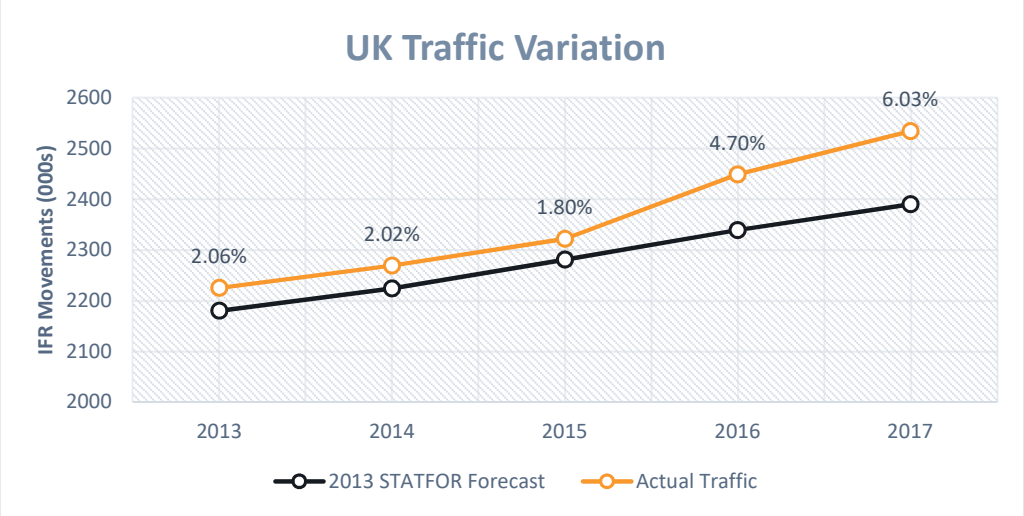
Cost Driver	Area	Cost Change	Primary Cause of Change
iTEC requirements	iTEC	£34M	Maturity/Scope/Transition
iTEC collaboration acceleration	iTEC	£9M	Accelerated Scope
iTEC / FourSight integration	iTEC	£7M	Maturity/Scope/Transition
iTEC contract Forex	iTEC	£8M	External Factor
Voice system costs	VCP	£10M	Mature planning
Voice system integration	VCP	£10M	Mature planning
Voice Contract Forex	VCP	£4M	External Factor
Foundation services scaling	Foundation Services	£10M	Mature planning
Service Operations Management	Foundation Services	£6M	Mature planning
NAS / NERC / NODE sustainment	Current Systems	£14M	Resilience
AMAN Enhancements	Current Systems	£5M	Mature planning
Oceanic Developments	Oceanic	£12M	New scope
Total		**£129M**	
Contingency	Deploying SESAR	£30M	Managing uncertainty
Total itemised changes		**£159M**	

Reasoning

9.58 As well as the aforementioned rationale in the 'Initial RP2 plan' and 'RP2 Plan acceleration' sections i.e. reduced legacy investment, risk of system outages, better ability to meet requirements of PCP and the change in public reaction to the airspace plan, NERL described the need for an increase in the capital expenditure envelope for a number of reasons. The main driving factors were the unanticipated increases in traffic and the decrease in fuel prices (by almost half) in comparison to the forecasts and prices the original capital expenditure plan was based on. This meant the environmental benefits from fuel savings were not as high and NERL responded to customer requests to focus to be on avoiding delays instead. This was

because customers began to experience delays greater than usual over the summer, so capacity was now seen as a constraint, whereas before the focus was on cost efficiency (driven by fuel prices). NERL also recognised the need to increase focus on increasing capacity to service future demands over RP2, and to make the service more resilient to unexpected outages.

Figure 9.4: UK IFR movements; 2013 base forecast versus actual traffic with percentage variation [STATFOR]



9.59 Figure 9.4 above shows the difference between actual IFR movements and the STATFOR forecasts. In a bilateral meeting with NERL, NERL informed us they were expected to use the STATFOR forecasts. In a previous consultation document, NERL also stated that STATFOR were '*well aligned with NATS latest internal forecasts*'[61] (regarding traffic) and that the '*close alignment of the STATFOR and NATS forecasts provided confidence in using STATFOR as a reference for the traffic outlook that underpinned the plan*'[62].

9.60 The February 2013 base forecasts was used when NERL was in the RP2 planning stage. As shown in Figure 9.4, in 2017 actual traffic was 4.7% above the 2013 February STATFOR

9.61 In 2015, traffic increased by 2.34% on the previous year and delay increased by 33.33% (from 0.06 to 0.08 minutes per flight). In 2016, traffic increased by 5.47% on the previous year and delay increased by 287.50% (0.08 to 0.31 minutes per flight in 2016). The union wide capacity target is set at 0.5 minutes of average ATFM delay per flight.

9.62 As previously mentioned, NERL stated it was responding to customer requests that the capital investment programme should now focus on capacity due to the high levels of delay per flight in 2016 (18.6 seconds per flight due to all causes).

Objectives of the new plan

9.63 NERL stated that the new plan took a "bottom-up" approach, whereas previously a top-down estimate which maintained the £620 million capex envelope had been used. NERL said that the bottom-up planning allowed an improved understanding of the scale and costs of

[61] NATS (En Route) plc, Service and Investment Plan 2015, NATS, 28th December 2014

[62] RP2 Revised Business Plan (2015-2019), NATS (En Route) plc, 18 October 2013

deployment, which led to a capex envelope in the SIP 2017 plan of £750-£780 million (including contingency).

9.64 NERL stated that the capex increases in RP2 related to expenditure that would otherwise need to be incurred during RP3. The investment in legacy systems was reduced substantially (c£70 million now envisaged during RP2, compared to £180 million set out in the original RP2 plan)[63]. The costs of the new plan can be found in Annex 2.

9.65 NERL believed that the changes to the plan would enable a series of benefits (Table 9.8).

Table 9.8: NATS (En Route) plc (NERL) - SIP 17

Compared to the alternative of remaining within the 620 plan, the SIP 17 plan:
1. Delivers safety, service and fuel efficiency benefits to the industry 2-3 years earlier
2. Ensures deployment of key operational capabilities including LAMP 2 airspace changes for the London TMA and Free Route Airspace across the UK 2-3 years earlier
3. Avoids the risk of c.500,000 to 1,100,000 minutes of additional delay during RP3 if capacity enhancements are not available in line with growing traffic
4. Delivers key capabilities earlier to meet regulatory requirements set out in the Pilot Common Project and other SES legislation, enabling earlier compliance and benefit and avoiding the risk of infraction
5. Maximises use of £100M secured INEA funds to deliver in line with SES legislation and to reduce costs to users.
6. Provides better value to customers over RP2 and RP3 due to avoidance of £50M investment on legacy systems
7. Provides increased resilience of service for the longer term earlier in response to customer needs and in light of recommendations from the Independent Enquiry
8. Minimises operational risk associated with transition of Deploying SESAR into operation
9. Enables lower user charges during RP3-RP5 (all other things being equal) and with no user charge impact in RP2

9.66 The new plan was intended to bring quantifiable benefits over the course of RP2 (see Table 9.9).

Table 9.9: RP2 Targeted Benefits

Key Performance Area	NERL RP2 Commitments
Traffic (growth vs 2014)	+13%
Safety	Unchanged
Capacity / delay	<6 secs
Environment	£180M pa (based on fuel prices at time of original RP2 business plan)
Price (by end of RP in real terms)	-21% (c.f. -18% in original plan)

9.67 Table 9.10 below (provided by NERL) provides an illustration of the approximate impact on unit rates between RP2 and RP5 as a result of the new plan (additional £130 million - £160 million capex).

[63] RP2 Capital Investment Plan (2015-2019) For Condition 10, NATS, 31 March 2017

Table 9.10: Impact of implementing the £750M plan rather than the £620M plan

Impact of adopting the SIP 2017 Plan rather than the 620m Plan [unit rates higher / (lower) with SIP 2017 Plan]	RP2 Unit Rate	RP3 Unit Rate	RP4 Unit Rate	RP5 Unit Rate
Timing of capex cost recovery^	No change	+2%	-	-2%
INEA funding (£50m) *	No change	-2%	-	-
Legacy capex (£50m) #	No change	-1%	-1%	-1%
Combined Impact of SIP 2017 plan	No change	-1%	-1%	-3%

^ The increase and subsequent reduction in unit rate indicated based on the timing of capex cost recovery will vary depending whether the total capex is £750M (1.8%) or £780M (2.2%). For simplicity a rounded average figure has been used, although in each case the reduction later fully offsets the initial increase.

* Additional INEA funding secured with SIP 2017 Plan. Assumes all returned in RP3 (illustration only).

Avoided legacy investment cost that would be required in the £620M plan but is not needed in the SIP 2017 Plan.

9.68 NERL explicitly stated that impacts and outcomes of public reaction may impact the scope and ultimate implementation of projects, with corresponding impact on project costs and timescales.

Our opinion and lessons learnt for RP3

Overall

9.69 **The clarity improved markedly**. Looking at the entire revised proposal, it is apparent NERL strived to give stakeholders greatly sought-after clarity into their investment plan and programme as a whole. Good logic was given for the proposal to revise the business plan and clearer reasoning for the need to increase the investment envelope was communicated to customers.

9.70 Whilst the reasoning is evident, it does raise questions as to the quality of the previous RP2 plan, having changed year on year since originally devised. We recognise external factors change but question whether the original plans were ever good enough and whether NERL should be held more accountable for not identifying the risks earlier of the previous RP2 plans e.g. heavy reliance on legacy systems. Variations in external factors need to be considered in the planning for RP3 such as potential traffic falls or changes in fuel prices that might need to be accounted for during RP3. **The key question to be asked is whether any of the factors in Table 9.7 and Table 9.8 could have been anticipated at the start of RP2, and if so, how similar judgements should be made for RP3**.

9.71 **Top-down planning needs to be supplemented with bottom-up planning**. NERL stated that the original £620 million acceleration was made using a top-down approach, whereas bottom-up planning was now used to provide better estimates of how much capital expenditure was truly needed. We understand the process of project maturity, with potential for increases in cost throughout a project's lifecycle. However, £130 million - £160 million is undoubtedly a substantial increase. Only a year prior, NERL was promoting the accelerated £620 million plan, detailing a number of benefits associated with it in line with the original cost of the RP2 plan. Despite that, in the SIP17 (£750 million - £780 million) plan, there were now substantial risks associated to the £620M plan such as the ability to meet regulatory requirements and the fact that overall lifecycle costs across multiple Reference Periods would have been increased by at least £50 million on legacy systems. In a meeting with NERL, NERL informed us that the £620

million plan were based on 'indicative' costs however, we are unsure whether this had been clear through early RP2 planning or SIP16.

9.72 A key takeaway which appears to have been consistent throughout the RP2 process is that NERL has not been able to show valid cost figures for the programme with estimates changing year-on-year. NERL appears to plan using indicative, immature cost figures and we question the suitability of this approach noting the scale of the resulting increase. Forward looking **we recommend explicit confirmation when costs are indicative, with upper and lower bounds provided, and planned contingency arrangements to deal with expected risks.**

9.73 Table 9.7 above describes the reasoning behind the additional £130 million - £160 million spend. We question whether certain items such as Voice Contract Forex should be additional or covered in contingency.

9.74 During consultation for the Accelerated Business Plan (2015-2016), several statements were made describing a better RP3 as a result of changing the capital expenditure plan. Some of the mentioned reasoning (such as a reduction in operating costs to be realised earlier in RP3, c.25% additional capacity) will need to be tested when looking at the RP3 business plan.

Transparency

9.75 During 2017, **NERL provided stakeholders with a lot more detail and transparency in the consultation documents than previously**. NERL broke down the key investment programmes i.e. Airspace and Technology, explaining the difference and main elements of the two, and the key projects that fed into each of the areas. NERL also further explained the subdivision of the technology programme to address the investment in the future technologies (Deploying SESAR) and the legacy (Current) systems. Adding to this, NERL also communicated the dependencies within the Deploying SESAR programme through a timeline, and a vertical hierarchy of requirements was used to show the way projects should feed through and lead to the new common platform.

9.76 **However, the changes have been hard to track**. Whilst dates are given for the new timeline, the SIP 17 was sometimes less helpful in comparing the new plan versus the old plan to demonstrate what was being accelerated and what was remaining unchanged. **This made it hard to determine what could be regarded as a true acceleration rather than additional cost, delay or overspend**. This trend also appeared in the prior years described above. Nevertheless, it should be noted that overall the information produced by NERL under the requirements of the Licence's Condition 10 were a very good, insightful and detailed addition to the usual consultation documents. This increase in transparency is welcomed by customers and looking forward at the RP3 plan, we recommend it be maintained.

Capacity & Traffic

9.77 In regard to capacity, in 2016 (but not 2015 and 2017) NERL did not meet their national target of 0.23 minutes per flight (all causes)64 , but still reported delay lower than the union-wide target of 0.5 minutes of average ATFM delay per flight (all causes). We recognise why the increased delay would have caused NERL to take a great deal of action, however we do still question what the threshold is in terms of 'high levels' of delay and what level of delay should trigger a revision to the investment plan.

[64] PRB Annual Monitoring Report 2016, Performance Review Body, 9th October 2017

9.78 Regarding traffic, it is undisputable that traffic in 2016 increased above the STATFOR forecasts which the original RP2 business plan was based on (4.7% as measured by IFR movements above the 2013 and 2014 February STATFOR). However, whilst there is a variation in traffic, we question how much effect this truly had and the justification that this was a key factor in the proposal to revise the £620 million plan to £750 million - £780 million; a £130 million - £160 million increase.

9.79 From 2015 to 2016, IFR movements increased by 5.47% and NERL maintained that the current operating systems were approaching the point where they could no longer continue to be developed to match the demand.[65] Whilst the events of 7 December 2013 supported this assertion, it is not clear why legacy escape was not originally proposed in 2014 or even 2015. Instead it was not until December 16 / March 17 that NERL appeared to have communicated this with stakeholders although it did provide a presentation to the CAA in September 2014 that the external environment had changed and it was considering a revised legacy escape plan. (In SIP 2015, NERL stated it was considering legacy escape but said it would be implemented "while still delivering all of its RP2 commitments and remaining within the RP2 cost envelope"). A key lesson learnt here is that variation from traffic forecasts of less than 10% (and certainly 5%) need to be better prepared for in RP3 and we recommend this scenario is considered in the business plan. It should consider the possible traffic variations and their impact on service quality with and without mitigations. Trigger mechanisms should be considered to activate the mitigations.

Benefits & Risks

9.80 NERL presented the benefits delivery in terms of Safety, Service, Cost Efficiency and Fuel savings, Obligations and Sustainment (system Resilience), citing the investment program from which the benefits are derived and giving a brief overview of what projects deliver the benefits. An RP2 timeline is also provided displaying a benefits matrix giving the time at which certain benefits should be delivered. The diagrams provided by NERL are quite clear and explained in NERL's Condition 10 appendix. The key risks being managed are also appropriately explained. We recommend this level of detail is provided in the RP3 business plan.

INEA

9.81 NERL gave an overview of the INEA funding and the way applications have been linked to NERL's deploying SESAR programme and aligned to the PCP and other implementing rules. NERL breaks down the projects and demonstrates which project is linked to which ATM functionality that enabled the approval for the funding. NERL has now started the process of reduced pricing offset by INEA funding as part of the proposed price for 2019.

9.82 **Does INEA obscure the acceptability of the changes**? Finally, it is likely that if the INEA funding had not been available, there would have been significantly more debate around the changes seen from 2013 to 2017, and in particular the changes set out in Table 9.7. Indeed, the performance plan would have needed to be re-opened. The reasoning behind these changes is critical to understand in depth, identifying what relates to true acceleration, and what is a function of project planning or risks becoming material. Nonetheless, we support NERL's decision to apply for INEA funding.

[65] RP2 Capital Investment Plan (2015-2019) For Condition 10, NATS, 31 March 2017

2018 // SIP 18

Overview

9.83 Following the CAA's approval of the Condition 10 report, NERL continued user consultation and produced the final SIP18 in December 2017. An update of the RP2 Capital Spend: Full Portfolio is given, with forecast spend differing from that of the Condition 10 report. The overall capital envelope remained at £780 million with contingency, however an extra £2 million from military funding was added to the contingency amount (the new programme costs can be found in Annex 3). NERL informed stakeholders that clear progression had been made with the £750 million - £780 million plan with 90% of the programme contracted or committed.[66]

9.84 A progress update on the airspace and technology plans is given within the documents and a description of the key risks being managed. NERL also described how the Portfolio, Programme and Project Office (P3O) was '*paying dividends in portfolio management*'. A people plan is also included.

Our opinion and lessons learnt for RP3

9.85 In the 2018 SIP documentation NERL provides a lot more transparency on the investment programme than it had previously done at the start of RP2 (e.g. in SIP 2016). The milestone reports included within SIP18 are informative with clear marking to see which have been completed and which are at risk. A comparison of the original expected completed date to the likely delayed completion date is also provided. LAMP developments are well mapped which is important as LAMP was a key driver for the original RP2 business plan, although most of LAMP is now scheduled for RP3 e.g. LAMP2/FASI-S. This level of transparency is recommended in the RP3 plan.

9.86 In SIP2018, portfolio management has considerably improved since the earlier years of RP2 and the P3O system appears to allow a much clearer tracking of programmes and benefits. As in the previous year, a benefits management matrix is given providing insight into what benefits were expected from which projects. However, the way in which the key contributing projects create the benefits was not explained. It is also apparent that a proportion of the benefits will not be seen until later years after project completion and RP3. We recommend that for the RP3 plan, benefits should be described (including those delivered after RP3) and linked to key contributing projects.

Summary and conclusions

9.87 We set out below our provisional conclusions on the various capital development plans produced by NERL during RP2.

RP2 Business Plan

9.88 Our analysis shows that:

- The airlines' expectations that the higher cost option offered during the original RP2 Business Plan consultation would be the upper limit of the investment programme turned out to be incorrect.
- The analysis of benefits improved but was high level and unclear in its link to the programme.

[66] NERL 2018 Service and Investment Plan, NATS (En Route) Plc, 28th December 2017

Accelerated Business Plan

9.89 Our analysis shows that:

- There were valid reasons for adjusting the original plan. However, change management and risk management at the start of RP2 was not clear enough and potentially not robust enough.
- Impacts on the benefit mechanism needed to be clearer.
- There was a lack of transparency in the changes and a limited set of projects was detailed, while the understanding of dependencies was lacking.

Revised Accelerated Business Plan

9.90 Our analysis shows that:

- The clarity of the plan improved markedly at this point. However, this raises questions about the quality of the previous RP2 plans, and about whether the factors on which the changed plan was based could have been anticipated.
- Top-down planning needed to be supplemented with more detail through bottom-up planning.
- We recommend that explicit confirmation be provided when costs are indicative, with upper and lower bounds provided, and planned contingency arrangements to deal with expected risks.
- NERL provided more detail and transparency than previously. However, the changes have been hard to track, making it difficult to distinguish true acceleration from additional cost, delay or overspend.
- We question whether the INEA funding obscures the acceptability of the changes in the plan.

10 Review of RP2 Consultation Processes

Introduction

Overview

10.1 This section reviews the quality of the consultation process for RP2 in terms of:

- Appropriateness of consultations (user ability to influence outcomes, accuracy, visibility, detail and maturity of options);
- Transparency of option implementation (feedback look, accountability process); and
- Strategic decision process (management of risks, dependencies, make vs buy decisions, supply change and programme).

10.2 This section does not comment on the content of the plans and NERL's delivery of it.

Requirements

10.3 In preparation for the RP2 the CAA released the expectations and timelines for the Customer Consultation process in CAP 1019 titled "*The CAA process update for the economic regulation of NERL and contribution to the UK-Ireland FAB Performance Plan for Reference Period 2 (2015-2019) of the Single European Sky Performance Scheme: A mandate for Customer Consultation between NERL and airspace users"*[67]. This document clarified the scope of NERL activities that are subject to the CAA review of the Customer Consultation:

- The UK en-route service;
- the London approach service;
- NERL's non-regulated activity; and
- the Oceanic service (which is outside of the SES Performance and Charging Schemes, but is separately regulated by the CAA).

10.4 NSL activities were excluded from this consultation process.

10.5 It was stated that "the CAA expects NERL to engage constructively to seek airspace users' priorities for RP2 and ensure these are taken into account in formulating its rBP and where it cannot meet these priorities and demands it provides a cogent and timely explanation."

10.6 Expectations regarding the discussion topics of the consultation process have also been laid out and included (amongst others):

- Key airspace user priorities for RP2 and beyond for UK en-route services.

[67] CAA, April 2013 URL: http://publicapps.caa.co.uk/docs/33/CAP%201019%20economic%20regulation%20of%20NERL.pdf

- NERL's proposed plans for meeting airspace users' needs in RP2, in terms of the KPAs under the Performance Regulation: safety, environment, capacity and cost efficiency.
- The key components of NERL's business plan including traffic projections, its capital plan, operating costs, and financing costs etc.
- The steps that NERL is taking to improve its cost efficiency in RP2 and beyond.
- The priorities of airspace users in relation to certain trade-offs relating to strategic choices NERL could make regarding cost and service quality.

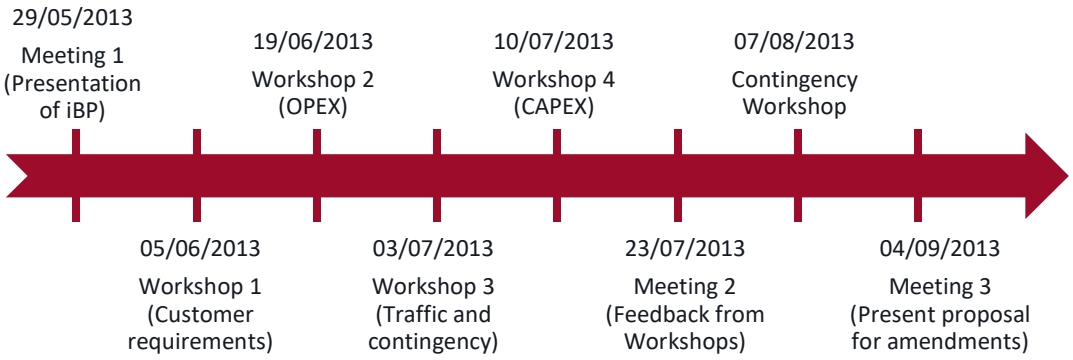
RP2 consultation process

Description of the process

10.7 The formal RP2 consultation process was launched on 29 May 2013 with the publication of the initial business plan (iBP) and an associated introductory workshop.

10.8 The consultation meetings undertaken are presented in Figure 10.1.

Figure 10.1: RP2 Customer Consultation meetings



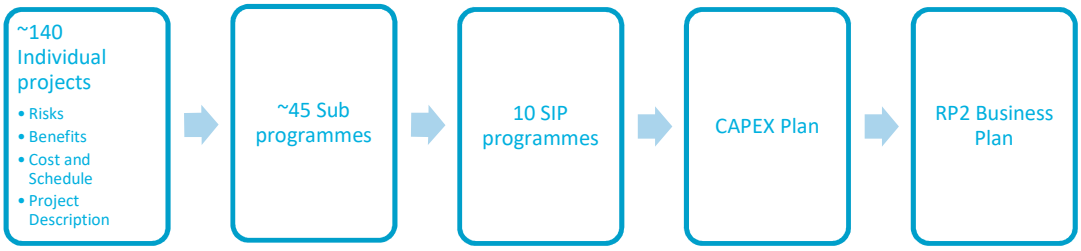
10.9 In the final RP2 consultation meeting NERL summarised that during the three plenary meetings and 5 workshops circa 400 slides were presented, NERL responded to over 500 questions and prepared c1,000 pages of transcripts.

10.10 The consultation slides included summaries of:

- The proposed plans and resulting service impact in terms of cost efficiency, price reduction, operating cost, service level and risk, safety, fuel saving and capital expenditure (in 2012 prices).
- Breakdown of benefits at the ten SIP programme level (see Figure 10.2: NERL structure of CAPEX investments) in outturn prices.
- Traffic forecasts with a comparison of STATFOR and internal forecasts, past performance and economic forecast.
- Cost effectiveness benchmarking – financial and economic cost.
- Past performance review.
- Governance approach – SIP consultation and reporting requirements
- CAPEX investments on the 45 sub-programme level were presented at specific "investment stands" during the CAPEX workshop.
- OPEX costs – pay and rostering overview.
- Oceanic service plan and resulting service along with an overview of long-term strategic options (Space based ADS-B).

- Airspace user feedback collated during the consultations in terms of process, non-regulated income, traffic, safety/service quality, OPEX, CAPEX/governance and oceanic.
- Chosen investment strategy at a CAPEX plan level (see Figure 10.2: NERL structure of CAPEX investments) with impact on benefits and unit price specified.
- Chosen RP2 plan benefits in terms of cost efficiency, price reduction, operating cost, service level and risk, safety, fuel saving and capital expenditure (in 2012 prices).

Figure 10.2: NERL structure of CAPEX investments



Review of process undertaken

Appropriateness of consultations

10.11 In our opinion NERL conducted a relatively intensive consultation process, much more detailed than that performed by other ANSPs in Europe in the run up to RP2. Unlike many other ANSPs NERL prepared two options and allowed the users to choose the preferred one from an operational and investment point of view. This was appreciated by the users, who felt that NERL was taking their opinions into account when preparing the RP2 plan.

10.12 However, in the proposed business plan the ability meaningfully to impact the size of investment was limited to 3 out of 10 investment groups. Plan 2, the minimal investment plan was equal to an investment of £603 million. Plan 1, the maximum investment plan was equal to £653 million, meaning that users had influence over an investment of £50 million (8.3% of the minimal investment).

10.13 Additionally, the costs on a sub-programme level were presented to the users in the Capital Investment Plan for Customer Consultation whereas the benefits per sub-programme level in the CAPEX consultation workshop. Collating the costs and benefits into one document would allow the users to have a better understanding of the trade-offs available to them. Similarly, consistency in the cost-base year in which the quotes are presented would improve the coherence and clarity of the messages.

10.14 With regards to the Oceanic plan users were presented with an investment plan but had little say over the scope of it. No options were provided for this area.

10.15 In our consultations, British Airways stressed how NERL provided a large amount of information, but this was not always easy to interpret. Airlines are not in the position to allocate a significant amount of effort to the consultation process, hence information presented to them should be clear, targeted and well-structured.

Transparency of option implementation

10.16 The consultation documents presented an acceptable level of detail with both cost and benefits being reported upon at a sub-programme level. However, this level of information was not presented in the approved RP2 Business Plan documentation.

10.17 In our opinion the approved RP2 plan should have included a finalised capital investment plan document setting out the expected investment timings as well as costs (both within the RP and thereafter) and benefits (similarly including short-term benefits expected to be generated within the RP and also long-term benefits which would start being generated at a later state). This should be done in a framework with a consistent structure that would be reported on annually. This would allow the users to monitor project progress and ensure NERL is delivering according to the agreed schedule.

Strategic decision and management processes

10.18 Airlines agreed that the principle of being able to choose between plans was good, but the information available was not always sufficient for the airlines to truly understand or challenge the plans, their interrelations and dependencies. NERL explained that the programmes were interdependent, but this interdependency was not elaborated upon. It was implicit that NERL managed the interdependencies and hence the plans available to the users were deconflicted. No trade-off dependencies were presented to the users.

10.19 With regards to risk management the only information provided was that the costs on sub-programme level (reported in the RP2 Capital Investment Plan dated 3 July 2013) were inclusive of risk and contingency. In addition to this, on a SIP programme level (see Figure 9.2 for the breakdown of the 10 SIP programmes included in the RP2 CAPEX plan) NERL included a separate line for risk and contingency.

10.20 Similarly, NERL did not report on the management of the supply chain, programme or the make versus buy decisions required.

10.21 For RP3 preparation NERL must ensure that the strategic decision processes are reflected upon clearly. Dependencies, trade-offs and process management must be captured accordingly, to allow the users to understand the plan in sufficient detail. NERL informed us that is has spent significant time discussing this with customers.

SIP consultation process

Description of the process

10.22 As a part of its licence, NERL is required to consult airspace users on their airspace plans. The SIP consultation period usually opens in October and closes at the beginning of December every year. The key event is a multilateral consultation on the SIP, which is undertaken at the beginning of the consultation period, prior to which a draft SIP is released to the stakeholders (usually beginning of October). This is an opportunity for NERL to present the draft of the SIP, explain the logic behind it and allow users to discuss and ask questions. Thereafter airspace users can request bilateral consultations or submit their opinions in a written format. The outputs of the consultations are then collated by NERL and the SIP is updated and submitted to the CAA for approval at the end of December.

10.23 Throughout the reference period, at the request of both the airspace users and the CAA, the consultation process continued (see Appendix A, Annex 4). In 2014, ahead of RP2, a single multilateral and three bilateral consultations were undertaken (NERL offered bilaterals to all

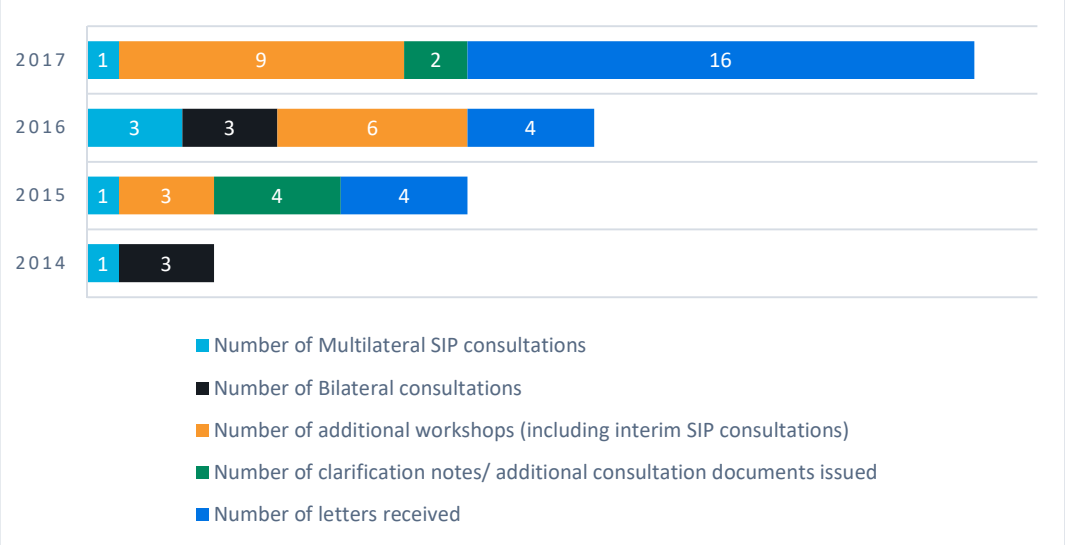
customers). The number of consultations increased in 2015, where NERL introduced the first round of changes to the CAPEX plan by changing the scope of the £620 million investment. At this point an interim SIP consultation was undertaken along with additional workshops on the SENATE project.

10.24 The following year NERL arranged further additional SENATE-focused workshops and users engaged in the topic by submitting multiple written opinions. Additionally, the unexpected increase in the capital budget from £620 million to £750 million resulted in high user dissatisfaction. This combined with NERL's decision to push forward Space Based ADS-B without the user endorsement resulted in the CAA refusing to accept the 2017 SIP due to an "*insufficient level of detail*" enclosed in the plan.

10.25 Due to the rejection of the 2017 SIP NERL was required to increase the rate and scope of reporting. Multiple "Deep Dives" workshops at which specific elements of the plan were discussed were undertaken. Additionally, NERL produced a "Condition 10" report (with supporting Annexes and Updates) reflecting the logic behind the CAPEX plan change, the detail of the new plan and NERL's approach to project and programme management. The Condition 10 documents contained a more detailed level of information on the plans and created a framework in which progress could be monitored.

10.26 The number of consultations undertaken by year is shown in Figure 10.3.

Figure 10.3: Stakeholder consultation undertaken by NERL (excluding RP2 consultation)



Review of process undertaken

Appropriateness of consultations

10.27 In the stakeholder consultation undertaken by the project team, users confirmed that they are generally satisfied with the format of the consultation process. However, the radical change to the content of the plan have reduced the user confidence in the consultation material and raised doubts if it was fit for purpose. While users appreciated NERL's ability to recognise that a plan was not feasible and required changing, they would have liked to have more influence over the direction of the plan revision. easyJet in particular mentioned how NERL should have given the users an option to have the LAMP investment money (that was no longer required) returned, instead of allocating it to the legacy replacement.

10.28 The fact that the capex plan changed soon after the start of RP2 also reduced confidence in the consultation process that has only recently finished.

10.29 IATA and British Airways noted that while a lot of information was available, in their opinion insufficient business case information was presented, and users were not able to assess the value of money of certain investments. It has been also noted that project names and scope have changed multiple times throughout the period, resulting in confusion and an inability to monitor NERL's progress. For this reason, users emphasised the need for having a consistent reporting format through which progress can be monitored year on year.

Transparency of option implementation

RP2 Business Plan

10.30 While in preparation for the RP2 period NERL presented a detailed breakdown of the possible capital projects, the information presented in the SIP consultations was much more fragmented. The 2015, 2016 and 2017 SIP documents contained useful appendices capturing the progress of the 10 key projects with information on the progress, key issues, investment progress and benefit expectation. While this was a good reporting format it is unclear how NERL identified the key 10 projects. For example, in the 2016 SIP the RP2 value of the 10 key projects was equal to £123 million, 20% of the overall RP2 capex investment. NERL did not provide any additional detail on the remaining 80% of investment. In the 2017 SIP NERL reported on 23% of the value of the investment programme. Going forward we recommend that NERL provides updates on all programmes being undertaken, with more detail being available on projects that are key from a cost or benefit perspective.

10.31 Another criticism is that once RP2 started, no reporting on CP2 benefits was undertaken. Reporting on benefits stemming from investments in the previous periods would build user confidence in the value for money.

Accelerated business plan

10.32 In SIP 2016, when moving from the RP2 plan to the accelerated £620M plan, NERL attempted to explain the new projects by including a diagram showing the interrelations between the plans (see Figure 9.3: New programme structure (SIP 2016) above). This chart explains the new programme areas and links them to the previous programme areas but does not allow an understanding the composition or investment schedule of the new programmes. Most importantly, the RP2 planning documents broke the investment down by sub-programme and included detailed information on the expected benefits at this project level. Following the revision of the RP2 plan this information was not available, meaning that users were unable to monitor the detailed project level investment and benefit progress.

Revised accelerated business plan

10.33 Following the introduction of the revised accelerate (£750 million) business plan, NERL was required to publish multiple editions of the "Condition 10" report, which provided more detail on cost and benefits of investment programmes. The level of detail on the timelines, costs and benefits was significantly higher, and users were receptive to receiving a word-based, rather than a slide-deck format report. However, following the successful publishing of Condition 10 reports, the subsequent SIP was presented in a slide-deck format, which did not provide a full update on all the information previously reported in the Condition 10 report.

10.34 Additionally, from this point onwards, NERL consultation activities were monitored by an independent reviewer, who provided suggestions on how the process could be improved. Airspace users speak highly of the reviewer and the impact he had on the process. In our view, this reviewer should continue in this role.

Strategic decision and management processes

10.35 Risk and dependency management was not thoroughly reported upon in the first half of RP2. In the Condition 10 report the focus on the project management and interdependency areas was increased, and this was also strongly reported upon in SIP 2018. However, SIP 2018 reports that a few critical-path milestones have been missed or delayed, but that the overall plan remains unchanged. Going forward NERL should ensure that in such circumstances explanation should be provided on how the entire project delivery will not be affected.

Summary and conclusions

10.36 We set out below our conclusions concerning the RP2 consultation process, as well as the subsequent SIP consultation process.

RP2 Consultation process

10.37 Our analysis shows that:

- NERL conducted a relatively intensive consultation process, which was more detailed than that conducted by other ANSPs. Providing two options was appreciated by users.
  - However, the ability to meaningfully affect the size of the investment was limited to three out of 10 investment areas.
- The consultation documents presented an acceptable level of detail. However, this level of information was not presented in the approved RP2 Business Plan documentation.
- Airlines were not consulted on issues such as interdependencies within the programme, or risk.
  - NERL should ensure that strategic decision processes are reflected on clearly, with dependencies and trade-offs clearly identified to allow uses to understand the plans in sufficient detail.

SIP Consultation process

10.38 Our analysis shows that:

- Users confirmed that they were generally satisfied with the format of the consultation process. However, the radical change undermined their confidence.
- The reporting on individual projects in the SIPs only covered a relatively low percentage (around 20%) of the value of the programme.

- The information reported in the Revised Accelerated Business Plan was significantly greater.
- Risk and dependency management was not reported in detail in the first half of RP2, but this improved in the Condition 10 Report and the 2018 SIP.
- The role of the Independent Reviewer was highly appreciated by airlines and should be continued.

11 Capital programme in the RP3 Business Plan

Overview and information in the BP

Introduction

11.1 In compliance with the regulatory requirements set by the performance and charging scheme of the Single European Sky, and subsequent guidance from the UK CAA, NERL produced a Business Plan (BP) for RP3 for customer consultation. The initial Business Plan (iBP) was consulted on through mid-2018, and a revised Business Plan (rBP) released in October 2018. Unless otherwise noted, mention of the Business Plan or BP in this section refers to the rBP. The BP describes the expected capital investment during RP3 (2020-2024), which is considered in this section.

Overall capital portfolio

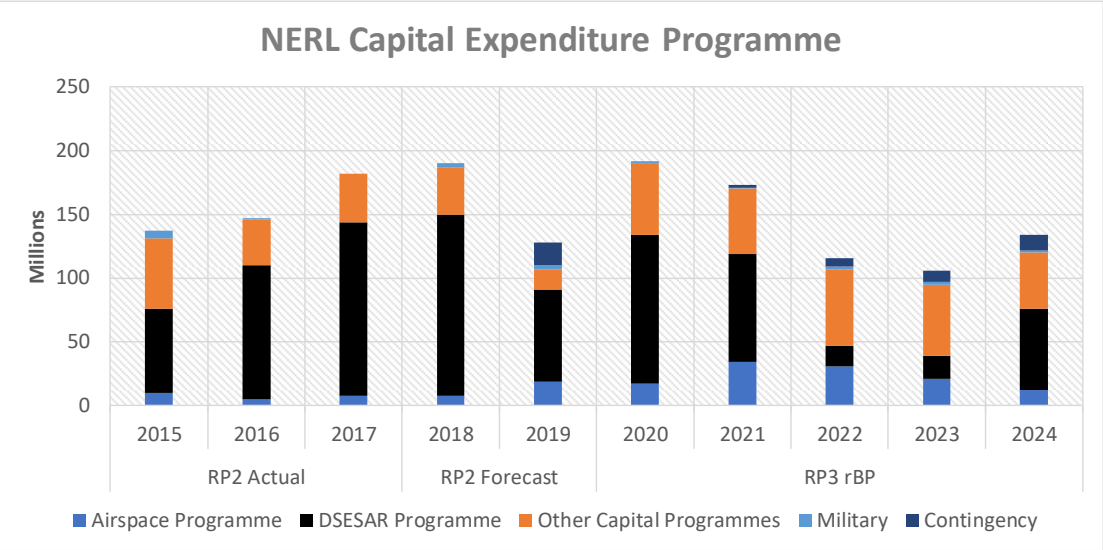
11.2 In the Business Plan, NERL proposes a capital investment programme with a similar investment level to RP2. The total RP3 investment is planned to be in the range of £725 million - £800 million and the core plan is based on a 'detailed estimate for the investment portfolio'[68] of £763 million. Expenditure in 2017 prices is forecast to total £782 million[69] in RP2, equating to £1.55 billion in 2017 prices across the 10 years[70]. Figure 11.1 provides a visual representation of the capital programme.

[68] Appendices, RP3 Business Plan 2020-2024, NATS (En Route) plc, 26 October 2018, p 101

[69] "RP3 CAPEX consultant's questions", 12 June 2018 – delivered by NERL to Helios/Steer

[70] Note that of this value the military covered £13 million in RP2 and is expected to cover £8 million in RP3

Figure 11.1: NERL's Capital Expenditure Portfolio



11.3 Within the Business Plan, CAPEX is presented in five major programmes (plus the oceanic programme which is not addressed in this section) with a breakdown of sub-programmes presented within Appendix L. In contrast to the RP2 business plans and consultation documents (such as the service and investment plans) which were produced in outturn prices, the BP is denoted in 2017 prices. The RP3 Business Plan is also longer than the business plan consulted with the users ahead of RP2, at 258 pages. The capital spend portfolio is set out in Table 11.1.

Table 11.1: RP3 Capital Spend Portfolio, 2017 prices

Programme capex	RP3 £M
Airspace	115
Delivering capability (DSESAR)	299
Technical resilience	144
Domestic en route service improvement	37
Business resilience	88
Oceanic	15
Total NERL Forecast	**698**
Military	8
Total Forecast	**706**
Contingency	34
Total Forecast including Contingency	**740**
Accelerated to RP2	23
Total including RP2 acceleration	**763**

11.4 When the £620m plan was revised through 2016/7, NERL stressed the additional capital expenditure acceleration – moving to £782 million (including £30 million contingency and £2

million for MOD) – related to "*expenditure that would otherwise need to be incurred during RP3"*[71]. Adding this additional expenditure back to RP3 equates to a CAPEX programme for RP3 of £893 million – £925 million given the current scope fo RP3.

11.5 We note that the CAPEX investments presented in the BP are quoted in 2017 prices, which is different to the pricing convention used throughout RP2, where investments were quoted in outturn prices. This needs to be taken into account in tracing relevant costs.

Our Opinion

Clarity

11.6 Some **areas of the RP3 portfolio are not sufficiently explained** in the BP. For example, the technical resilience programme which equates to £144 million has only 2 pages of description and the DSESAR programme valued at £299 million is summarised in 5 pages (Appendix L). The information presented does not offer sufficiently detailed insight into the investments included within the portfolios, their interdependencies and risks.

11.7 A report by CARR, reviewing NATS's approach to stakeholder consultations and examining the SIP process, found that, recognising improvements in reports, nevertheless ***"customers complain about a lack and an oversupply of information at the same time"***[72]. A theme which appears apparent in the BP, where much description and analysis has been provided, but there is limited detailed data on the Capital Programme. Specifically, **costs do not appear to be at the level of detail expected following C10 and independent reviewer reports** which stated: "*The purpose of each business plan shall be to describe in detail the Licensee's plans and expectations for each of the En route Businesses including its capital investment and operational plans, ….*". **We believe there is still an expectation for more detailed explanations of the RP3 capital portfolio in the BP[73].**

Scope of DSESAR

11.8 The scope of DSESAR has also been difficult to track within the BP, and specifically the timing of one of its sub-programme milestones: "TC FourSight" [74] – see Figure 11.2 below.

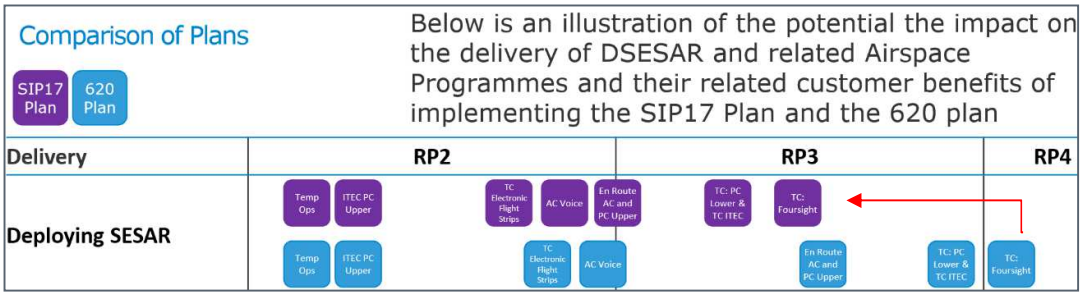
[71] RP3 Capital Investment Plan (2015-2019) For Condition 10, NATS, 31 March 2017

[72] NATS' approach towards stakeholder engagement, centre for analysis of risk and regulation, EVA Heims and Martin Lodge, page 18, http://www.lse.ac.uk/accounting/Assets/Documents/news/carr-NATS-final-report.pdf

[73] We understand that further information has been provided during the consultation process, without fully addressing this point.

[74] TC FourSight is a tool being developed by Altran to enable trajectory-based planning across UK airspace.

Figure 11.2: Extract from SIP 17, page 76, comparison of £750M-£780M Plan vs £620M Plan

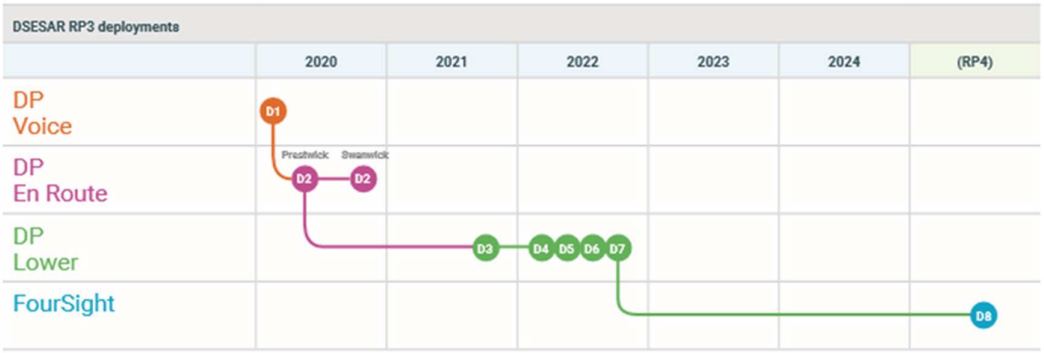


11.9 As shown on Figure 11.2, during consultation on SIP17 (£750 million - £780 million Plan), NERL promoted the earlier delivery of TC FourSight as one of the advantages of moving from the £620 million Plan to a larger capital expenditure portfolio. TC FourSight is shown moving from RP4 to RP3.

11.10 Within the complementary Condition 10 report that followed, NERL explains TC FourSight will "*complete the harmonisation of the systems across all operations and centres. This will be deployed during RP3*"[75]. It is therefore our understanding that TC FourSight was costed as part of the DSESAR Programme, and is included in the total programme cost shared with stakeholders through 2017 and 2018.

11.11 Within the RP3 BP, TC FourSight is now identified as a proposed investment in the final years of RP3 with planned deployment in RP4. FASI-S / LAMP2 is planned to be implemented prior to the deployment of TC FourSight. An option is given for the core plan allowing a delay to the TC FourSight investment, reducing investment in RP3 by around £60 million.[76] Later costings show that £80 million is planned to be invested into TC FourSight.[77] NERL proposes not to follow this option, ie to keep TC FourSight in the core plan.

Figure 11.3: Extracts from BP, page 85, slip of FourSight milestone



D7	Early 2027	iTEC & FourSight for Lower Airspace	Deployment of FourSight trajectory prediction, conflict detection and conformance monitoring into lower airspace. Tool support is an enabler for realising additional benefit from the systemised airspace created by LAMP.	AF6

[75] RP2 Capital Investment Plan (2015-2019) for Condition 10, NATS, 31 March 2017, p 59

[76] RP3 Business Plan 2020-2024, NATS (En Route) plc, 26 October 2018, p54

[77] Appendices to RP3 Business Plan (2020-2024), NATS (En Route) plc, 26 October 2018, p121

11.12 It appears that TC FourSight full costs were included in the RP2 and RP3 capital envelope, but that it has moved significant cost into RP4 (less than two years after promising delivery in RP3) and has no quantified benefits assigned. The cost slipped into RP4 is not quantified in the BP. **The scope of the DSESAR Programme therefore appears to have been reduced compared to SIP 17**.

11.13 We therefore question the inclusion of TC FourSight, and the presentation of DSESAR costs and comparisons to previous agreements. Aside from this milestone, **all other programme's milestones appear consistent with SIP17.**

Options relating to the core plan

Overview

11.14 Chapter 6 of the BP presents seven tactical optional investments with the latter two options not included in the core plan. Some of the options are discussed below.

11.15 Two of the options consider delaying elements of the plan. One of these is TC FourSight, discussed above. The other is Free Route Airspace (FRA) development, which would reduce RP3 investment by c. £15.8 million. The deployment of FRA is required by 2023 to meet European legislative requirements (specifically, the PCP mandate). Whilst stating that "*the option (to delay FRA deployment) would simplify and de-risk key elements of the RP3 Programme, notably DSESAR and LAMP",* NERL recognises that this is a European legislative requirement and any decision to delay would be taken by the State. This could be considered as a non-option in terms of NERL's planning.

11.16 The third option is Queue and Capacity Management which is to deliver additional airspace change in RP3, as well as improve operational performance in environment and service quality. The estimated costs are £16.3 million but no quantified benefits are given in the BP. Without knowing both costs and benefits the option cannot be assessed. NERL informed us that high level benefits were subsequently shared at customer consultation meetings. Elements of this option appear to be taken forwards (eg Heathrow Independent Parallel Approaches, and mention of the AMAN/DMAN option being "*further developed and discussed at a future SIP".*[78] When NERL were questioned about this, it stated that additional information would be provided if the option was progressed but that "*it would add unacceptable risk to the delivery of the LAMP programme*"[79].

11.17 The BP also presents the *"risk-based sustainment"* approach to capital investment (already included within the plan) as an option that can be removed. This approach means allocating capital to upgrade surveillance assets as and when they reach their end of life, and not replace them when they are still fully functioning as a precautionary measure. When asked about the purpose of including "risk based sustainment" as an option in the BP, NERL stated that "*It was important to be clear on the option to use a "risk-based" approach rather than "schedule-based" approach to sustainment so that customers understood the increase in resilience risk associated with this approach as well as the reduction in cost.*"[80] We think this option is best assessed by NERL as it has more information on risks and their consequence. We view this

[78] RP3 Business Plan 2020-2024, NATS (En Route) plc, 26 October 2018, p55
[79] Email clarification from NERL, 09 July 2018
[80] Email clarification from NERL, 09 July 2018

more an explanation of a programme feature than an investment option, and we would have preferred to see this information captured in a more appropriate position in the document.

Our opinion

11.18 Given the examples above, our view is that **some of the options appear to be non-options** because they could not reasonably be undertaken. They also do not represent clear trade-offs in cost vs benefit vs timing. The SIP process will enable discussion on specific options, but we recommend that a judgement of the RP3 BP investment should explore other options and trade-offs.

Benefits of the capital portfolio

Total capital portfolio

Overview

11.19 The performance and charging schemes set performance targets for European Air Navigation Service Providers (ANSPs) in the four Key Performance Areas (KPAs) of Safety, Environment, Capacity and Cost efficiency. Within the BP, the benefits of the capital investment programme can be extrapolated in the same four areas[81].

Table 11.2: Benefits of the Capital Expenditure Programme, BP, NERL, 26 October 2018

	Safety (RAT points reduction)	Capacity (delay reduction)	Cost Efficiency	Fuel savings (Fuel kT total)
RP2 (as per C10)[82]	134	2-3 s/flight	21% in real terms between end of RP1 and end of RP2	204kT
RP3	6-9%	6-9 s/flight	5% average DUC reduction reduction between RP2 and RP3	100 – 150kT

11.20 As seen in Table 11.2, NERL promises benefits in the four KPAs and they are reported in a similar format as that within the Condition 10 report for RP2. Within Appendix L of the BP, NERL splits the capital investment plan into five major programmes (+ oceanic) giving the high-level benefit information in the subsection of each programme area.

11.21 In addition to the above benefits, NERL included two additional benefit areas in the BP – Legislative Compliance (investments that allow NERL to meet its licence obligations, international mandates or implementing rules (IRs)) and Technical Service Risk (reduction in the net weighted value (NWV) of risk).

11.22 Table 11.3 provides an overview of the main focus areas for the programmes as detailed in the BP. During RP2 NERL proposed an approach of implementing the technical upgrade first, then enabling the airspace change. As shown in Table 11.3, the BP approach is consistent with that proposed in the Condition 10 report[83].

[81] COMMISSION IMPLEMENTING REGULATION (EU) No 390/2013, laying down a performance scheme for air navigation services and network functions

[82] RP2 Capital Investment Plan (2015-2019) for Condition 10, NATS, 31 March 2017

[83] RP2 Capital Investment Plan (2015-2019) for Condition 10, NATS, 31 March 2017, p 17

Table 11.3: Programme Focus Areas, BP, 2018

Programme	Focus	RP3 CAPEX £M
Airspace	Delivering substantial new capabilities	115
Domestic en route	Focussed on maintaining performance and operations	37
DSESAR	Focussed on maintaining performance and operations Delivering substantial new capabilities	220 80
Technical resilience	Focussed on maintaining performance and operations	144
Business resilience	Focussed on maintaining performance and operations	88
Totals	**Focussed on maintaining performance and operations** **Delivering substantial new capabilities**	**£489M** **£195M**

11.23 The above programmes are described as a balance of functional/technical upgrades (with new platforms for future viability, or smaller programmes to maintain the service levels), and significant operational concept change or new functionality (to deliver service improvements - enabled by airspace change in many instances)[84]. Within the BP, tube maps are given for the Airspace & Domestic en route RP3 deployments, DSESAR and Business resilience programmes. These tube maps demonstrate implementation dates of key projects within the sub-programmes.

Our opinion

11.24 Within the BP, there is **little information on the benefits that have already been generated** from RP2 investments. The benefits, which are aligned with the four KPAs of the performance and charging scheme, are all noted as reductions (e.g. reduction in delay, reduction in RAT points). Whilst there are additional details in the C10/SIP processes, without knowing the starting point or being able to compare with RP2 performance in the same document, it is hard to determine whether the scale of the benefit is substantial in isolation or worthy of a capital programme of this magnitude. NERL has separately provided us with additional information, for example on the evolution of C2 Delay with and without the RP3 plan. This information is valuable and we are pleased the BP is now supplemented with this data. However, we would have liked to see the cost-benefit analysis behind the programmes.

11.25 Whilst high-level benefit information (Table 11.2) is given, **the inter-relation between benefits is unclear.** The risks to timely delivery of the RP3 benefits or the way in which the benefits matrix will evolve from early or delayed deployment of the major programmes is also not given. This is hard to deduce as the benefits are linked to the overall programme as a whole, rather than individual sub-programmes. It would be helpful to explain the benefit mechanisms that each sub-programme delivers and how these relate to the high-level benefit targets – for example what are the operational benefits of the investments that allow service quality improvements. A sub-programme level of detail for costs and benefits would provide the level of clarity needed in approving the business plan. NERL provided additional detail on the sub-programme benefits and costs but these were not all added to the Business Plan.

11.26 The tube maps provide an implementation sequence allowing **greater transparency on the dependences of projects** within the sub-programmes, although it is still difficult to evaluate

[84] Appendices, RP3 Business Plan 2020-2024, NATS (En Route) plc, 26 October 2018, p 117

the interdependences of different sub-programmes with each other. This information is also only provided for some of the programmes. A short section on Risk and dependency management is provided in the BP, but the included chart shows a single dependency and a very high level categorisation of risks which gives no indication of likelihood or severity.

11.27 Overall, **the capital portfolio is less ambitious in terms of operational benefits compared to RP2.** Whilst the "*technical upgrade"* nature of the investment implies limited operational changes in RP3, there should be significant benefits in RP4 and there is no indication of these in the BP.

11.28 During an earlier meeting, NERL stated the new implemented P3O system[85] would "provide customers and the business certainty of outcomes, prioritised portfolios, effective decision making and strategic objectives"[86]. We find it **difficult to see the how the virtues of the P3O system and benefits management approaches are reflected in the BP**. Based on the P3O approach, we expected **a more detailed explanation of the benefits for the key programmes**, including benefit mechanisms, explanations of interdependencies, detailed "material" risks etc. We note that further outcome-level detail was provided in consultation meetings, but was not included in the BP.

Airspace programme

Overview

11.29 The airspace programme is one of the more detailed programmes with outline benefits given for the programme as a whole, and the four sub-programmes. These are listed as Free Route Airspace, systemised airspace, Heathrow independent parallel approaches, and queue and capacity management - which is further divided into three main elements: airspace capacity management, queue management (focusing on arrival management and interactions with departure management), and time-based separation.

Our opinion

11.30 We find the level of detail provided under the airspace programme section more advanced in comparison to the other programmes. This make it **easier to understand the benefits each of the sub-programmes are estimated to create**. However, **the mapping of benefits from sub-programme level up to programme level is difficult to understand**.

11.31 With the airspace change benefits only expected to be delivered at the end of the reference period, there is an obvious risk of slippage into RP4. **We recommend that RP3 reporting is arranged so that so that users can monitor progress on this critical programme**.

DSESAR programme

Overview

11.32 NERL described how new technology has been identified as a strategic response to meet the needs of customers and wider airline industry stakeholders. The DSESAR programme enables the decommissioning of older technology to reach legacy escape and allows NERL to meet key

[85] Portfolio, programme and project office

[86] Helios, Steer, NERL meeting, 27.02.2018

regulatory PCP requirements[87]. From this programme, NERL anticipates up to a 4% reduction in RAT points, 8 kT of fuel savings, and £88 million of technical service risk reduction. In addition, during user consultation NERL have noted that the implicit key benefit is continued operation given the existing legacy system is becoming too old to be maintained effectively.

11.33 The DSESAR programme is born out of the European ATM Master Plan which builds a roadmap for delivering high performing aviation for Europe[88]. The Master Plan details a wide list of potential benefits arising from deployment of its solution such as ANS productivity gains, reduced delays and fuel consumption.

Our opinion

11.34 The DSESAR programme is nearly 40% of the whole capital expenditure portfolio. While some benefits have been given in association to the programme, **the expected benefits from DSESAR are lower than we expected**. For example, we would expect to see material increases in ATCO productivity which deliver benefits through capacity increases or reduced ATCO numbers, however neither possibility is presented as a benefit in the BP[89]. Additionally, OPEX predictions for RP3 show little material improvement in this[90].

11.35 The analysis of DP En Route, a sub-programme of DSESAR, stated that "DP En Route will introduce new FDP capabilities, modern controller tools and a new CWP, supporting trajectory-based operations and the development of Free Route Airspace (FRA)"[91]. FRA is to be introduced by 2022 and initial dynamic sectorisation by 2021, however there are no service benefits for domestic en route noted in the private document received from NERL until 2024. NERL has since told us that benefits will be delivered earlier, and this was to avoid overstating benefits until solutions are known. During the initial Business Plan review, we recommended that the BP should provide information on the solutions that are still to be developed and NERL's best estimate of the benefits schedule before 2024. This was not done in the revised BP and should now be addressed through the ongoing governance mechanisms (such as the SIP process).

Uncertainty

Programme maturity

11.36 To assess the feasibility of the capital investment programme suggested by NERL, we requested additional information on the maturity of the planned investments. The information provided[92], along with the programme values, are presented in Table 11.4, and is also reflected in the BP.

[87] Appendices, RP3 Business Plan 2020-2024, NATS (En Route) plc, 26 October 2018, page 117

[88] European ATM Master Plan, Eurocontrol, Edition 2015

[89] Appendices, RP3 Business Plan 2020-2024, NATS (En Route) plc, 26 October 2018, page 107

[90] See discussion of ATCO efficiency in Chapter 6 above

[91] "20180613_Consultants Portfolio Question vD FINAL.pdf "– delivered by NERL to Helios/Steer

[92] "20180613_Consultants Portfolio Question vD FINAL.pdf "– delivered by NERL to Helios/Steer

Table 11.4: Capital Programme Maturity

Programme	Maturity	RP3 capex £M	% of the capital programme
Airspace	Medium	115	16.5%
Domestic en route	High	37	5.3%
DSESAR	Varied. Previous information from NERL suggests the following: To DP Lower (2022): "High" After 2022: "Lower"	218 82 (Total programme 299)	31.2% 11.7% Total programme 42.8%
Technical resilience	High	144	20.1%
Business resilience	High	88	12.6%
Oceanic	Separate consultation	15	2.1%
Service orientation	n/a	n/a	
Operations integration	n/a	n/a	
Total		698	

11.37 The table shows that 69.2% (£487 million) of the investment is considered to be at "high" maturity, whereas 28.2% (£197 million) is considered at "medium/lower" maturity (the remaining oceanic programme is yet to be determined). It is unclear how the maturity is determined, but it is our understanding that the maturity is factored into the programme costs and the £34 million contingency budget[93]. Nonetheless, it is not possible to assess from the BP if the allocated capital and contingency funds will cover all the maturity-related challenges**.**

11.38 In our opinion NERL should have provided more information on elements with lower level of maturity, such as the "Lower" DSESAR sub-programme and the airspace programmes. Keeping in mind that the Airspace Programme is seen as the key benefit driver[94], NERL needs to manage the timely delivery of these programmes particularly closely, reporting risk clearly as required.

11.39 The varied programme maturity and dependencies can also have an impact on the timescales of programme delivery. As seen throughout RP2 (see Chapter 9), the timescales and milestones have shifted on multiple occasions. The new P3O process being established by NERL should reduce risks of future changes[95] but as NERL stated the P3O would only be fully mature by the start of RP3, it is too early for its benefits to be tangibly demonstrated. Consequently, we **recommend that NERL provides evidence of the benefits from the P3O process as these emerge**, so that these benefits can be recognised. NERL informed us that its customer consultation has indeed covered this, though this was not clear from the summary of outputs from the process.

[93] More information on the contingency budget is provided in the subsequent sections

[94] See section 11.28

[95] Highlighted further by the draft SIP 2019 consultation documentation, where 10 out of 16 high level milestones are shown as delayed.

Uncertainty in the CAPEX plans

Level of detail presented

11.40 Fundamentally, we believe there is a mismatch in the understanding of the purpose of the BP. In discussions on the content of the BP with the consultants, NERL stated[96] that the aim of the BP was to "*set out a range of benefits we are committing to deliver and … a range of … capex*". It was our expectation, however, that the BP should report in detail on the costs and benefits at a sub-programme level.

11.41 NERL noted that "this plan is at an "outline" rather than "detailed" level as required by Condition 10 of the NERL Licence and developed looking seven years out." However, the Condition 10 of the NERL License states that:

- "By 30 June 2018, or any later date agreed with the CAA, the Licensee shall provide the CAA and publish, an outline technology programme covering the period January 2020 to December 2024."[97]; but also states that:
- "The purpose of each business plan shall be to describe in detail the Licensee's plans and expectations for each of the En route Businesses including its capital investment and operational plans, together with measures which it proposes to take to improve the efficiency and effectiveness of its operation in providing the services required by this Licence."[98]

11.42 The iBP was a draft business plan developed to be consulted with the users and as such it **should have presented the capital investment plan in detail**, not as an outline. We assess the level of transparency in the iBP regarding the capital programme was not sufficient to allow the users to engage in the consultation process in a more informed way, and this issue continues in the revised Business Plan.

11.43 NERL has stated CAP 1625 set out the CAA's guidance for the RP3 Business Plan, but did not specify the level of detail at which the plan should be prepared. Therefore, NERL stated that it exercised its judgement and provided a plan which enabled the reader to obtain a good understanding of the benefits that would be delivered in RP3 and the associated costs at a level of detail (30 pages) which was still accessible. NERL stated that this was consistent with the level of detail in the C10 report for RP2, which was approved by the CAA.

11.44 We note there is current work between the CAA and NERL to appoint an independent consultant to derive a mutually acceptable template for ongoing C10 reporting, and assess this level of detail should be consistent in future business plans where possible.

External uncertainties

11.45 Additionally, as noted in the BP, there are **external uncertainties** affecting the programmes, for example future SESAR investments are undefined, Common Project 2 plans are not mature and the Pilot Common Project is under review. Additional uncertainty will stem from the maturity observations described above.

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[96] Email clarification from NERL, 09 July 2018

[97] Condition 10 of the NERL License (consolidated June 2018 version), page 54

[98] Condition 10 of the NERL License (consolidated June 2018 version), page 54

11.46 While it is understandable that it is not possible to accurately plan capital investment with seven years lead time, we are concerned that the uncertainty may be so high that accurate forecasts of CAPEX cannot be derived at this time for all programmes – at least they are not evidenced in the BP. NERL indicates that a series of changes to the plan may be required:

- "we should anticipate a certain level of change in a portfolio defined up to seven years from delivery." [99]
- "When the programmes are launched they will do further work to plan and may not exactly match the initial plans created at this stage." [100]

11.47 We recommend any major change to the plan is fully consulted with the users and not managed only through the existing SIP process. We understand that the SIP process is going to be strengthened but we do not have sight of whether that will make it suitable for treatment of major changes. That will need to be considered by the CAA when the new process is complete.

Contingency

Capital plan contingency

11.48 As noted above[101], the BP capital expenditure programme includes £34 million for contingency purposes. This capital is intended to cover risk that may arise and new requirements that NERL may be required to address. It is our understanding that the *"new requirements"* provision only covers minor scope changes related to projects already included within the RP3 capital programme.

11.49 The basis for the contingency estimate (4.5%) is not clear given the relative uncertainties in the programme. It is a value that would be consistent with contingency expectations on a large well-defined programme but, in fact, there are areas that are not well-defined. We understand that this will be subject to further consultation in Spring 2019.

The "wider plan"

11.50 At CAA's request, NERL signposted areas where additional investment may be required[102]. The chapter lays down a series of areas in which additional capital may be needed (see Table 11.5) but is not always clear when this additional spend would be required as illustrated below.

[99] "20180613_Consultants Portfolio Question vD FINAL.pdf "– delivered by NERL to Helios/Steer

[100] "20180613_Consultants Portfolio Question vD FINAL.pdf "– delivered by NERL to Helios/Steer

[101] See section 11.80

[102] RP3 Business Plan 2020-2024, NATS (EN Route) plc, 26 October 2018, page 57

Table 11.5: Wider Plan elements

Elements of the wider plan
Airspace
Operational resilience
Drones
ADS-B and electronic conspicuity
Brexit
Cyber Security
Restructuring costs in RP3
Radio spectrum

11.51 For example, NERL state that with regards to cybersecurity[103]:

- "Our core plan will enable us to comply with known cyber security requirements and will equip us with the resources necessary to defend our safety critical service from cyber threats. We expect the CAA to publish new cyber security requirements in 2018, as outlined in CAP 1574. In CAP 1574, the CAA provided guidance detailing cyber security controls as a framework for the regulation of cyber induced risks within the aviation industry. Following that guidance, the network and information systems regulations came into force in May 2018. Our core plan contains the resources required to ensure we adhere to these regulations. If further requirements would cause us to incur materially more cost than assumed in our core plan, we propose to recover these costs via our wider plan regulatory mechanism."

11.52 While we accept that it would not be reasonable to expect NERL to cover any material changes to the investment, airspace users have no ability to judge what "*materially more*" would constitute in this case. Cybersecurity investments are already a part of a range of investments and the users would not be able to assess what is a truly new requirement and that should have been covered by the existing cost envelope. As an example, the BP states that cost over-runs in the latter years of RP2 were partly caused by additional requirements for cyber security[104]. A similar argument can be made for investments falling within the airspace, operational resilience and ADS-B and electronic conspicuity categories. **Consequently, we recommend that NERL provide more information on what is included in the Capital Investment Plan for RP3, specifically so that airspace users are aware when the "*wider plan*" elements would be required.**

11.53 Airspace users in the stakeholder consultation agreed that uncertainties are inevitable, however in the case of changes to plan being required, they would like to be given an option of either increasing the capital investment, or replacing an element of the initial plan with the newly required element. **Airspace users stressed that it will not be acceptable to increase the cost of investment every time there is an external change of requirements and that other options should be consulted on**.

[103] RP3 Business Plan 2020-2024, NATS (EN Route) plc, 26 October 2018, page 61

[104] Appendices, RP3 Business Plan 2020-2024, NATS (En Route) plc, 26 October 2018, page 69

Contingency mechanisms

11.54 As highlighted in the sections above and in the non-staff operating expenditure section, the BP includes **three "*contingency mechanisms*":**

- **The wider plan, with unknown liability, governed through a new regulatory mechanism;**
- **CAPEX contingency, £34m proposed in RP3, governed through NERL internal processes;**
- **OPEX flexibility fund, proposed as £7m per annum, governed through the SIP process.**

11.55 We **recommend that an appropriate governance structure is required for the funds to be managed**. Through this structure we expect the stakeholders to have transparency on when and how the funds are used, by:

- Providing a view on how much money should be released;
- Having a choice between releasing more money and re-allocating money within the existing capital investment plan;
- Understanding contingency across the three mechanisms.

11.56 In order to minimise the governance effort, we believe some harmonisation of treatment and management of the funds will be required. This may be done through creating a joint governance for all funds, with varied procedures depending on the value and requirement of the contingency funds. **We recommend that NERL is allowed to internally manage small overruns (below a certain threshold what would have to be agreed) of the capital programmes through the use of a dedicated fund. Larger overruns or scope changes will require a consultation process or other governance structure (e.g. similar to the FAS Facilitation Fund governance)**.

Delivery of the capital programme

Procurement processes

11.57 The optimum procurement process for the capital items cannot be determined at this stage. Some will be off-the-shelf items and others bespoke developments (inside or outside of NERL). The degree of competitive procurement that can be applied will vary. It is therefore difficult for NERL's customers to technically assess that Value for Money (VfM) will be delivered in the procurement process.

11.58 NERL has stated that it provided detailed evidence of its procurement practices at customer deep dive sessions where customers were able to explore fully its procurement policies, standards and practices and were both positive and complimentary on the way value was delivered in a restricted supply market place. NERL has achieved the CIPS Platinum accreditation for its procurement activities and has been regularly audited to ensure compliance with the professional standard.

11.59 Notwithstanding the anticipated benefits of the P3O process and also NERL's mature procurement processes, **we recommend that the CAA considers commissioning an audit at the end of RP3 to ensure that VfM was delivered in the procurement process**.

Risks of delays

11.60 The RP3 programme is ambitious and has pinch point in 2022 in which the following deliverables are planned for the DSESAR and Airspace programmes:

- D3 - Selected TC sectors to en route system
- D5 - iTEC & ExCDS PCLA

- D6 - iTEC & ExCDS TC
- D7 - Common platform: legacy escape
- A6 - Independent Parallel Approaches
- A7 - PLAS Manchester TMA
- A8 - TBS pairwise
- A9 - Free Route Airspace (completion)

11.61 In this context it should be noted that more than half of NERL's RP2 key milestones described in C10 have been missed. Draft SIP 19 (page 6) shows that 10 of the 16 milestones have been delayed in SIP 18 or 19.

11.62 The risk is that RP3 will start with slippage already incurred on RP2 tasks and then further delays could arise that will particularly risk the legacy escape plans of 2022. This would then lead to a clear risk of the subsequent larger airspace change programme slipping into RP4, with significant delay to benefit achievement for the users.

11.63 **The risk of delay needs to be carefully monitored through the existing governance processes.** There may be a benefit in de-scoping critical parts of the programme to reduce risk to the legacy escape ambition.

Reporting

11.64 In common with our reflections on the RP2 capital programme consultations (see previous section), we recommend that the way NERL reports on capital investment must be consistent and appropriate. We recommend NERL ensures consistency in reporting in terms of:

- Project names & scope.
- Level of detail being reported upon.
- Structure in reporting to ensure year-on-year monitoring is possible.
- We recommend the reporting should be by sub-programme, with additional attention paid to higher risk areas:
  - NATS has already provided us a list of projects down to ~£10M granularity so there is a good basis to work from for future governance (although focus on those areas that are delayed, etc.).
- We also expect NERL to explicitly link sub-programmes to quantifiable benefits and show interdependencies:
  - We anticipate this is an output from the new Benefit Management process, but are yet to see the benefits roadmaps and interdependencies.
- A high-level overview of the investment plan & costs/benefits for RP4 would also be welcome:
  - To demonstrate the next steps, e.g. regarding SESAR and give a whole programme view
  - To give a programmatic view of the benefits and costs, which are not neatly sub-divided into five year periods, but which should be judged over the lifetime of the programme.

Potential savings in the Business Plan capital programme

11.65 An objective of this section is to identify potential areas for cost savings in the proposed CAPEX programmes. Table 11.6 below details our opinion on efficient costs for each sub-programme in the proposed CAPEX plan and is followed by more detailed justification where relevant. The aim is to propose a reduction in some programmes, particularly those which are

lower priority or less mature. The reductions are indicative and it is not possible to test the feasibility of some of them due to the high-level information given in the NERL Business Plan.

11.66 In response, NERL has stated that reductions in capex on the scale that Steer proposes (c.19%, or £141 million) would require NERL to re-plan its entire long-term investment programme. NERL stated that this would involve giving priority to those investments which sustain systems and service performance e.g. the resilience and domestic en route programmes. Further, NERL stated that this would impact delivery of customer benefits notably from DSESAR and airspace change, including LAMP, in the planned timescales as agreed with customers. NERL stated that, in summary, such reductions in capex would delay and reduce benefits and increase the risk to meeting future service performance targets.

11.67 We assess these proposals to be feasible given the information available, and deliverable whilst maintaining the core service performance. The section below sets out our reasoning for this view, recognising that the other programmes are proposed to increase by 47% in annual spend for RP3 compared to RP2, and that the reductions proposed still represent a 14% increase in spend in the resilience and domestic en-route programmes. Furthermore, contingency funds are scoped in the business case in case of unanticipated issues.

Table 11.6: Testing potential reductions in CAPEX sub-programmes

DSESAR sub-programmes	
DP En route (£28m) - En route area control and PC Upper - Voice communications	Activities are planned for 2020, with most work done in RP2. No benefit in delaying or de-scoping.
DP Lower: iTEC and ExCDS (£92m) - Lower airspace: transition of selected lower airspace sectors to en route system - Lower airspace: transition TC and Prestwick centre lower airspace to iTEC and ExCDS	This is an enabler for airspace change, and therefore delay would risk this development. Delays would also have knock-on impacts on other programmes, such as the need to extend the lives of Node core, EFD and NAS.
RP4: iTEC and FourSight (£80m in RP3) - Terminal control and Prestwick lower iTEC and Foursight	Not required for legacy escape or for FASI-S introduction (due 2025, compared to 2027 for FourSight). A candidate for significant CAPEX reduction – see sub-section below table.
Airspace sub-programmes	
Free route airspace (£26m)	A regulatory requirement (PCP AF3), though noted as an option by NERL due to the increased risk compliance places on related programmes.
Queue and capacity management (£18m) - Airspace capacity management - Queue management - Time based separation	Most of these changes (eg TBS at Manchester and wider deployment of AMAN) meet PCP regulatory requirements.
Systemised airspace (£71m) - FASI-North and FASI-South	Driven by Heathrow Runway 3 and capacity shortage in London area. There is a broad industry acceptance that this change is essential and required as soon as possible. However, significant aspects are still being defined and subject to external risks. Experience of difficult airspace changes is that they are often delayed. Nevertheless, a reduction is not tested at this time.
- Heathrow independent parallel approach	Described in the BP as “vital to three runway operations at Heathrow” but a delay could be considered. No change is proposed at this stage.

Other programmes - domestic en route	
Operational airspace enhancements (£9m)	Small scale airspace changes. Potential savings from delaying proposed spend by one calendar year (by recognising existing delivery timescale risks and capacity). Later changes could be integrated into the wider FASI sub-programme.
Operational system enhancements (£29m)	

Other programmes – Technical Resilience	
Centres and builds sustainment (£79m) Nine sub-programmes: - Four relating to maintaining systems until they are retired or replaced in RP3 (NODE Core, EFD, NAS and simulations) - Five relating to replacements and sustainment for ongoing operations AMS UK, EAMS, cyber-security, minor sustainment, AIRAC). EAMS has "cyber vulnerabilities that may be critical"	Test a reduction of 10% based on maintaining sustainment for end-of-life systems but delaying other investment programmes.
Remote sites and CNS sustainment (£66m) Four sub-programmes: - Navigation: DVOR decommissioning - DME rationalisation - En route radar control and monitoring system updates - Surveillance. NERL notes that investment here is already "minimised" with a reduction in £20m compared to replacing all end-of-life surveillance assets (even recognising some rationalisation will be possible in RP4).	Test a reduction by suspending the DVOR decommissioning programme and slowing other sub-programmes. Assumption of one calendar year's delay to spend.
Other programmes – Business Resilience	
Facilities management (£52m)	FM costs are 136% higher than in RP2 (£22m). Test a return to RP2 spend + 20%, recognising that RP2 expenditure was "limited in RP2" according to NERL.
Information solutions (£36m)	Primarily related to ongoing replacements. Remove deployments from 2022 and delay later ones to 2024, aiming for a reduction of 20%.

RP4: iTEC and FourSight delay

11.68 This sub-programme is for the development of the FourSight for lower airspace. It has £80m CAPEX planned in RP3 (2023 and 2024). It does not impact legacy escape and is described as "lower" maturity by NERL.

11.69 NERL considered, and rejected, an option to delay TC FourSight because it would delay to late RP4 and "forecast growth in traffic in RP4 may result in unacceptable service performance".

11.70 However, we believe a delay in FourSight investment could be justified, for the following reasons:

- London airspace will change considerably, so the capacity shortfall described above cannot be predicted at present. Airspace will have been systemised with several new tools already added. The need for the tool has not been properly predicted.

- There is no explanation of how the tool will contribute to a step-change in controller productivity that is promised by SESAR.
- There requirements on this tool are not defined.
- The estimate is an envelope without specific deliverables.
- There is self-evident uncertainty around the programme, as it has already been moved in and out of RP3 investment plans over the past 2-3 years.
- We have concerns around delays to other parts of the CAPEX programme which is already very ambitious. The draft SIP 2019 shows delays to more than half of the RP2 milestones reported there, which suggests RP3 will start with slippage in some existing programmes. This additional and significant activity will add to the risk of other delays.

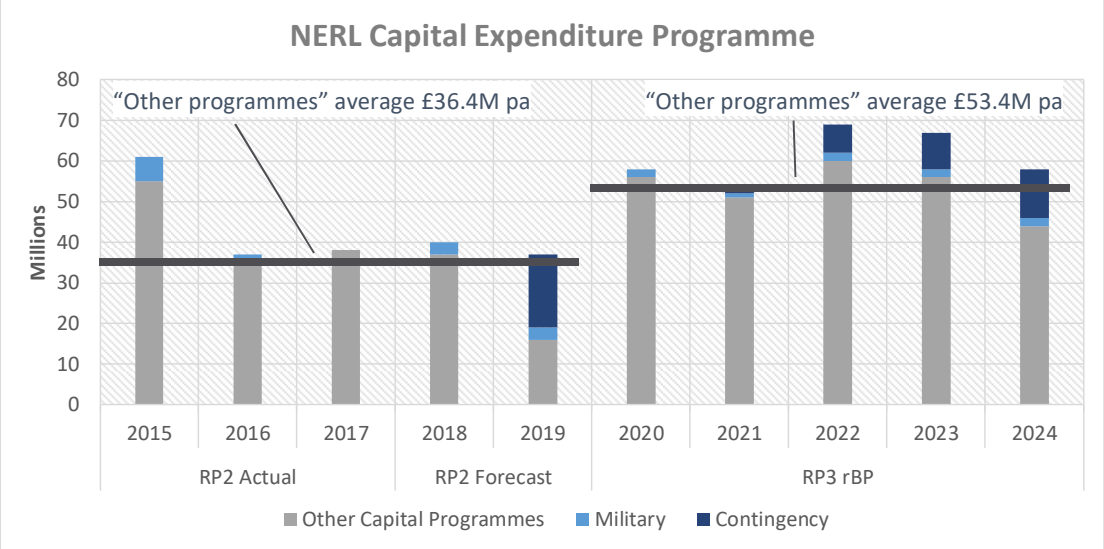
11.71 Furthermore, we believe that if conditions do emerge which encourage the earlier deployment of FourSight in lower airspace, activity could begin in the run-up to RP4 using an accelerated mechanism, similar to what has been achieved for DSESAR in RP2 and RP3.

11.72 Moving all TC FourSight spend into RP4 would reduce CAPEX for RP3 by £80m.

Other programmes reduced CAPEX scenario

11.73 The expenditure on programmes other than DSESAR and Airspace has risen significantly between RP2 and RP3. There was an average of £36.4m per annum in RP2 (actual and forecast), with a forecast spend of £53.4m per annum during RP3. This increase is largely unexplained and gives further justification for testing a reduced CAPEX scenario.

Figure 11.4: Comparison of other programme CAPEX between RP2 and RP3



11.74 The table below shows the reductions to be tested, given the reasoning above.

Table 11.7: Testing potential reductions in Other Programme CAPEX

Sub-programme	Business plan spend	Reduced scenario spend	Comments
Domestic En Route Programme			
Operational airspace enhancements	£9M	£7.2M	Delaying changes by one calendar year gives reduction of 20% CAPEX spend.

Sub-programme	Business plan spend	Reduced scenario spend	Comments
Operational system enhancements	£29M	£23.2M	
Technical Resilience Programme			
Centres and Builds Sustainment	£79M	£71.1M	Reduction of 10%
Remote Sites and CNS Sustainment	£66M	£52.8M	Reduction of 20% through slowing (suspending) the DVOR decommissioning programme
Business Resilience Programme			
Facilities Management	£52M	£26.4M	Returning to RP2 spend + 20%
Information Solutions	£36M	£28.8M	Reduction of 20%
TOTAL	**£271M**	**£210M**	

Summary of feasible CAPEX reduction scenario

11.75 In summary, the following scenario could be tested (excluding oceanic).

Table 11.8: A CAPEX reduction scenario

	Business plan	CAPEX reduction scenario
Airspace programme	£115M	£115M
DSESAR	£300M	£220M
Non-core programmes	£271M	£210M
Military	£8M	£8M
Contingency	£34M	£34M
Acceleration to RP2	£23M	£23M
TOTAL (excl oceanic)	**£751M**	**£610M**

11.76 We have proposed reductions for each programme, but the reductions could be considered in the round with some programmes taking more and others less.

11.77 Note that a CAPEX reduction could have knock-on benefits for overall service delivery:

- Resources would be released from programme delivery to improve service or de-risk other programmes;
- Overall portfolio management could potentially be simplified;
- Asset management costs could potentially be simplified.

Summary and conclusions

11.78 Our conclusions concerning the capital programme for RP3 in the BP are as follows:

- NERL has presented a capex plan which continues the core system replacement presented to the CAA and users in the C10 / SIP process. The capital programme for RP3 is of a similar size to the RP2 programme, at £763 million. Features of the programme include:
  - Replacement of old systems is the central benefit driver of RP3 with airspace change only planned to deliver significant benefits in the last year of the period and beyond.
  - The new systems allow ANS to be provided for a higher level of traffic with similar performance outcomes.
  - Airspace change follows technical deployment, and therefore many of the benefits are expected in RP4 and beyond.
- NERL is committed to DSESAR and legacy escape within the range of £750 million to £830 million outturn.
- There is insufficient detail provided on the capital programme in the BP to assess, for example, the sub-programme benefits and there appear to be inconsistent views of the BP as either “cost and benefit envelopes” or a “detailed plan” as required by Condition 10.
- The plan gives a qualitative description on the proposed capex programme in RP3, but it does not allow:
  - traceability of quantitative benefits at sub-programme level;
  - testing of whether the benefits proposed are appropriate or underplayed;
  - testing that the costs proposed are efficient;
  - understanding of programmatic risks and their impact.
- There is a mix of “maintain operations” and “new capabilities” within the plan and the latter elements require more details on the resulting benefits. In particular, the benefits from future operational changes (DSESAR tools and airspace) need more information.
- 69% of the capital programme has “high maturity”, which reflects its stage in the lifecycle, but there is considerable uncertainty about the remaining investment, especially the airspace programme.
- There are three separate contingency mechanisms proposed for the operational and capital expenditure, each of which may require additional governance arrangements.
- The P3O approach should add value, but benefits of its adoption have not been demonstrated through the content of the BP. For example, we would expect more evidence of risks and benefits.
- As such, Value for Money and efficiency of the CAPEX programme is hard to test, especially DSESAR. The CAA could aim to engage with appropriate groups to understand whether the costs of new ATM systems could be benchmarked across Europe.
- An audit process to ensure that capital expenditure has delivered expected benefits should be considered.
- A reduction in the CAPEX programme could be considered. We have proposed a scenario reducing CAPEX spend from £751 million to £610 million over RP3 that we consider should be tested with NERL.
- More adaptability in the CAPEX plan could reduce risk and allow efficiency to be better tested. For example, major projects should be reviewed prior to commencement so that their cost and risk can be tested before work starts. Specific milestones and the procurement methodology could be tested at this time. This would mean the CAPEX plan could change at that point.

12 Summary of differences between NERL BP and Steer projections

12.1 This chapter sets out a summary of the differences between the NERL BP and Steer's independent projections. While we recognise that NERL has access to a unique level of knowledge and expertise on the operation and planning of its business, Steer's own projections have been undertaken, in accordance with the requirements of its client, the CAA, on an independent basis, relying as far as practical, on independent sources of information.

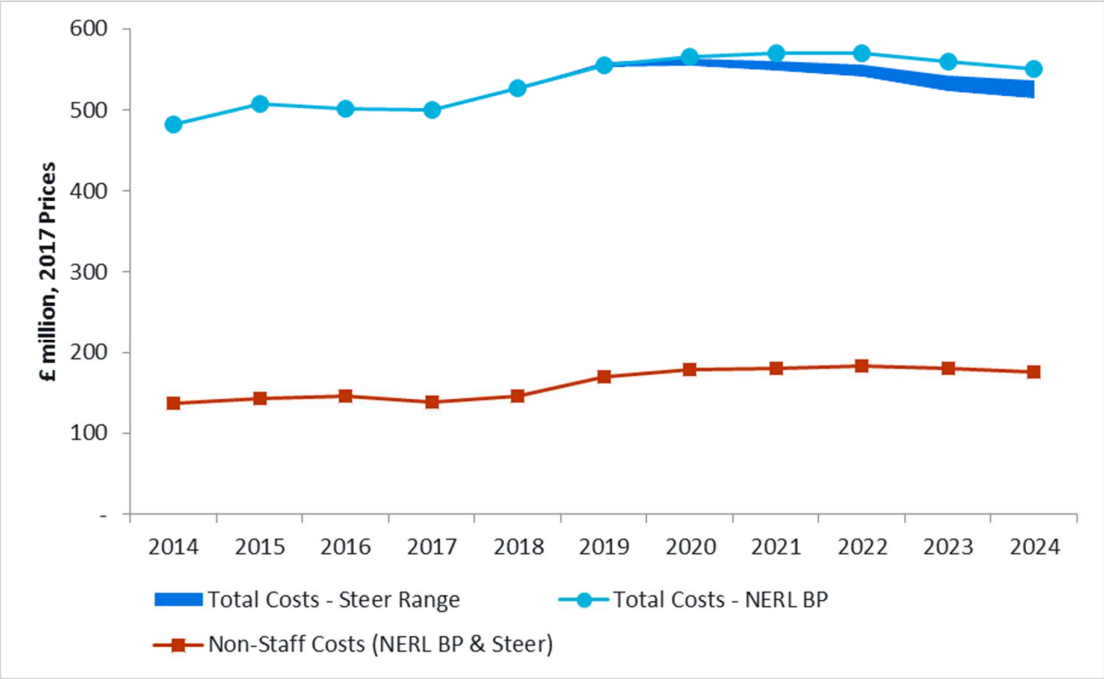
Operating costs

Total operating costs

12.2 As discussed in Chapter 6, we have identified staff salary cost differences between Steer assumptions and the NERL BP of -3.0% and -7.0% throughout RP3, equivalent to between £37 million and £86 million (2017 prices, undiscounted), which, when taking into account associated reductions in non-salary costs, is equivalent to total staff cost differences of between £57 million and £133 million. On the non-staff cost side, although we have not quantified any operating cost differences, it is possible that some cost items would reduce in combination with identified differences between the Steer Capex scenario and NERLs BP capital programme – in particular asset management costs.

12.3 The identified range of staff costs levels for Steer's range of assumptions and NERL's BP shown in Figure 6.22, against total operating costs, is shown in Figure 12.1. The BP level of non-staff costs is also shown for reference, which is unchanged within our efficient operator model.

Figure 12.1: Total operating costs: NERL BP and Steer identified range (2014-2024)



Source: NATS 23 April, 9 November & 13 November data submissions and Steer analysis
Note: Cost differences refer to total staff costs as per NATS data submissions (including pensions and redundancy and capitalised labour) and Steer projected levels.

12.4 By 2024, the identified staff cost level differences of between £15 million and £37 million (2017 prices) represent a total operating cost reduction of between -2.8% and -6.8%. Over RP3, the identified staff cost level differences of between £57 million and £133 million (2017 prices, undiscounted) represent a total operating cost reduction of between -2.0% and -4.7%.

12.5 A summary of the identified cost level differences between Steer modelled assumptions range and NERL BP in each year of RP3 is shown in Table 12.1 – cost reductions are shown as positive, costs increases as negative.

Table 12.1: Range of identified operating cost differences between NERL BP and Steer modelled range (2020-2024)

£m, 2017 prices		2020	2021	2022	2023	2024	RP3 Total
NERL	Total	**564.9**	**569.5**	**569.8**	**559.2**	**551.1**	**2,814.5**
Low range	Total	**563.6**	**559.9**	**555.9**	**542.6**	**535.9**	**2,757.9**
	Difference	1.3	9.5	13.9	16.7	15.2	56.6
	Difference %	*0.2%*	*1.7%*	*2.4%*	*3.0%*	*2.8%*	*2.0%*
High range	Total	**554.8**	**548.4**	**541.1**	**523.2**	**513.6**	**2,681.1**
	Difference	10.2	21.1	28.7	36.0	37.4	133.4
	Difference %	*1.8%*	*3.7%*	*5.0%*	*6.4%*	*6.8%*	*4.7%*

Source: NATS 23 April, 9 November & 13 November data submissions and Steer analysis

Determined Unit Cost (DUC)

12.6 To apply our identified cost level differences range to NERL's determined cost, we have calculated the determined cost, in both the Steer low and high cost level scenarios, using the regulatory building blocks approach set out on page 49 of Appendix H of NERL's BP.

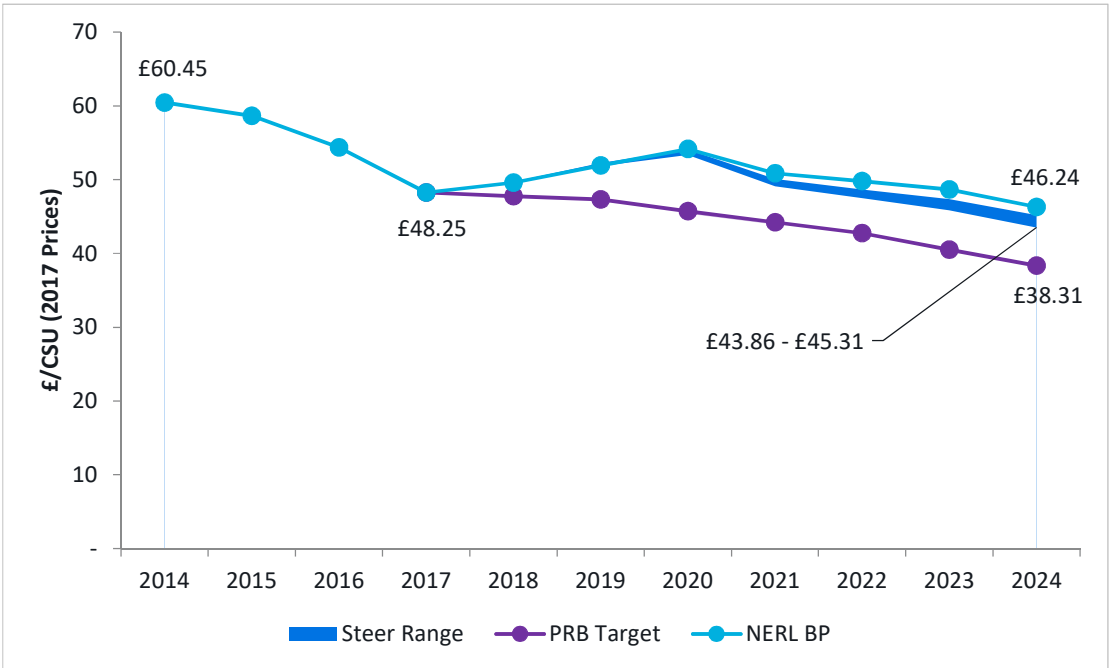
12.7 The assumptions we have made in relation to each of the building blocks used in the determined cost calculation, for each scenario, are as follows:

- **Efficient operating costs** are assumed to be equivalent to total operating costs within NERL's data submissions (to Steer) but excluding (accounting basis) pensions and capitalised labour (to which we have assumed no change).
- **Cash pension contributions** (defined benefit, defined contribution and cash alternative), as with other non-salary staff costs, are assumed to reduce proportionally with the reduction to staff salary costs.
- **Regulatory depreciation, regulatory return** and **non-regulatory income** are assumed not to change.

12.8 Using the approach described above, we have calculated NERL's determined cost for each Steer scenario. To convert NERL's determined cost to NERL en route's determined cost (to allow for comparison with PRB targets and NERL en route's DUC on page 66 of Appendix I of NERL's BP) we have applied the projected proportion of NERL en route's total determined costs with the NERL total determined costs (approx. 95.5%). We have used CSUs to generate NERL en route's DUC.

12.9 Based on the calculation steps described above, Figure 12.2 shows our range of identified cost differences applied to NERL en route's DUC compared to NERL's projections and PRB targets.

Figure 12.2: NERL en route DUC: NERL BP, PRB target and Steer identified cost levels range (2014-2024)



Source: Source: NATS 23 April & 9 November data submissions, NATS BP Appendix H & I, PRB Union-wide targets (Sept. 2018)

12.10 The cost level differences range we have identified represents between a -2.4 and -6.0% reduction to NERL en route's DUC by 2024; lower ambition than the PRB target, which represents a -17.2% difference. In our view, these levels of costs are achievable without a material impact on performance, but NERL does not agree with this.

Capital programme

12.11 As identified in section 11.66 above, a feasible scenario can be tested for a reduced cost CAPEX, taking account of:

- Benchmarking to RP2 spend
- Viability and deliverability of programme plans (particularly given current delays to key milestones evident from SIP 19)
- Uncertainty of longer term programmes, in particular TC FourSight, in terms of cost, benefit and need.

12.12 With this in mind, a reduced CAPEX scenario is proposed for testing in the table below. Although differences to regulatory depreciation are implied by differences to the level of capital expenditure, quantifying these was not within the scope of this study and, furthermore, would require the development of a regulatory model to robustly estimate.

Table 12.2: Potential capital expenditure scenario for RP3

	Business plan	CAPEX reduction scenario
Airspace programme	£115M	£115M
DSESAR	£300M	£220M
Non-core programmes	£271M	£210M
Military	£8M	£8M
Contingency	£34M	£34M
Acceleration to RP2	£23M	£23M
TOTAL (excluding Oceanic)	**£751M**	**£610M**

12.13 This scenario could also serve to de-risk aspects of the CAPEX delivery, allowing resource to be focused on core programmes and emerging milestone delivery risk. It could also potentially simplify asset management costs.

Restructuring costs

12.14 In response to the draft report NERL has identified that any reductions in staff numbers could incur restructuring costs, which, as a result of the cost level differences within Steer's efficient operator model, it estimated to be in the region on £20 million. Steer accepts that NERL would incur some restructuring costs as a result of the cost level differences, and we have therefore estimated the level of restructuring costs in the upper and lower bound scenarios based on the methodology set out below.

12.15 In order to achieve the lower level of FTEs, for each staff type, in each scenario of our efficient operator model, we have assumed restructuring costs will be incurred when:

- The 2024 level of FTEs, within our efficient operator model, is lower than the 2020 level within NERL's projections (and therefore staff level reductions may be required); and
- The 2024 level of FTEs, within our efficient operator model, is lower than the 2024 level within NERL's projections implied by no additional recruitment from 2020 and reasonable staff attrition rates.

12.16 We have assumed a staff attrition rates of -2.0% per year for each FTE type. This is based on NERL's own projections for ATCOs in RP3 (provided 13 June 2018), which assumes an average of 2.8% of staff retiring each year. This estimate is likely to be conservative as ATCOs are likely to have lower attrition rates compared to staff in lower paid or more general roles. This attrition rate implies that, in both our lower and upper bound scenarios, only ATSA and MSG FTEs are at a lower level in 2024 than NERL projections (assuming no additional recruitment from 2020).

12.17 Based on the average salary across RP3 for each staff type, [✂] , these staff level differences would incur total restructuring costs of between £4 million and £15 million in the lower and upper bound scenarios respectively.

12.18 NERL has stated that these restructuring costs relating to staff number reductions (for the upper bound scenario) are likely to be c£5 million higher than estimated by Steer, and hence up to c£20 million in total. This is because account needs to be made for the change in skill mix required by NERL in RP3 (e.g. to support airspace modernisation, drone environment, cyber security specialists). Therefore, any restructuring cost projections need to include an allowance for changing the skills mix, e.g. new headcount, as well as for reducing head count.

12.19 NERL has also commented to us that reducing the CAPEX programme could also incur restructuring costs. NERL stated that the costs associated with a £141 million reduction in CAPEX could be in the range of £20 million to £40 million. NERL stated that this range exists because 75% of Steer's proposed capex reduction occurs in the last two years of RP3, rather than being spread evenly across the period, which meant that it would not be possible to realise the reductions in capitalised labour projected by Steer evenly over the period. Therefore, NERL stated that to achieve the total reduction there would need to be a far larger reduction in staff, and a correspondingly higher restructuring programme and cost, towards the end of the period. NERL also stated that, as employees supporting the capital programme also work on other non capex activities, these labour costs could not be reduced and therefore higher operating costs would result.

12.20 Our estimate for the impact of the capex programme reductions, based on assumptions consistent with those used in relation to staff opex savings, is that it could require about £14 million in restructuring costs, assuming strategic manpower planning which reduces the capitalised labour following the delivery of the large DSESAR programme.

12.21 The restructuring costs relating to both staff number and capital programme differences would be offset against the cost differences identified above. However, how these restructuring costs are treated would need to be agreed between NERL and CAA based on the CAA's final proposals.

Appendices

A Capital Expenditure plans and consultation in RP2

Annex 1 Capacity (airspace change) plan evolution

The table below provides a brief explanation of the key elements of the original capacity plan vs the proposed capacity plan

Table A.1: Capacity (airspace change) plan evolution

Original RP2 Date	Project	Scope	Proposed Date	Proposed Project	Proposed Scope
2016	LAMP 1A	Airspace changes to support London City Airport	2016	LAMP 1A	Airspace changes to support London City Airport
	Prestwick Upper	Introduce iTEC Flight Date Processor (FDP) and new Controller Working Position (CWP) to Prestwick Upper Airspace.		Prestwick Upper	Introduce iTEC Flight Date Processor (FDP) and new Controller Working Position (CWP) to Prestwick Upper Airspace.
2017	Initial Free Route Airspace	Free Route Airspace (FRA) for Prestwick Airspace	2017	Initial Free Route Airspace	Free Route Airspace (FRA) for Prestwick Airspace
	LAMP 1B	Airspace Enablers driven by hot spots and benefits		Optimise Heathrow	Airspace Enablers driven by hot spots and benefits
2018	Transition Altitude	Raise Transition Altitude (TA) to 18000 feet using Legacy Systems.	2018	Terminal Control Electronic	Electronic interface and removal of paper strips in TC
	NTCA	Northern Terminal Control Area airspace change to support Manchester and other airports.		Optimise Airspace	Airspace Enablers driven by hot spots and benefits
2018 2019 2020	LAMP 2A	Airspace changes to support Heathrow Airport	2019	Legacy Escape	Removal of NATS Legacy FDP and controller working positions
	LAMP 2B	Airspace changes to support Luton / Stansted Airport		Swanwick Combined Operations	London AC and TC operated in combined Operations room using iTEC and CWP.
	LAMP 2C	Airspace changes to support Gatwick Airport	2020	Prestwick Combined Operations	Prestwick Upper and Lower airspace combined Operations room using iTEC and CWP.
2021	Terminal Control Upgraded	Introduce iTEC FDP and CWP to London Terminal Control	2021	Consult on Network Design	Consult on overall network design including key airports and principles of lower level airspace design.
2022	Free Route Airspace	FRA in London Area Control using Legacy systems.	2022	Free Route Airspace	FRA in London Area Control
2023	Swanwick AC Upgraded	Introduce iTEC FDP and CWP to London Terminal Control		Advanced SESAR Tools	Introduction of further advanced concepts and tools.
2022	Legacy Escape	Removal of NATS Legacy FDP and controller working positions	2023	Transition Altitude	Raise Transition Altitude (TA) to 18000 feet.
2024	Advanced SESAR Tools	Introduction of further advanced concepts and tools.		NTCA	Northern Terminal Control Area airspace change to support Manchester and other airports.

Original RP2 Date	Project	Scope		Proposed Date	Proposed Project	Proposed Scope
				2024	London Airspace Redesign	Implement Major redesign of London Airspace including airport procedures.

Annex 2 RP2 Capital Investment Plan for Condition 10

The new RP2 Programme cost (in pounds)

Table A.2: RP2 Programme Cost, RP2 Capital Investment Plan (2015-2019) for Condition 10

Programme	2015A	2016A	2017F	2018F	2019F	RP2F	SIP620
LAMP Phase 1a	5	1				6	
Prestwick Lower Airspace Systemisation	1	1	2	2		6	
Free Route Airspace				3	10	13	
Airspace Changes	2	1	4	5	9	21	
AIRAC	2	2	2	3	2	11	
Airspace	10	5	8	13	21	57	68
Platform & Deployment	3	21	32	32	12	100	62
Trajectory Services	50	51	43	39	31	214	190
Comms, Info & Surv Services	2	15	13	24	6	60	69
Critical Facilities	8	1	12	12	2	35	35
Foundation Services	5	20	25	13	9	72	83
DSESAR	68	108	125	120	60	481	439
Non-Legacy Escape (LE) Facilities/Services	22	15	21	12	13	83	
Legacy Systems	25	13	13	12	11	74	56
Facilities Management	7	5	4	4	1	21	21
CO2 and Fuel Saving					5	5	5
Oceanic^	3	4	7	4		18	6
Current Systems	57	37	45	32	30	201	88
Total NERL	135	150	178	165	111	739	595
Military*	6	1	1	2	1	11	20
Total	141	151	179	167	112	750	615
Contingency						30	5
Total including Contingency						780	620

^ Oceanic programme subject to Oceanic specific customer consultation

* Military programme subject to agreement with MoD under FMARS contract

Annex 3 RP2 Capital Investment Plan (SIP 2018)

The new RP2 Programme cost (in GBP)

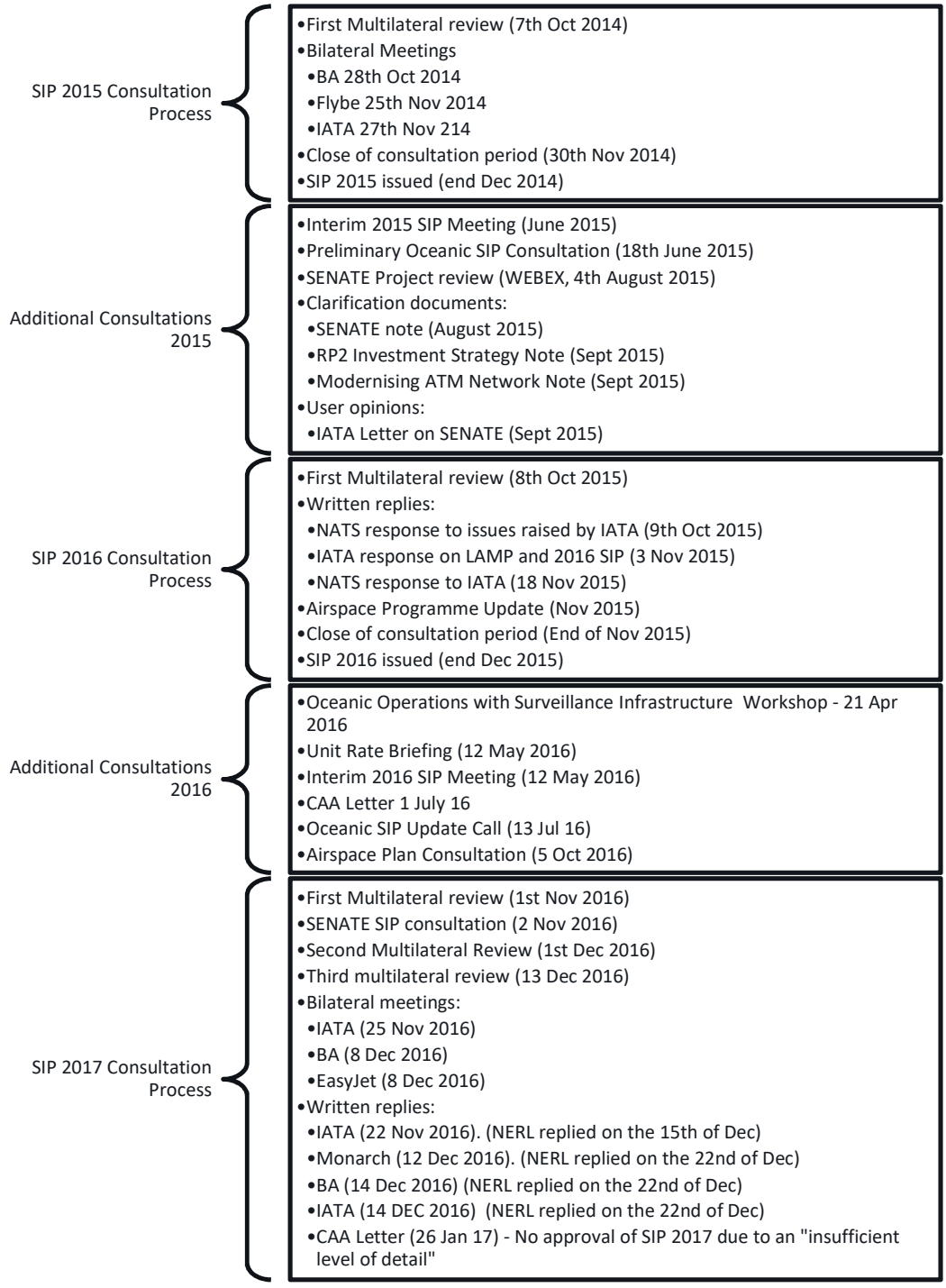
Table A.3: New RP2 Programme cost

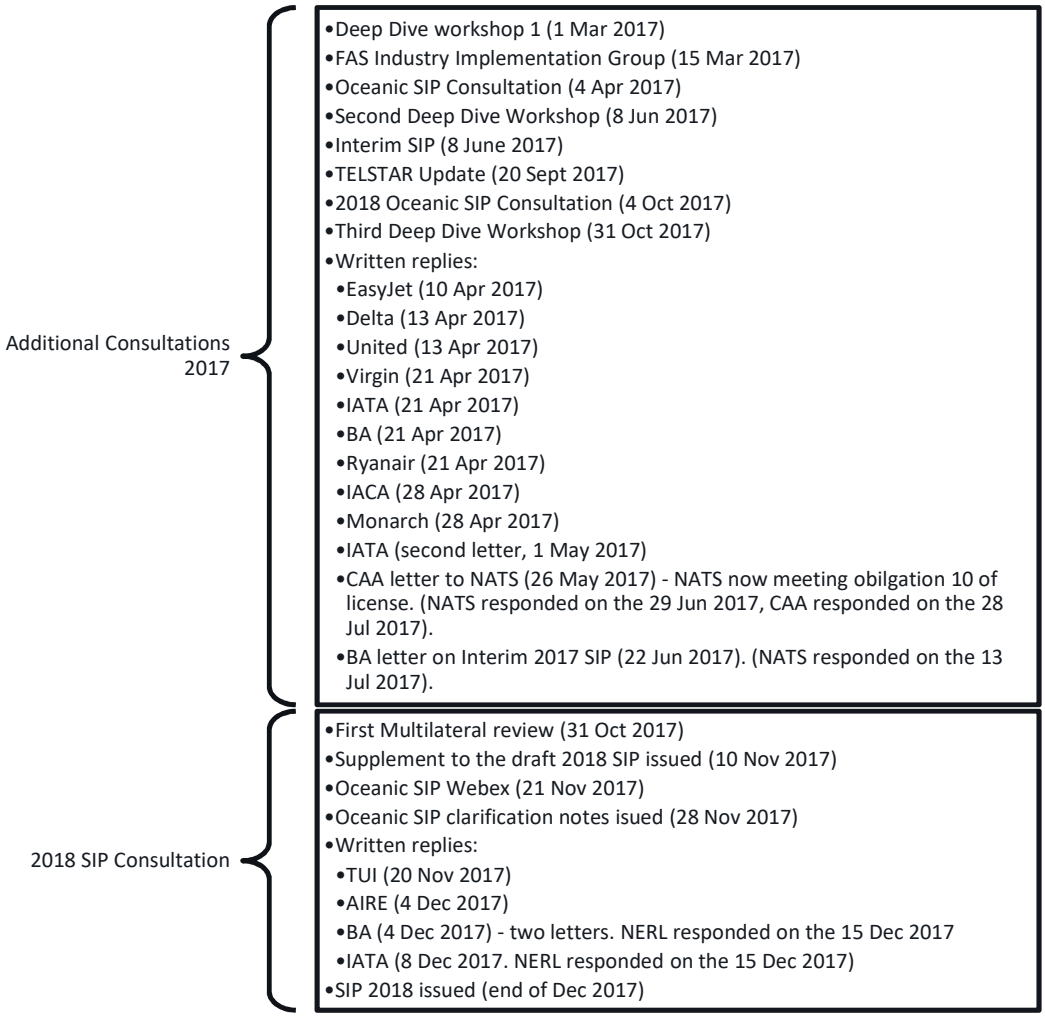
Programme	2015A	2016A	C10 2017F	SIP18 2017F	C10 2018F	SIP18 2018F	C10 2019F	SIP18 2018F	C10 RP2F	SIP18 RP2F
Airspace	10	5	8	8	13	12	21	20	57	55
Platform & Deployment	3	21	32	29	32	30	12	14	100	97
Trajectory Services	50	51	43	48	39	39	31	22	214	210
Comms, Info & Surv Services	2	15	13	16	24	21	6	4	60	58
Critical Facilities	8	1	12	12	12	15	2	4	35	40
Foundation Services	5	20	25	34	13	23	9	2	72	84
DSESAR	68	108	125	139	120	128	60	46	481	489
Non-Legacy Escape (LE) Facilities/Services	22	15	21	16	12	9	13	16	83	78
Legacy Systems	25	13	13	14	12	12	11	10	74	74
Facilities Management	7	5	4	4	4	3	1	2	21	21
CO2 and Fuel Saving							5	2	5	2
Oceanic^	3	4	7	6	4	5			18	18
Current Systems	57	37	45	40	32	29	30	30	201	193
Total NERL	135	150	178	187	165	169	111	96	739	737
Military*	6	1	1	1	2	2	1	1	11	11
Total	141	151	179	188	167	171	112	97	750	748
Contingency									30	32
Total including Contingency									780	780

No explanation is given as to the reason for the slight variances between the SIP17/C10 Plan and the SIP18 Plan.

Annex 4 Consultations undertaken by NERL for RP2

Figure A.1: Consultations undertaken by NERL for RP2




Additional Consultations 2017
•Deep Dive workshop 1 (1 Mar 2017)
•FAS Industry Implementation Group (15 Mar 2017)
•Oceanic SIP Consultation (4 Apr 2017)
•Second Deep Dive Workshop (8 Jun 2017)
•Interim SIP (8 June 2017)
•TELSTAR Update (20 Sept 2017)
•2018 Oceanic SIP Consultation (4 Oct 2017)
•Third Deep Dive Workshop (31 Oct 2017)
•Written replies:
•EasyJet (10 Apr 2017)
•Delta (13 Apr 2017)
•United (13 Apr 2017)
•Virgin (21 Apr 2017)
•IATA (21 Apr 2017)
•BA (21 Apr 2017)
•Ryanair (21 Apr 2017)
•IACA (28 Apr 2017)
•Monarch (28 Apr 2017)
•IATA (second letter, 1 May 2017)
•CAA letter to NATS (26 May 2017) - NATS now meeting obilgation 10 of license. (NATS responded on the 29 Jun 2017, CAA responded on the 28 Jul 2017).
•BA letter on Interim 2017 SIP (22 Jun 2017). (NATS responded on the 13 Jul 2017).
2018 SIP Consultation
•First Multilateral review (31 Oct 2017)
•Supplement to the draft 2018 SIP issued (10 Nov 2017)
•Oceanic SIP Webex (21 Nov 2017)
•Oceanic SIP clarification notes isued (28 Nov 2017)
•Written replies:
•TUI (20 Nov 2017)
•AIRE (4 Dec 2017)
•BA (4 Dec 2017) - two letters. NERL responded on the 15 Dec 2017
•IATA (8 Dec 2017. NERL responded on the 15 Dec 2017)
•SIP 2018 issued (end of Dec 2017)

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