



# REVIEW OF KEY CAPITAL PROGRAMMES PROPOSED BY NERL FOR THE NR23 PERIOD

**FINAL REPORT**

*26 October 2023*



## Document information

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## EXECUTIVE SUMMARY

### Context and purpose of the review

Egis was commissioned by the CAA to conduct a review of the capex programme produced by NATS (En Route) plc ("NERL") for the next regulatory period ("NR23"), with a specific focus on the DP En Route programme<sup>1</sup> and associated capex programmes such as the Common Platform.

This review is designed to provide the CAA additional context on the causes and impacts of the changes to the NR23 capex programme between the plan proposed in the NR23 Business Plan [34] and the replan presented in SIP23 [32]. This review does not cover the whole of the NR23 capex programme but focuses on the changes to the DP En Route programme and Common Platform and the impact on legacy escape.

Egis reviewed the documentation produced by NERL as part of the NR23 process, and the parallel SIP22 process [37]. After reviewing this documentation, Egis sent a series of written information requests to NERL who submitted its responses in writing. Online meetings were also conducted involving Egis, NERL and the CAA, to discuss the written answers provided by NERL and allow an opportunity for NERL to provide clarifications where appropriate. The information provided to Egis was analysed using wider industry developments and best practices as a benchmark. This analysis was summarised into a series of conclusions; from which the recommendations of this report were developed.

### Summary of conclusions

Below is a summary of the detailed conclusions contained in the main report:

- The options for replanning the DP En Route programme, which contributed to the revised plan set out in SIP23, were not fully developed, costed, or evaluated. The primary method of selection was subject matter expertise and managerial judgement. NERL only developed a business case for the selected option, and only evaluated the costs, benefits, timescales, and risks of NERL's selected option at a high-level.
- NERL could have raised its concerns over the achievability of the plan to the CAA (and potentially other stakeholders) before its business plan was published in February 2022.
- NERL's 2022 replan contained in SIP23 was based on a considered review of the programme. The logic and sequence of the replan is broadly consistent with the previous plan, which Egis believes should allow resourcing and efficiencies of sequencing (such as Prestwick FOS feeding lessons learned into Swanwick FOS) to be maintained. The decoupling of the applications from the underlying new technology programme reduces dependencies within the programme.
- Egis understands that some of the cost increases in NR23 are a consequence of slower delivery in RP3, greater plan resilience, risk reduction, security upgrades and the impact of Covid. There are several external factors which have resulted in an increase in costs for both NERL's internal resources and suppliers. NERL's explanation of these factors is properly costed and justified, but some of these factors could have been better anticipated in earlier cost forecasts.
- The replan delivers the programme over a longer timescale and condenses deployment dates towards the end of NR23. This is a consequence of updating the plan, in light of the Gate Review, to a feasible delivery schedule.
- NERL's replan prioritises sustaining current systems over legacy escape. NERL has stated that this will lead to no net change to opex in any year during NR23, with anticipated opex increases stated in iSIP 22 no longer expected due to "further work done in the period between iSIP22 and SIP23". This is in the context

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<sup>1</sup> The DP En Route programme aims to replace ageing infrastructure and provide new technology to meet the needs of customers and wider industry stakeholders. This aims to improve resilience by replacing ageing systems, improve safety by introducing new capabilities that reduce controller workload and, ultimately, enable NERL to leverage cost efficiencies.



of NERL's stated increased staffing costs affecting capex, which Egis would have expected to lead to an increase in opex.

- The replan delays elements of the Common Platform (meaning the completion of migrating all applications onto the new architecture) further into NR28. The impact of these delays on benefits has not yet been evaluated and presented to airspace users or the regulator. Egis' view is that these delays will likely have wider implications, including to benefits delivered through the AMS.
- NERL's day-to-day internal assurance processes are broadly consistent with best practice, although the same rigour does not appear to have been applied to the change management and particularly the options definition and evaluation in relation to the DP En Route programme. External assurance, beyond engagement in the regulatory process, appears to be limited to a specialist consultant that only provided verbal input during the replanning, resulting in no written evidence of external assurance. For a programme of this magnitude, best practice, such as the Government Functional Standard, would suggest more detailed and documented external assurance should be provided. It is noted that the specialist consultant has produced a written report in 2023, which indicates a recent improvement in the manner NERL receives input from external advisors.
- NERL stated that it reduced the risk and contingency budget specifically to retain the overall level of capex, and hence avoid re-opening a customer consultation, which implies the risk and contingency budget did not derive from a comprehensive assessment of risk. NERL's risk and contingency budget in the replan is substantially lower than the budget included in the NR23 Business Plan and NERL's statements indicate the budget was already low in the NR23 Business Plan. Therefore, the risk and contingency budget in the replan is not sufficient based on NERL's own benchmarks and the rate of risk materialisation at the start of NR23.

## Recommendations

Egis makes four recommendations applicable to NERL and the CAA based on the conclusions contained in the analysis and findings section:

- Rec1.** NERL should strengthen its change management procedures for capital projects and programmes. In particular, it should ensure that:
  - Options are fully developed and analysed (in terms of benefits, costs, risks, and timescales).
  - Whole life costs (i.e., including both opex and capex costs) are estimated when evaluating options.
  - Impacts on benefits are described and, if possible, quantified. The relationship between the magnitude of benefits and the timescale in which they are delivered should also be considered.
  - Key evidence, such as critical reviews, are documented.
  - NERL informs the CAA as soon as it becomes aware that a major change of plans may be required, even if the options for change have not yet been assessed.
- Rec2.** NERL should produce a comprehensive technical description of its plan for the completion of the DP En Route programme which is more detailed than that provided in the SIPs. DP En Route is a critical programme for NERL's customers and this will be used to provide greater confidence in its delivery by demonstrating there is sufficient detail in the plan. The technical plan should be reviewed by an independent party appointed by the CAA. The plan should provide a delivery timetable so that progress can be tracked against this as well as by project spend, and there should be sufficient (more granular) milestones that allow stakeholders to gain confidence in ongoing progress. This should also provide more transparency on the delivery of customer benefits and the relationship to legacy escape and opex. It should describe the technical and budgetary risks currently foreseen, and justify other budgets such as the future stream budget.
- Rec3.** The CAA should consider mechanisms for incentivising efficiency, delivery, and benefits in NERL's capex programme. The developmental nature of NERL's major technical projects mean that there is uncertainty in the programmes in later years. Therefore, the CAA should investigate mechanisms

to monitor programme delivery, so that NERL can be incentivised to avoid slippage of milestones that deliver significant customer benefits.

- Rec4.** NERL should provide a more detailed presentation of the risks to delivery, benefits, and costs. This would allow the risk and contingency budget to be estimated based on a more detailed analysis and understanding of the risks. The CAA should ensure there is a common understanding of risk and contingency budgets to be applied in future regulatory periods.

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# 1 INTRODUCTION

## 1.1 Purpose of the document

Egis has been commissioned by the CAA to conduct a review of the capex programme produced by NATS (En Route) plc (“NERL”) for the next regulatory period (“NR23”), with a specific focus on the DP En Route programme and associated capex programmes such as the Common Platform. The review considers the changes made by NERL to its capex plan between the publication of its NR23 Business Plan in February 2022 and the publication of its revised plan contained in SIP23 in December 2022. It focuses on the impact of the changes to the capex plan on the delivery of the DP En Route programme and Common Platform, and NERL’s ability to turn off legacy systems (known as “legacy escape”).

## 1.2 Scope

This review provides the CAA additional context and analysis on the causes and impacts of the changes to the NR23 capex programme between the plan proposed in the NR23 Business Plan [34] and the replan presented in SIP23 [32]. This review does not cover the whole of the NR23 capex programme but focuses on the changes to the DP En Route programme and Common Platform and the impact on legacy escape.

The CAA has defined eleven specific issues which it is seeking advice on as part of this review. These eleven issues consequently form the basis of this report. However, the section headings of this report do not directly correlate to each of these eleven issues. The table below maps the eleven issues to the sections contained within this report.

**TABLE 1: Mapping of the Invitation to Provide a Proposal (IPP) to sections in the report**

Issue to be considered	Section addressed
<p><b>(1) A comparison of the changes made by NERL to the capex plan between the February 2022 and December 2022 iterations. The comparison should cover both, what NERL is proposing to deliver (the scope of the plan), and the costs associated with the two iterations of the plan, on an annual basis. This should include a high-level comparison across the capex plan as a whole, and a more detailed comparison in relation to the DP En Route and Common Platform programmes.</b></p>	<p>Detailed changes are captured throughout the analysis, specific changes, relevant to each focal area are contained within each sub-section of the analysis and findings section of this document.</p> <p>There has not been sufficient detail to produce annualised costs analysis, but NERL’s reporting of planned spend is recorded in section 2.1.2</p>
<p><b>(2) An historical overview of NERL’s DP En Route programme, including earlier iterations under different names which were working toward similar objectives. This should highlight significant prior re-plannings of the programme, their causes, and their consequences, including in terms of costs. This work should be proportionate and, where possible, draw on and avoid repeating, previous analysis such as the CAA’s assessment of the DP En Route programme as part of the RP3 review, and the CMA’s subsequent analysis to inform the RP3 appeal decision.</b></p>	<p>Section 2.1.2 – History of DP En Route</p>
<p><b>(3) The potential consequences of changes made by NERL as part of the December 2022 revised capex plan, including the effects on the timeliness and scale of customer and consumer benefits (service quality, opex and broader benefits), and delivery of airspace modernisation. This should include reviewing the claims made by NERL in relation to the impact of the plan on service quality metrics</b></p>	<p>Section 3.6 – Consequences of changes to DP En Route including legacy escape</p>



<b>and wider benefits, and whether these claims are supported by appropriate evidence.</b>	
<b>(4) An assessment of what is driving the increase in costs for the DP En Route programme; and whether the costs proposed by NERL (on a forward-looking basis) are efficient, given what NERL is proposing to deliver.</b>	Section 3.5 – Justification for costs
<b>(5) NERL’s approach to re-planning the key technology transformation programmes over the course of 2022. This should include options considered, how these were evaluated, including whether NERL took account of whole-life costs, for example by considering the impact of delays in delivery on other types of costs, such as opex, and the quality of business cases produced by NERL to support the changes proposed.</b>  • Note, a detailed assessment of the approach to engagement with airline users is outside the scope of this study	Section 3.2 – Evaluation and costing of options for the DP En Route programme
<b>(6) Whether the revised plan proposed by NERL for NR23 (in relation to DP En Route) is a reasonable and efficient approach to delivering the objectives stated, given the prevailing technology and the other options that may be available.</b>	Section 3.3 – Planning
<b>(7) Whether the sequencing NERL has proposed is logical and will maximise benefits and minimise costs from the plan, given NERL’s operational environment</b>	Section 3.3 - Planning
<b>(8) Whether NERL is taking all reasonable steps to maximise the timeliness and scale of the consumer benefits, for example in terms of service quality and the need significant opex costs in relation to “legacy systems”.</b>	Section 3.6 – Consequences of changes to DP En Route including legacy escape
<b>(9) An assessment of the degree of certainty around delivery of NERL’s revised plan (and specifically the DP En Route programme), and whether NERL is taking all appropriate steps to manage the risk to delivery.</b>	Section 3.4 – Confidence in the replan
<b>(10) Whether NERL’s capex plan (overall not just DP En Route) has been robustly assured (e.g., has there been any independent review) and what internal governance processes NERL has gone through to produce the revised plan (and whether these processes are suitable given the scale of NERL’s plan and its potential impact on customers).</b>	Section 3.8 – Assurance process
<b>(11) Comparison with approaches taken by other ANSPs to delivery of similar programmes; and relevant lessons where this has been successful or unsuccessful, and whether NERL has considered these lessons in its plan.</b>	Section 2.1.1 – Wider context of ANSP system implementation.

### 1.3 Approach

To develop the findings included in this report, Egis reviewed the documentation produced by NERL as part of the NR23 process, and the parallel SIP22 process [37]. After reviewing this documentation, Egis sent a series of written information requests to NERL who submitted its responses in writing. Online meetings were also

conducted involving Egis, NERL and the CAA, to discuss the written answers provided by NERL and allow an opportunity for NERL to provide clarifications where appropriate. The information provided to Egis was analysed using wider industry developments and best practices as a benchmark. This analysis has been summarised into a series of conclusions; from which the recommendations of this report were developed.

Egis and the CAA were invited to NATS' Swanwick air traffic control centre, to tour the facility and hold a face-to-face meeting with NERL representatives. This meeting gave Egis the confidence that the conclusions and recommendations it has made are appropriate and allowed for a clearer understanding of the topics under discussion. However, this meeting did not feed into the report (only the written inputs) to ensure the review is fully traceable.

The annex provides a comprehensive list of all the documents used to inform this report.

## 1.4 Key terms

This report attempts to utilise terminology commonly used within the regulatory process, however there are also some terms adopted by NERL that are specific to their programmes. Key terms are highlighted in Table 2 below:

**TABLE 2: Specific terms used in this document**

<b>Term</b>	<b>Definition</b>
<b>AC FOS</b>	Entry into Full Operational Service of the final version of iTEC v2 providing new controller tools and FourSight at Swanwick Area Control and Military operations.
<b>Application</b>	A tool or element of the ATM system.
<b>Common Platform</b>	When capitalised, this typically refers to the programme of work, formally focussed upon implementation of iTEC v3 in lower airspace.
<b>Common platform</b>	When <b>not</b> capitalised, this can refer to the new technology platform architecture that will host the new systems. The platform should be common to the different centres and aims to make use of COTS hardware to reduce costs.
<b>DPER</b>	Deployment Point En Route (The DP En Route & Voice programme)
<b>legacy escape</b>	The technology transformation which allows NERL to turn off its legacy systems and transition onto new systems.
<b>LOS</b>	Entry into Limited Operational Service of the given system/location.
<b>New technology platform</b>	See common platform above.
<b>NR23</b>	The five-year regulatory period from 1 January 2023 to 31 December 2027, for which the licence conditions regarding charging, service delivery and other aspects of NERL's performance are specified by the CAA.
<b>PCUA FOS</b>	Entry into Full Operational Service of the new controller tools and FourSight capability with iTECv2 for Prestwick Upper Airspace.
<b>Replan</b>	Within this document this specially refers to the version of the DP En Route programme plan which is represented in SIP23.
<b>RP2</b>	Reference Period 2 (covering 1 Jan 2015 to 31 Dec 2019 inclusive)
<b>RP3</b>	Reference Period 3 (covering 1 Jan 2020 to 31 Dec 2022 inclusive)
<b>Transformation Review Committee (TRC)</b>	Transformation Review Committee (TRC) is a sub-committee of the NATS Board chaired by a non-executive director. It supports the Board in monitoring the planning and delivery of business transformation with NATS <sup>2</sup> .
<b>Whole life costs</b>	The total cost of a programme over its entire life from purchase to disposal, including both capex and opex elements.

<sup>2</sup> In the minutes provided the Chief Executive of NATS, Chief Financial Officer and other senior NATS personnel were in attendance, and "approved the funding" for aspects of the workstreams for DP En Route [40].

**2+5 approach**

NERL's approach to planning which involves a higher level of clarity and confidence in delivery in the near term (the next 2 years) and acknowledges that there is greater uncertainty in later years (the following 5 years)

## 1.5 Structure of the document

- Section 1 provides an introduction, explains the approach and structure of the report and defines the key terms contained within it.
- Section 2 describes the background to this report. It includes a history of the DP En Route programme and gives some wider context of ANSP system implementation.
- Section 3 presents the analysis and findings of the review under a series of focus areas and presents conclusions based on these findings under each focus area. The review references the input documentation which has informed the findings.
- Section 4 provides recommendations made by Egis to the CAA and NERL based upon the conclusions contained within section 3.
- Section 5 contains an annex that collates the conclusions contained within section 3 into a summary table.
- Section 6 provides the complete list of documents referenced within this report with their respective dates.

## 2 CONTEXT

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### 2.1 Background

In recent years, several key events have taken place relating to NERL's business planning, including NERL's capex plans. The timescale of these events is presented below:

- August 2019: CAA publishes its final decision on NERL's price controls for 2020-2024 (RP3).
- November 2019: CAA refers the RP3 final decision to the CMA after NERL rejects the proposed licence modifications.
- July 2020: CMA publishes its final report, and recommends a reconciliation review for the remaining RP3 period (2020 to 2022) due to the impact of Covid.
- December 2020: CAA publishes CAP1994, a consultation on the next price control for NERL.
- March 2021: CAA publishes CAP2119, an update on overall approach, timetable, process issues, traffic risk sharing, and the reconciliation review.
- April 2021: NERL publishes SIP21 Addendum which formalised the (new) baseline plan for RP3 updated after Covid.
- June 2021: CAA publishes CAP2160, an update on the approach to NR23 and the reconciliation of NERL's revenues for 2020-2022.
- Autumn 2021: NERL consults with stakeholders on NR23 Business Plan.
- February 2022: NERL submits its NR23 Business Plan to the CAA, including a proposed capex plan.
- Summer 2022: NERL consults with stakeholders on options to progress the DP En-Route Programme.
- October 2022: CAA publishes Initial Proposals consultation for the NR23 price control.
- December 2022: NERL proposes significant changes to the NR23 capex plan.

Particularly relevant to this report, NERL published its initial capital plans for the NR23 regulatory period in February 2022 as part of its NR23 Business Plan [34]. NERL had consulted on these plans with key stakeholders during the second half of 2021. In iSIP22 [38] and during consultations, stakeholders were made aware that the plan published in February 2022 would need replanning. In December 2022, NERL recorded significant changes to its NR23 capital expenditure plans within its SIP23 [32]. This was a few days after NERL proposed these changes to the CAA in December 2022 in response to CAA Initial Proposals.

#### 2.1.1 Wider context of ANSP system implementation

The past decade has seen ANSPs forming alliances (such as iTEC) to strengthen their position through distributing risk and costs, whilst also giving greater negotiating power with large ATM system suppliers. Partnering with other ANSPs allows for the pooling of resources and knowledge, consistent sharing of information, and the harmonisation of requirements – a particularly useful approach for something as complex as an ATM system. Furthermore, joining an established alliance with a proven system in operation enables an advanced assessment of its capabilities, easier installation and integration with other systems, and a higher rate of staff acceptance.

Nevertheless, even within alliances, system upgrade and implementation delays have been prevalent. Alongside delays resulting from the impact of Covid, delays have also been caused by the uncertainty around future supplier offerings and how advanced tools would be developed to meet future regulation. This led to delays to some implementation programmes. Furthermore, the suppliers' reluctance to embrace open architecture systems, in addition to their strong position within the industry, has hindered the push towards standardisation and the implementation of new projects. Egis has noticed that this leads to a market where suppliers face fundamental differences in system requirements for different customers, leading to a lack of system consonance.

Since Covid, many suppliers have reviewed their plans and have created more robust roadmaps with their ANSP partners, looking to balance the long-term vision with shorter term changes and improvements. Covid has also impacted system delivery, with many suppliers (and ANSPs) having to pause their investment and delivery roadmaps to maintain the safety of their teams. This period of uncertainty has therefore highlighted a push towards a single open architecture<sup>3</sup>, data-driven approach, separating ATS from ATM Data Services (ADS). Consequently, the system solutions proposed by a range of suppliers ultimately build towards this, indicating the likelihood of a convergence in solutions and functionalities offered by suppliers.

NERL is part of the iTEC collaboration which brings together NATS, DFS, Enaire, Avinor, Oro Navigacija, LVNL and PANSAs and brings increased procurement power with their key supplier Indra. NERL in SIP23 [32] explain the evolution of its iTEC system implementation with the following key points:

- iTEC v1 is the current version which is under sustainment.
- iTEC v2 is the version which will be deployed for PCUA and Swanwick AC.
- iTEC v3, then called iTEC SkyNex “is a common, next generation, version of iTEC developed by iTEC partners”.

### 2.1.2 History of DP En Route

The DP En Route programme was formally initiated by NERL in RP2 to deliver a modernised ATM system, replacing a system which has previously been based on technology that was designed and implemented in the 1980s and 1990s. This technology needs to be replaced to ensure a reliable and resilient service, and to provide new capabilities and facilitate airspace change as required by the industry.

NERL has set out three main objectives for the NR23 period, which are:

1. Sustainment (which includes sustaining existing services; ensuring resilient air traffic management services)
2. Airspace (which includes programmes to deliver: increased network capacity, enhanced safety, improved environmental performance and reduced fuel burn for customers)
3. Deploying Single European Sky ATM Research (SESAR) (replacing ageing infrastructure; and consolidating to a single platform, with improved tools and standardising operations)

The DP En Route programme, through replacing ageing infrastructure and systems, directly contributes to the third objective. The key implementations within the DP En Route programme involve replacing primary and secondary critical voice systems within the Swanwick and Prestwick area control centres, as well as implementing the iTECv2 flight data processor in Prestwick Upper Airspace Control and Swanwick Area Control.

NERL must balance its investment priorities between the significant resources required to deploy these new systems and the ongoing operation of existing systems. In addition, NERL through the DP En Route programme is developing a modernised technical platform known as the Common Platform, which is the architecture that the new ATM systems will be implemented on to.

Despite the DP En Route programme existing since RP2, some key aspects of the DP En Route programme such as the replacement of NAS (National Airspace System) (one of NERL’s legacy systems) have existed within other technology programmes which predate the DP En Route programme. NATS decided to adopt the iTEC FDP (Flight Data Processor) in 2004 [42]. In 2010 NERL’s Long-Term Investment Plan (LTIP) included the “development and deployment of an advanced flight data processing system (iTEC) in CP3, as the platform for deployment in CP4 of a new common workstation (to achieve system consolidation) and the advanced ATC functions/tools needed to support future concepts including SESAR” [49]. At this time, NERL stated that the iTEC would replace NAS in “late CP3” (ie 2013 or 2014) [49]. In fact, NAS will not be decommissioned until at least 2028, when iTEC v3 is introduced.

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<sup>3</sup> ANSPs have pushed towards open architecture as it would benefit their procurement and interoperability needs, which is in contradiction to suppliers’ resistance to its adoption, which is perceived as a threat to their proprietary IP rights.



This highlights that the DP En Route programme is in many respects an evolution of a previous programme, with the implementation of iTEC underway prior to the DP En Route programme and incorporated into the DP En Route programme.

This section reviews the history of forecast delivery dates for the DP En Route programme from SIP17 [46] until SIP23 [32]. During this period the DP En Route programme milestones have been integrated within NERL’s future technology plan or DSESAR programme. The DP En Route programme has existed since RP2, although key components of the DP En Route programme predate RP2 under different technology programmes. Given NERL has changed the nomenclature used to describe the milestones within this programme, it has not been possible to review the delivery dates for all programme milestones back to 2017. However, for two key milestones, PCUA FOS and Swanwick AC FOS, the forecast delivery dates have been traced. A description of these milestones is contained below, with an evolution of the forecast delivery dates contained in Table 3.

- Prestwick Centre Upper Airspace Full Operational Service (PCUA FOS): This milestone transitions Prestwick Upper Area Control operations on to the iTEC v2 flight data processor on the existing operational technical platform. It will also provide an advanced controller toolset called FourSight.
- Swanwick Area Control Full Operational Service (AC FOS): This milestone transitions the Swanwick Area Control operation, and the operations of NERL’s military customer onto the iTEC v2 flight data processor on the strategic technical platform. It will also provide the FourSight toolset.

**TABLE 3: History of forecast delivery dates for PCUA FOS and AC FOS**

Delivery dates	SIP17	SIP18	SIP19	SIP20	SIP21	SIP22	NR23 BP	SIP23
<b>PCUA FOS (Prestwick)</b>	2020	2020	2020	2020	2023	2023/2024	2023/2024	2024
<b>AC FOS (Swanwick)</b>	2020	2020	2020	2021	2024	2024/2025	2024/2025	2027/2028

In its current form, the DP En Route programme was initially expected to be completed in 2021 with some key elements such as PCUA FOS and AC FOS planned to be deployed earlier. Due to the impacts of Covid, in SIP21 [42] NERL presented six options for replanning the DP En Route programme. It is evident that this replan included a delay to key programme milestones (displayed between SIP20 [43] and SIP21 [42] in Table 3). NERL’s main reason for needing to replan the DP En Route programme at this time was the impact of Covid, which caused NERL a number of delivery constraints including:

- Lack of access to operational sites other than by operational staff;
- Lack of access to Head Office facilities, in particular access and utilisation of simulators and testing facilities;
- Furlough of 450 delivery staff for 6 months;
- Reduced size DP En Route teams as over 200 contractors released;
- Repatriation of suppliers back to their home countries;
- Limitations on access to operational staff due to the need to protect the ‘operational bubble’;
- Reduction in the scale of resource available following voluntary redundancy of 220 engineers.

After consultation, NERL proceeded with the selected option which was stated as “Revised plan – LOS2/reset and check/FOS”. In SIP22 [37] NERL included some delays to key milestones compared to those indicated in SIP21 [42].

In February 2022 NERL submitted its NR23 Business Plan [34] to the CAA, which included a proposed capex plan for the NR23 period. The CAA assessed this plan as part of its review of NERL’s Business Plan, and the plan was also assessed by CAA advisors, Steer and Integra, who produced a report setting out recommendations to the CAA for setting NR23 cost allowances in relation to capex. The CAA published its Initial Proposals consultation for the NR23 price control in October 2022, which included proposals for the level of capex that should be included in NERL’s Determined Costs.

After the NR23 Business Plan was published NERL set out a revised capex plan for the NR23 regulatory period in two separate documents: NERL response to CAA consultation on NR23 Initial Proposals and NERL draft 2023 Service and Investment Plan (SIP23). The revised plan kept the total capex the same but included considerable rephasing of the DP En Route programme. NERL first engaged with stakeholders on a number of options for replanning the DP En Route programme during the June 2022 stakeholder consultation briefing and in iSIP22. NERL’s preferred option and the option selected was to prioritise the delivery of PCUA FOS. The revised capex plan was published in SIP23 in December 2022 [32]. In the revised plan NERL separated the delivery of the DP En route programme into smaller streams, with the aim of reducing the level of risk and uncertainty in planning. Each stream<sup>4</sup> is focused on delivering in the following priority order [33]:

- Stream 1 – Prestwick Full Operational Service deployed on the existing operational technical platform;
- Stream 2 – Integrated DSESAR Services;
- Stream 3 – Second Voice System (SVS) in Swanwick Area Control Temporary Operations Room.

The evolution of planned delivery dates for the key DP En Route programme milestones between the publication of the NR23 Business Plan [34] and the replan in SIP23 [32] are shown in Table 4.

**TABLE 4: Changes to DP En Route forecast dates**

	NR23 Business Plan (Feb 22) [34]	Spring 22 forecast (n iSIP22) [38]	“Route to completing DP En Route” (iSIP22) [38]	Replan (Dec 22) [32]	Latest Forecast (March 2023) [2]
<b>Prestwick MVS</b>	2024/2025	2026	Not shown	2027/2028	2027/2028
<b>Prestwick SVS</b>	2024/2025	2026	Not shown	2027/2028	2027/2028
<b>Prestwick PCUA FOS</b>	2023/2024	2025	2024	2024	2024
<b>Swanwick MVS</b>	2022	2024	2026*	2026/2027	2026/2027
<b>Swanwick SVS</b>	2022	2023	2023**	2023	2023
<b>Swanwick AC FOS</b>	2024/2025	2026	2025/2026*	2027/2028	2027/2028

\* Subject to future consultation    \*\* Also listed as Q3-22 in Key portfolio milestones for Apr-22 Quarterly SIP

The replan delayed a number of programme milestones to the end of NR23. It is understood that this is because NERL’s NR23 Business Plan [34] did not take into account the outcome of NERL’s internal Gate Review [9]. It is evident from Table 3 that, at the time of publication of SIP20, PCUA FOS was less than a year away from the planned deployment date. NERL’s replan in SIP23 meant that at the time of SIP23’s publication PCUA FOS was one to two years from deployment. Swanwick AC FOS was due to be deployed in 2021 according to the forecast in SIP20, whereas the replan in SIP23 forecasts it to be deployed in 2027/2028. These key milestones appear to have moved considerably further away from being delivered than in SIP20, despite three years elapsing during RP3 where work on the DP En Route programme has been ongoing (notwithstanding the impact of Covid). Figure 1 shows that the programme spend for the DP En Route programme has also been ongoing, with a total expenditure of £156m during this period.

Figure 1 presents the change in NERL’s capex budget for DP En Route and Common Platform between the NR23 Business Plan [34] and the replan in SIP23 [32]. The planned capex for DP En Route has increased between the NR23 Business Plan and the replan in SIP23 from £40m to £180m for NR23 period, with no change during NR28. The capex plan for the Common Platform has decreased during NR23 from £134m to £34m, however there is a large amount of planned capex in NR28 in the replan with a planned capex of £151m. NERL state that, in the NR23 Business Plan, there were no figures published for Common Platform for NR28 as, when the plan was produced, NERL’s planning systems had no estimates for the Common Platform, given that 2028 was

<sup>4</sup> At the time of the re-plan in SIP23 NERL only presented three streams. However, since iSIP23 NERL have added Stream 4 - MVS Full Operational Service, as Stream 1 neared completion.

six and a half years away at the time. As a consequence, it is not possible to estimate the change in planned capex for the Common Platform for NR28 between the NR23 Business Plan and the replan in SIP23.

**FIGURE 1: Capex Plan for DP En Route & Common Platform**

**Q1 DPER budget estimate in (a) NR23 BP, Feb 2022, (b) NERL response to CAA IPs, Dec 2022, each year for RP3, NR23 and NR28**

DPER programme all costs £m, 2020 prices, CY	RP3 total	NR23 total	NR28 total	RP3-NR28	RP3			NR23					NR28				
				total	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
NR23 BP Feb 2022	175	40	0	215	54	62	59	28	11	1	0	0	0	0	0	0	0
NERL response to IPs, Dec 2022	156	180	0	335	54	57	45	50	50	40	27	13	0	0	0	0	0
Actuals	156				54	57	45										

**Q2 Common platform budget estimate in (a) NR23 BP, Feb 2022, (b) NERL response to CAA IPs, Dec 2022, each year for RP3, NR23 and NR28**

Common platform programme all costs £m, 2020 prices, CY	RP3 total	NR23 total	NR28 total	RP3-NR28	RP3			NR23					NR28				
				total	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
NR23 BP Feb 2022	0	134	0	134	0	0	0	19	19	32	26	39	-1	-	-	-	-
NERL response to IPs, Dec 2022	0	34	100	134	0	0	0	4	4	9	9	9	30	38	55	14	14
Actuals	0				0	0	0										

## 3 ANALYSIS AND FINDINGS

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### 3.1 Overview

This section presents the findings from the review of NERL's capex plans relating to DP En Route, Common Platform and legacy escape. These findings are subdivided across a number of specific focus areas which are summarised below. The mapping of the scope of this review as defined in the IPP (Invitation to Provide a Proposal) to the sections of this report is shown in section 1.2. A series of conclusions has been provided for each of the areas reviewed (these are marked with the following notation **C X**).

- Section 3.2 - Evaluation and costing of options for the DP En Route programme
- Section 3.3 - Planning
- Section 3.4 - Confidence in the replan
- Section 3.5 - Justification for costs
- Section 3.6 - Consequences of changes to DP En Route including legacy escape
- Section 3.7 - Changes to scope and timing of milestones
- Section 3.8 - Assurance process
- Section 3.9 - Risk and contingency budget

### 3.2 Evaluation and costing of options for the DP En Route programme

#### 3.2.1 Description of focus area

An important aspect of the replan of NERL's capital plan for the NR23 regulatory period is the changes NERL made to the DP En Route programme. NERL presented six different alternatives for the replan of the DP En Route programme, with the decision taken to prioritise the delivery of Prestwick Centre Upper Airspace Full Operational Service (PCUA FOS) [38]. This section focuses on the rigour of NERL's approach to evaluating the options, exploring the level of analysis undertaken to evaluate the feasibility and cost of delivering the options it considered. NERL presented its optioneering during stakeholder consultations on 10<sup>th</sup> June and 4<sup>th</sup> July 2022. In its previous role as Independent Reviewer, Egis provided a review of NERL's options assessment from a stakeholder engagement perspective where Egis stated that "in respect of those projects of programmes which have reached a sufficient stage of maturity that it would not be appropriate for NERL to engage in further optioneering but should be focusing on delivery". The independent reviewer assessment only evaluated the details presented during the stakeholder consultations on 10<sup>th</sup> June and 4<sup>th</sup> July 2022 and was based on an assumed level of optioneering supporting the information presented to stakeholders.

This report has a different scope and evaluates the evidence supporting the optioneering in significant detail.

#### 3.2.2 Review

##### 3.2.2.1 Option definition and evaluation

As part of the SIP stakeholder meetings and iSIP22, NERL presented an evaluation of alternative options for the replan of the DP En Route programme against several criteria. However, NERL only described each of the options at a high level and the outcome of the evaluation included limited justification [38].

As part of this review, Egis requested NERL to provide the analysis supporting the evaluation of options presented in the replan, however NERL acknowledged that a detailed assessment of the different options was not produced [7]. NERL instead stated that the assessment of different options which led to the ultimate preferred option was based upon "subject matter expertise and managerial judgement" [7].

NERL developed a "Take 5" report that tasked DP En Route programme management with developing a bottom-up plan for the May 2022 board [13]. "In spring / summer 2022, ■■■ undertook a focused review of the

*DPER programme, including **the** new plan for delivery which was developed by NiSIP ....*<sup>5</sup> [7]. Based on this, it is not clear to Egis that multiple options were developed in detail before the suite of high-level options were presented to the regulator and airspace users.

This is not consistent with best practice for an options appraisal process such as that defined by the Shortlist Options Appraisal within the HM Treasury Green Book guidance which is the official UK guidance for public sector organisations<sup>6</sup> [51]. Egis believes this guidance has relevance as NATS is a public-private partnership and an operator of critical national infrastructure. A completely revised business case for the whole programme would not have been expected given the status of the programme, however Egis believes that NERL should have developed an options assessment commensurate with the significance of the change by applying best practice pragmatically. It is noted that NERL, as of 2023, is applying the Optimism Bias guidance (from the Green Book) to its assessment of the future stream planning [7].

**C 1.** The option selected by NERL was based on subject matter expertise and managerial judgement. Egis believes an options evaluation commensurate with the significance of the change, pragmatically applying best practice such as the Shortlist Options Appraisal within the HM Treasury Green Book guidance would have been appropriate.

The first written evidence of any options definition and evaluation was in the presentation for the stakeholder consultation on 10<sup>th</sup> June 2022 [26].

Before the end of June 2022, NERL conducted a Transformation Review Committee (TRC) where the funding for milestones based on a new plan elaborated for the chosen option was discussed and approved. The minutes of the TRC discuss only *"the revised plan"* and make no mention of alternative options [40]. It is acknowledged that NERL had to approve a plan at this meeting to allow spending to continue and to avoid halting the programme, therefore NERL continued to present and consult on options externally, whilst proceeding with the selected plan internally [40]. It is noted that the first milestones associated with the replan were described in iSIP22 [38] however, they were subject to further change in SIP23 [32].

**C 2.** NERL presented options to stakeholders which had only been developed at a high-level internally for consideration.

NERL states that the decision to prioritise Prestwick Upper Airspace deployment (NERL's chosen option) was made in accordance with the view taken by a *"specialist independent consultant"* [38]. The specialist independent consultant referred to is understood to be [REDACTED].

NERL recorded that *"oversight from [REDACTED] had been invaluable and they would continue to be involved throughout the process"* [40]. It is understood that this is in reference to the DP En Route business case [39].

NERL was asked to provide evidence of a written report produced by the specialist independent consultant. In its response NERL indicated that the consultant's input was provided verbally during meetings [7].

NERL stated that *"In spring / summer 2022, [REDACTED] undertook a focussed review of the DPER programme ... This review included an overall assurance of the options assessment. The outputs from this work were presented orally in meetings with NATS' Chairman, non-executive chair of the Transformation Review Committee, and the CEO*

<sup>5</sup> Bold by EGIS, note that the remainder of this sentence is assessed below

<sup>6</sup> This guidance has been referenced as, although it is applicable to public entities, it explicitly notes that it is relevant for large private entities and NERL is an operator of critical national infrastructure.



and CFO, from June to October”[7]. Given that no report was provided, the scope of the review by [REDACTED] is unclear and there is no evidence that a detailed review was undertaken or how such a review influenced the decision-making of NERL.

- C 3.** In the absence of written evidence, it cannot be verified that any external assurance was provided for the option selection. As there was no detailed option evaluation, any review by the independent consultant ([REDACTED]) would have been necessarily high level in nature and therefore would not have added significant assurance to the option selection.

### 3.2.2.2 Costing of alternative options

In response to an information request for more detail on the comparison of options, particularly in terms of the whole life costs [1], NERL indicated that, other than the June 2022 DP En Route TRC Business Case [39], there is “no additional internal business case which would provide further evidence of costing for optioneering”.

Having reviewed the June 2022 DP En Route TRC Business Case, it is evident that a cost breakdown of each option was not produced by NERL [39]. Combined with NERL’s statement that “the options were considered at a high level only”[1], this indicates that an assessment of the whole life costs was not conducted for either the option that NERL selected (Prestwick Upper Airspace deployment first) or the alternatives.

The HM Treasury Guide To Developing The Programme Business Case, includes the assessment of the whole life costs [52]. Given the status of the DP En Route programme, a full revised business case for the whole programme would not have been expected. However, given the significance of the change, suitable guidance should have been applied pragmatically to inform the production of a detailed cost comparison of the alternative options. This would have included cost estimates by category (eg. for each team of resources) for each major milestone, with an assessment of the sensitivity of the outcomes to the uncertainty of the inputs. Cost modelling might have been focussed on a shortlist of alternatives (for example comparing a focus on Prestwick vs Swanwick).

- C 4.** NERL did not assess the whole life costs associated with implementing the alternative options for the DP En Route programme. Given the significance of the change, Egis believes NERL should have included a cost evaluation pragmatically applying best practice such as the HM Treasury Guide To Developing The Programme Business Case.

### 3.2.2.3 Quality of the business case underpinning the options

NERL has stated that other than the June 2022 DP En Route TRC Business Case there is “no additional internal business case which would provide further evidence of costing for optioneering” [39]. This is evidenced by the TRC minutes that state the paper “set out an updated business case and proposed changes to the DPER and Voice programmes in response to Covid and its ongoing consequences and the technical lessons learnt review conducted earlier this year” [40].

As described in section 3.2.2.1, the TRC minutes only presented a business case for “the revised plan”. This implies that a business case was only produced on the option to prioritise Prestwick Upper Airspace deployment first (NERL’s chosen option), and no business case was produced for any other option.

The business case presented to the TRC separates the revised plan into its three individual streams and describes at a high-level the benefits and risks associated with the delivery of each stream. It does not compare the benefits, costs, timescales, and risks associated with alternative options and only presents these aspects of NERL’s chosen option at a very high level.

NERL presented the total costs for each stream to the TRC and how this contributes to the total capex forecast for the DP En Route programme. NERL also presented a waterfall chart that compares the March 2021 business case and the July 2022 business case, breaking down the drivers for the increase in costs [39].

As described in more detail in section 3.2.2.1, the claim in the TRC minutes that [REDACTED] offered an “invaluable” oversight cannot be verified as NERL states that this was provided verbally, so the contribution of [REDACTED] in assuring the quality of the TRC business case cannot be assessed.

The HM Treasury Guide To Developing The Programme Business Case contains a Five Case Model for the preparation of a business case, covering the strategic, economic, commercial, financial and management case for a programme [52]. This guidance generally applies to developing a business case at the start of the programme and not necessarily to replanning. However, Egis’ view is that NERL should have developed an assessment commensurate to the level of change at this stage, which could have been achieved by a pragmatic application of the HM Treasury guidance.

**C 5.** The business case produced by NERL only covered the selected option, which was to prioritise Prestwick Upper Airspace deployment first. It did not compare this option with the other options identified. The business case only evaluated the benefits, costs, timescales, and risks of NERL’s selected option at a high level.

### 3.3 Planning

#### 3.3.1 Description of the focus area

This section analyses whether the replan for the DP En Route programme, which was proposed by NERL, was reasonable and efficient, and whether the sequencing of milestones contained in the replan is logical with respect to maximising the benefits and costs.

#### 3.3.2 Review

##### 3.3.2.1 Timeliness of the communication for the need to replan

NERL stated that “*The DP En Route programme planned a Business Case in October 2021 which, following a Gate Review, resulted in the programme commencing its Take 5 review in November 2021. At this stage, despite the Gate Review outcome, there was no indication that the programme would need to conduct an extensive replan*” [2]. This appears to not take into account the outcome of the Gate Review in October 2021 [9], which identified that “*Successful delivery of the programme appears to be unachievable*”. NERL define “*programme*” in this context as (LOS1 Shadowing, LOS1 SVS 2nd Ops Trial, SVS FOS (Swanwick) and SVS FOS (Mil)).

Given the Gate Review identified low confidence in the delivery of six programme milestones with near term delivery dates, it would be expected for NERL to have had an understanding in October 2021 that a replan would be required given that the successful delivery of the DP En Route programme appeared unachievable. The outcome of the gate review and the fact that NERL chose to undertake a significant programme review, including with external consultants [REDACTED], suggests that it was aware of the scale of the issue.

NERL conducted the Take 5 review [13] between November 2021 and February 2022 after the October 2021 Gate Review. However, the Take 5 review was not completed until after the publication of NERL’s original business plan in February 2022. NERL states that “*at the time we were required to publish our NR23 Business Plan, we did not have a clear view on the likely reconfiguration of the programme nor the scale of such change*” [2].

Based on the outcome of the Gate Review, Egis believes that NERL should have understood both prior to the Take 5 review and whilst the Take 5 review was ongoing. Whilst a redevelopment of the NR23 Business Plan

would not have been feasible, Egis believes that NERL should have raised its concerns over the achievability of the plan to the CAA (and potentially other stakeholders) before its business plan was published.

**C 6.** NERL could have raised its concerns over the achievability of the plan to the CAA (and potentially other stakeholders) before its business plan was published in February 2022.

### 3.3.2.2 Impact on delivery dates

NERL's replan has resulted in many of the forecasted key deployment dates for DP En Route being delayed. This is shown in the evolution of the DP En Route programme delivery dates since the publication of the NR23 Business Plan (see section 2.1.1). The delay in the delivery dates for Prestwick PCUA FOS from 2023/2024 in the NR23 Business Plan to 2024<sup>7</sup> in SIP23 and Swanwick AC FOS from 2024/2025 to 2027/2028 are particularly significant, and potentially delays customer benefits.

Some key deployment dates have been amalgamated in 2027 and 2028, with few milestones scheduled to be delivered in 2025 and 2026. The delay to key milestones, and the way milestones are condensed towards the end of the NR23 period, contrasts with a statement made in the TRC minutes, "*The revised plan should provide increased delivery confidence and programme resilience. The plan would also prioritise customer benefits with earlier delivery of targeted milestones and would maintain the overall goal of legacy escape*" [40].

In section 2.1.1, it is identified that in SIP20 Prestwick PCUA FOS was expected to be completed in 2020 and Swanwick AC FOS was expected to be completed in 2021. This means that Prestwick PCUA FOS has moved from being less than a year away from deployment in 2020 to around two years away from deployment when SIP23 was published. Swanwick AC FOS has similarly moved from being around one year away from deployment to four/five years away from deployment. This is despite NERL's reported spend of £156m on the DP En Route programme during RP3 as shown in Figure 1. It is noted that NERL's necessary Covid response would have been a significant factor influencing this.

**C 7.** NERL's revised plan condenses deployment dates at the end of NR23, Egis believes this increases the risk of customer benefits being delayed beyond NR23.

**C 8.** The key deployment dates for the DP En Route programme have been delayed since SIP20 when they were nearing expected completion.

### 3.3.2.3 Impact on sequence of key deployments

The replan has pushed the overall schedule of key deployments back, with delays to DP En Route and some Free Route Airspace milestones. This is explained by NERL, "*The SIP23 plan (and as articulated in the response to the CAA's initial proposals) for DP En Route is effectively the same plan as that presented in the NR23 business plan extended further into NR23*" [20]. It is noted that in the replan, the delivery of many milestones has remained in the same sequence as in the NR23 Business Plan, but the overall duration of the delivery schedule of capex deployments has been extended.

Egis believes that keeping the sequencing of deployments consistent has the potential to reduce the disruption caused by the replan by minimising the disruption to NERL's existing resource allocation and planned efficiencies (such as PCUA FOS providing lessons learned for AC FOS).

One of the contributing factors to NERL keeping the sequencing consistent in the replan is that NERL selected the option to prioritise the delivery of Prestwick PCUA FOS [32] for the DP En Route programme. It is stated by NATS' Director of Technical ATM Services that "*the reason NERL prefers to do PCUA first is to reduce the delivery*

<sup>7</sup> When viewed from a quarterly perspective this represents a delay of at least one quarter

*risk due to the higher complexity for implementing in AC” [25]. This is a logical sequencing for the programme as it allows the simpler implementation of iTEC into Prestwick to be completed first, allowing the lessons from this implementation to be carried into the potentially more complex Swanwick area control centre.*

In addition, the replan effectively makes use of parallel working on non-dependent systems within the DP En Route programme, with AC SVS FOS at Swanwick and PCUA FOS at Prestwick being deployed in 2023 and 2024 respectively.

**C 9.** NERL’s sequencing of its key deployments has stayed broadly consistent in the replan. Egis believes this approach minimises the disruption to NERL’s existing resource allocation and planned efficiencies (such as PCUA FOS providing lessons learned for AC FOS).

### 3.3.2.4 Dependencies

As set out in more detail in section 3.7, NERL has decoupled the Common Platform programme (which means implementation of the applications onto the new architecture) from the development of the architecture itself. The new technology platform uses a technical approach which adopts Commercial Off The Shelf (COTS) equipment and facilities to reduce costs. It is developed under workstream two within the replan of the DP En Route programme.

This approach has enabled NERL to reduce the dependencies between the development of the application (iTECv2) with the development of the architecture (new technology platform). Decoupling these allows for greater flexibility in resource usage, as the development of the application and architecture are no longer reliant on one another. Egis believes that this approach has the potential to reduce programme costs and to facilitate earlier adoption of specific applications onto the new technology platform.

It is understood that the new technology platform is already partially deployed to enable rapid validation and testing (see section 3.6.2.4).

**C 10.** The decoupling of the DP En Route and Voice applications from the underlying new technology platform reduces dependencies within the programme and allows for the early and incremental deployment of applications.

## 3.4 Confidence in the replan

### 3.4.1 Description of focus area

While the previous section focusses on whether the outcomes of the replan are the right ones (reasonable and efficient) this section focuses on whether the replan proposed by NERL is achievable and deliverable. This assesses the certainty of delivery, based on the evidence presented and track record, including approach to managing risk.

### 3.4.2 Review

#### 3.4.2.1 The take 5 and new approach to planning

When faced with the outcome of the Gate Review in October 2021, NERL commenced a Take 5 review which ran until March 2022.

The outcome of the Gate Review in October 2021, highlighting the risks to successful delivery, suggests that the capex plan published in the NR23 Business Plan in February 2022 would not be an accurate forecast of the programme costs for the NR23 period.

Egis believes that NERL's approach to adopt a Take 5 review at this stage was logical; it allowed for a considered review and replanning in preference to a rushed response. This approach also reduces the risk of inaccuracies further down the line, which is beneficial to stakeholders and facilitates the overall regulatory process.

**C 11.** In October 2021, when faced with the outcome of the Gate Review, NERL undertook the Take 5 review, which allowed for a considered review and replanning in preference to a rushed response.

NERL were asked to indicate the degree of certainty it has in its replan. NERL referenced its new '2+5 approach' to capex, which it states commits NERL *"to demonstrating a higher level of clarity and confidence in delivery in the near term (the next 2 years) and acknowledges that there is greater uncertainty in later years (the following 5 years)."* [2]

The move to a '2+5 approach' is logical, and adopts good business practice, reflecting the varying levels of uncertainty in the short and long term. This approach should consist of more precise and detailed plans for near-term targets and milestones, which are consistently delivered against. In contrast, more flexibility in terms of budgeting and milestones is sought for longer term activities, the dependencies and conditions for activating and refining these should be clearly documented. It is noted that NERL has been in a period of transition to this planning approach.

Although the '2+5 approach' is a logical approach to planning, it does not directly provide assurance that NERL is able to deliver against the plan that it has produced. It is expected that even before this planning approach was implemented, NERL would have had more certainty in its short-term planning compared to its long-term planning. The '2+5 approach' formalises its planning approach in a logical structure, but it is not a tool that intrinsically generates confidence that the revised plan is deliverable.

NERL noted within [2] *"the first three streams for Prestwick Upper Airspace, Integrated DSESAR Services and Second Voice System have been carefully scrutinised by the TRC, supported by external assurance. These Streams have remained on track since they were replanned and the first is delivered this summer"*. Although this is a relatively short timescale, it provides some evidence that the replan is achievable, at least within the initial two-year period.

The '+5' part of the plan acknowledges the inherent uncertainty of a medium and long term planning and recognises that not all events influencing such plans can be foreseen. This is particularly the case for research and development related work, where outcomes are necessarily unknown at the start. This part of the plan is intended to allow some flexibility and adaptability through iterative implementation and refinement.

**C 12.** NERL's decision to introduce the '2+5 approach' is a logical one. However, this approach, in and of itself, does not provide assurance that the revised plan is deliverable.

NERL's replan decouples architecture (new platform) development from that of critical applications. This approach helps to reduce dependencies, and the deployment of the new technology platform for validation and testing should enable incremental improvements to be delivered.



Furthermore, it is clear to Egis that NERL *had* to conduct a replan following the results of the Gate Review in October 2021; continuing to proceed with the existing plan (as stipulated in the NR23 Business Plan [34]) would certainly have led to failure to deliver on time, based on the information available to NERL..

**C 13.** The new programme workstream breakdown, and particularly the decoupling of architecture from applications results in reduced interdependencies between programme elements.

### 3.4.2.2 Monitoring and reporting of progress

Within the February 2022 NR23 Business Plan, NERL said of DP En Route: “*The programme is 80% complete [by cost and schedule]*”. Industry experience would suggest that at 80% completion, there should be limited uncertainty in planning. Yet, between the publication of the NR23 Business Plan in February 2022 and the latest forecast published in March 2023, there were many changes to the forecasted delivery dates for many of the milestones as shown in Table 4 in 2.1.1.

When asked to provide further clarification around the 80% programme completion estimate, it became clear that this was the percentage of expenditure spent out of the planned expenditure for the programme [7].

Whilst it is recognised that in documents such as the SIPs, NERL reports programme completion in terms of technical progress and milestones completed, reporting completion in terms of percentage of expenditure, as was included in the NR23 Business Plan, is not an appropriate way to monitor progress. This is not a typical metric for reporting progress. It is usual for project completion to be measured by a series of implementation milestones that are tied to the requirements of the new system being implemented. Spend against budget is normally reported separately and in conjunction with milestone progress to identify the extent to which the project or programme is on track to be delivered overall.

**C 14.** In the NR23 Business Plan, alongside the reporting of technical progress and milestones completed, NERL included a figure of 80% completion for the DP En Route programme. Reporting progress by cost and schedule is not a typical methodology to estimate the completion of a programme. Egis’ view is that future reporting of programme completion should be tied to technical progress.

### 3.4.2.3 Evolution of delivery dates

Table 4 in section 2.1.1 demonstrates the evolution of NERL’s forecast delivery dates for each key milestone within the DP En Route programme since the publication of NERL’s NR23 Business Plan [30]. There have been significant delays in the forecasted delivery of Prestwick MVS, Prestwick SVS, Swanwick MVS and Swanwick AC FOS between the NR23 Business Plan [34] and the most recent forecast provided by NERL [2] from March 2023.

As described in section 2.1.1 there has been a number of delays documented to the PCUA FOS and AC FOS milestones throughout the DP En Route programme. Given the significant delays to the key milestones described, it is difficult to have confidence that the delivery dates will not be further delayed into the future.

When considering the new delivery dates presented in SIP23 [32] in more detail, Egis has the following observations (these relate to deliverability of the plan – observations relating to the logic of the plan can be found in section 3.3):

- The replan proposed a set of simultaneous (or at least closely spaced) and significant deliverables around 2027, namely Prestwick MVS FOS and Prestwick SVS FOS, and AC FOS, with AC and Mil FOS completed immediately before work on PC MVS & SVS. It is noted that this is in the ‘+5’ period of the plan, and therefore likely subject to refinement. Nevertheless, this sequencing poses a potential risk due to the

relatively high resource demand on both staff and facilities, and the nature of deploying multiple interrelated systems around the same time. Furthermore, it presents an increased possibility that at least some deliveries are delayed into NR28.

- Additionally, the replan proposes that Prestwick MVS and SVS FOS are due to be deployed together (again, in practice this may be closely spaced rather than simultaneous). It may pose an unnecessary risk to deploy both the main and secondary voice switches so closely together given that there are no significant DP En Route deployments planned, for example, in 2025.

#### 3.4.2.4 Other factors

In addition to the main review above, the following factors are noted when considering the confidence in the replan:

As noted within section 3.8, NERL appears to have internal governance processes in place which are in line with industry best practice. NERL also states that *“individual projects within the streams are subjected to rigorous routine assurance which tests the underlying quality of planning, schedules and estimates of associated resources to achieve activities that contribute to the milestones set out”* [2]. This increases confidence that the replan will be delivered in practice.

One of the merits of the ‘2+5 approach’ is that more detail can be used to support short-term planning. NERL has provided evidence of some additional detailed planning in the first two years of the plan, for example NERL provided a Gantt chart for PCUA [10], which identifies deliverable milestones on a monthly basis at the project level, highlights the critical path and identifies risks. A MS Project extract [11], provides examples of resource planning at work package level, including from suppliers and captures dependencies.

### 3.5 Justification for costs

#### 3.5.1 Description of focus area

A key aspect of this review is the change in the costs for the DP En Route programme between the original NR23 Business Plan published in February 2022 and the revised plan published in December 2022. This section assesses the driving factors behind the increase in costs and whether the revised costs proposed by NERL for the programme are efficient (to the extent that this can be assessed based on the information available for this review).

#### 3.5.2 Review

##### 3.5.2.1 Drivers for the cost increase for the DP En Route programme

The drivers for the increase in costs for the DP En Route programme are stated in the TRC business case [39]. NERL describes the main drivers for the increase in costs for the DP En Route programme between the NR23 Business Plan and SIP23 [39]. These are: direct Covid impact/programme resource, supplier impacts, essential functionality, additional plan resilience, technology changes including security and other/PCUA risks.

NERL has also provided a detailed breakdown of the main cost drivers by project [19]. This gives confidence that the costs have been fully evaluated by NERL. However, some inconsistencies in the numbers provided by NERL have been noted below:

- The numbers contained in a request asking NERL to provide more detail on the cost drivers [2], do not correlate with the numbers in the original cost bridge diagram that the request for more detail was referring to [39]. Initially, NERL directed Egis to documentation that also did not correlate to the cost drivers in the request [7]. NERL later stated that this was due to some costs being recategorised after the business case was submitted to reflect appropriate accounting treatment.
- There is a lack of clarity over NERL’s original NR23 DP En Route capex budget forecast. In Appendix H of the NR23 Business Plan published in February 2022, NERL’s capex forecast is £205m for the RP3 and NR23 periods. However, in response to a CAA request for information the same forecast is stated as £215m [19].

NERL have subsequently clarified that this is because costs quoted in Appendix H of the NR23 BP are in 2020 prices whereas RFIs are in outturn prices. However, it should be noted that the way this has been presented by NERL has made it difficult to easily trace costs across different documentation.

Based upon the available evidence, the reason for the increase in NERL's costs falls broadly into two areas: the need to replan and external factors.

### **The need to replan:**

Some cost drivers NERL has described have arisen because of the need to replan the DP En Route programme. This is evident because many of the programme milestones have moved backwards by a considerable number of years, between the NR23 Business Plan and the replan as described in more detail in section 2.1.1. The need to replan the programme has been driven by less progress than originally planned during RP3, highlighted by delivery milestones moving backwards between the NR23 Business Plan and the replan. Less progress made than expected is understood to be largely a consequence of Covid and the impact it had on programme resource as well as suppliers. The justifications for the impact of Covid provided by NERL appear to be reasonable and in-line with the impact experienced across the industry [6]. The actions taken by NERL during the Covid period were consulted and agreed through the regulatory process, and naturally lead to significant consequences for the DP En Route and Voice programme.

**C 15.** Egis understands that some of the cost increases in NR23 are a consequence of slower delivery in RP3, greater plan resilience, risk reduction, security upgrades and the impact of Covid.

NERL provided a detailed description of cost increases to each of the other streams, broken down into each individual project component [19], which allows the costs on each workstream to be broadly tracked to the projects they are composed of. Conversely, the increase to the future stream budget by £31.4m, to a total of £80m, is not provided with a detailed justification.

When asked to provide further justification for the £80m total future streams allocation, NERL state *"The £80m estimate is a portfolio level assessment of initial costs to deliver MVS and AC FOS within the current delivery capacity of the portfolio. This is based on subject matter expert and managerial judgement and does not include any formal costing or assessments"* [2].

It is acknowledged that the budget allocation for future streams is subject to a great deal of uncertainty and that the costing approach for this budget has to reflect this. However, some formal costing and an approach that ties the release of the future streams budget to programme delivery is expected when there is more certainty around how the budget will be used.

**C 16.** The £80m future streams allocation has not been formerly budgeted as it is a stream subject to significant uncertainty. A formal costing approach which ties the release of the future streams budget to programme delivery is expected when there is more certainty around how the budget will be used.

### **External factors:**

Some of the cost drivers that NERL has presented are factors that are external to NERL's operation that will increase NERL's costs of delivering during NR23 compared to what it expected in the original plan.

One of these cost drivers is supplier impacts, NERL highlight that *"Supply chain challenges as a consequence of Covid-19 are widely known and reported with impacts ranging across almost every area from the availability of raw materials to computer chips."* [6].

NERL list a number of mitigation measures implemented to help reduce the impact of supply chain issues. These include purchasing refurbished equipment, working with manufacturers to utilise products that are already built and available, and working with Crown Commercial Services to improve NERL's lead times. Based on this information, it appears that NERL has taken reasonable efforts to mitigate the impacts of supply chain issues.

NERL has also highlighted programme resource as a cost driver, particularly in the specialist skills market NERL recruit in. NERL states that *"It is a matter of public record that staff shortages are an issue in the UK generally. This is particularly true in the areas NERL seeks resources"* [6]. In its response NERL provide evidence to support this. NERL also highlight that its suppliers Indra and Leidos face similar difficulties in recruiting specialist staff [6].

NERL faced a further resourcing challenge around contractors not wishing to work under IR35 terms. NERL states that *"75% of contractors required a pay increase to continue under former IR35 terms. "Whilst we subsequently released 149 contractors across Technical Services in 2020 (as part of Covid actions), we have found that to retain or to regain specialist contractors, we are required to offer a significant premium as a result of the combination of IR35 changes and scarcity of these skilled resources"* [6].

The constraints NERL faced in recruiting specialist staff and the further resourcing constraint imposed by the changes to IR35 rules are understood. However, it could be expected that factors would have been better anticipated when NERL produced and consulted on its original NR23 Business Plan published in February 2022. NERL highlighted risks relating to the resourcing of skilled staff for the DP En Route programme in SIP21 addendum published 30<sup>th</sup> April 2021 [41]. Additionally, changes to IR35 rules were expected in April 2020 and subsequently delayed until April 2021 due to Covid and the labour market.

**C 17.** There are several external factors which have resulted in an increase in costs for both NERL's internal resources and suppliers. NERL's explanation of these factors is properly costed and justified, but some of these factors could have been better anticipated in earlier cost forecasts.

### 3.5.2.2 Efficiency of NERL's costs

The drivers for the increase in costs for the DP En Route programme are stated in the TRC business case [39]. It is difficult to ascertain whether the increase in costs for each cost driver are reasonable and consequently whether the overall revised £335m capex forecast for the NR23 period is an efficient allowance given the programme NERL is aiming to deliver.

NERL indicates that the investment to date for the DP En Route programme is £670m [7]. Compared to the NR23 Business Plan, the replan has increased the forecast total spend at completion from £715m to £830m for the programme [7]. It is understood that this is for the period 2015-2028, however legacy ATM system replacement work (NAS replacement) has been underway since the early 2000s.

To gain a better understanding whether £830m of total expenditure on the DP En Route programme would be an efficient cost estimate given what the DP En Route programme is seeking to deliver, Egis has conducted a comparison with industry trends in ATM system procurement.

The current trend in ATM system procurement has seen two ends of the spectrum emerge in terms of costs: highly customised ATM systems being procured in mainland Europe and less complex, Commercial Off The Shelf (COTS) systems being procured by smaller, non-European states.

It is evident that NERL’s programme is more complex than a COTS ATM system procurement project, which has made direct comparisons with the majority of European ANSPs ineffective. However, when comparing the small number of European ANSPs with system implementations of a similar size and complexity to NERL’s, it is apparent that NERL’s costs (£830m between 2015-2028) are at the upper end – noting that NERL’s costs are over a shorter period and do not include ATM system replacement costs before 2015 (data below estimated based upon 2019 data [47]):

- DFS: Programme iCAS estimated spend is €448.3m between 2006-2027.
- DSNA: 4-FLIGHT (New ATM system integrating COFLIGHT, Java HMI and advanced ATC tools in an electronic environment) spend is €853.4m between 2003-2025. COFLIGHT (Automatic flight plan processing system forming the core of 4-FLIGHT) spend is €403.0m between 2003-2025.

**C 18.** NERL’s costs for its ATM system replacement programme appear to be at the upper end of European comparisons. However, it is difficult to directly compare NERL’s ATM system replacement with its European counterparts. Therefore, there is insufficient evidence to assess the efficiency of the DP En Route programme costs particularly in the absence of considering alternative costed options. An analysis of NERL’s spending at a project level would be required to ascertain the efficiency of NERL’s costs.

## 3.6 Consequences of changes to DP En Route including legacy escape

### 3.6.1 Description of focus area

This section investigates the consequences of changes to the DP En Route plan for the delivery of benefits to NERL’s customers. This focusses on the timescales and scale of delivery of the programme and the resultant impact on airspace modernisation. This section also considers whether the changes to customer benefits were communicated clearly to stakeholders.

This section also considers the impact of the continued delay to the legacy escape plan, particularly the legacy escape dependent on the investment through the Common Platform programme. This focus area strongly relates to the changes in scope of milestones in section 3.9, as NERL’s ability to transition away from legacy systems is dependent upon both the architecture and applications under development within the DP En Route programme.

### 3.6.2 Review

#### 3.6.2.1 Customer benefits

NERL states that *“There are very limited customer benefits that can currently be classified as having been delivered by the DP En Route programme and its streams”*[19].

NERL add that the first benefits are to be realised through completion of SVS (stream 3), inferring that no significant benefits have been achieved prior to this. This was planned to be delivered first in the NR23 Business Plan and this remained the first planned milestone to be delivered after the replan. It is therefore arguable that, in the short term, the December 2022 replan does not change the timeline for the delivery of customer benefits.

The lack of delivered customer benefits at this stage within the programme, seems to be inconsistent with NERL’s statement of using a *“benefits-led approach”* [34].

**C 19.** Up until the completion of SVS at Swanwick in 2023, NERL acknowledge that very limited customer benefits have been delivered by the DP En Route programme.



NERL has stated that “Free Route Airspace, and cross border Free Route Airspace in particular, do have a clearer dependency on deployment of DP En Route capabilities [compared to other programmes within the portfolio]” [4].

As part of its response on the impact of the replan to external benefit milestones, NERL provided an MS Excel file [5] breaking down changes to key deliveries between the forecast in the NR23 Business Plan [34] and the updated plan represented in SIP23 [28]. This excel file was subsequently updated in a later information request [23].

Out of the airspace milestone changes, 71% are attributable to factors other than changes to DP En Route [23]. NERL state this assessment was made based upon “subject-matter expertise drawn from the airspace programme and from across the portfolio team”. NERL state this assessment looked at two aspects which were whether any technical dependency existed on the DP En Route programme, or whether there was an impact due to DP En Route priorities. The outcome based on NERL’s assessment means the replan of DP En Route caused 29% of changes in milestones on the airspace programme.

The table below shows those deliveries that are noted as resulting from the DP En Route rephasing.

**TABLE 5: Delayed customer milestones**

<b>Forecast in BP</b>	<b>SIP23 Forecast</b>	<b>Milestone /Delivery</b>	<b>Description &amp; Outcomes</b>
<b>Q1 25 – Q4 26</b>	Q3 27 – Q2 28	XMAN on CSA at PWK for Manchester	Rehosting XMAN for Manchester on our Core Strategic Architecture (CSA), increasing visibility of arrival management data, enabling fuel and CO2 savings, and increasing resilience of this service.
<b>Q2 25 – Q4 26</b>	Q4 27- Q3 28	Cross Border FRA D1	Deployment of Cross Border FRA in the FRA D1 region, enabling fuel and CO2 savings.
<b>Q4 25 – Q4 26</b>	Q4 27 – Q3 28	Cross Border FRA D2 with Ireland	Deployment of Cross Border FRA with Ireland in the West Airspace Deployment region, enabling fuel and CO2 savings.
-	Q4 27 – Q3 28	Borders & Central (Borders)	Deployment of FRA in high level airspace across Borders region, increasing capacity and enabling fuel and CO2 savings.
-	2029	Borders & Central (Central)	Deployment of FRA in high level airspace across Central region, increasing capacity and enabling fuel and CO2 savings.
<b>Q2 / 2028 – Q2 / 2028</b>	2029	Cross Border FRA D2 with Brest	Deployment of Cross Border FRA with Brest in the West Airspace Deployment region, enabling fuel and CO2 savings.

From the supporting spreadsheet provided by NERL, it appears that five out of the six Free Route Airspace milestones changes have been caused by the replanning of the DP En Route programme [5]. The milestones shown above have been delayed by two to three years (as shown) and one milestone has moved from NR23 into NR28 due to the replan. The delays to milestones resulting from the rephasing listed above, delays the new milestones to the end of NR23/beginning of NR28 with the increased risk that the above milestones are no longer realised in NR23. An average delay of two years also means that two years of benefits associated with the milestones will be lost from NR28.

NERL have explained that some benefits could be enabled, although to a lower extent, on the existing platforms [4]. The material impact of this on benefits could not be assessed.

**C 20.** The delays to milestones resulting from the replan of the DP En Route programme will reduce benefits accrued by end users over NR28.

### 3.6.2.2 Communication of replan induced delays to stakeholder benefits

This section only covers the specific impacts of delays to the DP En Route programme and their impact on stakeholder benefits. The overall assessment of engagement with stakeholders is within the remit of the independent reviewer reports and is not within the scope of this study.

According to the minutes of the stakeholder consultation conducted on June 10<sup>th</sup> 2022 [25], NERL was asked about the impact of the replan on the Airspace Modernisation Strategy. NERL responded that it was looking into the impacts on the airspace modernisation programme. In the slides used for this consultation, NERL states that it was assessing the impact on cross-border Free Route Airspace D1, Cross Border Free Route Airspace D2 with Ireland and Borders and Central airspace change.

In the following consultation on 4<sup>th</sup> July 2022, the impact on airspace modernisation of changes to the DP En Route programme contained in the replan was not mentioned [27].

In the DP En Route Customer consultation on 14<sup>th</sup> September 2022 [30], NERL stated that it does “recognise the priority placed on Airspace modernisation” and that it would review CAA proposals expected in October 2022 “in conjunction with the portfolio impacts on airspace modernisation” so that NERL could “consult with customers through the SIP23 process”. However, it appears that the significance of the impacts on airspace modernisation of changes to the DP En Route replan was not highlighted during the SIP23 consultation.

There does not appear to be evidence that NERL addressed concerns raised by stakeholders on the impact of the replan on airspace modernisation, or that NERL explicitly informed stakeholders that there would be an impact.

**C 21.** The impact of the replan on airspace modernisation and the corresponding delay to dependent user benefits, was not fully communicated to stakeholders.

### 3.6.2.3 Impact of replan on legacy escape

As a consequence of the pause of NERL’s investment plan in RP3 due to Covid, NERL decided to prioritise the sustainment of current systems, in terms of “both the commitment of resources to projects in support of current operational systems but also in the use of the limited hardware available from our supply chain” [6].

It is clear that Covid has influenced delays in the delivery schedule of the DP En-Route programme, and this has necessitated the continued use of resources to sustain current systems. NERL states “Therefore legacy sustainment will be prioritised to protect safety and service which is our core accountability in providing a Critical National Infrastructure. This means that as our risks in legacy equipment evolve over time we need to make risk-based decisions to divert funding to protect these to ensure safety and service quality.”[2]

NERL states [2] “There is no change in the overall scope of the Common Platform” and confirm the main goals of the Common Platform. Whilst it states that “We will continue to explore opportunities to enhance our delivery capacity to accelerate our ability to increase the extent of scope delivered within NR23”, the current planning anticipates a further delay in NR28 and reduced scope delivered in NR23.

The impact of the replan on legacy escape is therefore a delay to the Common Platform into NR28.

The majority of opex costs (>60%), as described in the NR23 Business Plan [35] are attributed to staff costs (accounting for capitalised labour which are subtracted from opex). As recorded in section 3.2, NERL attributes a number of cost increases to NR23 capex to factors which relate to staff costs increasing<sup>8</sup>. Combining the

<sup>8</sup> E.g. “Continued impacts on working conditions including remote working, and critical staff impacts as a result of Covid cases” and “A highly competitive market for permanent and contractor specialist skills”.

delay to the Common Platform and the increased staff costs, Egis would therefore have anticipated an increase in opex costs.

Opex costs are described in [35] and the main impact of the changes are reported at a high level [20], with the following key claim made by NERL:

*"In summary, there is no net impact on opex in any year of NR23 arising from the change to the DPER delivery programme from Feb to Dec 2022 plan. iSIP22 we stated that 'the delay to achieving the transition to our new integrated DSESAR services and Swanwick Area Control is likely to result in an increase in opex costs of up to £8m in total in NR23. We will aim to mitigate these wherever possible.' Whilst there remains some risk of additional costs to support elongated dual running, further work done in the period between iSIP22 and SIP23 and reflected in our latest business plan (BP23) has maintained our engineering opex costs in line with the original NR23 plan".*

**C 22.** NERL's replan prioritises sustaining current systems over legacy escape. NERL has stated that this will lead to no net change to opex in any year during NR23, with anticipated opex increases stated in iSIP 22 no longer expected due to "further work done in the period between iSIP22 and SIP23". This is in the context of NERL's stated increased staffing costs affecting capex, which Egis would have expected to lead to an increase in opex.

#### 3.6.2.4 Implementation status of new platform to facilitate legacy escape:

NERL states [20] *"The main elements of the new platform architecture are already in use. The platform is being used by our Technical Services teams for the validation and testing of the software applications that will be deployed by the DPER programme. As such the associated licences and support costs are being expensed as opex and have been since the beginning of calendar year 2022."* Egis understands that the change in plan, to a decoupled architecture and application development as opposed to the previous approach, should result in a lower risk transition for applications thanks to increased testing opportunities and smaller, incremental application transitions. This should, theoretically, enable incremental opex savings throughout the implementation of the programme, but there does not appear to have been details to this effect from NERL.

**C 23.** NERL is already making use of the new technical platform for validation and testing and Egis understands this is likely to allow a lower risk transition from legacy systems than the previous approach. This should drive incremental opportunities for legacy escape, leading to reduction in opex. NERL has not given any detailed indication of this effect.

### 3.7 Changes to scope and timing of milestones

#### 3.7.1 Description of focus area

This section considers changes in scope of any of the milestones, in particular, the Common Platform workstream. This includes both consideration of changes in the schedule of milestones<sup>9</sup>, and scope of what is included within the milestones.

It is important to note the distinction between various terms used by NERL both internally and within the NR23 engagement process. *Common Platform* (capitalised) is typically used to refer to the programme associated with deploying iTEC v3 and associated applications. A *common platform* (not capitalised, sometimes referred to as, in part, new technology platform) is sometimes used to refer to the architecture (ie COTS Cisco hardware

<sup>9</sup> As changes, particularly delays, to a milestone can have a material impact on the benefits delivered by the programme, they can themselves be considered a change in scope in certain circumstances.

and software stack) that the future systems are intended to be migrated to. From the consultations with NERL we understand that the architecture is in place today for validation and testing exercises.

### 3.7.2 Review

#### 3.7.2.1 Overall scope (content) of milestones

NERL has consistently claimed that its overall strategy has not changed *"since we set out the strategy most clearly during 2016"*. NERL further state that the *"overall scope of DP En Route remains as submitted within the NR23 business plan"*, and *"the final delivered solution remains as previously stated"*. It notes that the *"changed timescale for DP En Route will mean that benefits have been rephased in line with the revised plan"* [4].

Apart from changes to timescales, the replan presented by NERL (as of the SIP23 [28] and the NR23 BP [30]) does appear to commit to a consistent overall scope for the programme as previously planned and communicated throughout the regulatory engagement process. Furthermore, the milestones themselves appear to contain the same deliverables, but their delivery dates have been changed (assessed below).

The replan, and specifically the delay in milestones between the NR23 Business Plan [30] and SIP23 [32] results in meaningful implications to the delivery scope of NR23. This is discussed in the next sub-section.

**C 24.** NERL has said that the overall strategy and scope of the milestones has not changed since at least 2016. NERL does appear to be targeting the same overall objective, but the replan and delay of milestones has meaningful implications on the delivery scope of NR23 compared to the NR23 Business Plan.

#### 3.7.2.2 Impact of changes to milestone dates

NERL stated that *"There is no change in the overall scope of the Common Platform"*, but also noted *"we have reduced the extent of the scope that we currently plan to deliver in NR23"* [4].

The overall milestones were consulted with customers during the June, July, and September 2022 customer consultations. However, Egis note that the following was recorded in the minutes of the September 2022 consultation, indicating that there was clearly still some industry uncertainty in the impacts at the time of consultation as a consequence of wider changes to FASl deliveries: *"[NATS] ... responded that DPER&V does not impact lower airspace but the next steps after DPER&V do impact the lower airspace"* [30].

During consultation, the AC FOS was indicated in 2026 with a note *"The programme will determine final dates for deployment subject to future consultation"*. This milestone will impact Free Route Airspace implementation, and this was not clearly indicated at the time of consultation. This has subsequently been identified as planned for implementation in Q1 2027 to Q2 2028 in SIP23 [32] and the latest forecast. While this does not infer a change in the scope of the milestone, it should be noted that the delay in and of itself can change the benefit of a deliverable (for example the environment it is introduced into may have changed) and reduce benefits in the given period (as benefits are provided for a shorter period of time).

The Common Platform delivery being post NR23 is recorded in the NR23 Business Plan [34]. The Common Platform workstream has been further delayed to later in NR28 in the replan. This is reflected by NERL's comment recorded above on the reduction in extent to be delivered in NR23. It can therefore be concluded that the Common Platform and its associated benefits will be further delayed, and Egis' view is that this is likely to have wider ramifications, including on the AMS.

**C 25.** The replan delays elements of the Common Platform (meaning the completion of migrating all applications onto the new architecture) further into NR28. The impact of these delays on benefits has not yet been evaluated and presented to airspace users or the regulator. Egis' view is that these delays will likely have wider implications, including to benefits delivered through the AMS.

NERL stated within SIP23 [28] that *"we propose to retain the overall level of capex as outlined in our business plan by reducing the risk and contingency allowance (below the 5% RP2/RP3 comparator) and by deferring planned work on the Common Platform programme."*

NERL states that PCUA FOS will be achieved in 2024 based on the existing operational platform using iTEC v2, whereas the NR23 Business Plan [34] aimed for DP En Route to be entirely deployed by 2025.

The delay expected in the Common Platform programme line appears to be detrimental to the delivery of the overall programme and its benefits. In particular, legacy escape and associated cost savings, as well as the benefits expected to development programme through increased validation capabilities would seem to be compromised. During review and discussion with NERL, it became clear that its use of the Common Platform term for multiple related concepts is confusing and results from a desire to avoid changing terms – which NERL has been criticised for in the past [50].

The Common Platform programme is not concerned with the development of the architecture itself, but the migration/transition of applications onto the new architecture. The new architecture is under development as workstream two within the DPER programme and theoretically allows applications to be migrated achieving some level of legacy escape. Nevertheless, NERL states in SIP23 [28] *"Our intent to achieve a common platform to complete legacy escape has not changed albeit it will be phased over a longer period"*.

Although there will clearly be an impact from delays to the Common Platform programme, they appear more significant than in reality, owing to the nature of the terms used to describe the workstream, with this explained in section 1.4. Whilst the completion of the Common Platform, including iTECv3, is further delayed, the common platform (or new technology platform) is still under development within NR23. A subset of the benefits from migrating legacy systems may be achieved, NERL explained the intent for Stream 2 to include the first two service transitions with its scope as a precursor to further transitions [22].

It is clear that, overall, the rephasing of the plan will reduce benefits delivered to end users in NR23 and NR28. The impact of changes to milestone timelines in terms of benefits to users, including the impact on legacy escape is discussed in section 3.6.

## **3.8 Assurance process**

### **3.8.1 Description of focus area**

This section considers the assurance process for NERL's capex plan (not just DP En Route) specifically the internal governance processes and independent assurance. Although, there is no ATS licence condition around NERL's internal governance, it is an important factor in ensuring NERL delivers against other aspects of its ATS licence.

### **3.8.2 Review**

#### **3.8.2.1 Internal governance**

NERL have highlighted a series of internal governance and assurance processes that informed the development of the NR23 Business Plan [2], including an NR23 working group which reported to the NATS Executive and Board, with the capex part of the plan *"developed through the established bodies for investment (primarily the PARB)"* [2]. Further assurance was provided by an independent challenge panel. This is consistent with best

practice such as the Government Functional Standard guidance relating to governance [53] and is aligned to the line of accountability defined in Project Delivery: Guidance The Role Of The Senior Responsible Owner [54].

NERL placed the DP En Route programme under “*Special Measures’ scrutiny and targeted assurance since the start of the Take 5 activity*” [2]. NERL does not describe what ‘Special Measures’ entails, but notes enhanced reporting to the TRC on a monthly basis.

NERL’s Take 5 report [13] notes that “*Risk based: Introduction of “Special measures” approach adopted for projects of concern (whether cost, schedule or benefits)*”, which are part of a set of recommendations to strengthen independence of assurance processes. This report concludes with a set of actions at the programme and portfolio management level which focus on replanning, with multiple lines of independent review and governance, and the appointment of various review boards and groups to apply additional governance. These measures are in accordance with best practice such as the Government Functional Standard guidance relating to governance [53].

Despite these additional governance measures, the option identification and evaluation for the replan was based on subject matter expertise and managerial judgement and not on a comprehensive evaluation.

**C 26.** NERL highlights the series of internal governance measures that normally take place before the submission of a business plan. NERL also placed the DP En Route programme under ‘special measures’ after the outcome of the Take 5 review. These internal governance processes are aligned to best practice, although this does not appear to have influenced the rigour of the identification and evaluation of options.

### 3.8.2.2 Internal documentation

It was requested that NERL provide evidence of the documentation that feeds into the high-level governance processes it describes, with specific reference to the documentation that feeds into the TRC [39].

NERL provided examples of monthly reports that feed the TRC, including the Programme Gate Review Certificate [9], a project Gantt chart and planning schedule [7]. As noted in section 3.4.2.4, NERL provided extracts of such documentation, and these contain the type of information that would be expected for the project and programme management activities within a mature ANSP.

**C 27.** Based upon the evidence provided by NERL, it appears that the day-to-day project and programme management documentation that feeds NERL’s high-level internal governance processes is broadly in line with best practice.

### 3.8.2.3 External assurance

As explained in more detail in section 3.2, NERL has claimed that external specialist consultants have been involved as part of its assurance process. NERL was asked to provide a written report produced by the specialist independent consultant, but in response NERL indicated that input was only provided verbally during meetings [7]. This is not consistent with best practice such as the Government Functional Standard guidance which states that “*where assurance includes formal review activity, the customer for the review should be clearly identified. Recommendations resulting from the reviews should be documented, agreed and acted on*” [53]. It is noted that the specialist consultant has produced a written report in 2023 [14], which indicates a recent improvement in the manner NERL receives input from external advisors.

In response to a request for details on NERL’s assurance processes [2], NERL stated “*Our processes for P30 delivery follow industry best practice (utilising Axelos Management of Portfolios (MoP), Managing Successful Programmes (MSP) and the Association of Project Management (APM) at project level). We retain APM Corporate*



*Certification (last confirmed in June 2021), and we plan to renew in June this year. We are also holders of ISO 9001 and ISO 55001 and are independently audited on a routine basis, and we achieve consistently good outcomes from those audits.*" This demonstrates that NERL's programme and project managers are undergoing training and certification appropriate to the roles they are performing, including through external review.

Within this response NERL also stated *"Externally, we consulted with customers and the CAA at a range of workshops to support the development of the plan during 2021 and there was a detailed review carried out by the CAA and its independent consultants in 2022"*. This appears to indicate that, apart from [REDACTED], NERL also used the regulatory and consultation process to provide external assurance.

**C 28.** No written evidence of external assurance processes applied to the replan of the DP En Route programme outside the regulatory consultation processes has been provided by NERL. The use of specialist external consultants has been limited to verbal reports only during the replan. For a programme of this magnitude, best practice, such as the Government Functional Standard would suggest more detailed and documented external assurance should be provided. It is noted that the specialist consultant has produced a written report in 2023, which indicates a recent improvement in the manner NERL receives input from external advisors.

## 3.9 Risk and contingency budget

### 3.9.1 Description of focus area

This section considers the rationale for the change in the risk and contingency budget from £44M to £9M between the publication of the original NR23 Business Plan in February 2022 [34] and the revised plan released in SIP23 in December 2022 [32]. The CAA proposed NERL to reduce its risk and contingency budget in its NR23 Business Plan to bring the percentage in line with the risk and contingency budget in RP2 and RP3 [31]. This would have reduced the risk and contingency budget by around £17m. In SIP23 NERL further reduced the risk and contingency allowance beyond this amount [32].

### 3.9.2 Review

#### 3.9.2.1 NERL's driver for reducing the risk and contingency budget

Within the replan, NERL substantially lowered the risk and contingency budget. NERL stated *"Given the constraints on the timeframe for the consultation of NR23, we also wished to avoid re-opening the consultation to request a further allowance for risk and contingency"* [19].

In SIP23 NERL states that *"We propose to retain the overall level of capex as outlined in our business plan (£638m in outturn prices) by reducing the risk and contingency allowance and by deferring planned work on Common Platform."*

Thus, NERL reduced the risk and contingency budget specifically to avoid significantly changing the overall capex budget and avoid the need to re-open the consultation with stakeholders, which would have resulted in a lengthier process.

NERL's rationalisation for taking this approach is based on two aspects [19]:

- NERL assumed that *"it will continue to be possible to utilise the existing regulatory and governance regime for capex. These arrangements, used effectively during previous reference regulatory periods, provide a mechanism by which capex expenditure can be increased within each regulatory period, above the forecast on which the price control was based."*

- Secondly, NERL states “we are aware of the current extent of our delivery capacity which limits our ability to invest additional funding at this stage. There is significant work underway to address our delivery capacity (engaging with Managed Service Providers for example). Once we have greater confidence in the maturity of their capability set against our needs, we will seek to engage with the CAA and customers through the mechanism above.”

Typically, a risk and contingency budget should correlate to a programme’s risk assessment.

**C 29.** NERL stated that it reduced the risk and contingency budget specifically to retain the overall level of capex, and hence avoid re-opening a customer consultation, which implies the risk and contingency budget did not derive from a comprehensive assessment of risk.

### 3.9.2.2 Suitability of the risk and contingency budget

The replan introduces a reduction in the risk and contingency budget from 7.6% of the capex envelope, to 1.5%, and NERL states that this revised risk and contingency budget aligns with previous iterations of its business plans, including those in RP2 and RP3.

In NERL’s original NR23 Business Plan published February 2022, when discussing its 7.6% risk and contingency budget NERL states that “At less than 8% this level of contingency is low compared to standard practice in industry but takes into account the mix of investment we are undertaking in sustainment (known technologies) and in modern technology where there is less certainty.” NERL states of its original 7.6% budget that “This compares with previous plans where contingency was planned at a far lower level (1.5% for the initial RP2 plan, 3.8% for the second iteration of the RP2 plan and 5% for the original RP3 plan)” [19]. The CAA, in its Provisional Decision, set an overall risk and contingency allowance of 3.8% based on its analysis and in line with the ~4% for RP2 and 5% for RP3 [31]. NERL’s reduction in risk and contingency budget in the replan to 1.5% is therefore below this.

A footnote in the original NR23 Business Plan to justify the 7.6% risk and contingency budget stated that “While there is no standardised percentage to set a level of contingency there is standardised guidance issued by HM Treasury and other studies that we have drawn upon in considering the requirement for contingency within our cost estimation” [34].

The same guidance does not appear to have been used to support the selection of the risk and contingency budget in the replan. It therefore appears that the justifications presented by NERL to support the risk and contingency budget at 7.6%, would contradict lowering the risk and contingency budget to 1.5% as was done in the replan. Furthermore, this budget appears substantially below industry practice based on NERL’s own statements.

The risk and contingency budget in the original NR23 Business Plan was £44m [34]. NERL stated in the NR23 Business Plan “there were £35m of previously identified risks”. NERL indicate that all the previously identified specific risks have materialised, with the £35m being incorporated into the replanned capex budget for the DP En Route programme in SIP23 [22].

In the NR23 Business Plan NERL stated “there were £35m of previously identified risks. Of this total, £15m has materialised from specific risks noted in our risk register”. NERL confirm that by the publication of SIP23 the entire £35m of previously identified risks had materialised [22]. Given NERL also state that it was “Not until we had concluded the ‘Take 5’ review of DP En Route in spring 2022 (but after publication of the NR23 Business Plan, 7 February 2022), was it clear there had been materialisation of risk” [19], it appears that NERL identified that the remaining £20m of specific risk materialised during the Take 5 review. NERL state the £35m of materialised previously identified risk was incorporated into the replanned capex budget for the DP En Route programme in SIP23 [22].

Given the rate of risk materialisation at the start of NR23, NERL's £9m risk and contingency budget for the NR23 period would appear to be insufficient [34], especially given the £9m risk and contingency budget is a portfolio risk allowance covering the whole capex plan and the only materialised risks have occurred in the DP En Route programme.

**C 30.** NERL's risk and contingency budget in the replan is substantially lower than the budget included in the NR23 Business Plan and NERL's statements indicate the budget was already low in the NR23 Business Plan. Therefore, the risk and contingency budget in the replan is not sufficient based on NERL's own benchmarks and the rate of risk materialisation at the start of NR23.

## 4 RECOMMENDATIONS

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This section sets out a series of recommendations from Egis' review of NERL's capex plans for the NR23 period, focusing specifically on the changes made to the DP En Route and associated capex programmes between the February 2022 NR23 Business Plan and the revised plan in December 2022. This set of actionable recommendations are presented for NERL and CAA to consider addressing concerns that this review has identified.

- Rec1.** NERL should strengthen its change management procedures for capital projects and programmes. In particular it should ensure that:
- Options are fully developed and analysed (in terms of benefits, costs, risks, and timescales).
  - Whole life costs (i.e. including both opex and capex costs) are estimated when evaluating options.
  - Impacts on benefits are described and, if possible, quantified. The relationship between the magnitude of benefits and the timescale in which they are delivered should also be considered.
  - Key evidence, such as critical reviews, are documented.
  - NERL informs the CAA as soon as it becomes aware that a major change of plan may be required, even if the options for change have not yet been assessed.
- Rec2.** NERL should produce a comprehensive technical description of its plan for the completion of the DP En Route programme which is more detailed than that provided in the SIPs. DP En Route is a critical programme for NERL's customers and this will be used to provide greater confidence in its delivery by demonstrating there is sufficient detail in the plan. The technical plan should be reviewed by an independent party appointed by the CAA. The plan should provide a delivery timetable so that progress can be tracked against this as well as by project spend, and there should be sufficient (more granular) milestones that allow stakeholders to gain confidence in ongoing progress. This should also provide more transparency on the delivery of customer benefits and the relationship to legacy escape and opex. It should describe the technical and budgetary risks currently foreseen and justify the other budgets such as the future stream budget.
- Rec3.** The CAA should consider mechanisms for incentivising efficiency, delivery, and benefits in NERL's capex programme. The developmental nature of NERL's major technical projects mean that there is uncertainty in the programmes in later years. Therefore, the CAA should investigate mechanisms to monitor programme delivery, so that NERL can be incentivised to avoid slippage of milestones that deliver significant customer benefits.
- Rec4.** NERL should provide a more detailed presentation of the risks to delivery, benefits, and costs. This would allow the risk and contingency budget to be estimated based on a more detailed analysis and understanding of the risks. The CAA should ensure there is a common understanding of risk and contingency budgets to be applied in future regulatory periods.

## 5 ANNEX 1 COLLATED CONCLUSIONS

This annex records all conclusions captured within the analysis and findings section. They are recorded here for the convenience of the reader.

**TABLE 6: Collated conclusions**

<b>ID</b>	<b>Conclusion</b>
<b>C 1</b>	The option selected by NERL was based on subject matter expertise and managerial judgement. Egis believes an options evaluation commensurate to the significance of the change, pragmatically applying best practice such as the Shortlist Options Appraisal within the HM Treasury Green Book guidance would have been appropriate.
<b>C 2</b>	NERL presented options to stakeholders which have only been developed at a high-level internally for consideration.
<b>C 3</b>	In the absence of written evidence, it cannot be verified that any external assurance was provided for the option selection. As there was no detailed option evaluation, any review by the independent consultant (■■■■) would have been necessarily high level in nature and therefore would not have added significant assurance to the option selection.
<b>C 4</b>	NERL did not assess the whole life costs associated with implementing the alternative options for the DP En Route programme. Given the significance of the change, Egis believes NERL should have included a cost evaluation pragmatically applying best practice such as the HM Treasury Guide To Developing The Programme Business Case.
<b>C 5</b>	The business case produced by NERL only covered the selected option, which was to prioritise Prestwick Upper Airspace deployment first. It did not compare this option with the other options identified. The business case only evaluated the benefits, costs, timescales, and risks of NERL's selected option at a high level.
<b>C 6</b>	NERL could have raised its concerns over the achievability of the plan to the CAA (and potentially other stakeholders) before its business plan was published in February 2022.
<b>C 7</b>	NERL's revised plan condenses deployment dates at the end of NR23, Egis believes this increases the risk of customer benefits being delayed beyond NR23.
<b>C 8</b>	The key deployment dates for the DP En Route programme have been delayed since SIP20 when they were nearing expected completion.
<b>C 9</b>	NERL's sequencing of its key deployments has stayed broadly consistent in the replan. Egis believes this approach minimises the disruption to NERL's existing resource allocation and planned efficiencies (such as PCUA FOS providing lessons learned for AC FOS).
<b>C 10</b>	The decoupling of the DP En Route and Voice applications from the underlying new technology platform reduces dependencies within the programme and allows for the early and incremental deployment of applications.
<b>C 11</b>	In October 2021, when faced with the outcome of the Gate Review, NERL undertook the Take 5 review, which allowed for a considered review and replanning in preference to a rushed response.
<b>C 12</b>	NERL's decision to introduce the '2+5 approach' is a logical one. However, this approach, in and of itself, does not provide assurance that the revised plan is deliverable.
<b>C 13</b>	The new programme workstream breakdown, and particularly the decoupling of architecture from applications results in reduced interdependencies between programme elements.
<b>C 14</b>	In the NR23 Business Plan, alongside the reporting of technical progress and milestones completed, NERL included a figure of 80% completion for the DP En Route programme Reporting progress by cost and schedule is not a typical methodology to estimate the completion of a programme. Egis' view is that future reporting of programme completion should be tied to technical progress.
<b>C 15</b>	Egis understands that some of the cost increases in NR23 are a consequence of slower delivery in RP3, greater plan resilience, risk reduction, security upgrades and the impact of Covid.
<b>C 16</b>	The £80m future streams allocation has not been formerly budgeted as it is a stream subject to significant uncertainty. A formal costing approach which ties the release of the future streams budget to programme delivery is expected when there is more certainty around how the budget will be used.
<b>C 17</b>	There are several external factors which have resulted in an increase in costs for both NERL's internal resources and suppliers. NERL's explanation of these factors is properly costed and justified, but some of these factors could have been better anticipated in earlier cost forecasts.
<b>C 18</b>	NERL's costs for its ATM system replacement programme appear to be at the upper end of European comparisons. However, it is difficult to directly compare NERL's ATM system replacement with its European counterparts. Therefore, there is insufficient evidence to assess the efficiency of the DP En Route programme

	costs particularly in the absence of considering alternative costed options. An analysis of NERL's spending at a project level would be required to ascertain the efficiency of NERL's costs.
<b>C 19</b>	Up until the completion of SVS at Swanwick in 2023, NERL acknowledge that very limited customer benefits have been delivered by the DP En Route programme.
<b>C 20</b>	The delays to milestones resulting from the replan of the DP En Route programme will reduce benefits accrued by end users over NR28.
<b>C 21</b>	The impact of the replan on airspace modernisation and the corresponding delay to dependent user benefits, was not fully communicated to stakeholders.
<b>C 22</b>	NERL's replan prioritises sustaining current systems over legacy escape. NERL has stated that this will lead to no net change to opex in any year during NR23, with anticipated opex increases stated in iSIP 22 no longer expected due to "further work done in the period between iSIP22 and SIP23". This is in the context of NERL's stated increased staffing costs affecting capex, which Egis would have expected to lead to an increase in opex.
<b>C 23</b>	NERL is already making use of the new technical platform for validation and testing and Egis understands this is likely to allow a lower risk transition from legacy systems than the previous approach. This should drive incremental opportunities for legacy escape, leading to reduction in opex. NERL has not given any detailed indication of this effect.
<b>C 24</b>	NERL has said that the overall strategy and scope of the milestones has not changed since at least 2016. NERL does appear to be targeting the same overall objective, but the replan and delay of milestones has meaningful implications on the delivery scope of NR23 compared to the NR23 Business Plan.
<b>C 25</b>	The replan delays elements of the Common Platform (meaning the completion of migrating all applications onto the new architecture) further into NR28. The impact of these delays on benefits has not yet been evaluated and presented to airspace users or the regulator. Egis' view is that these delays will likely have wider implications, including to benefits delivered through the AMS.
<b>C 26</b>	NERL highlights the series of internal governance measures that normally take place before the submission of a business plan. NERL also placed the DP En Route programme under 'special measures' after the outcome of the Take 5 review. These are appropriate internal governance processes are aligned to best practice, although this does not appear to have influenced the rigour of the identification and evaluation of options.
<b>C 27</b>	Based upon the evidence provided by NERL, it appears that the day-to-day project and programme management documentation that feeds NERL's high-level internal governance processes is broadly in line with best practice
<b>C 28</b>	No written evidence of external assurance processes applied to the replan of the DP En Route programme outside the regulatory consultation processes has been provided by NERL. The use of specialist external consultants has been limited to verbal reports only during the replan. For a programme of this magnitude, best practice, such as the Government Functional Standard, would suggest more detailed and documented external assurance should be provided. It is noted that the specialist consultant has produced a written report in 2023, which indicates a recent improvement in the manner NERL receives input from external advisors.
<b>C 29</b>	NERL stated that it reduced the risk and contingency budget specifically to retain the overall level of capex, and hence avoid re-opening a customer consultation, which implies the risk and contingency budget did not derive from a comprehensive assessment of risk.
<b>C 30</b>	NERL's risk and contingency budget in the replan is substantially lower than the budget included in the NR23 Business Plan and NERL's statements indicate the budget was already low in the NR23 Business Plan. Therefore the risk and contingency budget in the replan is not sufficient based on NERL's own benchmarks and the rate of risk materialisation at the start of NR23.



## 6 ANNEX 2 REFERENCE DOCUMENTS

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### 6.1 Overview

Through the course of this review, Egis has received documentation from NERL either directly in response to queries or provided by the CAA as an outcome of the regulatory and stakeholder engagement process. The documents that have been reviewed are listed below and are cross-referenced within the report above.

References are provided with document file name, and the date given within the document, note that some documents do not contain a specific date and may only state a month. All referenced documents are authored by NERL. Note that additional documents have been received and have been reviewed in the preparation of this report but are not directly referenced within the report. These documents are listed at the end of this annex.

### 6.2 NERL responses to Egis requests

- [1] Response to Egis RFI 21 April 2023 – v1, 26 April 2023, 26/04/2023
- [2] Response to Egis RFI 21 April 2023 - v2, 28 April 2023, 28/04/2023
- [3] Response to Egis RFI 21 April 2023 v2 Supporting paper, 28/04/2023
- [4] Response to Egis RFI 21 April 2023 - v3 - 03 May 2023, 03/05/2023
- [5] Response to Egis RFI 21 April 2023 - v3 - 03 May 2023 - NR23BP vs SIP 23 – Airspace, 03/05/2023
- [6] Response to Egis RFI 21 April 2023 - v4 - 16 May 2023, 16/05/2023
- [7] Response to EGIS RFI dated 16 May - version 1 - submitted 02 June 2023, 02/06/2023

#### 6.2.1 Enclosures to Response to EGIS RFI dated 16 May - version 1 - submitted 02 June 2023

- [8] Enclosure 01 - DPER and Voice update - April 2023, 03/2023
- [9] Enclosure 02 - DPER\_FY21\_Remaining\_Release\_Briefing\_Paper\_-\_Programme\_Gate\_Ce, 01/10/2021
- [10] Enclosure 03 - Prestwick Upper Airspace FOS Level 2 Plan\_v1.0, 07/12/2022
- [11] Enclosure 04 - Extract from L4 plan, undated – assumed 06/2023
- [12] Enclosure 05 - DPER Stream 1 CAD, undated – assumed 06/2023
- [13] Enclosure 06 - DP ER Take 5 Report. Final, 02/2022
- [14] Enclosure 07 - █████ Report from March 2023 Review Final - restricted access, undated - assumed 04/2023
- [15] Enclosure 08 - FutureStream\_StreamX\_SteeringGroup\_07Feb23, 07/02/2023
- [16] Enclosure 09 - Copy of AC FOS Equipment\_Development Optimisim Bias, undated – assumed Q1 2023
- [17] Enclosure 10 - Supply Chain BP23 Strategy Planning.extract, undated - unknown

### 6.3 NERL responses to CAA requests

- [18] NERL response to CAA Initial Proposals - confidential, 13/12/2022
- [19] Response to Capex review RFI 001 - version 2 - 05 April 2023, 05/04/2022
- [20] Response to CAA RFI 001 - version 1 - 24 March 2023, 24/03/2022
- [21] Response to Capex review RFI 001 - version 3 - 06 April 2023, 06/04/2022

### 6.4 Additional follow up clarification responses and documentation

- [22] CAA Egis RFI 06 Oct 2023 - response v1 - 11 Oct 2023 submitted (This RFI was a joint RFI containing questions from CAA and Egis)
- [23] Response to CAA RFI 06 October 2023 - v1 - 09 October 2023 - NR23BP vs SIP 23 – Airspace
- [24] CAA Egis RFI 06 Oct 2023 - attachment Stream 2 High Level Visio

### 6.5 Consultation Documentation

- [25] 2022 06 10 - DPERV Customer Consultation 10 June 2022 Meeting minutes\_For issue, 10/06/2022
- [26] 2022 06 10 - DPER Customer Session 10th June\_Final, 10/06/2022

- [27] 2022 07 04 - Interim SIP22 Customer Consultation 4 July 2022 Meeting minutes\_For Issue, 04/07/2022
- [28] 2022 07 04 - Interim SIP22 Customer Consultation slide pack\_FINAL, 04/07/2022
- [29] 2022 09 12 - DPERV 14 Sep 22 Customer Session\_FINAL, 12/09/2022
- [30] 2022 09 14 - DPER&V Customer Consultation 14 Sep 2022 Meeting minutes – FINAL, 14/09/2022
- [31] Economic regulation of NATS (En Route) plc: Initial Proposals for the next price control review – October 2022

## 6.6 Regulatory documents

- [32] SIP23, 31/01/2023
- [33] SIP23-Customer-Consultation-Final, 09/01/2023
- [34] NR23 Business Plan, dated 07/02/2021, assumed to be 07/02/2022
- [35] NR23 Appendix J: Operating costs, assumed to be 07/02/2022
- [36] NR23 Appendix O: Benchmarking, assumed to be 07/02/2022
- [37] SIP22, 31/01/2022
- [38] iSIP22, 29/07/2022
- [39] TRC 18\_22 DP En Route Business Case, June 2022
- [40] TRC minutes 30th June 2022 (DPER only), 30/06/2022
- [41] SIP21 Addendum, 30/04/2021
- [42] SIP 21, 29/01/2021
- [43] SIP 20 Independent Reviewer Report, 12/03/2020
- [44] SIP 19 Independent Reviewer Report, 01/03/2019
- [45] SIP 18 Independent Reviewer Report, 09/02/2018
- [46] SIP 17 Independent Reviewer Report, 17/01/2017

## 6.7 Additional documentation reviewed

- [47] ATM Cost-Effectiveness (ACE) 2019 Benchmarking Report with Special Focus on COVID-19 Impacts in 2020, available at: [eurocontrol-ace-2019-benchmarking-report.pdf](#)
- [48] Report on a High Level Review of NATS' Investment plan, LogicaCMG, 26 November 2004
- [49] NERL 10 Year Business Plan 2011-2020, March 2010
- [50] NERL's forward-looking capital programme and expenditure efficiency, February 2019, available at: <https://www.caa.co.uk/media/mjtpfq5o/steer-cost-efficiency-report.pdf>
- [51] The Green Book, HM Treasury, 18/11/2022
- [52] Guide To Developing The Programme Business Case, HM Treasury, 2018
- [53] Government Functional Standard, GovS 002: Project delivery portfolio, programme and project management, 15/07/2021
- [54] Project delivery: guidance The role of the senior responsible owner, Government Project Delivery Function, 11/04/2023

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