NATS (En Route) plc SIP 2019

Independent Reviewer Report

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1 March 2019

NOTE

This document has been produced for the CAA as part of Condition 10 to the NATS (En Route) [NERL] Licence and is based on ongoing observations and research by the CAA Independent Reviewer Grant Bremer.

This report summarises the author's findings and opinions and represents a snapshot of the situation as of 1 March 2019.

Background

Condition 10(3) of the NATS (En Route) plc [NERL] Air Traffic Services Licence dated 19 June 2018 requires NERL to prepare a Service and Investment Plan (SIP) that refers to the most recent business plan and the related airspace and technology programmes each year. Condition 10 (3a) then requires NERL to provide a SIP that, by reference to the most recent business plan and technology and airspace plans, updates NERL's investment plans, delivery against programme milestones and any material change in NERL's expectations regarding the level and quality of the provided services.

NERL submitted its Interim SIP18 update in June 2018. After consideration of the submitted update, the CAA was *"not minded to approve the level of detail of the interim SIP and outline RP3 programmes"*[1]. In particular, CAA considered that:

- *the interim SIP 2018 provides insufficient explanation of the slippages in the technology programme, and that NERL's explanation of the mitigations in place does not provide confidence that further slippages will be prevented;*
- *the explanation for how further changes in scope for investment in RP2 have impacted NERL's expenditure is insufficient; and*
- *risk management across projects in the interim SIP does not appear to be consistent.*

The CAA finally commented that it would *"continue to closely monitor NERL's delivery and reporting of its investments, and expect a marked improvement in the level of detail of NERL's reporting moving forward. If, after engaging with an external expert to improve the SIP, this is evident in your submission of SIP 2019, we will then consider the approval of the form, scope and level of detail of the interim SIP 2018."*

The stated purpose of NERL's investment programme to the end of 2019 is to sustain, develop and enhance operational capabilities to ensure the ability to provide on-going service performance, resilience to unplanned events (including system failure) and to improve performance and value to customers in line with agreed performance targets. NERL has once again confirmed that the Investment Programme comprises two main areas: Airspace and Technology. The Airspace investments will make changes to allow effective management of air traffic within the UK whilst the Technology investments cover NERL's systems, networks and infrastructure. The Technology programme is subdivided to address the investment in the future technologies (Deploying SESAR) and the legacy (Current) systems.

Through the last few months of 2018, considerable effort by all stakeholders was focused on the development of an agreed business and investment plan for RP3. Against this backdrop, NERL developed SIP19 and submitted it to CAA for approval on 21 Dec 18[2] in line with Condition 10 of its Licence.

Airspace Plan

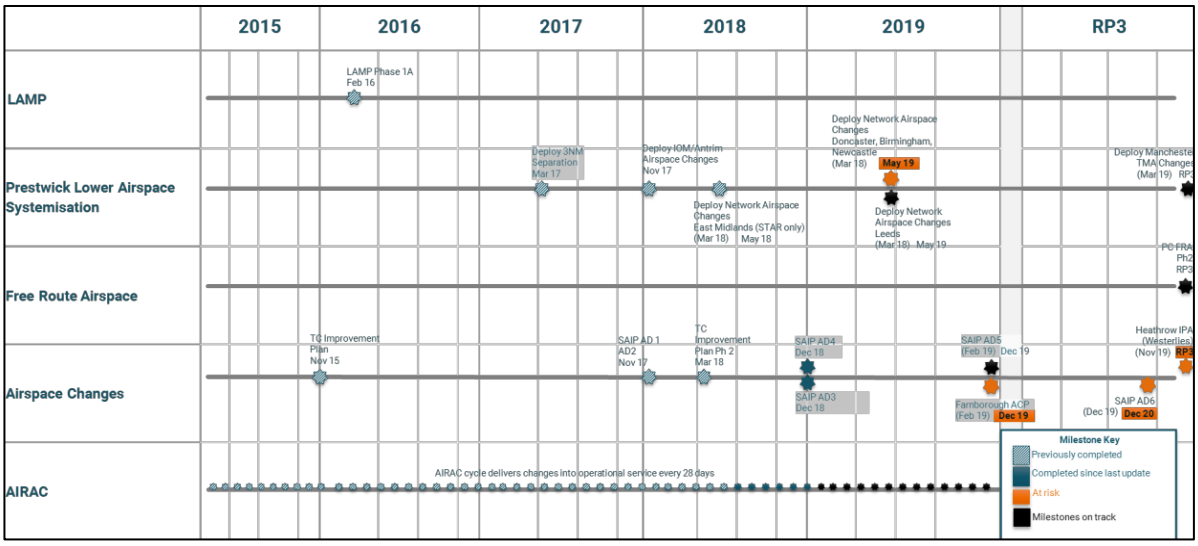
NERL's Airspace Plan aims to deliver changes to UK airspace to improve service delivery performance. In particular, this aspect of the SIP seeks to[3]:

- Improve safety by removing/reducing aspects within the airspace configuration and operation that have been identified as contributing to risk;

1. CAA Director Consumer & Markets Group to NATS CE 3 Oct 18.
2. https://www.customer.nats.co.uk/wp-content/uploads/2018/12/1550_NERL-SIP-19-Final-for-CAA-FINAL-FOR-ISSUE_PDF.pdf downloaded 23 Dec 18.
3. SIP 19, Section 6.2.2, page 23 of 78.

- Increase capacity, by systemising the operation to reduce controller workload (per flight);
- Provide a more efficient service, by offering more fuel-efficient profiles; and;
- Continue to comply with current, and satisfy future, legal requirements.

The Airspace[4] update in SIP19 reported that progress has been made but also noted that external challenges have impacted the schedule and increased costs. Enhancements have been delivered in LAMP1a, Swanwick Airspace Improvement Project (SAIP), Prestwick Lower Airspace Systemisation (PLAS) and the TC Improvements Project (TCIP). However, NERL asserts that there have been delays to some elements of the plan because some airports have been *"unable to gain CAA approval for elements of the change within their responsibility"*. NERL also confirms that work to minimise and "*mitigate these delays and accelerate airspace deployments as far as is practically possible"* is ongoing. The top-level milestone schedule is now:



SIP19 also makes it clear that although some work can be carried forward, some work will now need to be repeated through no fault of its own. NERL continue to report that many of the airspace delays are due to the changes in the CAP 1616 process previously reported as causes for delay in the SIP18/Interim SIP 18 updates.

NERL report that despite the changes in the consultation process, much of the Airspace programme has been successfully delivered. NERL has provided a commentary on the reasons and background for the Airspace milestone slippages as[5]:

> PLAS. Much of the PLAS work has delivered up to May 2018 but deployments at Doncaster, Birmingham and Newcastle Airports, have moved to May 2019 following delays to the approval of the Airport ACPs by the CAA[6,] whilst the date for Leeds Airport is still to be agreed but it is expected to align with the May 2019 deployment. Manchester TMA (MTMA) has seen an extension to the consultation timelines and costs so the required changes will not be made in RP2. MTMA has been re-phased into RP3 to align with Manchester and Liverpool Airport. PLAS still aims to match the implementation of the Scottish TMA changes in RP3

4. SIP 19, Section 6.2.4, page 24 of 78.
5. SIP 19, Section 6.2.4, page 26-27 of 78.
6. The CAA commented that Doncaster and Newcastle were delayed because their independently designed Instrument Flight Procedures (IFP) were unacceptable (Doncaster submitted an incorrect SDI design and Newcastle was missing a hold); Birmingham delayed because the CAA was not aware that they [BAL] were trying to progress two different elements of a change under one banner.

when they are agreed.

SAIP. The implementation of AD3 (Hurn Systemisation Part) and AD4 (Clacton changes) were delivered in December 2018. However, changes to West airspace (AD5) have been delayed from March 2019 to December 2019 with the project currently on track to achieve this deployment date. A study into the feasibility and options for TC Essex changes (AD6) completed in July 2018 although the consultation process means that the project cannot deliver the changes before December 2020[7].

Heathrow IPA. Independent Parallel Approaches (IPA) to Heathrow has been delayed until RP3 because Heathrow decided to delay its consultation process for airspace change until 2019. The revised consultation date is anticipated to be January 2019 and the project is now tasked with delivery in 2022.

NERL has provided a financial update for the Airspace plan:

Programme Area	Actual 2015	Actual 2016	Actual 2017	Forecast 2018	Forecast 2019	**Forecast RP2**	C10 Baseline	Delta
LAMP Phase 1a	5	1				**6**	6	
Prestwick Lower Airspace Systemisation	1	1	2	1		**5**	6	(1)
Free Route Airspace				2	2	**4**	13	(9)
Airspace Changes	2	1	4	3	7	**17**	21	(4)
AIRAC	2	2	2	1	2	**9**	11	(2)
Airspace Forecast Total	**10**	**5**	**8**	**7**	**11**	**41**	**57**	**(16)**

Overall, the Airspace programme has moved £10m of activity from RP2 to RP3 with £6m incorporated into the RP3 rBP and £4m scope transfer to DSESAR in RP2. NERL also report £4m savings in RP2.

Technology Plan

The Technology update provided in SIP19 has focused on the DSESAR and sustaining current/legacy systems programmes.

DSESAR

NERL report that considerable progress has been made in the DSESAR programme. ExCDS was successfully delivered into Terminal Control (TC) by Jun 2018. Despite this being the first comprehensive technology deployment into London TC since 2007, transition completed with less delay than had been anticipated and with customers being satisfied with the NERL engagement during the transition.

Key aspects of DSESAR were re-planned in 2018 because of emerging risks. The revised plan sought to protect key milestones of DP En Route and the programme is now reported to be operating

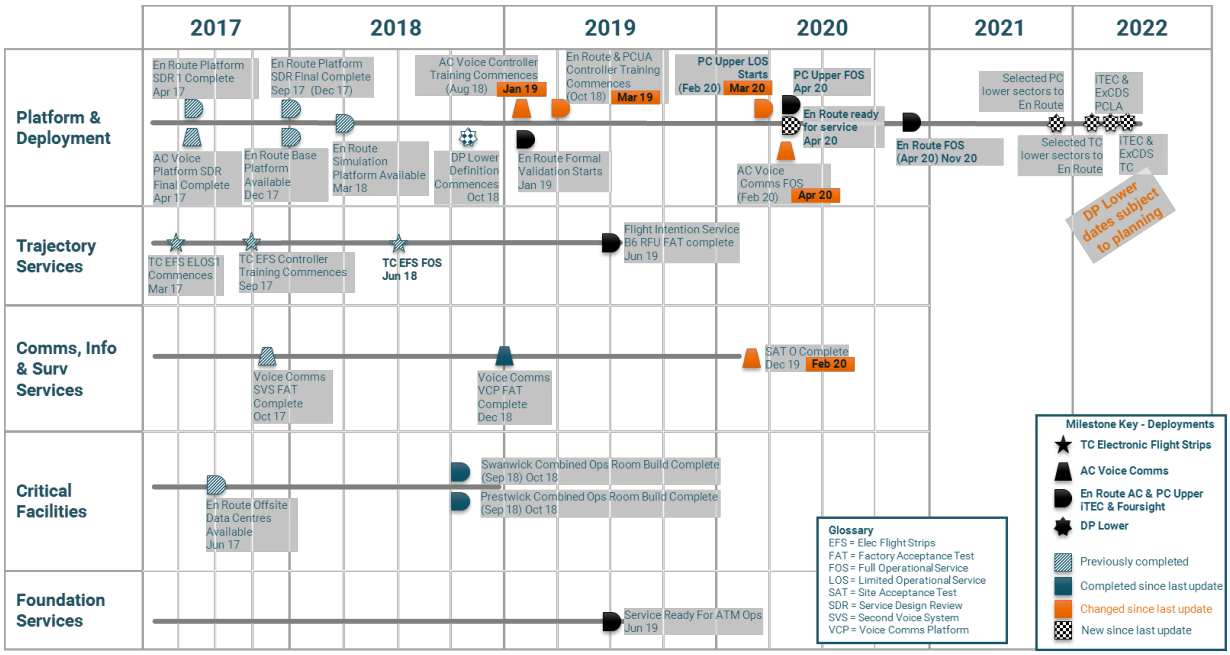
7. CAA offered to fast track this proposal through the process because NERL cited safety, but on investigation it turned out that the Co-Sponsor (Luton Airport) could not facilitate this until December 2020.

effectively to the new plan[8]. Much of the programme is now moving into Factory Acceptance Testing (FAT) and Site Acceptance Testing (SAT) stages. This will highlight any major issues that need to be addressed and should indicate if the planned schedule is robust or requires further amendment.

NERL reports that two other key projects (DP Voice and DP En Route) are delivering to plan ahead of operational handover in Feb 2020 and Apr 2020 respectively. In 2018 substantive progress was made for both projects:

> DP Voice. SAT of the Second Voice System, FAT of the Main Voice System and completion of installation of the final infrastructure platform, STRATUS, at the Data centres was completed in 2018;
>
> DP En Route. FAT of the Independent Surveillance and Flight Data System (ISFD), delivery of flight data processor and controller working position software builds were completed in 2018. Validation of the DP En Route platform at both Swanwick and Prestwick started in 2018.

The current DSESAR delivery plan[9] is:



NERL provided an update to the financial aspects of DSESAR as being:

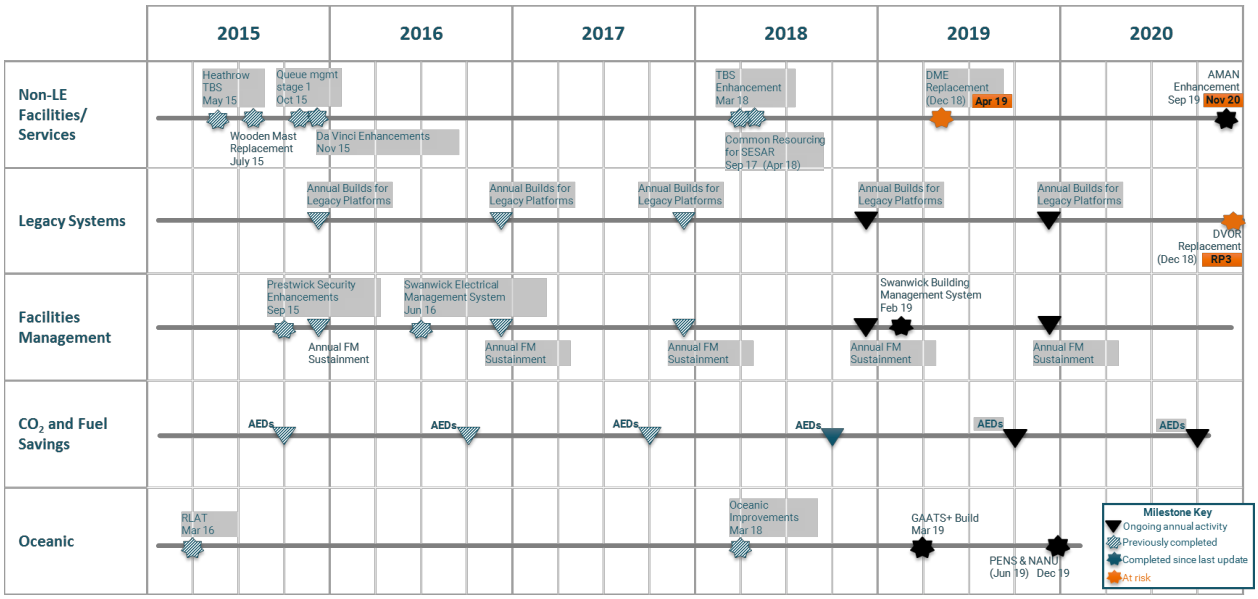
Programme	AC Temporary Ops Room	iTEC in Prestwick Upper	AC Voice Comms	TC Electronic Flight Strips	En Route AC and PCUA ITEC & Foursight Terminal	Operations: PCLA ITEC & Foursight, TC ITFC Terminal	Operations: TC Foursight	RP2 Current Forecast	C10 Baseline	Delta
Platform & Deployment			26		88			**114**	100	14
Trajectory Services		44		23	135	10		**212**	214	(2)
Comms Info & Surv Services			49		13			**62**	60	2
Critical Facilities	8		8		22			**38**	35	3
Foundation Services			94		13			**107**	72	35
DSESAR Forecast Total	**8**	**44**	**177**	**23**	**271**	**10**		**533**	**481**	**52**
C10 Baseline	**8**	**45**	**133**	**24**	**250**	**18**	**3**	**481**		
Delta		(1)	44	(1)	21	(8)	(3)	52		

8. SIP 19, Section 6.2.4, page 30 of 78.
9. SIP 19, Section 6.2.4, page 34 of 78.

The overall cost growth of DSESAR is reported[10] as being caused by some scope transfer from Airspace; some re-planning of activity (mainly for the Platform) and the failure of a key supplier to deliver the Foundation Services. The problem with the Foundation Services supplier was the failure of that supplier to understand NERL's complex deliverable requirements. NERL is challenging the supplier to "design to cost" and taking steps to avoid further cost growth and/or delay. Some of the delay (c£11m) has been transferred into RP3.

Current/Legacy Systems

The Current/Legacy Systems programme continues to support the older systems still in use ahead of DSESAR deployment. The latest milestone plan[11] is:



NERL report that some elements of the programme have been delivered, but also that the overall DVOR Replacement work is now forecast to complete in Sep 19, some 11 months behind the baseline plan with the HIAL DVOR being delayed into RP3 due to the current operator re-equipage. NERL also revised the incorrect reporting of the planned delivery date of the Swanwick Building Management System from June 18 to Feb 19.

The Current Systems programme financial report[12] is now:

Programme Area	Actual 2015	Actual 2016	Actual 2017	Forecast 2018	Forecast 2019	Forecast RP2	C10 Baseline	Delta
Non-LE Facilities/Services	22	15	19	14	12	**82**	83	(1)
Legacy Systems	25	13	12	7	6	**63**	74	(11)
Facilities Management	7	5	3	4	3	**22**	21	1
CO2 and Fuel Saving							5	(5)
Oceanic	3	4	4	4	3	**18**	18	
TOTAL NERL Forecast	**57**	**37**	**38**	**29**	**24**	**185**	**201**	**(16)**
*Military**	6	1		2	4	**13**	11	2
Total Forecast	**63**	**38**	**38**	**31**	**28**	**198**	**212**	**(14)**

10. SIP 19, Section 6.3.26-27, page 35/36 of 78.
11. SIP 19, page 36 of 78.
12. SIP 19, page 37 of 78.

The savings in the Current Systems programme are largely related to further progress on the DSESAR plan that has resulted in fewer changes to current systems than had been planned[13].

Programme Cost Update

NERL report that overall programme costs compared with the revised baseline plan in SIP17 is14:

	Actual 2015	Actual 2016	Actual 2017	Forecast 2018	Forecast 2019	Forecast RP2	C10 Baseline RP2	Delta RP2
Airspace	**10**	**5**	**8**	**7**	**11**	**41**	**57**	**(16)**
Platform & Deployment	3	21	34	30	26	**114**	100	14
Trajectory Services	50	51	43	27	41	**212**	214	(2)
Comms Info & Surv Services	2	15	15	14	16	**62**	60	2
Critical Facilities	8	1	11	13	5	**38**	35	3
Foundation Services	5	20	33	30	19	**107**	72	35
DSESAR Forecast Total	**68**	**108**	**136**	**114**	**107**	**533**	**481**	**52**
Non-LE Facilities/Services	22	15	19	14	12	**82**	83	(1)
Legacy Systems	25	13	12	7	6	**63**	74	(11)
Facilities Management	7	5	3	4	3	**22**	21	1
CO2 and Fuel Saving						**0**	5	(5)
Oceanic	3	4	4	4	3	**18**	18	
Current Systems Total	**57**	**37**	**38**	**29**	**24**	**185**	**201**	**(16)**
Total NERL Forecast	**135**	**150**	**182**	**150**	**142**	**759**	**739**	**20**
Military	6	1		2	4	**13**	11	2
Total Forecast	**141**	**151**	**182**	**152**	**146**	**772**	**750**	**22**
Contingency					10	**10**	30	(20)
Total Forecast including Contingency	**141**	**151**	**182**	**152**	**156**	**782**	**780**	**2**

NERL has also provided a comprehensive analysis of the cost changes[15] through RP2:

Programme	March 2017 C10 Baseline RP2	Moved to RP3 (in IBP)	New Scope	Savings	Increases/ Changes to Scope	Interim SIP 2018 (June C10 Update) RP2	Moved to RP3	Savings	Increases/ Changes to Scope	SIP19 Fcast RP2
LAMP Phase 1a	6					6				6
Prestwick Lower Airspace Systemisation	6	(1)	1			6	(1)			5
Free Route Airspace	13	(2)				11	(3)		(4)	4
Airspace Changes	21	(3)	1	(2)		17				17
AIRAC	11			(2)		9				9
Airspace	**57**	(6)	2	(4)		**49**	**(4)**		**(4)**	**41**
Platform & Deployment	100				13	113	(4)		5	114
Trajectory Services	214				(6)	208			4	212
Comms, Info & Surv Services	60				(2)	58	(6)		10	62
Critical Facilities	35				4	39	(1)			38
Foundation Services	72				30	102			5	107
DSESAR Forecast Total	**481**				39	**520**	**(11)**		**24**	**533**
Non-Legacy Escape (LE) Facilities/Services	83			(2)		81			1	82
Legacy Systems	74				(12)	62			1	63
Facilities Management	21					21			1	22
CO_2 and Fuel Saving	5				(4)	1			(1)	
Oceanic *	18					18				18
Current Systems Forecast Total	**201**			(2)	(16)	**183**			**2**	**185**
Total NERL Forecast	**739**	(6)	2	(6)	23	**752**	**(15)**		**22**	**759**
*Military**	*11*		*2*			*13*				*13*
Total Forecast	**750**	(6)	4	(6)	23	**765**	**(15)**		**22**	**772**
Contingency	30				(13)	17			(7)	10
Total Forecast including Contingency	**780**	(6)	4	(6)	10	**782**	**(15)**		**15**	**782**

13. SIP 19, Section 6.3.31, page 38 of 78.
14. SIP 19, Section 11.1.1, page 64 of 78.
15. SIP 19, Section 11.1.12, page 67 of 78.

Some of these changes are a result of delivery challenges, and some through re-planning including transfer of some work to RP3, as well as some acceleration of work from RP3 to RP2. NERL also report that use has been made of the planned contingency funding.

Service Performance

SIP19 has reported Service Performance as being[16]:

Service/ Investment/ Finance	Outcome this period	Impact
Service	Service has shown an improving trend over the summer in the face of high traffic (growth expected to be c13% in RP2 compared to forecast 10%).	**Figures below: (SIP19 v interim SIP 18)** C2 service: 12.9 secs v 13.7 secs – trend ✓ C1 service: 17.7 secs v 18.7 secs – trend ✓ Service not yet to target ✗
Service	Comparison of safety performance with last period of comparable traffic in 2007 completed.	28% improvement in overall safety ✓ Safety (RAT pts/ 100k flights) 35.5 v 44.5 ✓ Safety not yet to target ✗
Service	Environment improvements realised moving NERL performance down into dead-band.	3Di score 29.3 (deadband) v 29.8 ✓

NERL has provided further detail on the key areas of Safety, Service Quality and Environmental.

Safety Performance: NERL has indicated that, although providing a safe service and meeting the SES safety target, the data from the Risk Analysis Tool shows that performance is below its internal target[17]:

RP2 Safety Targets	2018 Target	30/11/18 (A)	End 2018 (F)	2019 Target	End 2019 (F)
External Target					
SES Target – Deployment and use of RAT[6]	80%	100%	100%	100%	100%
Internal Target					
NATS RAT points per 100,000 movements[7]	29.0	35.5	34.5[8]	28.2	TBC[9]
Key for internal target	Greater than 38		Between Target and 38		Achieving Target

NERL attributes[18] this performance to a range of factors including increased overall traffic levels, and increased general aviation flights through the summer. Increased drone traffic has also impacted the broader safety picture (accounting for >50% of all monthly airprox reports. NERL has confirmed that a range of initiatives are in hand to help meet its target. While the figure does not yet meet the target, NERL does note the improvement since the last report (reduction from 44.5 to 35.5 RAT points per 100,000 movements achieved by a range of safety performance improvements including the introduction of ExCDS).

Service Quality Performance: NERL reports that Service Quality is still efficient and that the Service Quality target performance is:

16. Section 2.1 headlines. Page 5 of 78.
17. SIP 19, Section 5.2, page 18 of 78.
18. SIP 19, Section 5.2, page 19 of 78.

RP2 Service Quality Term	2018 Target	11/12/18 (A)	End 2018 (F)	2019 Target	End 2019 (F)
C1 Service: Delay per flight at FAB level[10]	13.8	17.7	16.9	13.8	12.6
C2 Service: Average Delay per flight	10.8	12.9	12.6	10.8	10.2
C3 Service: Impact Score[11]	22.0	17.9	17.1	22.0	22.5
C4 Service: Variability Score[12 13]	2,000	16.1	16.1	2,000	N/A[14]
Key	Exceeds target & outside dead-band (where exists)		Achieving target or within dead-band		

NERL attributes these results to the ExCDS transition and the unexpected and increasing traffic levels[19] exceeding ATM capacity within the TC Essex sector at times and notes that without the pre-planned transition to ExCDS agreed with customers the end of year forecast for C2 was 7.8s which would have met the target.

Environmental Performance: Based on data for 14 Oct 18 NERL reports that the current forecast of outturn values for environmental performance exceeds the KEA target:

RP2 Service Quality Term	2018 Target	30/11/18 (A)	End 2018 (F)	2019 Target	End 2019 (F)
KEA: Horizontal Inefficiency Score[15]	3.09%	3.65%	3.70%	2.99%	TBC[16]
E1 Flight Efficiency: 3Di Score[17]	28.1	29.3	29.2	27.7	TBC[18]
Key	Exceeds target & outside dead-band (where exists)		Achieving target or within dead-band		

NERL has provided a full analysis of why the KEA target will not be achieved and recognises that it is unlikely that the KEA target will be met. It also confirms that the E1/3Di score is likely to remain in the dead-band for 2018.

People Plan

NERL reports significant changes in the integration of its People Plan within the wider SIP[20]. Using a "People Centred Implementation" approach, NERL has defined a follow-on programme which is currently moving through the implementation phase managed as part of the wider P3O work. This "One Operation" programme defines the vision for future operations through the adoption of a unified operating model which will introduce the necessary standardised processes and flexible ways of working needed to maximise the benefits of the SIP. Whilst the "One Operation" is not formally part of the SIP, NERL has recognised its importance and have outlined the aims, milestones and future plans for the People Plan.

Service Transformation

A further enabler to the SIP is the Service Transformation capability[21]. NERL reports that it is progressing, using industry standard approaches such as ITIL, to provide a sound basis for ensuring that the organisation is fully ready to manage and operate the new services and capabilities deployed by DSESAR. The general approach to this work is:

19. SIP 19, Section 5.3.2-3, page 20 of 78.
20. SIP 19, Section 6.4, page 38 of 78.
21. SIP 19, Section 6.6, page 39 of 78.

Benefits

SIP 19 reporting confirms the approach taken by NERL for benefits tracking[22]. Using Benefit Delivery Panels chaired by Executive Team members NERL continues to anticipate SIP benefit delivery through RP2 and RP3. The six benefits areas status report23 is:

- Safety. NERL's Safety target is a 13% reduction in RAT points/100k flights. Current forecast is a 26% increase/100k flights. While NERL does not yet forecast meeting the target, NERL notes that success in the actions taken can be seen both in the improvement in performance since the last report and in comparison of forecast performance to that which would be predicted without the improvement actions;
- Capacity. NERL's Capacity targets (C1: 13.8s; C2: 10.8s; C3: 23.8s; C4: 2,000) are all currently forecast to be on track;
- Environment. NERL's Environmental targets are to enable a 10% fuel and CO2 savings by 2020, compared with the 2006 baseline. Following some adjustments, the current target is 432kT enabled fuel savings/year by the end of RP2. However, the latest forecast is for a saving of 221kT which is below the target and NERL notes that the reduction is driven primarily by changes to the airspace programme (e.g. LAMP & PLAS) although NERL states that a significant level of enabled savings have been realised since the last SIP;
- Cost Efficiency. With a target of 21% price reduction, NERL are currently forecasting savings of 27% due to staff cost savings and a lower than forecast inflation rate;
- Compliance. NERL seeks to be compliant with the current set of 75 European Implementing Rules/Directives and all relevant UK legislation. NERL anticipates being compliant through RP2 and into RP3;
- Sustainment. Although there is no declared Sustainment target, NERL manages Technical Service Risk to ensure the maintenance of service and operational resilience throughout the various upgrade programmes with a Net Weighted Value (NWV) of £139.9m and NERL report that achievement of this NWV target is on track.

Risks

There is a refreshed Risk assessment in SIP19 that covers the approach taken with respect to both portfolio and programme risks. There is also a refreshed assessment of the risks of both[24]:

22. SIP 19, Section 9.2, page 48 of 78.
23. SIP 19, Section 9.3, page 49-57 of 78.
24. SIP 19, Section 10, page 58-62 of 78.

Portfolio Risks are assessed as those that could impact benefit delivery, or significant delivery risks that might affect the overall portfolio. The latest Portfolio Risk Assessment is reported as being:

Risk Name	Description	Impact of Risks	Probability Rating - June 18	Probability Rating	Impact Rating - June 18	Impact Rating	Mitigation Actions
Benefit and Delivery	As a result of scope change, technical difficulties, supplier and other delays, or other project related issues, there is a risk that NATS is unable to deliver the full benefit (including Safety, Service, 3Bi and Value) associated with the change Portfolio.	The impact of this would be financial penalties and Opex increases beyond the target value. In addition, safety is considered a key company priority, should this materialise, remedial action will be required.	Unlikely	Unlikely	Moderate	Moderate	Benefit panels have been established to monitor benefit delivery and provide early visibility of issues enabling corrective changes to be made to the Portfolio.
Technical (Risk of System Failure)	NATS continuing to operate on ageing operational technologies and platforms which are becoming increasingly difficult to maintain and support. Whilst currently stable, there is a risk that resources required to support these will no longer be available and the systems may become unreliable.	Failure within the core NATS operating technologies or platforms could prove detrimental to both the service and safety offered to our customers, depending on time taken to resolve any issues. Safety is our priority and unplanned investments may be required.	Unlikely	Unlikely	Major	Major	Asset Sustainment projects have been initiated to mitigate these risks. Additionally, NATS has a Sustainment budget to maintain and support current systems until such time they are replaced by new technology.
Legacy Escape Delay	As a result of a delay to the delivery of system solutions to replace ageing equipment sets, there is a risk that additional time, funding and extended maintenance support would be required.	This would lead to increased RP3 capital funding plus extended OPEX costs.	Likely	Likely	Major	Major	The DSESAR programme is a key step to provide legacy escape. The programme is managed and tracked monthly against key milestones to enable a timely delivery. The DP En Route D Date has changed but this will not have a significant impact on this risk.
Supplier Performance	As a result of NERL being reliant on the performance of suppliers rather than internal staff for the development of core systems, and integration support onto a single platform, there is a risk that these initiatives could suffer delivery delays. In addition, given the unique nature of what NATS does, there are limited suppliers who can provide services to the company.	The impact of this would be delays to delivery of core systems and increased supplier costs.	Unlikely	Likely	Major	Major	Tender evaluations and detailed contracts have been agreed to ensure selected suppliers deliver on all requirements. Weekly/Monthly reviews are undertaken between NATS and suppliers to monitor and control against the contract baseline targets. Additionally, increased Exec level engagement has lead to tighter controls to mitigate this risk.
Regulatory Requirements / Changes	As a result of political and environmental changes, there is a risk that additional scope may be required to be delivered within the reference period to maintain compliance and meet licence obligations. There is additional risk that work currently being undertaken to maintain compliance will not be necessary in the new environment.	Increased costs in order to deliver the additional scope or wasted effort and funds if changes are not required.	Likely	Likely	Moderate	Moderate	Continue to work closely with the CAA and EU to have early warning on potential changes to regulations which would impact the NATS change portfolio. NATS is seeking to maintain an agile investment profile.
Airspace Consultation Delay	As a result of airport operators and /or the regulator taking longer than envisaged to reach a decision on consultation requests, or the request being rejected, there is a risk that airspace initiatives seeking approval to proceed could be delayed.	This could lead to delay of airspace change and associated benefits plus potentially an increase in cost to re-work the airspace design.	Almost Certain	Almost Certain	Major	Major	Continue to work closely with the CAA, local councils and Airports when designing new airspace solutions to ensure minimal impact on external parties (i.e., local residents). Utilise the Automated Airspace Design tool (when available) to minimise the impact on NATS resources.
Critical Resource Availability	As a result of variability in demand timing and volume, complexity of projects and a labour-intensive method for introducing change into Operations, there is a risk that demand from the Change Portfolio is greater than the operational resource available to deploy key project activities. This is further exacerbated by increasing pressure on Operational resource due to increases in traffic volume, potential retirements within the workforce and length of training required to replace these staff.	This could lead to project delays, increased costs and delay to the realisation of associated benefits.		Likely		Major	Key Mitigations are: 1) Resource office to work more closely, and at an earlier stage, with key projects to define and agree working assumptions (effective mid-term planning). 2) Improve project planning and communication with resource teams. Project planning to include named resource planning where possible, and not just schedule and cost. 3) Strategic Resource Boards are held monthly to make priority decisions on operation versus programme resource demands. 4) Modify the approach to delivery of OCT training programmes, and the deployment of staff to deliver this training (End-to-End Training Improvement programme). 5) Review assurance activities for projects.

Programme Risks are assessed at programme level and are judged as being capable of directly impacting milestone delivery. The current delivery/programme risks are assessed as:

Risk Name	Description	Impact of Risks	Probability Rating - June 18	Probability Rating	Impact Rating - June 18	Impact Rating	Mitigation Actions
Requirements Management	With any new system, the capturing of good quality requirements is key to project success. There is a risk that in such a large scale programme, the complexity of the requirements also increases, which could ultimately affect how clearly scope is defined, which contributes directly to project success.	Re-design of service solutions would extend the projects schedule and increase costs.	Remote	Likely	Moderate	Moderate	We are implementing a new requirements management process based around our Business Change Framework to ensure direct and traceable linkage between strategic objectives (key customer requirements) and programme and project requirements. The dedicated requirements teams within each programme undertake modelling of requirements and assess the maturity prior to significant contract awards. Design reviews, gate reviews and deep dives are also undertaken by independent representatives to verify the requirements captured and matured at each stage of the programme lifecycle.
Resourcing/Training	The traffic growth in RP3 is predicted to increase significantly. There is a risk that this makes the NERL operations increasingly busy which may limit the ability to take staff out of the operation to evaluate the software and undertake training. This has a direct impact on project success as evaluation timelines extend, and staff may not be able to use new tools when they are implemented.	An extended training programme would extend the projects schedule and increase costs. Achievement of benefits is delayed.	Unlikely	Likely	Moderate	Moderate	Detailed work packages and plans are produced for all projects, identifying all required resources, effort and dates to deliver all tasks and deliverables. A high profile "people" programme has been created to challenge all resource requirements and identify solutions to solve resource gaps. Strategic Resource Boards are also held monthly to make priority decisions on operation versus programme resource demands. The recent decision to deliver DP En Route at Prestwick in April 2020 and Swanwick in November 2020 takes into account operational resource availability.
Managing change/ transition	There is a risk that, given the safety critical nature of the operations and the scale of this transformation, coupled with the 24/7 operation, the management of the changes and transition to the new system could be compromised. This is critical to the success of the outcome.	An extended transition period may impact the services available to customers. An extended transition programme would also extend the projects schedule and increase costs.	Remote	Remote	Moderate	Moderate	Detailed transition strategies have been agreed and detailed tactical transition plans will be produced and agreed by internal and external stakeholders. Multiple validation, shadowing and Limited Operational Service (LOS) activities will also be undertaken prior to any final transitions; to ensure all services perform as expected. It is expected that the platform will be technically ready by April 2020 for both Prestwick and Swanwick.
Supplier performance	NERL is reliant on the performance of suppliers rather than internal staff for the development of the core system and to support integration into a single platform. There is a risk that, given the unique nature of what NATS does, there are limited suppliers who can provide services to the company. There is also little competition between suppliers, which could lead to complacency.	Poor supplier performances would extend the programme schedule; as corrective actions would be required to be undertaken by the suppliers.	Unlikely	Likely	Major	Major	Tender evaluations and detailed contracts have been agreed to ensure selected suppliers deliver on all requirements. Weekly / Monthly reviews are undertaken between NATS and suppliers to monitor and control against the contract baseline targets. Proof of concept activities and early informal validation of supplier deliveries are providing early indications on the quality of supplier deliverables and identifying remedial actions if required.
Airspace consultation	Delivery of the programme will rely on successful consultation of proposed airspace changes by NERL and other stakeholders. There is a risk that this process could be delayed if alignment on airspace changes is not reached, which would delay project delivery and deliver benefits late.	Delayed airspace consultations would extend the projects schedule, increase costs and delay benefits to airlines.	Almost Certain	Almost Certain	Major	Major	Establishment of the Airspace Change Delivery Group (Chaired by NATS) and the FAS Exec (Chaired by DfT) to seek alignment behind airspace changes during RP3. Working with the airports, DfT and CAA to develop and agree plans for airspace changes.
Complexity of Change	There is a risk that, due to the complexity of the new architecture and capabilities to be delivered, managing the delivery of these will be complicated and challenging. This can be mitigated by developing new approaches to assurance by both NATS and CAA.	Inadequate assurance would extend the project's schedule and increase costs.	Unlikely	Unlikely	Moderate	Moderate	Regular meetings between NATS and SARG to ensure both organisations have clear awareness of project scope, solutions, assurance plans, tasks and dependencies between both organisations. Workshops to be held between NATS and SARG to gain an understanding of the different approaches to be undertaken for delivering the required assurance.

Analysis

The Airspace programme continues to make progress despite some changes in external processes that have had a negative impact on NERL's plans. Although many of the factors causing slippages are outside NERL's control, it is a reminder of the imperative for NERL to work closely with Airports to align programmes as closely as possible. Changes at a local or regional level have been seen to have a national impact that NERL must try to accommodate and continued close integration and consultation with Airports can help in this regard.

The DSESAR programme continues to deliver despite some slippage and cost growth. NERL has provided considered commentary on the reasons for these changes and also what action is in place to ensure no further slippage or cost growth but it is too early to be confident that there will not be further slippage or cost growth, or to be sure of success here.

The legacy work is ongoing, with progress linked to DSESAR delivery, although there have been slippages due to external factors. The effective maintenance of these critical legacy systems is clearly essential and NERL has also provided an update on its internal Service Transformation programme that will support these older systems as well as prepare to support the new systems as they come into service.

The development of a more integrated People Plan is another welcome step by NERL. The approach for developing the people aspects of NERL will be critical in the future, so this update on how NERL plans to deliver its future workforce is both timely and helpful.

NERL reported that SIP benefits continue to be managed by focused executive-led delivery panels which will continue through into RP3. NERL reports that four of the six benefit areas will meet the agreed targets, but it is disappointing that the planned benefits in the other two areas are not going to be achieved. While it is clear that improvements have been delivered in both the areas of safety and environmental benefits it would be helpful if NERL could provide additional commentary of what might be done to drive further successful delivery in these areas. While there is no suggestion that the other benefits are not on track it could be helpful to provide commentary on how NERL will ensure that those that are on track will be secured. As has been reported previously, NERL should provide further evidence that benefits are being driven rather than simply monitored and NERL should consider how it might demonstrate its drive for successful benefit delivery rather than acceptance of potentially failing to meet the agreed targets.

NERL's refreshed Risk Management approach and report is a welcome change that provides a more balanced view of both portfolio and programme level risk management. The mitigating actions offer comfort that the current and emerging risks will be monitored and tackled effectively although this will need close attention going forward. However, more clarity concerning the risk rating and colour reporting would help[25].

The inclusion of a reflective Lessons Learned[26] section in the SIP19 is a very helpful indicator that NERL is able to critically assess its delivery performance and identify possible actions to prevent reoccurrence of identified problem areas.

25. Risks that are 'Likely with major impact' & 'Unlikely with moderate impact' are the same colour which can be confusing.
26. SIP 19, Section 7, page 41-43 of 78.

Despite these improvements in the overall clarity of reporting, NERL needs to ensure it achieves the right balance in terms of reporting on service performance. NERL reports the improvement in safety performance since the last report, and comments on the good underlying service performance without the ExCDS transition. Nevertheless, NERL missed its safety and service performance targets for 2019. This shortfall should also be given appropriate prominence in the executive summary (where a "good overall service performance"[27] is cited) as well as in the more detailed sections of the report.

Conclusion

The submitted SIP19 is in a considerably improved format against previous SIPs. The layout and commentary make the report more effective and takes the reader through a logical evolution of the SIP in explaining the latest status and also plans for the future. There is a marked improvement in the depth of analysis in SIP19 than previous SIP submissions, with clear explanation in either the main text or appropriate Appendices. The inclusion of the People Plan and the Service Transformation plans, which are not within the SIP but are critical enabling activities, are particularly helpful. The Lessons Learned section in the SIP19 is also a very welcome addition that gives confidence in NERL's ability to be a learning organisation that can adapt for the future.

The SIP submission has evolved a great deal through RP2. This latest format, with a clear scope and level of detail is now helpful and more easily accessible. With some further development of the planned actions needed/taken to ameliorate any further slippages and contain cost growth, the SIP is in a format that should be maintained through into RP3.

27. SIP19, Executive Summary, page 5 of 78.