NATS (En Route) plc Interim SIP 2017

Independent Reviewer Report

Grant Bremer, Chase Partners Limited

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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 20 July 17.

Background

Condition 10(3) of the NATS (En Route) plc [NERL] Air Traffic Services Licence dated 29 June 2016 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(3b) then requires NERL to provide an interim 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 Airspace and Technology programme plans in March 2017. The CAA conditionally approved the submitted plans, providing that by 30 June 2017 NERL provided a letter that provided:

- further commentary and clarity on the linkage between programmes and the benefits that will be delivered, including specifically how the investment outlined will contribute towards improving NERL's performance for each of the Key Performance Indicators, at the project level where feasible. This might usefully be shown on a Benefits Map, but we will leave the format to [you] to decide; and
- greater clarity on the major risks and dependencies within the programmes and any potential impacts on service provision should these risks materialise.

In accordance with the CAA's conditional approval NERL responded by letter on 29 June 2017. Also, and as per Condition 10 of the Licence NERL, submitted their Interim SIP17 (Update on RP2 Capital Investment Plan (2015- 2019) for Condition 10 dated 29 June 2017) on 30 June 2017 with a supporting addendum describing Benefits and Risks to the Capital Investment Plan.

The stated purpose of NERL's investment programme for the remainder of RP2 (to 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 confirmed that the airspace programmes will make changes to allow effective management of air traffic within the UK whilst the technology programme updates and improves NERL's systems, networks and infrastructure.

Airspace Plan

The submitted Airspace plans appear to be unchanged since the previous plans[1] although NERL has delivered the first plan milestone of "deploying 3nm Separation (under Prestwick Lower Airspace Systemisation)" as planned in March 2017. The Airspace Plan is moving forward on track, and within RP2 there do not appear to be any major dependencies on technological deliveries. However, the potential future RP3 requirements for Airspace Plans are already informing key aspects of the Technology Plan.

Technology Plan

NERL's Technology Programme remains focused on two areas: Deploying SESAR and sustaining existing, legacy systems. The latest update to the Deploying SESAR plans is largely unchanged from previous plans[2]. The only material change at the higher level is the addition of two extra Service

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1. NATS RP2 Capital Investment Plan (2015-2019) for Condition 10 dated 31 March 2017.
2. *Ibid.*

Design Reviews (SDR) in September 2017, following the achievement of the planned SDRs in April 2017, as part of the Platform & Deployment programme but the associated capability delivery dates remain unchanged. NERL also reported that the Terminal Control Electronic Flight Strips (ELOS1) started in March 2017 as planned.

The work sustaining the existing systems is reported as being on track as planned.

Programme Cost Update
NERL has reported that Programme Costs remain as planned in the previous update.

Programme	Actual 2015	Actual 2016	Fcast 2017	Fcast 2018	Fcast 2019	Fcast RP2	C10 Plan RP2	Delta RP2
Airspace	**10**	**5**	**8**	**13**	**21**	**57**	**57**	**-**
Platform & Deployment	3	21	32	32	12	**100**	100	-
Trajectory Services	50	51	43	39	31	**214**	214	-
Comms, Info & Surv Services	2	15	13	24	6	**60**	60	-
Critical Facilities	8	1	12	12	2	**35**	35	-
Foundation Services	5	20	25	13	9	**72**	72	-
DSESAR Total	**68**	**108**	**125**	**120**	**60**	**481**	**481**	**-**
Non-Legacy Escape (LE) Facilities/Services	22	15	21	12	13	**83**	83	-
Legacy Systems	25	13	13	12	11	**74**	74	-
Facilities Management	7	5	4	4	1	**21**	21	-
CO_2 and Fuel Saving					5	**5**	5	-
*Oceanic^*	*3*	*4*	*7*	*4*		***18***	*18*	*-*
Current Systems	**57**	**37**	**45**	**32**	**30**	**201**	**201**	**-**
Total NERL	**135**	**150**	**178**	**165**	**111**	**739**	**739**	**-**
Military*	*6*	*1*	*1*	*2*	*1*	***11***	*11*	*-*
Total	**141**	**151**	**179**	**167**	**112**	**750**	**750**	**-**
Contingency							30	30	-
Total including Contingency						**780**	**780**	**-**

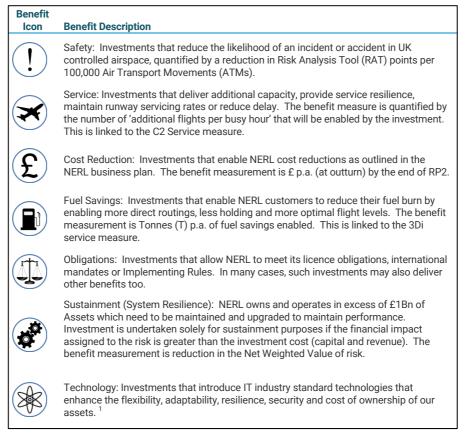*^ Oceanic programme subject to Oceanic specific customer consultation*

* Military programme subject to agreement with MoD under FMARS contract

NERL has also provided further cost analysis of the DSESAR programme spend in Appendix 1 to the Plans.
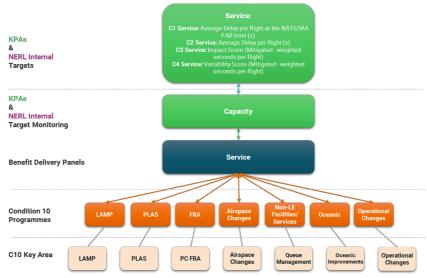
<u>Benefits and Risks Addendum</u>
NERL has provide a detailed update on their Programme Risks and Benefits in the Addendum to the main plans. In the Addendum the approach taken to benefits, and the governance for realisation of this benefits, has been described. In the Addendum NERL confirms the Benefit

Categories, with Benefit Delivery Panels overseeing each area, that they attribute benefits towards as being:

Benefit Icon	Benefit Description
(!)	Safety: Investments that reduce the likelihood of an incident or accident in UK controlled airspace, quantified by a reduction in Risk Analysis Tool (RAT) points per 100,000 Air Transport Movements (ATMs).
(✈)	Service: Investments that deliver additional capacity, provide service resilience, maintain runway servicing rates or reduce delay. The benefit measure is quantified by the number of 'additional flights per busy hour' that will be enabled by the investment. This is linked to the C2 Service measure.
(£)	Cost Reduction: Investments that enable NERL cost reductions as outlined in the NERL business plan. The benefit measurement is £ p.a. (at outturn) by the end of RP2.
(⛽)	Fuel Savings: Investments that enable NERL customers to reduce their fuel burn by enabling more direct routings, less holding and more optimal flight levels. The benefit measurement is Tonnes (T) p.a. of fuel savings enabled. This is linked to the 3Di service measure.
(⚖)	Obligations: Investments that allow NERL to meet its licence obligations, international mandates or Implementing Rules. In many cases, such investments may also deliver other benefits too.
(⚙)	Sustainment (System Resilience): NERL owns and operates in excess of £1Bn of Assets which need to be maintained and upgraded to maintain performance. Investment is undertaken solely for sustainment purposes if the financial impact assigned to the risk is greater than the investment cost (capital and revenue). The benefit measurement is reduction in the Net Weighted Value of risk.
(⚛)	Technology: Investments that introduce IT industry standard technologies that enhance the flexibility, adaptability, resilience, security and cost of ownership of our assets. [1]

NERL also confirmed that there is not a Benefits Panel to oversee Technology but that the required technical solutions are governed through the Design Governance Board. Each Benefit Category has an explanation of how the component parts contribute to the overall delivery of that Benefit Category with, where possible, quantification of those component parts.

An example of the approach is that of Capacity:

Each flow diagram is supported by a breakdown of the component parts' contribution to the overall Benefit Category:

KPA/Target		Enabled by	Investment Areas	C10 Programmes	C10 Key Areas	
Target: C1-4 delay targets RP2 Service Quality Term 2017 C1 Service 13.8 C2 Service 10.8 C3 Service 23.8 C4 Service 2,000	Forecast: RP2 Service Quality Term 2017 C1 Service On Track C2 Service On Track C3 Service On Track C4 Service On Track	Capital Investment	Airspace	LAMP	LAMP	Clear & predictable flow of traffic inbound to London City Systemisation robust at busiest times, indicative of ability to absorb future demand and improving resilience
				PLAS	PLAS	Delivers a 5% - 10% increase in capacity to Prestwick Lower Airspace sectors
				FRA	PC FRA	Delivers an increase to the Number of flights per busy hour within Prestwick Upper sectors. To be quantified during the initial stages of the Project
				Airspace Changes	Airspace Changes	Delivers a 1% to 5% increase to Swanwick Airspace capacity by the end RP2 and Improve situational awareness in Terminal Control through RP2
			Technology	Deploying SESAR	DSESAR	Capacity improvements are being assessed across the deployments, but are anticipated to be more significant in RP3 once the tooling is deployed to exploit the airspace change estimated in a range of between 10-20% capacity increase
				Non-LE Facilities/Services	Infrastructure	Delivers an increase to Heathrow landing rate between 1 and 3 flights per busy hour by Deployment Point Lower
				Oceanic	Oceanic Improvements	Delivers additional Airspace Capacity within the most fuel efficient levels, and material customer benefit in line with projected traffic growth
		Operational Changes	Operational Changes	Operational Changes	OPA Hotspots	Delivers small capacity increases through: 1. Improved Strategic Planning & Traffic Forecasting 2. Dynamic Flight Planning assessment 3. Airline inputs into the FUA state programme 4. Options for SID and STAR offloads to improve weather resilience

This approach is repeated for all 6 Benefit Categories that contribute towards NERL's Key Performance Area targets.

The Addendum also describes how NERL identifies and manages risks at project and then at the aggregated portfolio levels. There are no project risks shown, but they are well managed and escalated as necessary within NERL, with the portfolio key risks are shown as being:

Risk Name	Description	Probability Rating	Impact Rating	Mitigation Actions	Impact of Risks
Requirements Management	With any new system, the capturing of good quality requirements is key to project success. In such a large scale programme, the complexity of the requirements also increases.	Medium	Medium	Having dedicated requirements capture teams appointed to each programme. The teams undertake modelling of requirements and assessing maturity and completeness prior to significant contract awards. Gate reviews and Deep Dives are also undertaken by independent representatives to verify completeness of requirements throughout project lifecycles.	Re-design of service solutions would extend the projects schedule and increase costs.
Resourcing/Training	The traffic growth in RP2 has been far greater than expected and continues to develop. 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.	Medium	Medium	Detailed work packages and plans are produced for all RP2 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.	An extended training programme would extend the projects schedule and increase costs.
Managing change/ transition	Given the safety critical nature of the operations and the scale of this transformation coupled with the 24/7 operation makes the management of the changes and transition to the new system critical to the success of the outcome.	Low	Medium	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.	An extended transition period may impact the services available to customers. An extended transition programme would also extend the projects schedule and increase costs.
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.	Medium	High	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.	Poor supplier performances would extend the programme schedule; as corrective actions would be required to be undertaken by the suppliers.
Airspace consultation	Delivery of the programme will rely on successful consultation of proposed airspace changes by NERL and other stakeholders.	High	High	Establishment of the Airspace Change Delivery Group (Chaired by NATS) and the FAS Exec (Chaired by DfT) to seek alignment behind airspace changes during RP2 and RP3. Working with the airports to develop and agree plans for airspace changes.	Delayed airspace consultations would extend the projects schedule, increase costs and delay benefits to airlines.
Assurance	The new architecture and capabilities to be delivered will require new approaches to assurance by both NATS and CAA.	Medium	Medium	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.	Inadequate assurance would extend the projects schedule and increase costs.

The Addendum finally describes how NERL tackles the complex issue of inter-programme Dependencies. NERL uses the 'tube maps' to manage resourcing and delivery conflicts on a unit by unit basis and use dependency agreements between projects and programmes to manage

dependencies within the normal planning/monitoring process. In Deep Dive workshops NERL has explained the 'tube maps' and shared them with attendees.

Analysis
This updated Interim SIP17 has been updated and provided only a few weeks after the previous iteration. Unsurprisingly, there are virtually no changes in the plans or costs and some milestones have been delivered.

The plans that have been provided in either the Interim update or the Deep Dive workshops and consultations remain more robust and detailed than those seen before the refreshed approach early in 2017.

The Addendum that describes how NERL plans and monitor benefits is much clearer than seen to date and a welcome development. This approach provides considerably improved clarity over how benefits are aggregated and how they contribute towards achievement of NERL's KPAs. The use of Benefits Panels to maintain focus on the individual Benefit Categories appears a sensible addition to benefits governance and oversight. A minor concern is that if the executive lead of a panel is accountable for benefits delivery then, ideally they would also have management responsibility to direct actions if necessary. Since this will not be the case, ongoing senior management attention will be needed to maintain the delivery of benefits across the portfolio. Looking forward, the way in which Benefits, Outcomes and Programmes are now linked bodes well for RP3 planning if the required Targets and Outcomes, with concomitant Benefits are used as the basis for portfolio and programme planning.

Risk management at project level is robust, but the portfolio risks provided in the Interim SIP17 appear to be somewhat generic and surprisingly do not reflect any technical risk. Given the scale and scope of the Technical Programme risk matrix as provided in the Addendum does not appear to be complete. However, further research with NERL has shown that risk management at the portfolio level is being managed proactively. The development of portfolio-level risks that are not simply the aggregation of project-level risks, and the governance and management of risks at this level, is still maturing but already shows a welcome level of scrutiny and resilience. Following this extra research it is now clear that NERL are working at managing portfolio, programme and project risks and have appropriate systems and processes to effectively manage these different range of risks.

The comments above regarding portfolio-level risks are reflected in the portfolio-level dependencies. Following further research and discussion with NERL, it is clear that the cross-programme dependencies are understood and being managed. For instance, the Airspace Plan does not have any dependency on Technology Plan deliverables in RP2 although NERL is already looking forward to likely RP3 dependencies. Conversely, the Technology Plans are being informed by potential RP3 Airspace Plan requirements. This "reverse" dependency mapping is a sensible way to ensure future programme alignment. The Technology Plan cross-programme dependencies are multiple and complex. However, the use of cross-programme dependency agreements to formalise any such dependencies offers considerable confidence that individual programmes and projects will be held to account for their outcomes and deliverables as delivery progresses. As has been previously noted, the separate reporting of deployment points (that seem to be the primary focus for the 'tube maps') and the established programme milestones is unhelpful in programmatic terms, but works for NERL as a internal communications tool. Translation of the

'tube maps' for external use will require care to ensure that the right information and messages are understood by those external audiences.

Comment has been made in previous Independent Assessor Reports on the absence of a 'People Plan' within SIP17. Any 'People Plan' is, and should be, outwith the capital investment umbrella of SIP but it remains a key enabler. In recent workshops and consultation sessions NERL has provide an overview of how the 'People Plan' will be developed and integrated into future programme delivery, but further work in this area would be helpful so that CAA and customers can be confident that service quality and levels will not be impacted by SIP delivery at any emergent 'pinch points' in the next few years.

The Interim SIP17 has detailed investment through the remainder of RP2. Whilst recognising that RP3 is still not planned, let alone agreed, it is clear that NERL will not simply stop investment programmes at the end of RP2. It might therefore be helpful if some indication, without commitment at this time, of RP3 plans were included in the next iteration of the SIP. This would enable debate regarding RP3 to start and would give customers confidence that the RP2 investment will realise benefits and improvements into the future.

Conclusion
The Interim SIP17 provided by NERL on 29 June 2017 is another welcome step forward. There is a consistency of approach and expression that provides clarity and confidence in many areas. The management of cross-programme risk management and cross-programme dependencies, which are inextricably linked, are being managed by NERL at all levels although this is not as clear as it could be in the published Interim SIP17. However, NERL does have the detail and clarity of purpose and a firm grasp on these key areas, but would benefit from considering further how to better share that understanding with external stakeholders.