

NATS (En Route) plc SIP 2018

Independent Reviewer Report

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9 February 2018

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 9 February 2018.

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 (3a) then requires NERL to provide an 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.

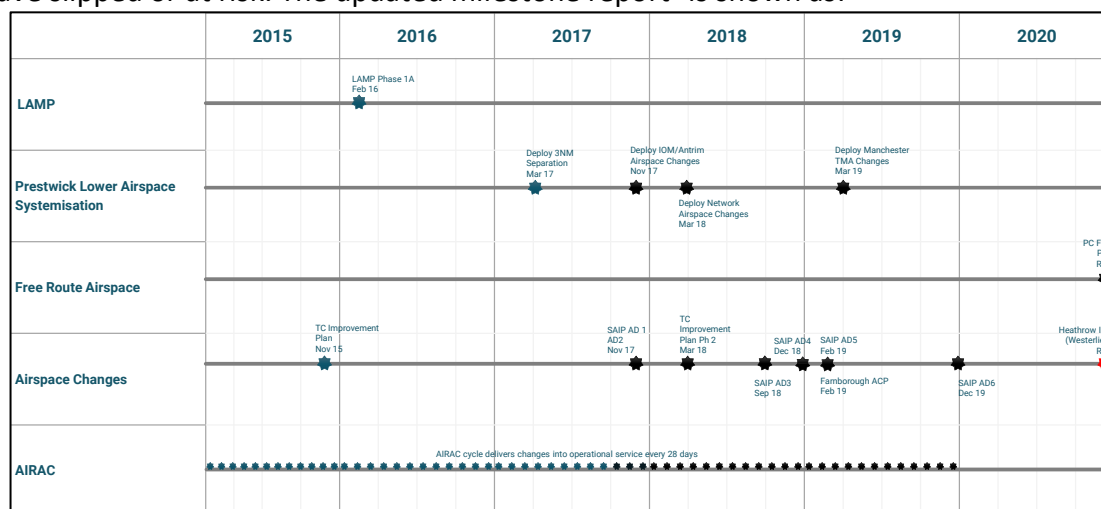
NERL submitted its Airspace and Technology programme plans in March 2017 and an interim SIP in June 2017. The CAA approved the Interim SIP on 28 July 2017 and commented that "we will carefully monitor the delivery of, and reporting against, your revised investment plans and associated performance over the next year to ensure the reality has lived up to the expectations". Additionally, it was noted that the Interim SIP "established the requirement in terms of level of detail for reporting" and that this would be the minimum going forward.

The stated purpose of NERL's investment programme for the remainder of RP2 (to end 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 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.

NERL submitted its SIP 18 to the CAA, in line with Condition 10, on 21 December 2017 and the SIP is supported by the October 2017 Update on RP2 Capital Investment Programme (2015-2019) for Condition 10 posted on the NATS website¹.

Airspace Plan

The Airspace update in SIP18 indicates that considerable progress has been made in the areas under NERL's control. However, there are milestones in the agreed plan that depend upon airports that have slipped or at risk. The updated milestone report² is shown as:



1. Update on RP2 Capital Investment Programme (2015-2019) for Condition 10 v0.9 downloaded 27 December 2017.

2. SIP 18 Slide Deck, Slide 19.

The supporting text³ for the Airspace plan notes that there is a risk that the Manchester TMA change milestone is at risk because of delays in the associated public consultation at Manchester. It is also noted that the IPA (Westerlies) at Heathrow will now be postponed until RP3 because of the delay in the public consultation scheduled for October 2017 that has been delayed due to DfT consultations on the Airports National Policy Statement.

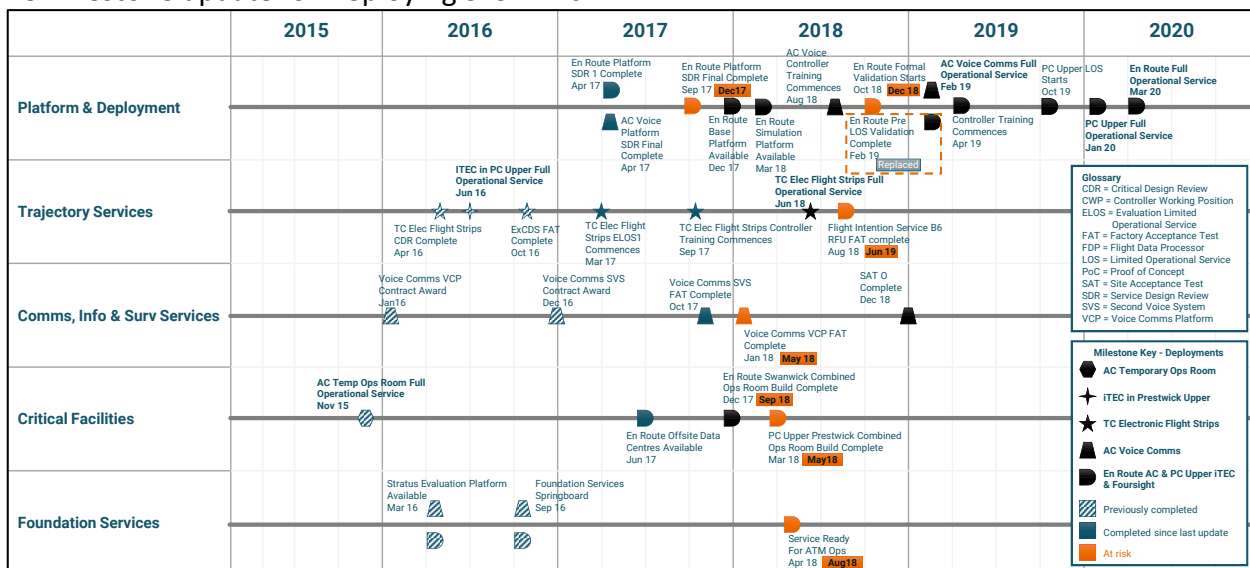
Technology Plan

The Technology update provided in SIP18 highlights the considerable effort and progress in a wide range of areas across the DSESAR and Current systems programmes.

DSESAR

NERL report that “the DSESAR Level 0 tube map remains unchanged. Lower level milestones have changed, but impacts and dependencies are being managed carefully and these do not affect delivery of the Level 0 milestones”⁴.

The milestone update for Deploying SESAR⁵ is:



Through 2017 there has been clear progress⁶ with the planned milestones of Offsite Data Centres (July 2017), ExCDS Simulator Training (September 2017) being delivered to plan with the Combined DP Voice and En Route SDR due in September 2017 being achieved in December 2017 with no concomitant slippage to other parts of the programme. Progress in delivering ExCDS is good and early indications are that the capability will improve NATS’ service and resilience with Full Operational Service remaining on track for June 2018. The DP Voice and En-Route programmes are reported to be progressing although there are some apparent slippages of milestones (Harris VCP V1 FAT – critical path with 4 months slippage; Foundation services SRU with 4 months slippage) that do not appear to impact the overall delivery milestone of “Ready for Operational Service” in February 2019.

3. SIP 18 Slide Deck, Slide 20.

4. SIP 18 Slide Deck, Slide 22.

5. SIP 18 Slide Deck, Slide 30.

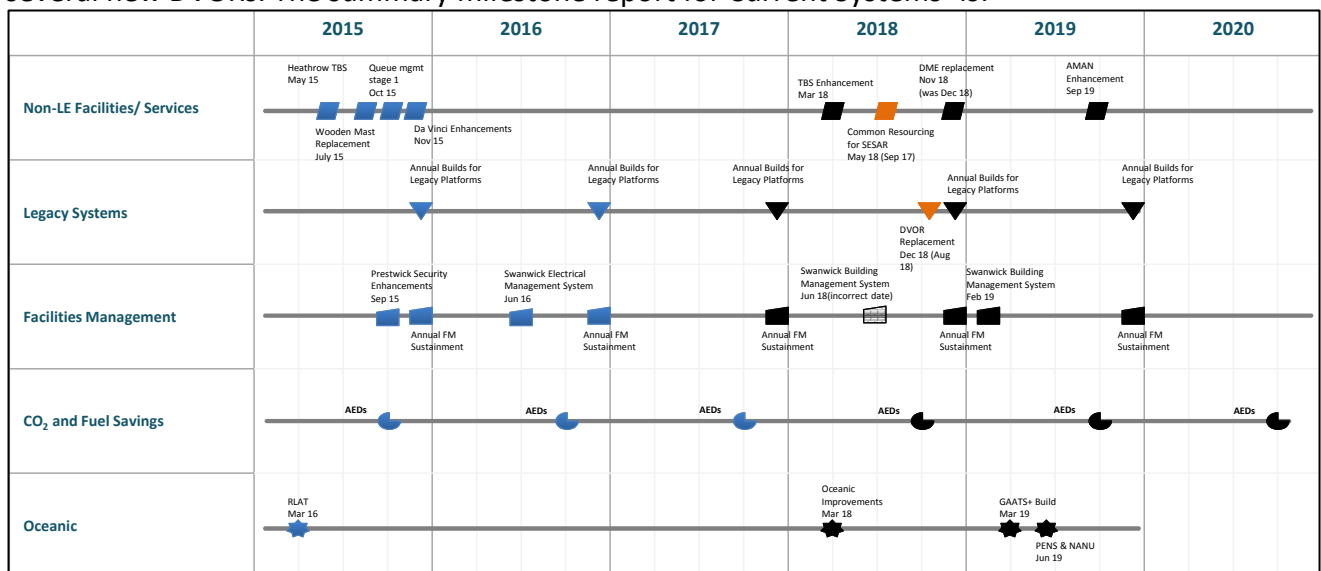
6. SIP 18 Slide Deck, Slide 24-29.

A total of 30 months future slippage across the DSESAR programme has been declared⁷ although there are mitigation actions to minimise any risk to the overall DSESAR delivery schedule. Key points that have been highlighted are:

- **Platform & Deployment:** Service design work is taking longer than originally planned, causing a 3 month slip, and changes to the iTEC build plan will delay formal validation of the wider ATM platform by 2 months. Mitigation action is in place to ensure that the overall Platform milestone of Full Operational Service in March 2020 is secure;
- **Trajectory Services:** Following contract award for delivery of iTEC FDP and CWP being awarded in July 2017, it has become clear that “a more detailed understanding of the requirements” will be needed to develop the required software causing a 10 month slip for the B6 RFU FAT milestone. The build plan has been realigned to regain the time needed for this extra work;
- **Comms, Info & Services:** Dependencies and delays to the core Harris product and “challenges with the NATS’ specific SW development” has delayed the FAT by 4 months as noted above. Mitigation work is underway to recover this time and achieve Acceptance Test by the planned December 2018 date;
- **Critical Facilities:** The build of both Swanwick and Prestwick Ops Rooms have been split to allow incremental delivery of operational capability. However, there are declared delays of 9 and 2 months respectively against the planned service milestones;
- **Foundation Services:** The “complexity of defining the requirements and high level design” has led to a delay of 5 months.

Current Systems

The Current Systems programme has delivered several key milestones through 2017 including several new DVORs. The summary milestone report for Current Systems⁸ is:



Looking forward there is an anticipated delay of 4 months⁹ (August 2018 to December 2018) in DVOR replacement due to unforeseen civil works need at several sites as well as some supplier technical issues. Additionally, the Common Resourcing for SESAR milestone has slipped by 8 months (from September 2017 to May 2018) “largely due to resourcing and requirements clarification issues”.

7. SIP 18 Slide Deck, Slide 31-32.

8. SIP 18 Slide Deck, Slide 34.

9. SIP 18 Slide Deck, Slide 35.

Work relating to the Oceanic area has had considerable focus and customer engagement through 2017. In SIP18, NERL reports¹⁰ that customers supported implementation of both STAMPER (delivers ATM system, datalink performance and controller workload improvements as well as concluding RLatSM trails) and TELSTAR (provision of DLM on Tango routes by VHF Communications and surveillance capabilities) projects. STAMPER appears to be on track for successful delivery by 28 March 2018. TELSTAR is moving forward and there is growing acceptance that the space-based approach is the right way forward, albeit a strong desire to retain ground-based as a contingency option should there be difficulty in realising the space-based solution. NERL are currently planning for a space-based solution subject to further discussion and agreement early in 2018.

Programme Cost Update

NERL report that overall programme costs remain on plan. The latest summary of costs¹¹ is:

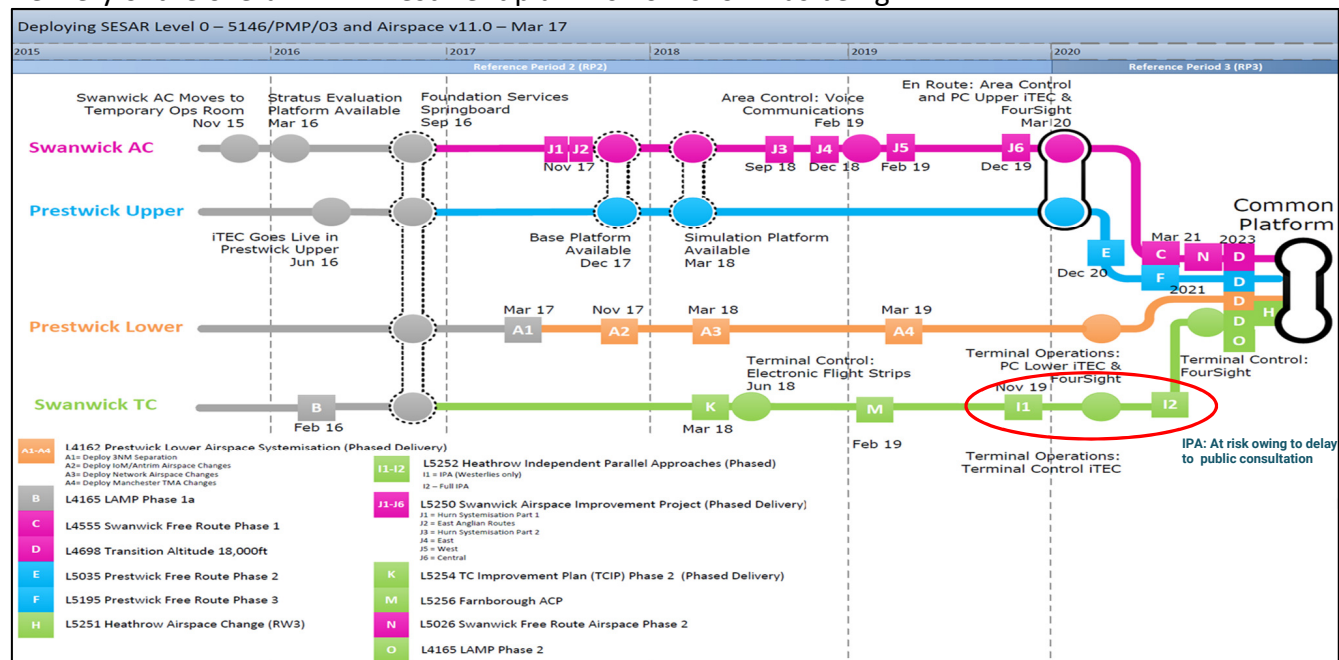
	Actual	Actual	Fcast	Fcast	Fcast	Fcast	C10 Baseline	Delta
Programme	2015	2016	2017	2018	2019	RP2	RP2	RP2
Airspace	10	5	8	12	20	55	57	-2
Platform & Deployment	3	21	29	30	14	97	100	-3
Trajectory Services	50	51	48	39	22	210	214	-4
Comms, Info & Surv Services	2	15	16	21	4	58	60	-2
Critical Facilities	8	1	12	15	4	40	35	5
Foundation Services	5	20	34	23	2	84	72	12
DSESAR Forecast Total	68	108	139	128	46	489	481	8
Non-Legacy Escape (LE) Facilities/Services	22	15	16	9	16	78	83	-5
Legacy Systems	25	13	14	12	10	74	74	-
Facilities Management	7	5	4	3	2	21	21	-
CO ₂ and Fuel Saving					2	2	5	-3
Oceanic [^]	3	4	6	5		18	18	-
Current Systems Forecast Total	57	37	40	29	30	193	201	-8
Total NERL Forecast	135	150	187	169	96	737	739	-
<i>Military*</i>	6	1	1	2	1	11	11	-
Total Forecast	141	151	188	171	97	748	750	-2
Contingency						32	30	2
Total Forecast including Contingency						780	780	-

Although some 2018/2019 costs have flexed between years and there is a small increase in forecast for 2017, the overall costs are broadly the same as previously reported in the Interim SIP17. It is understood that the final 2017 data was not available at the time of publishing.

10. SIP 18 Slide Deck, Slide 46.

11. SIP 18 Slide Deck, Slide 16.

Delivery of the overall RP2 investment plan¹² is now shown as being:



Service Performance

SIP18 notes that Service Performance is largely on track despite continued increase of traffic levels. NERL report that the summary of Service Quality¹³ is:

RP2 Service Quality Term (NERL element of National Performance Plan)	2015	2016	2017 Target	End Nov	2017 EoY Forecast
C1 Service: Average Delay per flight (s) at the NATS/IAA FAB level (s)	4.8	17.8	13.8	10.33	c.10
C2 Service: Average Delay per flight (s)	2.4	12.8	10.8	6.05	c.6
C3 Service: Impact Score (Mitigated - weighted seconds per flight) [1]	5.2	25.0	23.8	12.75	c.13
C4 Service: Variability Score (Mitigated - weighted seconds per flight) [2]	14.2	176.7	2,000	1.23	N/A
E1 Flight Efficiency: 3Di Score	30.13	30.26	28.9	29.7	c.30
KEA: Horizontal Inefficiency Score at FAB level [3]	3.48	3.87	3.18	3.73	3.75

Exceeds target & outside dead-band (where exists)
 Achieving target or within dead-band

1: With Transition Exemptions applied
 2: Asymmetric term, penalty payable above 2,000
 3: Not an incentivised RP2 Service Quality Term and reported for completeness (reported to end of October)

NERL also note¹⁴ that the internal 10% CO₂ emissions targets will not now be delivered in RP2 due to delays in airspace changes due to changes in government policy on noise distribution with associated impact on LAMP Phase 2.

12. SIP 18 Slide Deck, Slide 23.

13. SIP 18 Slide Deck, Slide 10.

14. SIP 18 Slide Deck, Slide 14.

Benefits

SIP 18 does not reflect any significant change in the Benefits area but provided a summary¹⁵ as being:

SAFETY		VALUE	
Maintain safety with forecast 13% traffic growth		21% price reduction	
Methodology Investments that are expected to reduce the likelihood of an incident or accident are quantified. Reduction quantified in Risk Analysis Tool (RAT) points per 100,000 movements "Tempest" model used by Analytics for evaluation. Evaluation repeated during implementation and post go-live.		Key Contributing Projects ALL projects have potential to impact Opex costs RP2: Technology Programme: Current Systems Wooden masts replacement CNS power systems renewal Technology Programme: DSESAR TC Electronic Flight Strips (ExCDS) Realisation of Opex reduction opportunities in RP3.	
SERVICE		LEGISLATIVE COMPLIANCE	
Av. Delay per Flight NATS Att. <10.8 seconds		76 Implementing Rules	
Methodology 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. Analytics model for Effective Capacity per Traffic Flow Volume and Capacity/Delay forecast Model takes account of airspace design and forecast staffing levels.		Key Contributing Projects RP2: Technology Programme: Current Systems ADQ (Aeronautical Data Quality) 8.33kHz channel Spacing RP3: Technology Programme: DSESAR LARA Technology Programme: Current Systems TBS enhancement DME Replacement and Rationalisation	
ENVIRONMENT		TECHNICAL SERVICE RISK	
Fuel reduction av 10% per flight		Maintain service resilience through risk mitigation	
Methodology Benefits from projects and airspace initiatives tracked against targets, monthly review of progress. Overseen by the Environment Benefit Delivery Panel and 10% Programme, supported by Analytics providing assessments of the enabled benefits. 3Di improvements are being driven through operational controller awareness, trend analysis and Unit initiatives.		Key Contributing Projects Technology Programme: DSESAR AC Voice Communications Technology Programme: Current Systems Upgrades to Navigational Aids and Radar.	
		Further details can be found in the C10 Report	

The C10 Report describes NERL's approach to Benefits Management¹⁶ through RP2 in greater detail and the use of Benefits Delivery Panels provides a process that NERL believe will ensure that the business and customers will achieve the agreed benefits.

Risks

There is limited commentary on Risks in the submitted SIP 18. The major programme risks are stated¹⁷ 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. 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.	Medium	Medium	In order to mitigate this, there are 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. 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. Achievement of benefits is delayed.	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	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.	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. 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.	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. 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.	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.
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 GAA.	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.

15. SIP 18 Slide Deck, Slide 37.

16. Update on RP2 Capital Investment Programme (2015-2019) for Condition 10 v0.9 downloaded 27 December 2017, p14-23.

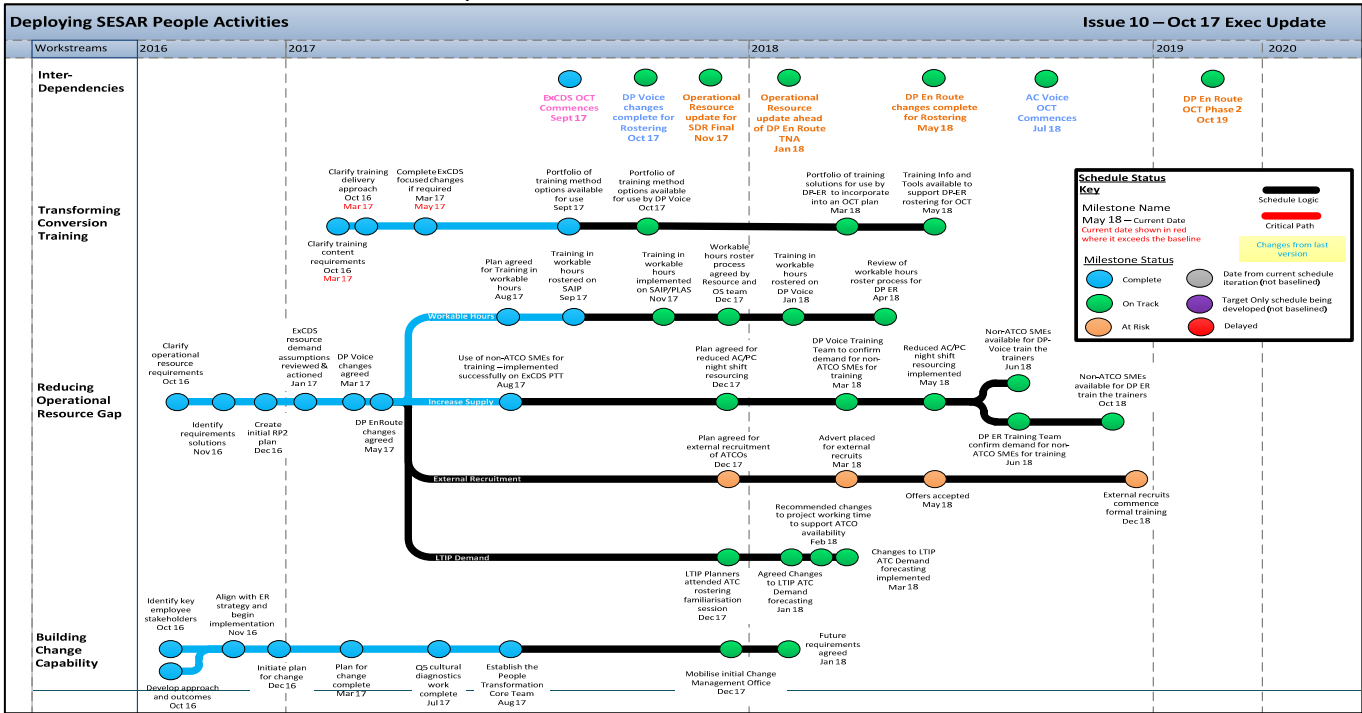
17. SIP 18 Slide Deck, Slide 36.

The October 2017 C10 Report¹⁸ also notes the following Portfolio risks:

Risk Name	Description	Probability Rating	Impact Rating	Mitigation Actions	Impact of Risks
Reputational Risk	Should technical (or other) risk materialise, and impact either Safety or Service targets, there is a risk that NATS could suffer significant reputational damage which could impact our ability to operate.	Medium	High	Various programmes have been initiated (such as DSESAR and Airspace) to modernise and strengthen day-to-day operations, whilst minimising ATC workload. These programmes will also equip NATS to be able to scale operations to respond to increasing air traffic in a safe and sustainable way.	Impact to the Safety or Service operation within NATS could irreparably damage the company's reputation as global leaders in air traffic control. This could have significant impact across the entire business and affect its ability to operate.
Benefit and Delivery Risk	As a result of technical difficulties, supplier delays, or other project related issues, there is a risk that NATS is unable to deliver the full benefit associated with the change Portfolio.	Medium	Medium	Benefit panels have been established to monitor benefit delivery and provide early visibility of issues enabling corrective changes to be made to the Portfolio.	This could result in an impact to service delivery, which, in turn, would impact our reputation. Additionally the regulatory and customer relationship could be affected.
Technical Risk: Risk of System Failure	NATS continues 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 fail.	Medium / Low	High	The DSESAR Programme has been instigated to modernise NATS' operations, so we can move to 'One Operation at Two Centres on a Common Platform'. It will continue to provide a safe operation, which is flexible, efficient, reliable, secure and scalable.	Failure within the core NATS operating technologies or platforms would prove detrimental to both the service and safety offered to our customers. This will impact the company's reputation, and ultimately the ability to operate.
Technical Risk: Lack of Agility	With increasing global competition, there is a risk to the business caused by ageing technology that we will be unable to respond to our customer's evolving needs. We will also be unable to effectively drive improvement in performance and efficiency, and may miss legislative compliance targets. This could have an impact on profit margins, and ultimately could impact licence renewal.	Medium	Medium	The DSESAR Programme has been instigated to modernise NATS' operations to be able to respond to market place challenges and ever increasing global competition in a more agile way, whilst continuing to meet the expectations of our stakeholders.	Increased global competition could impact the company's profit margins if we are unable to meet our customer's needs.
Technical Risk: Legacy Systems	As a result of the re-allocation of funding from supporting existing systems to the development and implementation of new systems there is a risk that the resilience of the operation could reduce over time and the mitigation of replacing the old systems with new technology could be delayed.	Medium	High	Minimal investment needed for Sustainment until end of RP2. The Minor Sustainment project has been initiated.	This would result in an extended period of unreliability with potential impact to customers through potential delays, increased costs from sustaining old equipment and implementing new technology, with the potential to damage to NATS' reputation in implementing new technology.
System Performance and Voice Quality	As a result of legacy system failure, or the degradation of system performance or voice quality caused by moving to the new VoIP, there is a risk we could impact service delivery.	Low	High	The project has successfully completed the proof of concept, has a comprehensive V&V plan and is delivering to schedule. Consequently the likelihood of the risk materialising is assessed as low and additional portfolio mitigation action is not deemed necessary at this stage.	Failure within the core NATS operating technologies or platforms would prove detrimental to both the service and safety offered to our customers. This will impact the company's reputation, and ultimately the ability to operate.

People Plan

SIP 18 has presented a People Plan within the SIP building on the version first introduced in the 2017 Interim SIP. The People Plan is focused on the DSESAR element in order to build for the future, although as previously noted it does not represent capital investment despite it being a critical enabler for success. The People Plan¹⁹ is shown as:



18. Update on RP2 Capital Investment Programme (2015-2019) for Condition 10 v0.9 downloaded 27 December 2017, p25.

19. SIP 18 Slide Deck, Slide 42.

Analysis

The SIP18 update on the Airspace Plan, with one milestone at risk and another delayed into RP3 due to airport consultation delays, highlights the need to maintain a close working relationship between NERL and the major airports. SIP18 also notes that the 10% CO₂ emissions targets will not be met in RP2 due to changes to the plans for LAMP 2 agreed earlier in RP2 and in part driven by changes in government noise distribution policy. It is understood that, as well as the update to the noise policy, the airspace change process has also changed. These changes might impact other aspects of the Airspace Plan and should be considered in developing that plan.

The Technology Plan has declared a range of successful milestone deliveries which is clearly a welcome step forward. However, there are a number of slippages of interim milestones. Whilst NERL assert that these slippages will not affect the overall delivery of their Technology Plan, it is something that will need action and close attention to ensure that these slippages do not impact the overall programme. The customer base clearly wanted more detail on the Oceanic plans and to ensure aligned expectations and understanding NERL will need to continue to address customer questions and concerns. It is understood that NERL has continued to engage with customers since publishing the SIP and expects to publish a further document shortly to close off outstanding actions.

NERL's inclusion of a People Plan within SIP18 following its introduction in the 2017 Interim SIP is a welcome development and will help build confidence in the integrated approach to programme delivery. However, the early declaration of milestones at risk regarding the recruitment of new ATCOs warrants confirmation of how NERL will recover this key element of the wider programme. Additionally, there is a thread of resource challenges facing NERL and it would be helpful if future SIPs provided greater detail on how NERL will tackle these resource challenges without negatively impacting on operational service delivery or programme delivery.

Within the SIP18 there are two themes which should be noted:

- **Reporting Cycle**: The final version of the SIP18 published in December 2017 provided an update on detailed milestone delivery between the Draft SIP published in October and the final version. However, there were no changes shown to the timings for the formally reported milestones and NERL did not provide a revised version of the C10 update report which had been published in October 2017. In future it would be helpful to formally provide such an update either to confirm that the status was unchanged, or to document any variations where appropriate. This would also clarify the status of the formal report of status within the SIP process;
- **Reasons for slippages**: There appears to be a common theme cited for the various delays that involve requirements definitions and/or resource challenges. It is hoped that these delays are only "bedding down" as might be expected at the early stages of some of the constituent project/programmes within the overall SIP18 programme. However, it also suggests that some elements of the planning did not accurately foresee the time needed to compile NATS' specific requirements into the delivery plan.

Risk Management by NERL appears to be stable, as does the approach to Benefits Management through the programme. It should be noted that there are no plans which have been shared to date on how the programme benefits will be delivered and reported post RP2. Since the majority of the programme benefits will be seen after SIP18 it is essential that appropriate mechanisms and accountabilities for post-programme benefits management are established and formalised now rather than after programme completion.

Consultation on SIP18 between NERL and its customers has been completed with the usual varying levels of engagement by customers. NERL commissioned a formal review of their stakeholder engagement approach²⁰, particularly with respect to SIP consultation, that was published in November 2017. The report highlighted some areas for potential action and it might have been helpful if NERL had indicated its response to that report. One of the key findings in the report was that the quality of information was often “undigestable” and aligns with previous IR report comments.

For the Interim SIP17 NERL published a formal report that was clear and concise as well as using a slide deck to present key information to customers at the multi-lateral. This format was welcomed by all stakeholders and NERL’s stated intention was to follow the same approach for future SIP reports²¹ including SIP18. However, the final submission for SIP 18 consisted of just the slide deck submitted on 21 Dec 17 whilst the October C10 Update Report was not revised leaving customers to cross refer between the two.

Whilst the overall level of detail concerning updates provided by the two documents is satisfactory, the form of the submitted documents is less so. It would have been preferable for NERL to republish the C10 Update report as the formal record of programme delivery, incorporating any changes emerging from the consultation and providing the latest update on programme status. Moreover, there is insufficient analysis of why milestones have slipped and what corrective action has been taken to ensure that there is no further slippage, or potentially recover lost time and such additional information should be provided in future.

Conclusion

The submitted SIP18 does demonstrate that delivery is moving ahead at pace in some areas and already delivering operational benefits. The integration of a People Plan is a welcome development, although there is clearly more work to be done in this regard. However, there are a range of subordinate milestone delays that will need consistent and focused attention to ensure that there is no wider impact or delay. More analysis of why slippages have occurred, and what restorative action is being taken, will be essential in future to maintain credibility for the SIP process.

20. <http://www.lse.ac.uk/accounting/CARR/research/Impact/carr-NATS-final-reportpdf>

21. NATS CEO letter to CE CAA date 29 June 17.