

Appendices A to D to Final Decision for the NR23 price control review

CAP 2597b



Published by the Civil Aviation Authority, October 2023

Civil Aviation Authority
Aviation House
Beehive Ring Road
Crawley
West Sussex
RH6 0YR

You can copy and use this text but please ensure you always use the most up to date version and use it in context so as not to be misleading, and credit the CAA.

First published 2023
First edition

Enquiries regarding the content of this publication should be addressed to: economicregulation@caa.co.uk

The latest version of this document is available in electronic format at: www.caa.co.uk

Contents

Contents	3
Appendix A	4
Legal and Regulatory Frameworks	4
Appendix B	8
Abbreviations	8
Appendix C	13
Service Quality	13
Appendix D	22
Capex Engagement Incentive	22

APPENDIX A

Legal and Regulatory Frameworks

Introduction

- A1 This appendix summarises the legal and regulatory frameworks which apply to the economic regulation of NERL.
- A2 The CAA is a public corporation established¹ to act as the UK's independent aviation regulator, with civil aviation regulatory functions (economic regulation, airspace policy, safety regulation, consumer protection and aviation security regulation) being integrated within a single specialist body. As well as our responsibilities for aviation safety and consumer protection, we act as the economic regulator for certain UK airports and for air traffic services.
- A3 Chapter I of the TA00 provides for the economic regulation of air traffic services.² NERL is currently the only licence holder under the TA00, which authorises it to provide the UK en route, London Approach and Oceanic air traffic services. UK terminal air traffic services are authorised under The Air Traffic Services (Exemption) Order 2019³ and are provided on a competitive tendering basis.
- A4 Our approach to the economic regulation of NERL includes price controls, given effect through conditions in the NERL licence, where we specify the maximum amounts that NERL can charge its customers for its regulated services. These amounts depend on how NERL performs against performance targets.

TA00 duties

CAA duties

- A5 As explained in the relevant chapters, our Final Decision has been formulated on the basis of the CAA's general duties set out in section 2⁴ of the TA00.
- A6 The CAA's primary duty is set out in subsection 2(1) as follows:
- “The CAA must exercise its functions under this Chapter so as to maintain a high standard of safety in the provision of air traffic services; and that duty is to have priority over the application of subsections (2) to (5).”*
- A7 With respect to safety, most aviation regulation and policy is harmonised across the world to ensure consistent levels of safety and consumer protection. Worldwide

¹ Section 2 Civil Aviation Act 1982: <https://www.legislation.gov.uk/ukpga/1982/16/section/2>

² See section 98 TA00 for the definition of “air traffic services”: [Transport Act 2000 \(legislation.gov.uk\)](https://www.legislation.gov.uk/ukpga/2000/32/section/98)

³ [The Air Traffic Services \(Exemption\) Order 2019 \(legislation.gov.uk\)](https://www.legislation.gov.uk/ukpga/2019/12/section/1)

⁴ Section 2 TA00: [Transport Act 2000 \(legislation.gov.uk\)](https://www.legislation.gov.uk/ukpga/2000/32/section/2)

safety regulations are set by ICAO. UK safety law applicable to air navigation services providers is contained in UK legislation (such as the Air Navigation Order 2016) and retained EU law and adopted Acceptable Means of Compliance (AMC), Guidance Material (GM) and Certification Specifications (CS), as amended.⁵

- A8 Throughout the development of this Final Decision, the CAA’s economic regulation and safety teams have worked together to ensure that the decisions are consistent with the CAA’s primary duty. See from paragraph 1.58 of the Introduction for further information on this.
- A9 The ‘secondary duties’ over which the primary duty has priority are set out in subsections 2(2) to 2(5) TA00.
- A10 Subsection 2(2) TA00 provides that the CAA must exercise its functions under Chapter I of the TA00 in the manner it thinks best calculated:
- to further the interests of operators and owners of aircraft, owners and managers of aerodromes, persons travelling in aircraft and persons with rights in property carried in them (referred to as “customers and consumers” in this Final Decision). Subsections 2(3) and 2(4) further provide that:
 - the only interests to be considered are interests regarding the range, availability, continuity, cost and quality of air traffic services; and
 - the reference to “furthering interests” includes a reference to furthering them (where the CAA thinks it appropriate) by promoting competition in the provision of air traffic services;
 - to promote efficiency and economy on the part of licence holders;
 - to secure that licence holders will not find it unduly difficult to finance activities authorised by their licences. We interpret this as referring to financeability of the notionally financed company;
 - to take account of any international obligations of the UK notified to the CAA by the Secretary of State (whatever the time or purpose of the notification). See further below; and
 - to take account of any guidance on environmental objectives given to the CAA by the Secretary of State. It should be noted that no such guidance has been given to the CAA by the Secretary of State.
- A11 Subsection 2(5) TA00 provides that if, in a particular case, there is a conflict in the application of the secondary duties noted above, the CAA must, in relation to that

⁵ [UK Regulations | Civil Aviation Authority \(caa.co.uk\)](https://www.caa.co.uk)

case, apply them in the manner it thinks reasonable having regard to them as a whole.

A12 Subsection 2(6) TA00 provides that the CAA must exercise its functions under Chapter I of the TA00 so as to impose on licence holders the minimum restrictions which are consistent with the exercise of those functions.

NERL's duties

A13 The TA00 also places duties on NERL as a licence holder. It must:⁶

- secure that a safe system for the provision of authorised air traffic services in respect of a licensed area is provided, developed and maintained;⁷
- take all reasonable steps to secure that the system is also efficient and coordinated;
- take all reasonable steps to secure that the demand for authorised air traffic services in respect of a licensed area is met; and
- have regard, in providing, developing and maintaining the system, to the demands which are likely to be placed on it in the future.

UK's international obligations

A14 As required by section 2(2)(d) TA00, in developing our decisions in respect of the price controls in NERL's licence, the CAA has taken account of the UK's international obligations which have been notified to the CAA by the Secretary of State. These include:

- Article 15 of the Chicago Convention 1944;
- the Eurocontrol Multilateral Agreement relating to Route Charges 1981 (the Multilateral Agreement);
- air services agreements and provisions relating to the imposition of charges on airlines for the provision of air traffic services in agreements between the UK and third countries; and
- agreements between the UK and Republic of Ireland on parts of the Atlantic Ocean.

⁶ Section 8 TA00: [Transport Act 2000 \(legislation.gov.uk\)](https://www.legislation.gov.uk)

⁷ Subsection 8(4) TA00 explains that for the purposes of subsection 8(1)(a), "a system for the provision of services is safe if (and only if) in providing the services the person who provides them complies with such requirements as are imposed by Air Navigation Orders with regard to their provision."

UK Performance Plan

- A15 The UK and the other contracting states to the Multilateral Agreement (Contracting States) have agreed to adopt a common policy in respect of the calculation of the charges and of their cost base, which is set out in the Principles for establishing the cost-base for en route charges and the calculation of the unit rates (Eurocontrol Principles).⁸ The CAA will continue to take account of the determined costs methodology set out in the Eurocontrol Principles when determining the charges for the UK en route air traffic services. See from paragraph 1.50 of the Introduction for further information on this.
- A16 Under the Eurocontrol Principles, Contracting States following the determined costs method are required, amongst other things, to have a performance plan. The Eurocontrol Principles do not prescribe in detail what needs to be included in a performance plan and nor do they set out a procedure for its adoption. We engaged with stakeholders on the proposed scope and procedure for adoption of the UK NR23 performance plan in July 2021.
- A17 As explained in the Executive Summary and the Introduction, the UK's Performance Plan consists of two parts:
- our decisions in relation to NERL's UK en route costs which are set out in this Final Decision and implemented through modifications to its licence; and
 - our decision in relation to the DfT, Met Office and CAA en route costs (the Non-NERL costs), which was set out in CAP2553b.⁹

⁸ Eurocontrol Principles dated January 2020 (EN): [doc-20.60.01-eurocontrol-principles-january-2020-en.pdf](#)

⁹ CAP 2553b: [NR23 Review: UK performance plan Decision on DfT, Met Office and CAA en route costs \(2023 to 2027\)](#)

APPENDIX B**Abbreviations**

Abbreviations	
ACOG	Airspace Change Organising Group
ACOMS	Airspace Coordination and Obstacle Management Service
ACP	Airspace Change Proposal
ADP	Aéroports De Paris
ADS-B	Automatic Dependent Surveillance-Broadcast
AICR	Adjusted Interest Coverage Ratio
AMS	Airspace Modernisation Strategy
ANSP	Air Navigation Service Provider
ART	French Transport Regulatory Authority
ATC	Air Traffic Control
ATCE	Air Traffic Control Engine
ATCO	Air Traffic Control Officer
ATFM	Air Traffic Flow Management
ATM	Air Traffic Management
ATS	Air Traffic Services
ATSA	Air Traffic Services Assistant
AWE	Average Weekly Earnings
CAA	UK Civil Aviation Authority
CAAPS	CAA Pension Scheme
CAGR	Compound Annual Growth Rate
Capex	Capital Expenditure
CAPM	Capital Asset Pricing Model
CCWG	Customer Consultation Working Group

CDO	Continuous Descent Operations
CMA	Competition And Markets Authority
CMA determination	Competition And Markets Authority Determination on Reference Period 3
Contracting States	Contracting States to the Multilateral Agreement on Route Charges
CPI	Consumer Price Index
CRCO	Eurocontrol Central Route Charges Office
CSU	Chargeable Service Units
DB	Defined Benefit
DC	Defined Contribution
Decision on NERL's licence	Our Decision: The Decision taken by the CAA to modify NERL's Licence to implement the NR23 Price Control
DfT	Department for Transport
DIWE	Demonstrably Inefficient and/or Wasteful Expenditure
DUC	Determined Unit Cost
EUMETSAT	European Organisation for the Exploitation of Meteorological Satellites
FFO	Funds From Operations
Final Decision	Our final decision on the UK NR23 performance plan under the Eurocontrol Principles including statutory consultation on the modifications to NERL's Licence
FIR	Flight Information Region
Flint	Flint Global
FMARS	Future Military Area Radar Service
FTE	Full-Time Equivalent
GAD	Government Actuary's Department
HAL	Heathrow Airport Limited

IATA	International Air Transport Association
ICAO	International Civil Aviation Organisation
IFR	Instrument Flight Rules
ILGs	Index-Linked Gilts
IMF	International Monetary Fund
IR	Independent Reviewer
IRR	Internal Rate of Return
iSIP21	Interim Service & Investment Plan 2021
iSIP22	Interim Service & Investment Plan 2022
MoD	Ministry of Defence
NERL	NATS (En Route) Plc
NERL's business plan	NERL's NR23 business plan
NOP	Network Operations Plan
NSL	NATS Services Limited
NWR	Network Weather Resilience
OBR	Office For Budget Responsibility
OFF	Opex Flexibility Fund
opex	Operating Expenditure
PBO	Pensions Benefit Obligation
PCA	Pension Cash Alternative
PCM	Price Control Model
Provisional Decision	Our provisional decision on the UK NR23 performance plan under the Eurocontrol Principles including statutory consultation on the modifications to NERL's Licence
RAB	Regulatory Asset Base

reconciliation review	Review: The CAA review of NERL's efficient costs in 2020 to 2022
RfR	Risk-Free Rate
RIM	Rolling Incentive Mechanism
RP2 (2015 to 2019)	Reference Period 2
RP3 (2020 to 2022)	Reference Period 3
RPI	Retail Price Index
RRA	Redeployment & Redundancy Agreement
SAAS	Software As a Service
SARG	The CAA's Safety and Airspace Regulation Group
SES	Single European Sky
SESAR	Single European Sky ATM Research
SIP	Service and Investment Plan
SOC	Standard Occupational Classification
SoS	Secretary of State
SWIM	System Wide Information Management
TA00	The Transport Act 2000
TANS	Terminal Air Navigation Services
TATC	Trainee Air Traffic Controller
the Eurocontrol Principles	Eurocontrol Principles for establishing the cost base for en route charges and the calculation of unit rates
the Multilateral Agreement	Eurocontrol Multilateral Agreement Relating to Route Charges 1981
the NERL licence	NERL's Air Traffic Services Licence
TMR	Total Market Return
TPR	The Pensions Regulator

TRS	Traffic Risk Sharing
TSU	Total Service Unit
UKATS	UK en route and London Approach
UTM	Uncrewed Aircraft System Traffic Management or Unified Traffic Management
VR	Voluntary Redundancy
WACC	Weighted Average Cost of Capital
WAFS	World Area Forecast System
WBS	Whole Business Securitisation

APPENDIX C

Service Quality

- C1 This appendix provides further details of service measures and incentives, including:
- an overview of the measures we use to assess NERL's performance in relation to environmental flight efficiency and delay; and
 - details of our Final Decision on service quality targets and incentives, including the structure of incentives, the annual review of the environmental measure and exemption days for certain capacity measures.

Overview of service quality measures

Environment metric (3Di)

- C2 NERL's environmental performance is measured and incentivised through the 3Di metric which aims to monitor and improve flight efficiency. 3Di stands for 3-Dimensional Inefficiency/Insight. It is a metric that calculates the score for the efficiency of a flight based on comparing the actual path flown against an optimal profile. The annual score is a combined score for all flights and indicates overall efficiency in UK airspace. It is a proxy measure for aircraft fuel burn and emissions.
- C3 The 3Di score method is used to calculate an annual score as a combination of:
- horizontal flight efficiency - defined as the difference between the UK portion of the overall optimal flight distance and the actual flight path flown within UK airspace. Horizontal flight efficiency is measured from the actual entry and exit point into and out of UK FIR, where the optimal flight distance is calculated consistent with Eurocontrol methods; and
 - vertical flight efficiency - defined as the difference in altitude between the reference (requested) flight level and the actual altitude of the period of level flight, alongside the time spent in level flight. Vertical inefficiency is split into flight phases of climb, cruise and descent.
- C4 Vertical (in)efficiency is calculated for each individual flight phase as follows:

$$\text{Vertical Inefficiency} = V = \sum_s \frac{T_s}{T} \left(\frac{L - L_s}{L} \right)$$

where: V=Vertical Inefficiency, T=Total Flight Time (UKFIR), S=Step reference,¹⁰
Ts=Duration of Step, L=Reference Level, Ls=Level of Step.

- C5 Vertical and horizontal flight efficiency are combined using the following model form based on a multiple linear regression. This is a proxy estimate for the impact of the flight trajectory on fuel burn:¹¹

$$\varphi = \beta_1 H + \beta_2 V_{CL} + \beta_3 V_{CR} + \beta_4 V_D$$

Where φ = 3D Inefficiency Score, β_1 , β_2 , β_3 and β_4 are constants, V_{CL} = Vertical Inefficiency of Climb, V_{CR} = Vertical Inefficiency of Cruise, V_D = Vertical Inefficiency of Descent, and H = KEA Horizontal Inefficiency

- C6 The 3Di coefficients for each of the four parameters (horizontal, climb, cruise and descent) are shown in Table C.1. They were developed through a base model which used a sample of 145,865 flights from 2013, and tested on a further sample of 72,935 flights.

Table C.1: 3Di coefficients

Parameter	Coefficient
Horizontal flight inefficiency (β_1)	1.1876
Climb vertical flight inefficiency(β_2)	0.6687
Cruise vertical flight inefficiency(β_3)	0.7617
Descent vertical flight inefficiency (β_4)	1.8712

Source: NERL

Capacity metrics (C1 to C4)

- C7 NERL's capacity performance, in terms of the delays incurred by aircraft resulting from en route air navigation services, is assessed through the measures set out below.
- C8 C1 (all delays) is a measure that captures all Air Traffic Flow Management (ATFM) delays attributable to ANS, expressed as the average delay per flight. We set targets for C1 but these are not subject to financial incentives.

¹⁰ A step is a period of the flight at constant level, each step having a corresponding duration and level.

¹¹ This estimated impact is calculated by comparing the fuel burn for the journey based on an optimal trajectory (continuous climb and descent to/from the reference flight level) to the fuel burn for the actual trajectory followed. These fuel burn estimates are generated by the NATS Kerosene Emissions Research Model (KERMIT) model which uses data on aircraft performance from the Eurocontrol BADA 3.11 database.

- C9 C2 (NERL-attributable delay) is a measure that includes only ANSP-attributable delays,¹² excluding for example delays caused by weather conditions. For NR23 the C2 targets are 3.84 seconds per flight lower than those that we set for C1 delays, based on the average difference between these two metrics between 2015 and 2019. The targets we set for C2 delays in NR23 also determine the targets for C3 delays.
- C10 C3 (impact score) is a measure that places greater weight on long delays and delays in the morning and the evening peaks. NERL's performance is measured by applying the weights shown in Table C.2 below, which were developed through consultation between stakeholders in a previous control period and will continue to apply in NR23.

Table C.2: Weights for C3 impact score

	Morning peak period	Evening peak period	Other times
Delay > 0 and <= 15 minutes	3	2	1
Delay > 15 and <= 30 minutes	6	3	2
Delay > 30 and <= 60 minutes	9	6	3
Delay > 60 minutes	18	9	6

Source: CAA

Notes: "Morning peak" means flights with an off-block estimated time between 0400 and 0800 UTC in Summer (April – October inclusive) and between 0500 and 0900 UTC in Winter (January – March inclusive and November-December inclusive). "Evening Peak" means flights with an off-block estimated time between 1500 and 1900 UTC in Summer (April –October inclusive) and between 1600 and 2000 UTC in Winter (January-March inclusive and November-December inclusive).

- C11 Consistent with our approach in RP3, we have set the upper threshold (above which NERL incurs penalties) for C3 as 2.0 times the C2 target, and the lower threshold (below which NERL earns bonuses) at two-thirds of the upper threshold (or four-thirds of the C2 target). The target for C3 is midway between these two thresholds, and is therefore equal to five-thirds of the C2 target.¹³
- C12 C4 (daily excess delay score) is a weighted measure that is triggered each day that the average delay per flight exceeds a certain threshold. The thresholds and weightings are shown in Table C.3 below. Delays on days when the average is below the threshold are weighted as zero.

¹² These causes are ATC capacity (C), ATC routeings (R), ATC staffing (S), ATC equipment (T), airspace management (M) and Special Event (P), as set out in the Eurocontrol, ATFCM Users Manual.

¹³ In RP3 we calculated the upper and lower thresholds as described, but did not identify a specific target. For NR23 we are identifying a target for C3 with deadbands either side of the target, so that our approach is consistent with that for other service quality metrics.

Table C.3: Weights for C4 excess delay score

Season	Daily delay thresholds (average delay per flight)		Weighting
Winter	Lower threshold	40 seconds	1
	Upper threshold	80 seconds	2
Summer	Lower threshold	60 seconds	1
	Upper threshold	110 seconds	2

Source: CAA. Summer is April–October inclusive, winter is January–March inclusive and November–December inclusive.

- C13 For both C3 and C4 measures NERL is able to exclude up to 100 days (over the whole of NR23) when new systems or airspace changes are being implemented and transitions are made. This is explained further below alongside other details of our Final Decision.
- C14 On days when C4 is triggered and at least some C3 delays are attributed to equipment failure, the delays for that day will count towards only one of the annual scores for C3 or C4, depending on which has the highest implied penalty for that day.

Details of our Final Decision

- C15 Table C.4 below shows our Final Decision on the targets for each service quality metric.

Table C.4: Final Decision on service quality targets

		2023	2024	2025	2026	2027
3Di	score	27.59	26.99	26.45	25.91	25.33
C1	seconds/flight	12.29	12.79	12.79	12.79	12.79
C2	seconds/flight	8.45	8.95	8.95	8.95	8.95
C3	seconds/flight	14.08	14.91	14.91	14.91	14.91
C4	score	1800	1800	1800	1800	1800

Source: CAA

- C16 The sections below give further details of how these targets will be implemented, including the structure of financial incentives (for 3Di and C2 to C4), the annual review protocol for 3Di, and the exemption days that NERL is able to exclude from the C3 and C4 measures.

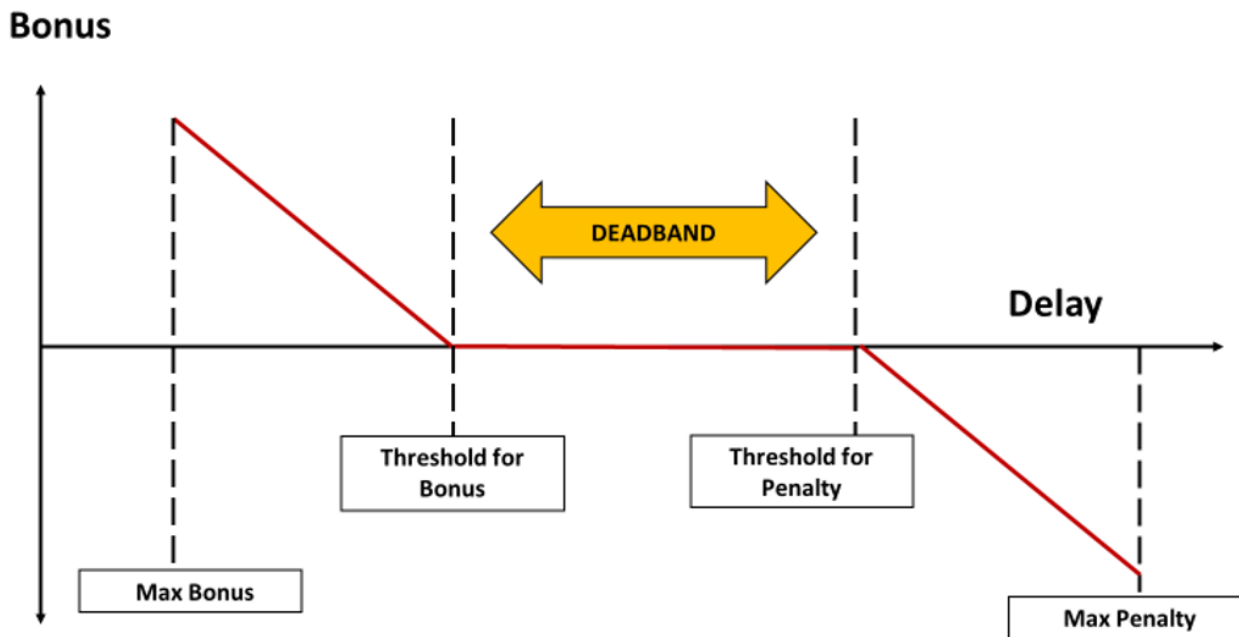
Structure of incentives

- C17 NERL is subject to financial incentives for all measures described above, except for C1. The basic structure of the incentives for 3Di, C2 and C3 are illustrated in Figure C.1 below. In each case, there is a deadband around the target where no bonuses

or penalties are incurred. Outside of the deadband, the amount of bonus or penalty increases until a further threshold is reached at which the maximum bonus or penalty applies. The maximum bonuses and penalties are set out in chapter 2 and reproduced in Table C.5 below.

- C18 The incentive for C4 is “penalty” only and there is no deadband. Consistent with the other measures, the size of the penalty increases gradually until it reaches the maximum.

Figure C.1: Indicative summary of incentive structure



Source: CAA

Table C.5: Maximum bonuses and penalties

	Bonus (% of Determined Cost)	Penalty (% of Determined Cost)
3Di	0.5%	0.5%
C1	0%	0%
C2	0.05%	0.25%
C3	0.25%	0.75%
C4	0%	0.25%

Source: CAA

- C19 Within this overall approach, the size of the deadbands and the method for determining the thresholds where the maximum bonus or penalty occur differ between the measures, as explained below and summarised in Table C.6.

- C20 For 3Di, the deadband is $\pm 5\%$ and the maximum bonus or penalty is reached when performance is 20% greater or less than the deadband threshold, i.e. a difference of $\pm 25\%$ from the target).
- C21 Similarly, for C2, the deadband is $\pm 15\%$ and the maximum bonus or penalty is reached when performance is a further 40% greater or less than the deadband threshold, i.e. a difference of $\pm 55\%$ from the target.
- C22 For C3, the deadband is $\pm 20\%$, but the calculation of bonuses and penalties is based on pre-determined incentive rates. These are calculated, based on Determined Costs and traffic forecasts for 2023, so that the maximum bonus is awarded if the C3 score is zero, and the maximum penalty is incurred if the C3 score exceeds the upper threshold by an amount equal to that threshold (i.e. the outturn C3 score is 140% above the target). The incentive rates are calculated based on 2023 values, and then uplifted by (CPI) inflation in subsequent years.
- C23 With the 2023 Determined Cost of £639.170 million (2020 CPI prices), the maximum bonus and penalty for C3 are respectively £1.598 million (i.e. 0.25% of £639.170 million) and £4.794 million (i.e. 0.75% of £639.170 million). Given the C3 bonus threshold of 11.27 seconds per flight (i.e. four-thirds x the C2 target of 8.45 seconds), the C3 penalty threshold of 16.90 seconds (i.e. 2 x the C2 target of 8.45 seconds) and the 2023 traffic forecast of 2.422 million flights, the C3 incentive rates for 2023 are:
- a bonus rate of 0.059 ($= 1.598 / (11.27 \times 2.422)$); and
 - a penalty rate of 0.117 ($= 4.794 / (16.90 \times 2.422)$).
- C24 As noted above, the C4 incentive is penalty only and there is no deadband. As for C3, penalties are calculated on the basis of a pre-determined incentive rate. This is calculated, again based on a traffic forecast of 2.422 million flights, so that the maximum penalty of £1.598 million (i.e. 0.25% of £639.170 million) would be incurred if NERL's 2023 C4 score is 20% (or 360 = 20% of the target of 1800) above the target.
- C25 The C4 incentive rate for 2023 is therefore 0.00183265 ($= 1.598 / (360 \times 2.422)$). As with C3, this incentive rate will be uplifted by (CPI) inflation in subsequent years.

Table C.6: Summary of bonus and penalty ranges (% difference from target)

	Max bonus payable	Threshold for bonus	Threshold for penalty	Max penalty payable
3Di	- 25%	- 5%	+ 5%	+ 25%
C2	- 55%	- 15%	+ 15%	+ 55%
C3	-100% *	- 20%	+ 20%	+ 140% *
C4	n/a	n/a	0%	+ 20% *

Source: CAA

* For C3 and C4 bonuses and penalties are calculated using a pre-determined incentive rate. The rates for 2023 are calculated based on 2023 Determined Costs and traffic forecasts, together with the thresholds shown in this table. The rates for subsequent years are not recalculated but are uplifted in line with (CPI) inflation.

Traffic modulation of C2 and C3 thresholds

- C26 The same approach to modulating C3 for traffic volumes that was used in RP3 will be maintained in NR23 for both C2 and C3 measures. If traffic is more than $\pm 4\%$ different from the level forecast for that year, the bonus/penalty thresholds will be adjusted. The thresholds will be modulated by the net change in traffic beyond the $\pm 4\%$ threshold, multiplied by an “elasticity factor” of 5.
- C27 For example, if the traffic growth in a particular year is 7% higher than forecast, the thresholds will be adjusted upwards by 15% (i.e. $(7\% - 4\% = 3\%) \times 5$). To illustrate, should this be the case in 2023, the C3 bonus threshold would increase from 11.27 to 12.96 ($= 11.27 \times 1.15$) and the penalty threshold would increase from 16.90 to 19.44 ($= 16.90 \times 1.15$).

3Di annual review protocol

- C28 The continued appropriateness of the modelling coefficients used to generate the 3Di score is currently tested on an annual basis based on a representative sample of data from the previous year. If the difference between the mean 3Di score produced by the base model and the annual review test model is greater or equal to 8%, then the test is considered failed and the financial incentives for that year are suspended.
- C29 We intend that the flight efficiency regression model and output will continue to be reviewed each year. The annual review will test the continued appropriateness of the regression modelling coefficients that underpin the 3Di as described above. As noted in chapter 2 we will consider changes to the annual 3Di review metric as part of a wider review of the 3Di model in NR23.
- C30 The annual review will use a sample of the review year data chosen (using cluster sampling) to provide a sample reflective of the underlying population, with a target of 50,000 flights, and apply the same linear regression methodology used to derive new 3Di model coefficients.

- C31 The test model will be applied to the full calendar year data from the review year and the calculated mean 3Di score is compared to the actual mean 3Di score using the base model (3DI) for the year.
- C32 If the difference between the mean 3Di score produced by the base model and the test model is greater than or equal to 8% of the base model score (3DI), then our intention is that the 3Di bonus/penalty for the year would not be applied. If the difference between the mean scores falls within the pre-specified threshold, then the bonus/penalty is applied.
- C33 The test will be verified by us, and NERL should supply all data used to undertake the analysis (and any other relevant data requested) to us by end of March in each year to allow the verification to be undertaken.
- C34 The data to be supplied to us will comprise:
- dataset to comprise of 50,000 sample flights representative of the population of all flights in the year;
 - details of how the sample has been chosen using cluster sampling, including number of clusters identified, total number of days falling within each cluster, number of days sampled from each cluster and number of flights operated on the days sampled;
 - the test model coefficients;
 - the test model estimate of 3Di for the review year (X) based on the test and base model adjusted by -0.6 to account for exempt non-revenue flights;
 - the existing set of coefficients from the base model;
 - the existing estimate of 3Di for the review year (Y) based on the base model coefficients; and
 - for each flight - values for I, H, VCI, VCr & VD as used in the existing model.
- C35 The result of the annual review will be published by 30 April in the year following the review year to allow financial statements to reflect the outcome.
- C36 If the annual review test falls outside the accepted tolerance in a given year, then the test will be repeated in the following year as per the protocol set out above.
- C37 If the annual review test falls outside the accepted tolerance in two consecutive years, we would expect the incentive to be withdrawn for the remainder of the period. If, however, the CAA and NERL are in agreement that the retention of the incentive is justified then it may remain in place until the following annual review. This justification would require sufficient analytical work, to be conducted and shared by NERL, to demonstrate:
- an understanding of the underlying causes of the variation in test results, and

- that continuing the model in its existing form would not lead to the generation of unwarranted bonuses/penalties in future years.

Exemption days for C3 and C4

C38 The principles for the application and use of exemption days are consistent with those set out for RP3 and are as follows:

- the mechanism allows NERL to exclude up to 100 days from counting against the C3 and C4 incentives when major new systems or airspace changes are being implemented and transitions are made;
- the exemption days apply only to the C3 and C4 measures;
- the amount of days NERL will be allowed to use towards its transitions is capped at 100 days for the entire five-year period of NR23;
- NERL will consult airspace users on the exemption days in advance under currently existing consultation mechanisms (e.g. SIP) or targeted consultation;
- the length of any given transition should be limited to three weeks (unless otherwise agreed with users) and will be agreed in advance as well as the amount of days from the overall cap that NERL wishes to use towards this transition;
- the number of days agreed during the consultation will be fixed (unless subsequently revised with the agreement of users) but the particular exempt days within the agreed transition period would not need to be specified as part of the consultation;
- NERL will carry out the transition by means of the detailed steps and timing that are most operationally practical and *ex post* nominate the exempt days (up to the pre-agreed maximum) for the transitional period (length of which is also pre-agreed); and
- if at the end of the transition period NERL does not need/wish to use the pre-agreed amount of exempt days, these will still count against the overall 100 day cap (i.e. they cannot roll over of unused exclusions).

C39 In addition to the above, NERL shall include a section in its quarterly performance reports on the proposed and actually used exemption days.

APPENDIX D**Capex Engagement Incentive**

Overall aim of the guidance

- D1 This guidance sets out how we intend to assess NERL's performance in respect of the capex engagement incentive set out in Condition 10 of the NERL Licence. Subject to appropriate engagement and consultation, and taking account of our statutory duties, it may be revised from time to time to reflect best practice, the law and our developing experience.
- D2 This guidance addresses the following issues:
- Measuring performance: building on our experience of the operation of the incentive, the guidance provides details on how we intend to assess NERL's capex engagement including detailed scoring criteria.
 - Process and timings: setting out the processes and timings involved in the assessment of NERL's capex engagement.
 - Calculating financial penalties: setting out how financial penalties should be calculated.
- D3 The Independent Reviewer (IR) should score NERL's performance using this guidance and assess NERL's performance from the perspective of what users of its services expect from meaningful engagement by NERL on its capex plans, so that:
- there is sufficient transparency of NERL's capex plans and enhanced accountability by NERL to its stakeholders; and
 - the incentive encourages NERL to seek improvements to the development of its capex plan to benefit both current and future users of its services.
- D4 In assessing the appropriate score that should be awarded to NERL in relation to each assessment criterion, the IR shall consider NERL's engagement with its stakeholders on its plans for capex as a whole, including, the information it provides to stakeholders and/or the IR through:
- the Service and Investment Plans ("SIPs"), published in accordance with Condition 10 of the Licence;
 - any "interim" SIPs published during the regulatory year; and
 - any other meetings, forums or other forms of engagement relating to the development of its capex plan, such as the Technical Customer Advisory Board (TCAB) or other meetings or forums with a similar purpose.
- D5 As part of this, the IR should consider the extent to which NERL has sought to provide information to stakeholders on an equal basis and given them reasonable opportunity

to engage with NERL on these matters. While the focus of this incentive is NERL's capex engagement, the IR may consider opex where appropriate, for example in relation to the "optioneering" criterion.

- D6 In determining the specific score for each of the criteria, the IR's assessment shall include (but not be limited to) assessment of the matters set out in the Table D.1 below.

Measuring Performance

Criteria for assessment

- D7 In assessing the quality of NERL's engagement on its capex plans, we intend to use the following criteria.
1. **User Focus:** including timeliness of information, traceability and proportionality: NERL should provide information to users, the IR and us:
 - a. in forms, and through mechanisms, that reflect user priorities and resource constraints and that are clear and accessible;
 - b. in a timely manner, including through providing early warning and explanation of factors that may put planned delivery timelines at risk;
 - c. that enables specific elements of projects or programmes that have moved between programmes (such as the scope, costs, delivery timescales and benefits accruing from those changes, and any impacts on opex) to be traced from one consultation to another; and
 - d. the level of substantiation NERL provides should reflect the materiality of the change under consideration.
 2. **Optioneering:** NERL should seek to identify a range of different responses that might be adopted where practicable, explain the need for the programme and the outcomes and benefits it is seeking to deliver, and to provide opportunities for engagement and scrutiny of those options by users and the IR. In addition, NERL should be transparent about the opex impacts and delivery risks of different options presented.
 3. **Responsiveness:** NERL should respond constructively, meaningfully and in a timely manner to submissions by users, the IR and us, and explain clearly how it has considered and taken account of those submissions.
 4. **Mitigating/corrective actions:** NERL's engagement with its customers should include appropriate mitigating and/or corrective actions in the light of submissions by users, the IR and us, and it should communicate those actions to stakeholders in a timely manner.

Scoring system

- D8 NERL's performance for each capex project during the period will be scored for each of the assessment criteria against a points-based scoring system on a scale of 1 to 4, where:
- 1 1 = poor;
 - 2 2 = below expectations;
 - 3 3 = baseline expectations; and
 - 4 4 = excellent.
- D9 The IR will also be able to awards half marks of 1.5, 2.5 and 3.5 when scoring NERL's performance under the assessment criteria.
- D10 Further guidance of what NERL would need to achieve to obtain each of these scores is set out in Table D.1 below.

Table D.1: Proposed guidance on scoring

	Underperformance		Baseline expectations (3)	Excellent (4)
	Poor (1)	Below expectations (2)		
1. User Focus, including timeliness of information, traceability and proportionality	<p>Some delay in providing information to at least some stakeholders, limited early warning of factors that may affect delivery.</p> <p>Unclear, inaccessible or perfunctory provision of information on the capex proposed (and other details, including where practicable what is proposed, cost, delivery timescales and benefits, and any impacts on opex) with limited regard for user priorities and resource constraints.</p> <p>Limited additional information provided for material changes to the capex plan and unclear on traceability of changes back to previous plans.</p>	<p>Information provided in a timely but not proactive manner to some/all stakeholders, reasonable early warning of factors that may affect delivery.</p> <p>Reasonably clear, accessible and meaningful information provided on the capex proposed (and other details, including where practicable what is proposed, cost, delivery timescales and benefits, and any impacts on opex) with reasonable regard for user priorities and resource constraints.</p> <p>The level of substantiation provided reasonably reflects the materiality of the change under consideration but does not allow users systematically to trace changes to the plan to previous plans.</p>	<p>Information provided to all stakeholders proactively and promptly, early warning and (where relevant) explanation of factors that may affect delivery.</p> <p>Clear, accessible and meaningful information on the capex proposed, including where practicable what is proposed, cost, delivery timescales and benefits, and any impacts on opex, with good regard for user priorities and resource constraints.</p> <p>Comprehensive substantiation for all material changes to the capex plan under consideration, including clear traceability of all material changes from previous plans.</p>	<p>Information provided to all stakeholders proactively and promptly, excellent quality early warning and (where relevant) explanation of factors that may affect delivery.</p> <p>Extremely clear, accessible and meaningful information on the capex proposed, including where practicable what is proposed, cost, delivery timescales and benefits, and any impacts on opex, with excellent consideration of user priorities and resource constraints.</p> <p>Excellent substantiation for all material changes to the capex plan under consideration and comprehensive traceability of all changes from previous plans.</p>
2. Optioneering	<p>Poor information on the overall approach to optioneering adopted (including the need for the programme or the outcomes and benefits that</p>	<p>Limited information on the overall approach to optioneering adopted (including the need for the programme or the outcomes</p>	<p>Good information on the overall approach to optioneering adopted (including the need for the programme and the</p>	<p>Excellent information on the overall approach to optioneering adopted (including the need for the programme and the</p>

	<p>NERL is seeking to deliver).</p> <p>Limited information on alternative options presented (including limited discussion of costs, risks, timing, how benefits would be delivered, opex interactions, delivery risks and service quality), limited opportunity for meaningful scrutiny of relative merits of different options by users and IR.</p>	<p>and benefits that NERL is seeking to deliver).</p> <p>A range of different options identified where possible (including costs, risks, timing, how benefits would be delivered and explicit consideration of opex interactions, delivery risks and service quality), reasonable opportunities for meaningful user and IR engagement and scrutiny.</p>	<p>outcomes and benefits that NERL is seeking to deliver).</p> <p>Good information provided on a range of alternative options where possible (including costs, risks, timing, how benefits would be delivered and explicit consideration of opex interactions, delivery risks and service quality), good opportunities for meaningful user and IR engagement and scrutiny.</p>	<p>outcomes and benefits that NERL is seeking to deliver).</p> <p>Excellent information provided on alternative options where possible (including costs, risks, timing, how benefits would be delivered and explicit consideration of opex interactions, delivery risks and service quality), extensive opportunities for meaningful user and IR engagement and scrutiny.</p>
3. Responsiveness	<p>Perfunctory response to at least some user and IR submissions, insufficiently clear or untimely explanation how these submissions have been accounted for.</p>	<p>Generally constructive response to user and IR submissions, reasonably clear and timely explanation to some/all stakeholders of how these submissions have been accounted for.</p>	<p>Engaged and constructive response to user and IR submissions, clear and timely explanation to all stakeholders of how these submissions have been meaningfully accounted for.</p>	<p>Engaged and highly constructive response to user and IR submissions, very clear and timely evidence to all stakeholders that submissions have been meaningfully accounted for after substantial consideration.</p>
4. Mitigating/corrective actions	<p>Limited evidence of mitigating and/or corrective actions, where appropriate, following user and IR submissions. Actions not communicated to at least some stakeholders in a timely manner.</p>	<p>In most cases reasonable mitigating and/or corrective actions taken, where appropriate, following user and IR submissions. Actions communicated to some/all stakeholders in a timely manner.</p>	<p>In almost all cases appropriate mitigating and/or corrective actions taken promptly, where appropriate, following user and IR submissions. Actions clearly explained to all stakeholders in a timely manner.</p>	<p>In all cases appropriate mitigating and/or corrective actions taken promptly and proactively, where appropriate, following user and IR submissions. Actions very clearly explained to all stakeholders in a timely manner.</p>

Notes:

“timeliness” includes not only the timeliness of the overall engagement with stakeholders, but also the timeliness of responding to stakeholders’ feedback;

“traceability” applies to identifying where specific deliverables and costs have either changed or moved between projects or programmes. Traceability should be such that changes to deliverables, project milestones, project costs and benefits can be clearly identified between the plans published by NERL over time. NERL should reconcile those changes to deliverables, project milestones and project costs to the delivery of the specific benefits that would accrue from those elements and any impacts on opex or other capex projects. Traceability should also indicate those elements of projects that are no longer planned to be delivered or which NERL plans to deliver later. Particular attention should be given to addressing the traceability of changes to those elements of the capital plan that are to be delivered in the two years following the date of the Service and Investment Plan in question; and

“optioneering” includes not only the setting out how NERL has considered different options and seeking stakeholders’ views on them, but also the benefits of those options and the opex impact of changes to the capex programme the consequential changes to the overall capex plan that any such changes bring. The IR should award a score of “baseline expectations” (3) in respect of those projects of programmes which have reached a sufficient stage of maturity that it would not be appropriate for NERL to engage in further optioneering but should be focusing on delivery.

Process and timings

Timings, periodicity and relevant score

- D11 The IR will score NERL's performance twice a year, after publication of the SIP and interim SIP. For the purpose of assessing any possible penalty, the relevant score will be the final score for each project or programme awarded during the price control period and prior to the decision for the next price control review. This score will be based on the last engagement assessed in the latest SIP or interim SIP (rather than, for example, a look back over the whole of the period). Should a capex programme end before the end of the period, the final score for that programme will be used.
- D12 We will take account of the findings of the IR and representations from stakeholders (including NERL) in forming our assessment. We will make the final decision on scoring NERL's performance. If our score is different from the IR's score, we will clearly explain why this is the case. Any final penalty will be calculated and applied at the price control review, which will provide NERL and other relevant stakeholders with an opportunity to appeal any decision (in addition to its procedural rights to judicial review).

Calculating an overall capex engagement score

- D13 The IR will calculate an average final score for each project using a simple average across the scores achieved under each assessment criterion. For calculating the overall engagement score, average project scores will continue to be weighted according to their forecast capex spend. We explain below what may happen to the weightings if changes in scope occur to certain projects.

Projects included in the incentive

- D14 We will engage with NERL and users before deciding on the projects and programmes that are to be included in the scope of the scoring. It may be appropriate to condense individual projects into a smaller number of larger programmes to be reviewed together, although some individual projects may also be of sufficient importance to users to warrant scoring on an individual basis.
- D15 We envisage having a relatively small number of projects/programmes which collectively represent a large share of NERL's overall total capex.

Assessment steps

- D16 NERL's consultation of users on its capex should be continuous and engagement is not restricted to the SIP. The SIP should be viewed as a summary of NERL's consultations. While the SIP would be a natural basis for our assessment, we will consider the quality of NERL's engagement more broadly.
- D17 It is for NERL to clarify the purpose of each discussion forum at which information on capex is being presented (for instance, the TCAB) and how this fits into the consultation process for the SIP. We expect the IR to consider NERL's approach to

consultation in subsidiary forums to support the SIP process in the assessment of the appropriate score. As part of this, the IR should consider whether the role of each forum is clear to users, and whether all users have appropriate access to equivalent information in a timely manner to be able to contribute to NERL's consultation processes.

D18 The IR and users may engage with each other directly, either at the publication of the annual SIP or at any other point in time. However, users' primary interface should continue to be with NERL and they should use all reasonable endeavours to work within the SIP processes.

D19 The assessment will proceed in the following steps.

5 Step 1) Initial and ongoing assessments

- NERL will provide us, the IR and users with continuous updates on capex projects/programmes. In doing so, it will use feedback from the IR, users and us and engage with users and the IR. The regular SIPs and interim SIPs, supplemented by quarterly updates, will represent a record of NERL's consultations.
- The IR will then give a score for the quality of NERL's engagement following the publication of each SIP and interim SIP. For the initial assessment, the IR will score NERL's engagement on the basis of the next SIP or interim SIP after the publication of the final version of this guidance.
- We and the IR will work with NERL to set out the reasons for how we have scored its performance and help NERL to understand where improvements should be made to meet baseline expectations.

6 Step 2) Final capex engagement assessment

- Should a capex programme end before the end of the price control period, the final score for that programme will be used. Otherwise, the scores for the last SIP or interim SIP assessed during the period will be used.
- We will make the final decision on scoring NERL's performance. We can deviate from the IR's score, but if we do so, we will explain why we have done so.

7 Step 3) Weighted average overall capex engagement score

- Once there is a final score for each project/programme, the weighted average score across all projects/programmes will be calculated in line with the approach described above. We presently envisage that steps (3) and (4) would take place at the price control review.

8 Step 4) Calculation of penalty (if relevant)

- The maximum penalty will be capped at a value equal to NERL's return on equity (used in the calculation of NERL's cost of capital in the price control) on its actual capex in the price control period.
- This penalty will be increasing with the level of underperformance. As any final penalty will be calculated and applied at the price control review, NERL and relevant stakeholders will have an opportunity to appeal (in addition to its procedural rights to judicial review).
- The incentive is penalty-only.

Changes to the capex plan within the period

- D20 The IR will assess the quality of NERL's engagement on its capex plan across several projects/programmes. This is important to ensure a sufficiently broad and proportional appraisal of NERL's capex engagement and to identify areas of consistent underperformance.
- D21 However, we recognise that NERL's capex programmes and projects may change over the regulatory period. If during the period the value of projects is changed, new projects are added, or projects are discontinued or deferred, it may be appropriate to adjust the weighting of projects in the overall score.
- D22 When adjusting the weighting of projects where the capex plan changes during the period:
- If the budget of a project is reduced or the project is cancelled or deferred, then it is important that NERL is held to account for the quality of its engagement with stakeholders on why the decision was made. Therefore, we may not reduce the weighting of such projects or remove them from the assessment but may keep the initial weights as they were.
 - If the budget of a project is increased, then it is important that NERL's accountability is also increased. Therefore, in these instances, we may update the value of the project in the weightings. We would then adjust all weightings such that the overall sum of weightings does not exceed 1.
 - If the overall capex plan changes significantly, we may engage with NERL and users again before deciding on more significant changes to the projects and programmes that are to be included in the scope of the scoring and/or the weighting applied to those projects and programmes.

Calculating the penalty

- D23 The incentive is focused on NERL's capex engagement, not the delivery of the capex programme. The incentive is penalty-only and, except for the impact of capex changes on opex mentioned above, relates only on engagement on NERL's capex plan.

Method for calculating penalties

- D24 The maximum penalty shall be capped at NERL's rate of return on its actual capex in the price control period. Any penalty will be implemented by either a RAB adjustment or a revenue adjustment at the price control review.
- D25 Only the final scores for each project or programme would be used to calculate the incentive. Specifically, we will use the overall capex engagement score, calculated as the weighted average final score across projects, as described above.
- D26 The penalty will continue to apply on a "sliding scale" basis to performance scoring below 3 (baseline expectations), with the maximum penalty payable if NERL's score is 1.5 or below. The penalty will increase linearly with the level of underperformance up to the maximum, at a rate of 0.1 units of underperformance with scores rounded to the nearest 0.1 decimal.